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Bank Market Power and Interest Rate Setting: Why Consolidated Banking Data Matter

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POUVOIR DE MARCHÉ DES BANQUES ET FIXATION DES TAUX D'INTÉRÊT : DE l' IMPORTANCE DE PRENDRE EN COMPTE LES DONNÉES BANCAIRES SUR BASE CONSOLIDÉE [2]

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Bank Market Power and Interest Rate Setting: Why Consolidated Banking Data Matter

Abstract: The literature on the effects of bank market power on access to credit has produced many results that are sometimes contradictory. Yet, all of these studies are based on unconsolidated data that ignore the national market power of banking groups. This results in an underestimation bias that this paper proposes to correct. Using a panel of more than 55,000 French firms covering the period 2006–2017, I consider a set of structural and non-structural measures of bank market power both at the unconsolidated and consolidated levels. My results strongly support the *market power hypothesis* which emphasizes the virtues of competition on interest rate setting. I find that bank market power increases the interest rate charged, but only when using my consolidated measures. This effect is stronger for small and risky firms and is concentrated on long-term loans. My findings highlight the need to take into account the capital linkages of subsidiaries within the same banking group in order to fully assess the implications of bank market power. Yet, the vices of greater bank market power need to be put into perspective with its costs and benefits on financial stability, which goes beyond the cost of this paper.

Keywords: Cost of Credit, Bank Competition, Bank Concentration, Relationship Lending.

JEL Classification: E43, E51, G01, G21.

Pouvoir de marché des banques et fixation des taux d'intérêt : de l'importance de prendre en compte les données bancaires sur base consolidée

Résumé : La littérature sur l'effet du pouvoir de marché des banques sur l'accès au crédit des entreprises a abouti à des résultats parfois contradictoires. Toutefois, cet article montre que les mesures traditionnelles du pouvoir de marché des banques sont toutes problématiques car elles s'appuient sur des données non consolidées et ignorent par la même le pouvoir de marché national des groupes bancaires. Il en résulte une sous-estimation que je propose de corriger. En utilisant un panel de plus de 55 000 entreprises françaises couvrant la période 2006-2017, je considère un ensemble de mesures structurelles et non structurelles du pouvoir de marché des banques à la fois au niveau non consolidé et consolidé. Mes résultats corroborent l'hypothèse du *pouvoir de marché bancaire* qui met en avant les vertus de la concurrence sur la fixation des taux d'intérêt. Alors que les mesures non consolidées du pouvoir de marché des banques n'affectent pas le coût du crédit, je constate que les mesures consolidées augmentent le taux d'intérêt pratiqué. Cet effet est plus fort pour les petites entreprises et les entreprises risquées et se concentre sur les prêts à long terme. Ces résultats soulignent la nécessité de prendre en compte les liens capitalistiques des filiales issues d'un même groupe bancaire pour évaluer pleinement les implications du pouvoir de marché des banques. Les avantages d'un plus grand pouvoir de marché des banques doivent toutefois être mis en perspective avec les coûts et les avantages pour la stabilité financière, ce qui dépasse le cadre de cette recherche.

Mots-clés : coût du crédit, compétition bancaire, concentration bancaire, relation bancaire.

JEL Classification : E43, E51, G01, G21

1. Introduction

How does bank market power affect firms' funding costs ? This traditionally important issue for policymakers and researchers is taking on new relevance in the context of the European Banking Union, which increases incentives for cross-border banking consolidation in Europe (Schoenmaker, 2015). Carrying potential economies of scale (Wheelock & Wilson, 2012; Hughes & Mester, 2013), these mergers and acquisitions are seen as a strategic response to growing competition from large US banking groups in a low interest rate environment that is pushing European banks to adapt (Fernandez-Bollo, 2021). While some banking supervisors encourage these developments to increase financial integration and make banks more efficient (Nouy, 2017), little attention has been paid to the potential negative implications of greater bank market power in terms of firms' access to credit.

