

External Credit Ratings and Bank Lending

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Abstract

We study how external, not-for-profit, credit ratings influence banks' lending decisions and firms' real outcomes. We exploit a refinement in this rating information, which makes some firms receive a rating surprise. Although this surprise does not alter firms' risk weights in banks' required capital calculation, we find that affected firms enjoy greater and cheaper access to bank credit, start new bank relationships more easily, and invest more. Banks react to the rating surprise more strongly the less they already have information on the borrower. Overall, this suggests that banks use credit ratings for their informational content. Consequently, ratings help reducing the information gap between them.

Keywords: Credit Ratings, Banks, Lending Technology, Corporate Financing, Real Effects, Hold-up problem.

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I Introduction

The information on which credit institutions rely for assessing borrowers' credit quality affects lending decisions and, consequently, firms' real outcomes. Credit ratings are opinions on borrowers' creditworthiness produced by third-party agencies, and may be a potential source of information for credit institutions. However, whether banks rely on third-party ratings for their lending decisions is not obvious: Given their superior screening and monitoring technologies, they may prefer to produce the assessment of borrowers' credit quality internally (Brealey et al., 1977; Diamond, 1984). The existing literature focuses on the use of credit ratings by capital market investors, and thus analyzes the effects of ratings for large-sized firms that obtain funding through bonds. Scant evidence exists on the use of third-party credit ratings by banks. As a result, little is known about the implications of ratings for small- and medium-sized firms that obtain funding mainly through bank loans.

This paper fills this gap and studies whether, and how, rating information influences firms' access to bank financing and corporate policies. We consider a unique setting in which a large number of small- and medium-sized firms have a credit rating. These ratings are issued by the Banque de France, the French central bank. They are available to banks, together with other firm level information, such as balance sheets and income statements. We exploit a reform of 2004 that increases the number of levels of the rating scale. Based on the new rules that make a more stringent and precise classification of firms, each firm within a rating class is assigned to newly-formed notches. The consequence is that within the same rating class some firms receive a better classification, and so benefit from a positive rating surprise vis-à-vis the others. Importantly, such rating surprises are not due to changes in the firms' fundamentals.

Our main hypothesis is that credit institutions rely on ratings for their lending decisions. We test this by studying whether the exogenous change in the rating information influences firms' credit availability. We exploit firm level data on quarterly bank debt exposure. We select a panel of firms for which Banque de France's analysts do not report any change in their judgement in the five quarters preceding the reform. By doing so, we focus on firms that most likely display similar parallel trends up to the reform. When the reform is implemented, some firms receive the rating surprise vis-à-vis the others. We employ a difference-in-differences methodology, and compare the trajectories of the firms that receive the surprise and the firms

that do not, before and after the reform. We saturate the panel with firm, industry–quarter, and rating-class–quarter fixed effects. In this way, we remove any constant firm characteristic, industry-specific business cycle, and rating class-specific dynamics. We find that exactly when they receive the rating surprise, affected firms experience a greater supply of credit. The effect is economically significant: The rating surprise implies a larger annualized flow of bank loans of approximately one fifth of the standard deviation, equivalent to about 1.2% of (lagged) total assets.

That finding is consistent with the idea that banks use the third-party certification in their lending decisions. However, it is silent on the precise mechanism at play. In particular, it does not clarify whether banks use credit ratings to learn about the borrowing firms and assess their credit quality. If that was the case, a bank should react more strongly to the rating surprise the less it already knows about the borrower. We then highlight which mechanism is at play by testing such conjecture. We consider a more granular version of the panel used above, and whose unit of observation is bank-branch-firm-quarter. This panel enables us to distinguish across bank-firm relationships along two dimensions.

The first dimension refers to the bank’s cost of collecting information and monitoring the borrower, right before the reform. In line with prior studies, we argue that the shorter the distance between the bank branch and the firm’s headquarters (Degryse and Ongena, 2005; Hauswald and Marquez, 2006; DeYoung et al., 2008; Agarwal and Hauswald, 2010), and the larger the number of loan contracts that the firm has with the bank (Mester et al., 2006; Schenone, 2009; Jiménez et al., 2009; Norden and Weber, 2010), the easier and cheaper it is for the bank to access the borrower’s information. In those cases, banks are thus more informed.

The second dimension refers to the incentives that the bank has to gather information and monitor the borrower, right before the reform. Following the literature on the syndicated loan market (e.g., Lee and Mullineaux, 2004; Sufi, 2007), we argue that the main bank—i.e., the bank that is the main source of funding for the firm—is the lender with the strongest incentives to collect information and monitor the borrower. It is thus better informed on the borrower relative to non-main banks, which free-ride (Carletti et al., 2007). Also the relative importance of a single borrower over the total lent by the bank has implications for the incentives to monitor. Typically, the greater the amount lent to the firm to the total amount lent by the bank, the

more the bank has skin in the game and thus incentives to acquire information on the firm.

We employ the difference-in-differences methodology detailed above, and interact the rating surprise dummy with the measures of bank knowledge just described. We further add bank–quarter fixed effects to absorb bank-specific lending patterns. We find that less informed lenders (i.e., banks located far from the borrower, banks with a smaller number of products with the firm, non-main banks, and banks with less skin in the game) react more strongly to the rating surprise, and adjust their loan supply more. These results indicate that banks use credit ratings to learn about borrowing firms. Moreover, they suggest that when the reform is implemented and there is a more precise classification of firms, there is a flow of information to all banks and the informational gap between lenders that directly collected information and those that did not reduces. Thus, by overall increasing banks’ knowledge on borrowing firms, the reform makes borrowers more contestable, and increases competition among banks (Hauswald and Marquez, 2003).

The fact that firms receiving the rating surprise obtain more credit especially from less informed lenders is a signal that the reform reduces the hold-up problem. Prior to the reform, better informed banks could exploit their informational advantage and lock-in their customers (Boot, 2000). However, the information released with the reform helps borrowers to avoid this informational capture. Indeed, we find that the rating surprise is also associated with a higher quarterly probability to start a new bank relationship. The effect is equivalent to an increase of almost 4%. This is a large effect, especially considering that the quarterly probability of starting a bank relationship is on average equal to 6%. The reform thus enables firms receiving the surprise to better reveal their quality to new lenders and obtain credit from them, thus reducing the power of incumbent lenders.

We conclude our analysis by studying the effects of the rating surprise on firms’ cost of debt and corporate policies. Our hypothesis is that firms receiving the rating surprise should benefit from a lower loan rate. This is because they appear better rated vis-à-vis the others, and since ratings are used by banks to measure borrowers’ creditworthiness, a better rating should imply a lower loan rate. Another reason is that there are more lenders competing to provide such firms funding. Relative to corporate policies, our hypothesis is that the relaxation of financial constraints should make the firms receiving the rating surprise 1) less inclined to

fund themselves via equity and 2) thus more able to distribute dividends, 3) less willing to store precautionary cash, and finally 4) more able to invest. We test these conjectures by employing firms' balance sheet data, which have yearly frequency. Overall, we find confirmation of our hypotheses. The rating surprise is associated with a lower cost of debt of about 15 bps. In parallel, firms receiving the rating surprise adjust their funding mix, reducing their reliance on equity relative to firms not receiving the rating surprise. Also, relative to them, they pay more dividends, store less cash, and invest more.

An important aspect of this paper is that it shows that ratings are used by banks for their informational content, and not only for their regulatory implications as previous literature emphasizes (see, e.g., Bongaerts et al., 2012; Fraisse et al., 2015; Gropp et al., 2016). The mechanistic reliance on credit ratings as a consequence of rules based on them, such as Basel II capital requirements, is well documented and a concern for regulators.¹ The reform under study realizes because the Banque de France aims to be in line with Basel II guidelines for credit rating agencies. However, we claim that our findings highlight the informational content of ratings rather than the consequence of changes in the capital requirements, for the following reasons.

First, Basel II enters into force more than two years after the reform is implemented. This also means that at the time of the reform banks are still subject to Basel I rules, which imply no link between corporate borrowers' creditworthiness and banks' required capital. Second, the Banque de France is recognized as External Credit Assessment Institution only in 2007. Thus, at the time of the reform, Banque de France's credit ratings can not be used to calculate banks' capital requirements. Third, at the time of the reform there is uncertainty on the capital charge related to each rating notch, and on whether loans to firms which receive a rating surprise bear a greater capital charge than loans to firms which do not receive the rating surprise. Fourth, we find that the rating surprise implies a greater loan supply with both maturity up to one year and maturity more than one year. Only if credit ratings carry an informational content, banks would use them for short-term loans that are repaid before Basel II enters into force. Fifth, as documented above, banks react more strongly to the rating surprise the less they know about the borrower. Such reaction is compatible only with a story where ratings are used

¹Regulators tried to remove rules which triggered mechanistic reliance on ratings for assessments of creditworthiness (see, e.g., section 939A of the Dodd-Frank Wall Street Reform and Consumer Protection Act and Art. 5b(1) Regulation (EU) No 462/2013 of the European Parliament).

for their informational content: Otherwise, banks should adjust their supply irrespectively of the information they already have.

Overall, this paper highlights a novel mechanism for the provision of bank financing: Banks use external credit ratings for their informational content in their lending decisions; as a result, ratings impacts 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 lending, under which lending decisions are based on hard information (e.g., credit scoring), and relationship lending, which is based on soft qualitative information directly acquired by the bank. This paper sheds light on a new type of lending technology under which banks rely on both hard and soft information gathered and processed by a third-party certifier. The fact that banks prefer to outsource the assessment of their small- and medium-sized corporate borrowers to a rating agency is a key and novel result: This is surprising especially considering that banks have sophisticated monitoring and certification skills and, unlike rating agencies, have skin in the game. We also highlight that the use of rating information favors the competition among lenders and reduce the hold-up problem.

Although our research question shares similarities with other studies on the effects of credit scoring on bank lending (Berger et al., 2005), 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. As such, while the increase in competition induced by the use of credit scoring raises concern for the reduction in the use of soft information (Bolton et al., 2016; Hombert and Matray, 2016), the lending technology we highlight still incorporates this information.

In the second strand of literature, prior studies show how credit ratings increase the availability of debt (Faulkender and Petersen, 2005; Sufi, 2007), how firms' investment and debt change according to the outstanding rating (e.g., Lemmon and Roberts, 2010; Chernenko and Sunderam, 2011; Almeida et al., 2017), and how more precise Moody's rating information impacts the cost of capital (Kliger and Sarig, 2000; Tang, 2009). 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-sized enterprises to obtain bank financing. Second, 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., Jiang et al., 2012; Bolton et al., 2012; Stahl and Strausz, 2017). 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 a better allocation of credit. Moreover, we show that the existence of a system of credit ratings can increase competition in the banking sector. However, this system is *per se* not sufficient to benefit borrowing firms and the economy. It must be that credit ratings are precise enough to distinguish across borrowers. This re-opens the debate on what is the optimal level of ratings' granularity and the fact that a rating scale with a continuum of notches might be optimal (Goel and Thakor, 2015).

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 rating surprise on firms' access to bank credit, ability to start a new bank relationship, funding mix, and capacity to invest. It also implements a battery of tests to understand if credit ratings are used by banks precisely because of their informational content on firms. Section V discusses the results and their implications. Finally, Section VI concludes.

II Institutional Framework

A The Banque de France's Credit Rating

Since its inception, the Banque de France has performed corporate credit risk analysis. This activity eventually brought the Banque to assign credit ratings to firms. In principle, all firms whose headquarter is located in France may be rated by the Banque de France. In practice,

only firms with total sales greater than €0.75 million receive a credit rating.² The Banque de France's credit rating refers to the firm and not to the single debt instruments this may have contracted. Importantly, firms do not pay to be rated by the Banque de France. The rating is not public, but each firm is informed about its own.

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 region. The analysts base their assessment combining hard and soft information. Hard information comprises accounting and financial data (from tax returns), trade bill payment incident data, data on bank debt exposures (credit register data), and descriptive data on the firm's legal form, managers, location, and so forth. Soft information derives from the interviews conducted by the analysts to the management of each firm. This part of analysis thus involves 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 —such as a payment default on trade bills— is brought to the attention of the analysts. Revisions happen, in particular, when the statistical analysis highlights significant changes. Firms' financial statements thus constitute the most important input for the modification of the rating.³

Until April 2004, the rating scale comprised four 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 analysts had no information to base the assessment.

The main users of Banque de France's credit ratings are credit institutions. They access the ratings on demand and remotely through the information system of the Banque de France. This information system gives access to the database FIBEN (*F*ichier *B*ancaire *d*es *E*ntreprises): This comprises firms' credit ratings, as well as other firm level information, such as the income statement and the balance sheet. In parallel, credit institutions also have access to the credit register data, and can see the total amount borrowed by a firm, thus assessing the stake of other lenders. Overall, this implies that the credit rating is only part of the information that the Banque de France disseminates on firms. The consultation of each of the pieces of information entails the payment of a fee.

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

³Filing financial statements and depositing them to commercial courts are mandatory by law. If a firm decides not to deposit its financial accounts, it incurs a fine of €1,500.

In the period under analysis, and still currently, one reason Banque de France's ratings may be used by banks refers to how monetary policy is implemented. Monetary and financial institutions can in fact obtain Eurosystem refinancing by pledging as collateral the credit claims that they hold on companies, provided that these have sufficiently high credit ratings. Banque de France's ratings are not the only ratings that serve this purpose, but often are the only ratings that French SMEs have. To have a sense of the importance of this activity, in the period that we consider, bank loans represent around 40% of the total volume of collateral pledged by French banks for refinancing operations.

B The Reform of the Rating Scale of April 2004

The Basel I accord of 1988 prescribed that all credit claims that a bank had on the corporate sector belonged to the same risk category, and would not be differentiated depending on their actual credit quality. For a bank, a €100 loan to a sound and well-rated firm thus entailed the same capital charge as a €100 loan to a significantly less sound and well-rated firm.

In the early 2000's, it appeared the need to define a more appropriate measure of the credit risk borne by banks, with particular attention to the heterogeneity across borrowers. The Basel Committee thus started to conduct discussions on how to modify existing rules so to strengthen the soundness and stability of the international banking system. 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.

Major innovations of the Basel II accord were the link between banks' capital requirements and corporate borrowers' credit quality, and the possibility offered to banks to use external credit ratings to measure borrowers' creditworthiness. During the discussions on the new framework, it arose that the Banque de France's rating scale, while methodologically coherent, was too coarse to be used to compute the McDonough ratio, the new solvency ratio suggested by the Basel Committee. Indeed, the firms rated '3' and '4' accounted for nearly 70% of the total of the firms rated, and would not enable to distinguish enough across corporate borrowers. As a consequence, the Banque de France decided to adapt its rating scale to fit the requirements

imposed by the new regulation. Eventually, the Banque became recognized by the banking supervisors as an External Credit Assessment Institution in 2007, and its ratings could then be used to compute the McDonough ratio.

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 appeared rated accordingly.

The reform of the rating scale consisted in a refinement of the original rating classes, and in the introduction of three new rating levels accounting for different frequencies of default on trade bills. Figure 1 illustrates the changes that occurred during the refinement process. After the reform, the rating scale includes eleven positions. The important changes for the analysis that follows are that rating class '3' is split into three new subcategories labelled '3++', '3+', and '3', rating class '4' is split into two new subcategories labelled '4+', and '4', and rating class '5' is split into two new subcategories labelled '5+', and '5'.

To achieve the rating scale refinement, the analysts elaborated finer rules to distinguish across firms. Specifically, within each rating class, the new methodology introduced new thresholds for selected financial ratios. For example, the equity ratio, the EBIDTA margin (earnings before interest, tax, depreciation and amortization divided by total revenue), and the Banque de France's *credit score*. The Banque de France's credit score is an estimation of the firm's probability of failure over a 3-year horizon. It is computed by applying an internal model of the Banque de France on the basis of hard information such as level and cost of financial debt, balance sheet structure, profitability, solvency and growth (see Bardos, 1998; Avouyi-Dovi et al., 2009). The higher the score, the higher is the firm's probability of default.

Clearly, the higher the equity ratio and the EBIDTA margin, and the lower the Banque de

France’s score, the better the firm’s creditworthiness. Thus, firms falling above the established thresholds for the equity ratio and the EBIDTA margin and below the threshold for the Banque de France’s score were more likely to receive the rating surprise at the moment the reform was implemented. However, the thresholds were only a benchmark and the assignment of the rating surprise was not mechanical. Each analyst could decide to assign the rating surprise even if the firm’s financial ratios fell below or above the relevant thresholds. Such decision could be based on the soft information the analyst obtained, but had to be justified and motivated.

The important aspect of the reform is that firms in the new subcategories ‘3++’, ‘3+’, ‘4+’, and ‘5+’ appear to benefit from an exogenous change in their rating level—i.e., a rating surprise—relative to firms in the subcategories ‘3’, ‘4’, and ‘5’. Such rating surprises are due to the exogenous change (refinement) in the Banque de France’s opinion and do not depend on changes in the firms’ underlying fundamentals.

An important note is that firm loans’ *eligibility* as collateral in Eurosystem refinancing operations was not altered by the rating reform: all firms which were eligible remain eligible after the reform. This is important because, otherwise, changes in the eligibility of the (loans to) firms may influence the loan supply of credit institutions (Cahn et al. (2017), and Mésonnier et al. (2017)).

III Data

Our analysis exploits administrative data on small- and medium-sized enterprises, which are collected by the Banque de France and are included in the FIBEN database. We focus on firms that are rated by the Banque de France, and thus whose turnover exceeds €0.75 million. More particularly, we make use of two datasets. The first is the **Service Central des Risques** dataset, which is the French credit register. The second is **FIBEN Bilans**, which includes firm level balance sheet and income statement information. Both datasets are merged with the firms’ 3-digit industry information.