The theoretical literature devoted to this issue proposes two competing mechanisms. The *information hypothesis* argues that a less competitive market structure is conducive to the establishment of long-term customer relationships that allow banks to generate information about their customers, thereby reducing information asymmetry problems and improving access to credit (Petersen & Rajan, 1995; Dell'Ariccia & Marquez, 2006; Ogura, 2010). In contrast, the *market power hypothesis* emphasizes the virtues of competition on the level of prices charged (Freixas & Rochet, 2008). Empirical research that has examined these conflicting predictions has produced mixed results. Discrepancies have sometimes been explained by the choice of indicators used to measure market power which is not directly observable (Boone, 2008; Carbo-Valverde et al., 2009; Liu et al., 2013). The latter can for example be understood in terms of both market concentration and low barriers to entry. Yet, another crucial methodological aspect that has been little explored so far concerns the scope of the data used to measure market power. Indeed, the structural and non-structural indicators used in empirical studies are calculated from unconsolidated data, thus ignoring the very notion of banking groups. Calculating market power indicators on the basis of non-consolidated data therefore leads to an underestimation bias.

This paper fills this gap by proposing more accurate measures of bank market power based on a new methodology that first reconstitutes the national scope of activity of French banking groups in order to recalculate three traditional measures of bank market power such as the concentration ratio (CR3), the Herfindahl-Hirschman Index (HHI) and the Lerner Index at the consolidated level. Hinging on granular banking data made available by the Banque de France and the French banking supervisory authority (ACPR), I am able to link all the French banks to their banking group by aggregating their financial statements and taking care to restate intra-group transactions to avoid double counting.

In December 2017, there were 193 banking groups for 442 banks operating in France. Yet, only few banking groups hold almost the entire credit market[1]: on average the top 3 banking groups account for over 75% of the regional credit market. Thereafter, in order to identify the effects of both unconsolidated and consolidated measures of bank market power on firms' funding costs, I draw on five different databases encompassing 55,000 French firms covering the period 2006—2017. My empirical strategy relies on a unique panel design that enables me to control for time-varying loan, firm, bank and relationship lending characteristics.

In line with the *market power hypothesis*, my results indicate that bank market power is associated with worse credit conditions. My baseline estimations indicate a positive relation between bank market power and the cost of credit for the three consolidated measures, while unconsolidated ones turn out to have no effect. Turning to firm heterogeneity, I find that the effect of bank market power on interest rate is detrimental precisely where the *information hypothesis* predicts it should be most beneficial. Indeed, I found that that firms that are smaller and less profitable are charged higher rates as bank market power increases. In other words, the most "captive" firms, whose elasticity of demand for credit is the lowest, suffer the most from bank market power. Wondering whether higher bank market power is relatively more beneficial to firms borrowing from banks with a comparative advantage in relationship

[1] These banking groups are BNP Paribas, BPCE Group, the Crédit Agricole Group, Crédit Mutuel-CIC Group, Société Générale and Banque Postale.

lending or not, I observe that bank market power has no differential effect according to the size of a bank, the existence of a single banking relationship or cooperative banking. Finally, in contrast with the *information hypothesis*, firms that have a longer relationship with their bank suffer more from the increase in the interest rate due to the market power of banks and this adverse effect is concentrated on long-term loans that are more information-intensive.

This paper contributes to a large literature that investigates the relationship between bank market power and firms' access to credit. Against this background, I make two distinct contributions to this debate. First, to my knowledge, this paper is the first to demonstrate that consolidated banking data matter for assessing the true effect of bank market power on firms' credit conditions. Until now, the empirical literature attempting to decide between two conflicting theoretical predictions has always relied on unconsolidated measures that are responsible for an underestimation bias. The reason why the measurement of bank market power is based on unconsolidated data stems from the willingness to circumscribe market power within a given geographical area. As consolidated data coming from commercial databases such as SNL or Bankscope do not allow for consolidation at the country level, unconsolidated data are traditionally preferred. Yet, I argue that it is possible to reconstitute the national scope of activity of banking groups using granular data made available by central banks and supervisory authorities. In this regard, my results suggest that the literature should not only focus on the type of indicators used (i.e. structural or non-structural) but also on the scope of data consolidation.

The second contribution of this paper is to use firm and bank individual data as well as loan-level information to measure the effect of bank market power on the cost of credit. These granular data enable me to assess how much the interest rate associated with a given firm is related to its reference bank's market power while simultaneously controlling for firm, bank and relationship lending characteristics. In contrast with previous research that measures bank market power either at the country level (Beck et al., 2004; Ryan et al., 2014; Love & Martínez Pería, 2015; Fungavcova et al., 2017) or the regional level (Carbo-Valverde et al.,

2009), I follow Grandi & Bozou (2022) who use Lerner indexes at the bank level to gauge the role of banks' local market power on firms' credit conditions. Finally, no empirical study uses the true interest rate paid by firms based on loan-level information. Most of them take advantage of firms' financial statements to calculate an indirect measure defined as the ratio of financial expenses divided by bank debt. For all these reasons, my identification strategy is likely to refine the previous analyses.