A Credit Register Data

The credit register collects bilateral credit exposures between resident financial institutions and non-financial corporations, with monthly frequency. In the period under analysis, a bank

reports individual credit exposures of all its client firms when the total exposure per firm is larger than €76K. Total exposure includes drawn and undrawn credit, as well as guarantees granted by the bank. The part of credit effectively drawn can be categorized with maturity either up to one year or more than one year.

In our baseline analysis, we collapse the register to have a firm-quarter unit of observation. We construct four variables: the quarterly flow of total bank loans, the quarterly flow of short-term loans, the quarterly flow of long-term loans, and the new bank relationship dummy. The first three variables are defined, respectively, as the quarterly change in the sum of drawn and undrawn credit, the quarterly change in credit with maturity up to one year, and the quarterly change in credit with maturity greater than one year, all 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 occurrence of a new bank-firm relationship for a given firm. A potential pitfall of this dummy variable comes from the fact that the credit register only reports exposures greater than €76K. Thus, the first occurrence of a bank-firm link in the data may not be the actual first occurrence 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.

Our analysis also exploits the heterogeneity existing across bank-firm relationships. In that case, we consider a version of the credit register data with a more granular unit of observation, which becomes bank-branch-firm-quarter. We construct measures of the knowledge that a given bank has on a firm along two dimensions.

First, the bank's screening and monitoring cost: proxies include the geographical distance between the bank branch and the firm's headquarters and the number of loan contracts the bank has with the firm. So, the dummy '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, and 'N products with the bank' is the number of loan products (e.g., leasing contracts, mortgages, etc.) that the firm has with the bank.

⁴Since 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.

Second, the incentives the bank has to screen and monitor the firm. Conditionally on the firm having more than one bank relationship, proxies include the proportion of lending given by that particular bank to the total borrowed by the firm ('bank importance in the pool of lenders'), whether that bank is the main bank for the firm and so the previous proportion reaches the highest value across the relationships the firm has ('main bank'), and the proportion of lending to that firm to the total amount lent by the bank ('firm importance in the pool of borrowers').

Our empirical analysis focuses on rating classes '3', '4', and '5'. Our cleaning strategy works as follows. Firms are tracked from five quarters before the policy change to four quarters after it. We select firms that in the five quarters before 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 judgement. By doing so, we ensure that there are no appreciable changes in firms' fundamentals and firms are likely to follow a similar parallel trend up to the reform. After the reform, some firms receive the rating surprise, while others do not. Variables are winsorized at the 1st and 99th percentiles.

B Firm Accounting Data

FIBEN Bilans includes corporate balance sheet and income statement data with yearly frequency. We merge this information with the firms' credit score information. We exploit this dataset when we analyze the effect of the rating surprise on firms' cost of debt and real outcomes. We thus construct the following variables. The yearly flows of bank debt, equity, and cash, obtained as yearly changes in the value of 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 unit of observation of the panel is firm-year. Note that FIBEN Bilans reports the outstanding amount of every item even if it is nil. This enables us to have a more complete set of firms relative to one from the credit register data, which includes firms whose total exposure with a given bank is greater than €76K.

Firms are tracked from two years before the policy change to the first year after it. Similarly to before, we retain firms that in the two years before the reform belong to the same rating class and for which Banque de France's analysts do not report any change in their appreciation. We

also impose that until the reform selected firms do not have a significant change in their Banque de France’s credit score.⁵ As before, these conditions ensure that there are no appreciable changes in firms’ fundamentals before the policy change and firms are likely to follow a similar parallel trend. Variables are winsorized at the 1st and 99th percentiles.

C Summary Statistics

Table I provides the summary statistics of the baseline credit register sample (first four rows in each panel) together with the balance sheet sample (subsequent rows). The table reports the statistics separately for each rating class. The baseline credit register panels runs from five quarters before the policy change to four quarters after it, making a total of nine quarters. This means that the roughly 121,000 observations (across all rating classes) represent about 13,500 firms. Conversely, the roughly 50,700 observations of the balance sheet panel represent about 17,000 firms tracked over three periods. The balance sheet panel includes more firms because there is no collection threshold as in the case of the credit register sample, where the total exposure of a firm with a bank needs to be greater than €76K.

Overall, the summary statistics indicate that firms in rating class ‘3’ are typically larger and older, with average total assets of about €8.6 millions. The 95th percentile of the distribution of total assets is below €15 millions, indicating the small- and medium-sized nature of the firms in the sample.⁶ 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 Banque de France’s score increases, confirming that firms in rating class ‘5’ have a higher probability of failure.

Table II reports instead the summary statistics of the cross-section of bank-firm relationships existing at the end of the first quarter of 2004, i.e. right before the reform is implemented. The number of relationships in the sample is about 31,000 (all rating classes). We find that only in less than .1% of cases firms borrow from a bank located in a different town. This happens more often for firms in rating class ‘3’, and so with greater creditworthiness. The number of products

⁵In fact, we could not impose this condition in the credit register sample since the release of the the Banque de France’s credit score happens yearly, when the balance sheet is reported. This implies that in the five quarters before the policy change, which is the period considered as pre-reform in the credit register sample, most firms have only one value of score available.

⁶According to the European Commission, the category of small- and medium-sized enterprises includes individual enterprises which employ fewer than 250 persons and which have an annual turnover not exceeding €50 million, and/or total assets not exceeding €43 million.

a firm has with a bank is on average less than 2. Consistently with the numbers reported in (Ongena and Smith, 2000) for European countries, the majority of firms in our sample have more than one bank relationship: the average number is slightly greater than 2 for all rating classes. These figures provide a rationale for focusing on the heterogeneity existing within the pool of lenders to the same firm.

IV Empirical Analysis

The main question we ask is whether, and how, banks use third-party credit ratings for their lending decisions. Our hypothesis is that credit ratings carry an important informational content for banks, and help them screening borrowers. We test this hypothesis by studying the effects of the 2004 rating scale reform on firms' access to bank credit. We first look at whether firms that receive a rating surprise benefit from greater loan supply after the reform. Then, we implement a battery of tests to understand if credit ratings are used by banks precisely because of their informational content on firms. Finally, we show the implications of credit ratings for firms, in terms of ability to start new bank relationships, funding mix, and capacity to invest.

A Do Banks Use The Third-Party Credit Ratings For Their Lending Decisions?

We start our analysis by focusing on the first of the margins mentioned above: we study if firms that receive a rating surprise have more bank credit offered. In principle, the reform discloses that such firms are relatively better, thus pushing banks to revise their information sets and loan supply schedules. However, the rating surprises might have limited content for banks. The reason is that banks have a superior screening technology, and may have already distinguished across firms within each rating class before the reform. According to this alternative hypothesis, the rating surprises are redundant information for banks.

As a first pass at testing these two competing hypothesis, we conduct a graphical analysis on what are the effects of the 2004 reform on firms' access to bank credit. We consider the quarterly data on firms' bank debt exposures. The relatively high frequency of this dataset enables us to precisely time the changes in firms' credit supply, 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 assigns some firms a rating surprise (either the ‘+’ or the ‘++’). We group firms depending on whether after the reform they receive the rating surprise or not. We regress the quarterly flows of bank loans over firm and industry \times quarter fixed effects, and take the average of the resulting residuals within each group of firms and quarter.

Figure 2 plots the dynamics of the two groups of firms. The group of firms that will not receive the surprise is defined by the solid black line. The group of firms that will receive the rating surprise is described by the dotted red line. The vertical red line identifies the implementation of the reform. The figure shows that up to the implementation of the reform, the two groups have very similar parallel dynamics. However, exactly when the reform is implemented, firms that receive the rating surprise have a rapid increase in the bank credit offered, especially with respect to firms that do not receive the rating surprise. This preliminary evidence suggests that banks base their loan supply decisions on the third-party credit ratings.

We provide an econometric counterpart to the graphical analysis just presented. We structure a difference-in-differences model that writes:

$$\frac{\text{bank loans flow}_{jq}}{\text{total assets}_{jq-1}} = \beta \text{rating surprise}_{jq} + \eta_{\text{industry}_j;q} + \eta_{\text{rating class}_j;q} + \eta_j \quad (1)$$

where $\frac{\text{bank loans flow}_{jq}}{\text{total assets}_{jq-1}}$ is the normalized flow of bank loans. $\text{rating surprise}_{jq}$ denotes if firm j has received the rating surprise at quarter q . $\eta_{\text{industry}_j;q}$ identifies industry–quarter fixed effects, $\eta_{\text{rating class}_j;q}$ identifies rating-class–quarter fixed effects, while η_j is the firm fixed effect.

The parameter of interest of equation (1) is β . It captures the effect of receiving the rating surprise on the credit supply to the firm. Its identification works by comparing firms that following the rating scale reform receive the rating surprise, with firms that do not. Note that the rating surprise does not depend on changes in the firm’s fundamentals, but it is due purely to the refinement of the rating scale.

Importantly, we saturate the model with a set of fixed effects. Industry–quarter fixed effects control for differences across industry dynamics. Rating-class–quarter fixed effects control instead for differences in the dynamics between rating classes. Including them implies that the effect of the rating surprise is identified *within* each rating class, by comparing firms that receive the surprise with those that do not. Finally, firm fixed effects control for firm characteristics

that are not time-varying in the period analyzed.

Table III, first column, reports the estimated coefficients. We find that following the implementation of the reform, firms that receive the rating surprise experience a greater supply of bank credit. The effect is economically significant: it implies a greater annualized flow of bank loans equivalent to about 1.2% of lagged total assets. The exogenous rating surprises are not redundant information: banks do take them into account when they supply credit.

Of course, what we estimate is the differential effect of receiving the rating surprise vis-à-vis not receiving it. This means that we can not say that it derives purely from firms that receive the surprise, with firms not receiving it not being affected by the reform. In fact, the reform enables banks to better distinguish firms within a pool. So, even if the reform does not modify the name of all rating notches, the value of being rated ‘3’, ‘4’, or ‘5’ after the reform is different from its value before the reform. This is because each of such notches does not include anymore the firms that after the reform appear with a ‘+’ or a ‘++’. However, this does not change the bottomline of our results: The fact that after the reform the two groups of firms have a differential dynamics in the bank credit offered implies that banks base their lending decisions on the credit rating.

The results of Table III are however silent on the precise mechanism that relates the rating surprise with the greater loan supply. Our hypothesis is that credit ratings carry an informational content on the firms. Therefore, when firms receive the ‘+’ or the ‘++’, banks learn something positive and new about them, and provide more credit. The following subsections present a battery of tests to characterize whether this is actually the case.

A.1 Do Banks Learn About Borrowers From The Third-Party Credit Ratings?

One mechanism alternative to the informational content of ratings refers to the fact that the 2004 rating reform is implemented by the Banque de France to comply with future Basel II requirements. It might be that the rating surprises alter banks’ loan schedules because banks anticipate that loans to firms which receive the rating surprise will have lower capital charges when Basel II requirements become operational.

This alternative hypothesis has, however, severe limitations. First, as described above, Basel II requirements enter into force only on July 20, 2006, which is more than two years past the

implementation of the rating reform. It is thus unlikely that banks select firms based on an event relatively far in the future. This also means that at the time of the reform banks are still subject to Basel I rules, which imply no link between banks' capital charge and borrowers' creditworthiness. Second, in 2004, it is not clear that the Banque de France would later become an External Credit Assessment Institution. So, at that time, there is a non-negligible probability that its ratings would not be useful to calculate the capital charges in the future. Third, in 2004, there is uncertainty on the precise capital charge that each new notch implies under Basel II. As a consequence even if a firm receives the rating surprise, it may end up having the same capital charge of a firm that does not receive the rating surprise.

Nevertheless, we can rule out the hypothesis based on banks anticipating Basel II requirements by studying whether our results depend on the maturity of the loans considered. If our earlier results depend on banks anticipating Basel II capital charges, the effects should be mainly with loans of longer maturity. Only in those cases, in fact, the bank still has loans lent in 2004 on its balance sheet when Basel II requirements enter into force. Alternatively, if credit ratings have an informational content and the reform leads to a flow of new information to banks, the effects should be even across loans with different maturity.

The credit register data distinguishes loans with maturity up to one year from loans with maturity greater than one year. We study the effect of the rating surprise on the flows of loans in these two categories using equation (1). The second and third columns of Table III report the estimated coefficients. The rating surprise leads to greater flows of both short term and long term bank loans. The fact that the rating surprise implies a greater flow of loans with maturity up to one year rules out the mechanism with banks anticipating Basel II requirements. Rather, it favors the idea that the reform increases banks' knowledge on borrowing firms.

What these results do not dismiss refers to the fact that the credit ratings under study are produced by the central bank. Even if the French central bank has no direct supervisory power on the banking system, its ratings may have a disciplining effect on credit institutions and be taken as benchmark to measure firms' credit quality. After the implementation of the reform, credit institutions may thus be more willing to lend to firms that receive the rating surprise as these are certified by the Banque de France to be relatively better. This 'disciplining' hypothesis is alternative to the 'learning' hypothesis, which rather suggests that banks use credit ratings

to learn about the borrowers and so that the rating reform increases banks' knowledge on firms. The following Subsection tests which mechanism is actually at play by studying *in what cases* banks adjust their loan supply more following the rating surprise, and so in particular when they use the external credit ratings.

A.2 When Do Banks Use The Third-Party Credit Ratings?

We analyze when the rating surprise has a stronger bite on lending decisions (i.e., in what cases banks make greater use of the external credit ratings). Under the disciplining hypothesis outlined above, banks take Banque de France's credit ratings as benchmark to measure firms' credit quality. So, they should shift their loan supply for *all* firms that receive the rating surprise, and the effects should be uniform across bank-firm relationships. Conversely, under the learning hypothesis, which suggests that the reform increases banks' knowledge on borrowing firms, the effect should be stronger the less a bank already knows about a firm.

We test these competing hypotheses using the uncollapsed version of the credit register data and distinguishing across bank-firm relationships. As detailed in Section III, we measure the knowledge a bank has on a given firm by two dimensions: the bank's screening and monitoring cost, and the incentives the bank has to screen and monitor the firm.

We expect that the greater the distance between the bank branch and the firm, the harder it is for the bank to screen and monitor the firm, and the less the bank knows about the firm. Conversely, the larger the number of loan contracts through which the firm borrows, the more the bank monitors if the firm repays each loan in due time, and the greater the knowledge it accumulates on the firm.

As for the second set of measures, when the firm borrows from more than one bank, the non-main lenders may free-ride on the main lender for monitoring. Thus, the lower the proportion of lending given by the bank to the total borrowed by the firm, the greater the incentives of the bank to free-ride and not monitor the firm, and the less the bank learns about the firm. On the opposite, the main bank does not free-ride, and accumulates more information on the firm. Finally, the greater the lending to the firm to the total amount lent by the bank, the more the bank has skin in the game and incentives to monitor the firm, and therefore the more the bank knows about the firm.

We use the same difference-in-differences model used in the baseline regression, and interact the rating surprise dummy with the proxies detailed in Section III. We run the regressions over the sample of bank relationships existing right before the reform is passed. We include bank–quarter fixed effects so to capture any bank-quarter specific shock that may affect a bank’s loan supply.

Table IV reports the estimated coefficients for what relates to the measures of the bank’s screening and monitoring cost. The rating surprise has stronger effects the greater the distance between the bank branch and the firm—i.e., when the the firm is headquartered in a different town than where the bank branch is located—and the fewer the number of borrowed loan contracts. This indicates that the rating surprise has stronger bite when, until the reform, the cost to screen and monitor is higher, and so when the bank has less information on the firm.

The results on the measures of the bank’s incentives to screen and monitor are in Table V. The first two columns, which report the effects of ‘bank importance in the pool of lenders’ and ‘main bank’, are based on the sample of firms that borrow from more than one bank at the same time. This is to avoid the non-interesting cases in which there is no pool of lenders but just one bank. The estimated effects indicate that the lower the bank’s incentive to screen, and thus the less the bank knows the firm, the stronger are the effects of the rating surprise.

Overall, both Table IV and Table V reject the mechanism based on Banque de France’s ratings disciplining banks’ lending decisions. Rather, they lead to the idea that the rating reform increases banks’ knowledge on firms: Since banks learn something new especially when they have little prior information, it is in those cases that their loan supply schedules change more.

The evidence provided so far indicates that: *i*) Banks use the third party ratings for their lending decisions, *ii*) Credit ratings increase banks’ knowledge on firms, and *iii*) Banks use the credit ratings particularly when their prior information is modest. Given this, the next subsection focuses on the firms’ side and studies how the rating surprise affects corporate policies.

B The Effects of Third-Party Credit Ratings On Corporate Policies

B.1 Probability of Starting a New Bank Relationship

The results of the previous Subsection indicate that it is the non-main banks that adjust the supply the most following the rating surprise. This is suggestive of the fact that the rating surprise reduces the hold-up problem. In general, because the main bank has a lot of information on the firm, it has the ability to charge higher rates, which results in a lower quantity borrowed. Our findings claim that when the firm receives the rating surprise, there is a flow of information to other lenders, and the power of the incumbent bank decreases. Since the results of Table VI are derived from bank-firm relationships that already exist when the rating reform is implemented, they address the intensive margin of this mechanism. Then, there is an extensive margin that entails the ability to start new bank relationships.

We study if the rating surprise affects firms' ability to start new bank relationships. We tackle this question using the following conditional fixed effects Logit model:

$$Pr(\text{new bank } rel_{jq} = 1|\cdot) = \Lambda(\gamma \text{rating surprise}_{jq} + \eta_q + \eta_j) \quad (2)$$

where *new bank rel_{jq}* is a dummy that takes the value of 1 when firm *j* starts a new bank relationship (as defined in Section III) in quarter *q*. Λ is the Logistic function, *rating surprise_{jq}* denotes if firm *j* has received the rating surprise 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 VI. We find that the rating surprise is associated to a larger probability of starting a new bank relationship. This result holds with both the conditional Logit and the linear probability model. In terms of magnitude, the rating surprise leads to a

larger probability of almost 4% (as obtained from the conditional Logit). This is a large effect, especially considering that the quarterly probability of starting a bank relationship is on average equal to 6%.

These results corroborate the idea that the third-party credit ratings ease the hold-up problem. Not only firms have a greater supply of loans from existing banks, but they also have a greater ability to start new bank relationships. The reason is that credit ratings carry valuable information on firms for banks, thus reducing the cost of screening prospective borrowers.

The remaining questions include how credit ratings affect the cost of bank debt, and more generally corporate policies. For instance, given the greater access to bank credit following the rating surprise, how do firms compose their funding mix? Do they invest more?

C Cost of Bank Debt, Funding Mix, and Investment

We investigate how the rating surprise affects the cost of bank debt, the funding mix, and the investment. Our hypotheses are the following. We expect that firms receiving the rating surprise have a lower cost of debt. This is because such firms appear better rated vis-à-vis the others in the same rating class. And, since banks use the external credit ratings to measure borrowers' creditworthiness, a better rating should imply a lower loan rate. Another reason is that, as detailed above, the rating surprise is associated to more competition among lenders, and this should imply lower rates charged. Relative to corporate policies, our hypothesis is that the easier access to bank funding should make the firms receiving the rating surprise less inclined to fund themselves through equity (i.e., retained earnings), and consequently more able to distribute dividends. In addition, the relaxation of financial constraints should make such firms less willing to store precautionary cash, and more able to invest.

The analysis of the cost of bank debt and corporate policies can be conducted only at yearly frequency, when firms report their balance sheet. Measuring the effect of the rating surprise on the cost of bank debt complements the effects on bank credit supply. We thus start by a graphical analysis similar to the one performed in Subsection A. We focus on the period that goes from two years before the reform to the first year that follows. We group firms depending on whether after the reform they receive a rating surprise or not. We regress the loan rate over

firm and industry \times quarter fixed effects, and take the average of the resulting residuals within each group of firms and year.

Figure 3 plots the dynamics of the two groups. As in Figure 2, the group of firms that will not receive the surprise is defined by the solid black line, while the group of firms that will receive the rating surprise is described by the dotted red line. The vertical red line identifies the implementation of the reform. Up to the implementation of the reform, the two groups have similar parallel dynamics. When the reform is implemented, however, firms that receive the rating surprise have a marked decrease in the loan rate paid, especially with respect to firms that do not receive the rating surprise. This is suggestive that the reform not only acts on the quantity of credit but also on its price.

We now more formally explore the effects of the rating surprise on the loan rate, and also on the yearly flows of bank loans, equity, and cash, normalized investment, and dividends paid, based on model (1). Differently from the analysis based on the credit register, in this case the data have yearly frequency, and we consider firms from two years before the reform to the first after it. Note that the reason we still look at the flow of bank loans is for robustness. In fact, balance sheet data report the actual total amount of loans borrowed, and not only the sum of those above the threshold of €76K, as it results from using the credit register data.

We present the estimation results in Tables VII and VIII. The estimates confirm that the rating surprise is associated with a lower loan rate paid. The effect is of the order of 15 basis points. This confirms our initial hypothesis. Moreover, Table VII corroborates the results on the quantity of loans presented earlier. The rating surprise is related to a greater yearly flow of bank loans, with a magnitude consistent with the one presented in Subsection A obtained exploiting the quarterly credit register data.

The greater and cheaper access to bank credit has important consequences on firms' funding mix and investment. First, the rating surprise leads to a lower reliance on equity as a funding source. In fact, for every extra dollar received through bank loans, there is an equal reduction in the flow of equity. Consequently, firms receiving the rating surprise have a greater distribution of dividends. Finally, the surprise leads to less cash stored and, correspondingly, greater investment.

Overall, these results confirm our hypotheses. Once bank credit becomes more available,

there is less need to obtain financing through equity and keep precautionary amounts of cash to be used in case of need. Rather, the firm has more ability to invest and remunerate equity holders. These findings clarify the importance of external credit ratings in affecting corporate policies.

V Discussion

Our findings indicate the importance of external credit ratings in lending decisions, especially in those cases in which banks have limited information on the borrowing firms. Since credit ratings are available in FIBEN together with other firm level information, a central question refers to what *additional* information credit ratings carry relative to what an analysis of available hard information (e.g., financial ratios) provides. This question can be further detailed as: Was the rating surprise predictable based on firms' fundamentals? Do banks react to the rating surprise because this discloses positive soft information?

We provide an answer to the first question by checking to what extent the firms receiving the rating surprise could be identified in advance by banks using the information available on the FIBEN database. We compare firms that later receive the rating surprise with later unaffected firms, right before the reform. This comparison is done within each rating class, and is based on the following firm characteristics: equity over total assets, tangible assets over total assets, cash over total assets, return on assets, Banque de France's score, and log total assets.

The results are in Table IX. Within the three rating classes, the firms that later receive the rating surprise 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. Their greater creditworthiness could thus be identified by banks before the reform, at least to some extent. However, since these firms obtain more and cheaper credit exactly at the time of the rating surprise, our results suggest that banks did not identify them in advance.

Table IX seems to indicate that our results especially derive from banks that use the credit ratings as main input and that do not process other available information. This is not surprising. In fact, our findings also indicate that the greater loan supply comes in particular from banks that have limited incentives to screen the borrowing firms in the first place. In those cases, banks do not screen the borrower thoroughly. This means that they may react to positive news

only when this is simple to process and access. That is, for example, a positive surprise in the credit rating.

To provide an answer to the second of the questions asked above, and better characterize what additional information the rating surprises carry, we repeat part of our analysis using a propensity score matching methodology (instead of the baseline difference-in-differences methodology). The idea is to check if across firms with *similar* observable fundamentals, those receiving the surprise experience greater and cheaper loan supply than those not receiving it. Since their fundamentals are similar, what changes between them is either the simple fact of appearing with the rating surprise and thus looking better than firms which do not receive it, or unobservable positive soft information that makes the first receiving the rating surprise, or both.

The metric to measure similarity across firms is the propensity score. This is function of the following before-the-reform characteristics: 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), industry, and rating class. The matching procedure is done with replacement, which means that each firm that does not receive the rating surprise can be used as a neighbor for several 'treated' firms, which receive the surprise. We take the closest five firms not receiving the rating surprise as control for each treated firm receiving the surprise.

We then study the effect of the rating surprise on different outcome variables: the change in the normalized flows of bank loans, equity, and cash, the change in normalized investment and dividends, and the change in the loan rate. Such changes are obtained by differencing the values of the variables of interest before and after the reform. By looking at the changes, the effect of the rating surprise we measure is on the dynamics of the variable of interest rather than on its level, and it has the same interpretation of the difference-in-difference estimates obtained including firm fixed effects.

The resulting estimates appear in Tables X and XI. The effects are very similar to those obtained in the difference-in-differences regressions. Similar firms before the reform have different outcomes after the reform, and this depends on whether they receive or not the rating surprise. These findings have two implications. First, they suggest that our difference-in-differences results were not driven by differences in trends due to firms' fundamentals before

the reform. Second, we cannot rule out that banks react to the rating surprise because it makes the firms' fundamentals being more easily processable by banks or because it discloses positive soft information.

Both mechanisms are consistent with the findings of Section IV. On the one hand, banks with lower incentives to screen a borrower may react more to the rating surprise because this is simple to process and access, even if it is mainly a repackaging of available hard information. On the other hand, the soft component of the rating surprise may be the first motive of reaction of banks located far away from the borrower, which have lower ability to collect soft information (Degryse and Ongena, 2005; Agarwal and Hauswald, 2010).

Having characterized which banks react to the rating surprise and what this discloses to them is important to derive the policy implications. One policy concern is that because they have the possibility to use the Banque de France's credit ratings to screen borrowers, banks become 'lazy'. What we show is that it is especially banks with limited incentives to screen firms to react to the rating surprise. These banks choose not to gather thorough information and absent the reform they would be less informed. Thus, even if these banks over-rely on these ratings, the reform increases their knowledge, and this is a positive effect.

On another note, we can argue that credit ratings on small- and medium-sized firms help reducing the informational gap between banks. In effect, a major result of this paper is that external ratings decrease the power of incumbent lenders and increase bank competition. This increase in competition differs from the one induced by the use of credit scoring, or more broadly, by technological progress (Hauswald and Marquez, 2003; Berger et al., 2005; Sutherland, 2018). Such studies document that as technology improves, banks increase the use of transaction lending. But this implies a reduction in the use of soft information and thus the loss of its benefits (Bolton et al., 2016; Hombert and Matray, 2016). In our case, instead, since credit ratings are a combination of both hard and soft information, the induced increase in competition does not come at the cost of the disappearance of soft information.

Finally, DeYoung et al. (2008) show that greater credit supply may be triggered by loans to riskier borrowers. This is not the case in our setting. Indeed, the greater supply is targeted to firms receiving the rating surprise, which are firms with better creditworthiness. In fact, Table IX indicates that firms that subsequently receive the rating surprise have a smaller flow of bank

debt, and rely overall more on equity as a funding source, right before the reform. We thus argue that the refinement of the rating scale allowed to reach a better allocation of credit with important effects on the firms' real outcomes. In this sense, we shed light on a bright side of the banks' reliance on credit ratings.

To conclude, the existence of a system of credit ratings is *per se* not sufficient to benefit borrowing firms and the economy. It must be that credit ratings are precise enough to distinguish across borrowers. This opens the debate on what is the optimal level of ratings' granularity and the fact that a rating scale with a continuum of notches might be optimal (Goel and Thakor, 2015).

VI Conclusions

We study how rating information influences firms' access to bank credit and corporate policies. We consider a unique setting in which a large number of small- and medium-sized firms have a credit rating issued by the Banque de France, the French central bank. Such ratings are available to credit institutions. We exploit a reform that increases the number of notches of the credit rating scale. The consequence is that within the same rating class some firms receive a positive rating surprise, despite not having changes in their fundamentals.

Consistently with the hypothesis that banks base their lending decisions on the third-party ratings, we find that firms receiving the rating surprise enjoy greater and cheaper access to bank credit. In particular, we find that such firms receive more credit from previously less informed banks, such as banks located far from the firm and non-main banks. In addition, these firms are also more likely to start new bank relationships. These results suggest that external rating information can reduce the hold-up problem and increase bank competition.

We also investigate the effect of the rating surprise on corporate policies. We find that firms receiving the rating surprise rely less on equity, store less cash, invest more, and pay more dividends relative to unaffected firms.

Overall, this paper highlights the importance of external credit ratings for the provision of bank financing. We show that lenders' reliance on this information can have important consequences for borrowers' real outcomes and the competition among lenders.

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VII Figures

Figure 1

The rating scale reform of April 2004

This figure depicts 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.

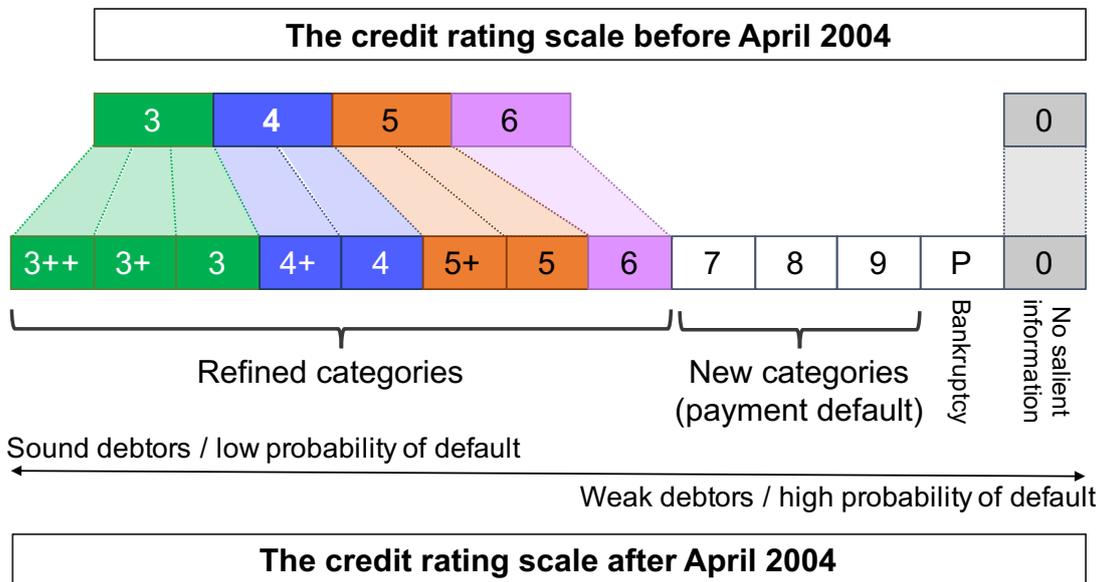


Figure 2

Flow of bank loans around reform

This figure plots the average residuals in the quarterly flow of bank loans depending on the distance from the implementation of the reform. The residuals are obtained with respect to firm and industry \times quarter FEs, which control for time-invariant firm unobservables and industry dynamics. The policy change is identified by the vertical red line between quarter 0 and quarter 1. Firms are grouped depending on whether after the policy change receive the rating surprise or have no rating surprise. The figure also reports the 95% confidence bounds.

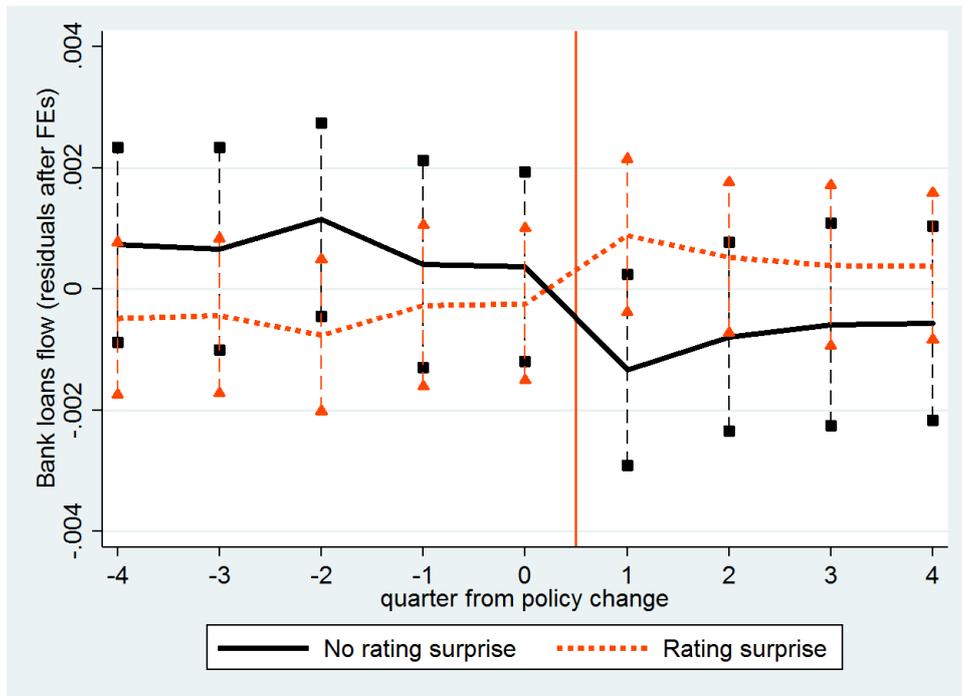
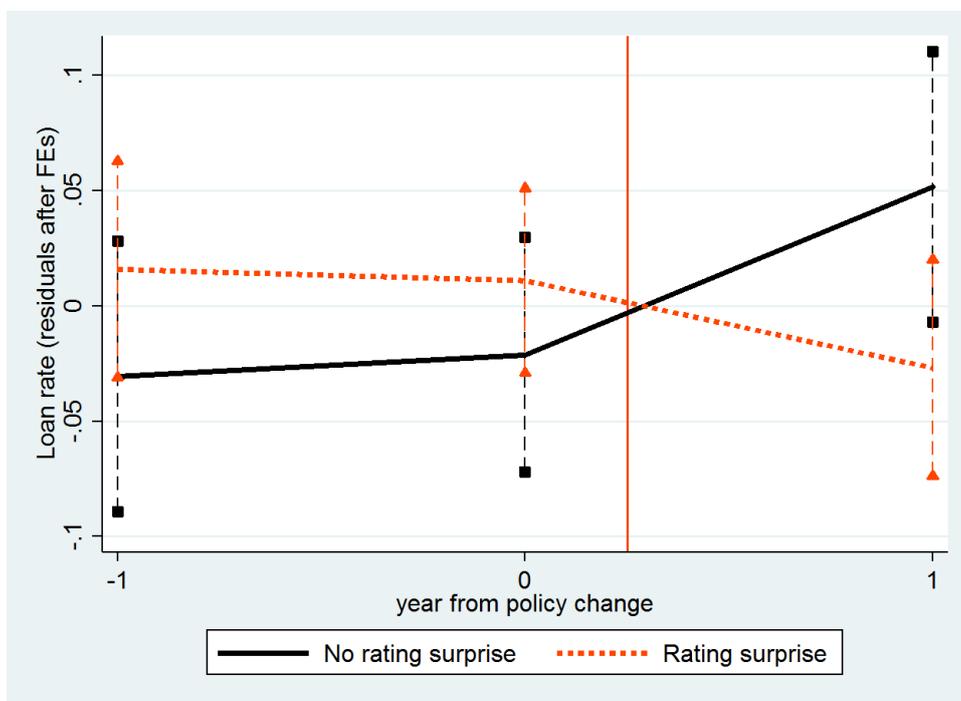


Figure 3
Loan rate around reform

This figure plots the average residuals in the loan rate paid depending on the distance from the implementation of the reform. The residuals are obtained with respect to firm and industry x year FEs, which control for time-invariant firm unobservables and industry dynamics. The policy change is identified by the vertical red line between year 0 and year 1. Firms are grouped depending on whether after the policy change receive the rating surprise or have no rating surprise. The figure also reports the 95% confidence bounds.



VIII Tables

Table I

Firms' summary statistics

This table displays summary statistics for the firms in the sample, by rating class. The quarterly flows of bank loans, in total or distinguished by maturity (up to 1 year or above), and the 'New bank relationship' dummy are derived from the credit register data. The flows are computed as quarterly changes in the amount of interest and are normalized by lagged total assets. The dummy defines if a firm starts 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 amount 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 reform is implemented some firms receive the rating surprise, while others do not.

	Rating class: 3				
	N	Mean	St.Dev.	5th pctile	95th pctile
Bank loans (norm. quarterly flow)	54,024	-0.001	0.043	-0.057	0.074
Bank loans up to 1yr mat. (norm. quart. flow)	54,024	0.000	0.028	-0.035	0.036
Bank loans more than 1yr mat. (norm. quart. flow)	54,024	-0.001	0.022	-0.023	0.036
New bank relationship	54,024	0.050	0.218	0.000	1.000
Bank loans (norm. yearly flow)	34,501	-0.001	0.045	-0.058	0.075
Loan rate (in pp)	23,542	6.019	3.652	1.373	13.924
Equity (norm. yearly flow)	34,501	0.035	0.064	-0.055	0.143
Cash (norm. yearly flow)	34,501	0.020	0.098	-0.136	0.195
Tot. investment (norm., yearly)	34,501	0.002	0.044	-0.051	0.079
Dividends paid (norm., yearly)	34,501	0.061	0.066	0.000	0.200
Total assets (in M EUR)	34,501	8.623	136.439	0.553	14.300
Return on Assets (yearly)	34,385	0.198	0.096	0.069	0.381
Equity / Total assets	34,500	0.526	0.178	0.249	0.825
Banque de France's score	34,461	0.916	1.128	0.210	2.360
	Rating class: 4				
	N	Mean	St.Dev.	5th pctile	95th pctile
Bank loans (norm. quarterly flow)	33,086	-0.001	0.065	-0.103	0.119
Bank loans up to 1yr mat. (norm. quart. flow)	33,086	0.001	0.051	-0.085	0.090
Bank loans more than 1yr mat. (norm. quart. flow)	33,086	-0.002	0.026	-0.030	0.043
New bank relationship	33,086	0.070	0.256	0.000	1.000
Bank loans (norm. yearly flow)	10,183	-0.003	0.066	-0.095	0.118
Loan rate (in pp)	7,862	6.531	3.940	1.563	15.000
Equity (norm. yearly flow)	10,183	0.017	0.048	-0.052	0.093
Cash (norm. yearly flow)	10,183	0.006	0.083	-0.124	0.159
Tot. investment (norm., yearly)	10,183	-0.001	0.047	-0.062	0.086
Dividends paid (norm., yearly)	10,183	0.028	0.054	0.000	0.151
Total assets (in M EUR)	10,183	6.293	100.890	0.405	11.801
Return on Assets (yearly)	10,159	0.116	0.089	0.015	0.285
Equity / Total assets	10,183	0.330	0.167	0.112	0.667
Banque de France's score	10,170	2.677	3.173	0.370	8.290
	Rating class: 5				
	N	Mean	St.Dev.	5th pctile	95th pctile
Bank loans (norm. quarterly flow)	34,298	-0.008	0.069	-0.120	0.119
Bank loans up to 1yr mat. (norm. quart. flow)	34,298	0.001	0.055	-0.096	0.098
Bank loans more than 1yr mat. (norm. quart. flow)	34,298	-0.006	0.026	-0.035	0.036
New bank relationship	34,298	0.063	0.243	0.000	1.000
Bank loans (norm. yearly flow)	5,959	-0.015	0.082	-0.130	0.137
Loan rate (in pp)	4,956	6.908	3.915	1.852	15.385
Equity (norm. yearly flow)	5,959	0.009	0.057	-0.081	0.089
Cash (norm. yearly flow)	5,959	-0.000	0.062	-0.099	0.101
Tot. investment (norm., yearly)	5,959	-0.007	0.052	-0.080	0.079
Dividends paid (norm., yearly)	5,959	0.018	0.043	0.000	0.113
Total assets (in M EUR)	5,959	4.265	55.515	0.360	10.116
Return on Assets (yearly)	5,943	0.086	0.092	-0.045	0.242
Equity / Total assets	5,927	0.179	0.178	0.004	0.514
Banque de France's score	5,938	6.120	6.582	0.600	18.610

Table II

Bank-firm relationships summary statistics

This table displays summary statistics for the bank-firm relationships as at the end of the first quarter of 2004 – i.e., right before the reform – by rating class. ‘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. ‘N bank relationships’ is the number of bank relationships. In this case, we report only one observation per firm so not to double count those firms that have multiple bank relationships. Conditional on having more than one relationship, ‘bank importance in the pool of lenders’ denotes the proportion of bank debt borrowed from a given bank over the total borrowed, and ‘main bank’ is a dummy variable that equals 1 when the previous proportion reaches the highest level across the relationships the firm has. Finally, ‘firm importance in the pool of borrowers %’ denotes the percentage of bank debt that the firm obtained relative to the total amount of debt lent by the bank.

	Rating class: 3				
	N	Mean	St.Dev.	5th pctile	95th pctile
bank branch is located in a diff. town	12,737	0.001	0.027	0.000	0.000
N products with the bank	12,737	1.556	0.794	1.000	3.000
N bank relationships (1 obs. per firm)	5,729	2.202	2.452	1.000	6.000
bank imp. in the pool of lenders	9,910	0.303	0.235	0.010	0.757
main bank	9,910	0.312	0.463	0.000	1.000
firm imp. in the pool of borrowers (%)	12,567	0.076	0.200	0.000	0.384
	Rating class: 4				
	N	Mean	St.Dev.	5th pctile	95th pctile
bank branch is located in a diff. town	9,227	0.000	0.021	0.000	0.000
N products with the bank	9,227	1.752	0.936	1.000	4.000
N bank relationships (1 obs. per firm)	3,512	2.587	2.207	1.000	7.000
bank imp. in the pool of lenders	7,851	0.282	0.220	0.027	0.727
main bank	7,851	0.288	0.453	0.000	1.000
firm imp. in the pool of borrowers (%)	9,178	0.064	0.164	0.000	0.297
	Rating class: 5				
	N	Mean	St.Dev.	5th pctile	95th pctile
bank branch is located in a diff. town	9,143	0.000	0.010	0.000	0.000
N products with the bank	9,143	1.717	0.946	1.000	4.000
N bank relationships (1 obs. per firm)	3,712	2.444	2.137	1.000	7.000
bank imp. in the pool of lenders	7,512	0.286	0.216	0.031	0.718
main bank	7,512	0.294	0.455	0.000	1.000
firm imp. in the pool of borrowers (%)	9,088	0.066	0.165	0.000	0.285

Table III**The effect of the rating surprise on the flow of bank loans**

This table shows the effect of the rating surprise on the quarterly flow of bank loans, also distinguishing by the maturity of the loans. The flows are obtained as quarterly changes in the stock of interest, and are normalized by lagged total assets. Firms are tracked from five quarters before the policy change to four quarters after it. When the reform is implemented some firms receive the rating surprise while others do not. 'rating surprise' measures the impact on the flow of bank loans of receiving the rating surprise relative to not receiving it. Standard errors are clustered at the firm level, and t-statistics are in parenthesis. Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Dependent Variable:			
	(1) Bank loans (norm. quarterly flow)	(2) Bank loans up to 1yr mat. (norm. quarterly flow)	(3) Bank loans more than 1yr mat. (norm. quarterly flow)
rating surprise	0.003*** (4.57)	0.001*** (2.76)	0.001*** (3.28)
Firm FE	Yes	Yes	Yes
3 digit industry x Quarter FE	Yes	Yes	Yes
Rating class x Quarter FE	Yes	Yes	Yes
Observations	121,408	121,408	121,408
R^2	0.14	0.09	0.18

Table IV

The effect of the rating surprise depending on the bank's screening and monitoring cost

This table shows the effect of the rating surprise on the quarterly flow of bank loans as a function of the bank's before-the-reform screening and monitoring cost. 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. When the reform is implemented some firms receive the rating surprise while others do not. The effect of the rating surprise is differentiated depending on proxies for the bank's screening and monitoring cost right before the reform. '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. Standard errors are clustered at the firm level, and t-statistics are in parenthesis. Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Dependent Variable:	(1) Bank loans (norm. quarterly flow)	(2) Bank loans (norm. quarterly flow)
rating surprise	0.001*** (3.03)	0.003*** (9.24)
— x bank branch is located in a diff. town	0.007*** (2.73)	
— x N products with the bank		-0.001*** (-8.36)
bank branch is located in a diff. town	0.007 (0.71)	
N products with the bank		0.001*** (6.48)
Firm FE	Yes	Yes
Bank x Quarter FE	Yes	Yes
3 digit industry x Quarter FE	Yes	Yes
Rating class x Quarter FE	Yes	Yes
Observations	270,384	255,598
R^2	0.11	0.12

Table V
The effect of the rating surprise depending on
the bank's incentives to screen and monitor the firm

This table shows the effect of the rating surprise on the quarterly flow of bank loans as a function of the bank's before-the-reform incentives to screen and monitor the firm. 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. When the reform is implemented some firms receive the rating surprise while others do not. The effect of the rating surprise is differentiated depending on proxies for the bank's incentives to screen the firm right before the reform. 'bank importance in the pool of lenders' is the proportion of bank debt borrowed from a particular bank over the total borrowed. 'main bank' is a dummy variable that equals 1 when the previous proportion reaches the highest level across the relationships the firm has. Finally, 'firm importance in the pool of borrowers' denotes the proportion of bank debt that the firm obtained relative to the total amount of debt lent by the bank. Standard errors are clustered at the firm level, and t-statistics are in parenthesis. Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Dependent Variable:			
	(1)	(2)	(3)
	Bank loans (norm. quarterly flow)	Bank loans (norm. quarterly flow)	Bank loans (norm. quarterly flow)
rating surprise	0.003*** (12.35)	0.002*** (8.74)	0.001*** (4.21)
— x bank imp. in the pool of lenders	-0.009*** (-12.88)		
— x main bank		-0.004*** (-12.91)	
— x firm imp. in the pool of borrowers			-0.005*** (-6.73)
bank imp. in the pool of lenders	0.002*** (4.54)		
main bank		0.001*** (5.83)	
firm imp. in the pool of borrowers			0.000 (1.10)
Firm FE	Yes	Yes	Yes
Bank x Quarter FE	Yes	Yes	Yes
3 digit industry x Quarter FE	Yes	Yes	Yes
Rating class x Quarter FE	Yes	Yes	Yes
Observations	216,750	216,750	253,577
R^2	0.09	0.09	0.12

Table VI

The effect of the rating surprise on the probability to start a new bank relationship

This table shows the effect of the rating surprise 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. When the reform is implemented some firms receive the rating surprise while others do not. ‘rating surprise’ measures the impact on the probability to start a new bank relationship of receiving the rating surprise relative to not receiving it. The column on the left reports the marginal effects obtained with a Conditional 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 right are clustered at the firm level. T-statistics are in parenthesis. Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Dependent Variable:	(1) New bank rel. (Logit)	(2) New bank rel. (LPM)
rating surprise	0.036*** (2.83)	0.007*** (2.63)
Firm FE	Yes	Yes
Quarter FE	Yes	No
3 digit industry x Quarter FE	No	Yes
Rating class x Quarter FE	No	Yes
Observations	44,176	121,408
R^2		0.18

Table VII
The effect of the rating surprise on the cost of debt and funding mix:
Difference-in-Differences estimates

This table shows the effect of the rating surprise on the cost of debt and funding mix, estimated using the baseline difference-in-differences methodology. 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. When the reform is implemented some firms receive the rating surprise while others do not. ‘rating surprise’ measures the impact on the variable of interest of receiving the rating surprise relative to not receiving it. Standard errors are clustered at the firm level, and t-statistics are in parenthesis. Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Dependent Variable:			
	(1)	(2)	(3)
	Bank loans (norm. yearly flow)	Loan rate (in pp)	Equity (norm. yearly flow)
rating surprise	0.009*** (7.02)	-0.156*** (-2.67)	-0.013*** (-11.25)
Firm FE	Yes	Yes	Yes
3 digit industry x Period FE	Yes	Yes	Yes
Rating class x Quarter FE	Yes	Yes	Yes
Observations	50,643	34,668	50,643
R^2	0.35	0.74	0.58

Table VIII
The effect of the rating surprise on the employment of funds:
Difference-in-Differences estimates

This table shows the effect of the rating surprise on the flow of cash, investment, and the dividends paid, estimated using the baseline difference-in-differences methodology. 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 reform is implemented some firms receive the rating surprise while others do not. ‘rating surprise’ measures the impact on the variable of interest of receiving the rating surprise relative to not receiving it. Standard errors are clustered at the firm level, and t-statistics are in parenthesis. Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Dependent Variable:			
	(1)	(2)	(3)
	Cash (norm. yearly flow)	Tot. investment (norm., yearly)	Dividends paid (norm., yearly)
rating surprise	-0.006*** (-3.02)	0.006*** (5.61)	0.006*** (8.83)
Firm FE	Yes	Yes	Yes
3 digit industry x Period FE	Yes	Yes	Yes
Rating class x Quarter FE	Yes	Yes	Yes
Observations	50,643	50,643	50,643
R^2	0.29	0.39	0.81

Table IX

Differences between firms that later receive the rating surprise and firms that later do not

This table compares the financial conditions of firms that later receive the rating surprise and firms that do not, right before the implementation of the reform. The comparison is repeated within each rating class. The sample includes the firms that are 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		
	No future rating surprise	Future rating surprise	Difference wrt no rat. surprise
Equity / Total assets	0.37 (0.13)	0.59 (0.15)	0.22*** (0.00)
Tang. assets / Total assets	0.14 (0.13)	0.12 (0.11)	-0.03*** (0.00)
Cash / Total assets	0.20 (0.16)	0.31 (0.19)	0.10*** (0.00)
Return on Assets	0.17 (0.09)	0.21 (0.09)	0.04*** (0.00)
Banque de France's score	1.37 (1.18)	0.62 (0.60)	-0.75*** (0.02)
log Total assets	7.60 (1.02)	7.64 (0.99)	0.04** (0.02)

	Rating class: 4		
	No future rating surprise	Future rating surprise	Difference wrt no rat. surprise
Equity / Total assets	0.32 (0.18)	0.34 (0.15)	0.02*** (0.01)
Tang. assets / Total assets	0.11 (0.12)	0.15 (0.14)	0.04*** (0.00)
Cash / Total assets	0.14 (0.15)	0.13 (0.14)	-0.01 (0.01)
Return on Assets	0.07 (0.06)	0.14 (0.09)	0.07*** (0.00)
Banque de France's score	2.80 (3.17)	2.08 (1.89)	-0.72*** (0.10)
log Total assets	7.43 (1.11)	7.31 (0.98)	-0.12*** (0.04)

	Rating class: 5		
	No future rating surprise	Future rating surprise	Difference wrt no rat. surprise
Equity / Total assets	0.13 (0.20)	0.20 (0.16)	0.06*** (0.01)
Tang. assets / Total assets	0.14 (0.15)	0.18 (0.20)	0.04*** (0.01)
Cash / Total assets	0.07 (0.10)	0.06 (0.09)	-0.00 (0.00)
Return on Assets	0.03 (0.08)	0.11 (0.08)	0.07*** (0.00)
Banque de France's score	8.48 (7.16)	4.79 (5.33)	-3.69*** (0.32)
log Total assets	7.30 (1.15)	7.25 (0.95)	-0.04 (0.05)

Table X
The effect of the rating surprise on the cost of debt and funding mix:
Propensity Score Matching estimates

This table shows the effect of the rating surprise on the changes in the normalized flows of bank loans and equity, and on the change in the loan rate, using a Propensity Score Matching methodology. We first obtain the change in the variables of interest that each firm experiences from the last year before the reform to the first after it. We then compute propensity scores based on the following firm characteristics in the last year before the reform: total assets in log, equity to total assets, Banque de France's score, industry, and rating class. The matching procedure is done with replacement, which means that each firm that does not receive the rating surprise can be used as a neighbor for several 'treated' firms, which receive the surprise. We take the closest five firms not receiving the rating surprise as control for each treated firm receiving the surprise. We then study of effect of the 'rating surprise' on the outcome variables. Standard errors are robust, and t-statistics are in parenthesis. Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Dependent Variable:			
	(1)	(2)	(3)
	Change in bank loans (norm. flow)	Change in loan rate (in pp)	Change in equity (norm. flow)
rating surprise	0.003** (2.07)	-0.171*** (-3.15)	-0.008*** (-6.56)
Observations	38,131	25,871	38,131

Table XI
The effect of the rating surprise on the employment of funds
Propensity Score Matching estimates

This table shows the effect of the rating surprise on the changes in the normalized flow of cash, investment, and dividends paid, using a Propensity Score Matching methodology. We first obtain the change in the variables of interest that each firm experiences from the last year before the reform to the first after it. We then compute propensity scores based on the following firm characteristics in the last year before the reform: total assets in log, equity to total assets, Banque de France's score, industry, and rating class. The matching procedure is done with replacement, which means that each firm that does not receive the rating surprise can be used as a neighbor for several 'treated' firms, which receive the surprise. We take the closest five firms not receiving the rating surprise as control for each treated firm receiving the surprise. We then study of effect of the 'rating surprise' on the outcome variables. Standard errors are robust, and t-statistics are in parenthesis. Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Dependent Variable:			
	(1)	(2)	(3)
	Change in cash (norm. flow)	Change in tot. investment (normalized)	Change in dividends paid (normalized)
rating surprise	-0.012*** (-5.90)	0.002** (2.15)	0.003*** (5.18)
Observations	38,131	38,131	38,131