The remainder of the paper is structured as follows. The next section presents the related literature and the theoretical basis for my research hypotheses. Section 3 presents the data. Section 4 outlines my empirical strategy. Section 5 discusses my findings. Section 6 checks the robustness of the results. Section 7 concludes.

2. Related literature

2.1. The difficult measurement of bank market power

As it is not directly observable, bank market power is an intricate concept that is subject to various evaluation methods. The literature that focuses on this issue falls into two broad categories. The first one is based on the traditional Structure-Conduct-Performance (SCP) model, which uses structural indicators to measure the degree of competition in the banking sector (Berger & Hannan, 1989). In this paradigm, the structural characteristics of a market are assumed to drive the behaviour of firms and hence their performance. Greater concentration in the banking market is associated with less competitive pressure and leads to greater profitability for banks, as the latter are able to set higher interest rates on loans or lower deposits rate. The family of structural indicators includes two main types of measures: the Herfindahl-Hirschmann index (HHI), which is the sum of the squared market shares of all banks, and concentration ratios such as the market share of the three largest banks (CR3). For these two indicators, the total assets of banks are most often used as a benchmark, while the total amount of credit granted is sometimes used as an alternative.

However, the reliability of the SCP paradigm and related structural measures of market

power have been questioned (Berger, 1995; Rhoades, 1995; Hannan, 1997; Carbo-Valverde et al., 2009). The main criticism against these measures is that they only indirectly capture the market power of banks, and therefore do not take into account the "contestable" nature of the banking sector. In other words, these measures do not provide information on barriers to entry and exit. Yet, in theory, the threat of bank entry and exit can potentially put pressure on incumbent banks and maintain the competitiveness of the sector, even when banking sector concentration is high. In practice, this free entry into the banking services market is sometimes illusory, as new entrants are rare, and it is unclear whether the rise of fintechs in several segments of banks' business (such as corporate lending and payment services) will change this situation.

In response to the limitations of structural measures, the New Empirical Industrial Organisation (NEIO) has led to the emergence of non-structural measures, which aim to directly assess how banks respond to changes in supply and demand conditions without looking at the market structure. Consistent with the standard oligopoly theory, the Lerner index and the H-statistic are the two benchmarks of this approach. The Lerner index is equal to the difference between price and marginal cost, divided by price. It measures the market power of a bank by its ability to price its services above its marginal cost. The more the competition the lower the value of the Lerner. In the same vein, the H-statistic based on the Panzar & Rosse (1987) model measures the elasticity of a bank's interest income with respect to the prices of the production factors it uses. The higher the competitive pressure, the higher the elasticity.

There is no consensus regarding the best way to evaluate bank market power but the most recent studies tend to favour non-structural measures to the detriment of structural measures, which nevertheless have the merit of being much easier to interpret and calculate. In this regard, the Lerner index is probably the most used indicator in empirical studies, and yet perhaps the least straightforward. Since the marginal cost of a bank is not directly observable, it is necessary to estimate a multi-factor cost function (resources from deposits and the money market, labour, and fixed capital), whose prices are proxied by simplistic ratios compared to

the complexity of the banking services produced (Demirguc-Kunt & Martínez Pería, 2010). More recently, Igan et al. (2021) point out that the Lerner index may have become uninformative in a low interest rate environment due to the effects of expansionary monetary policies on both the interest rate earned by banks on their assets and the interest paid on their liabilities. It is therefore not clear that the Lerner index provides the most reliable measure. Moreover, it often appears to be very poorly correlated with concentration ratios (Shaffer, 1993; Maudos & De Guevara, 2004; Carbo-Valverde et al., 2009). All in all, the measurement of bank market power is based on various, sometimes even divergent, indicators. It is nonetheless essential, especially if the market power of banks plays a significant role in firms' access to finance and their ability to grow.

2.2. Bank market power and bank lending activity

How does Bank market power influence banks' lending activity? The results of the studies devoted to this question are contradictory. There are two opposing theoretical approaches: the *information hypothesis* and the *market power hypothesis*. In the former, a less competitive market structure is conducive to the establishment of long-term customer relationships that allow banks to generate information about their customers, thereby reducing information asymmetry problems and improving access to credit (Petersen & Rajan, 1995; Dell'Ariccia & Marquez, 2006; Ogura, 2010). In contrast, the *market power hypothesis* emphasizes the virtues of competition on the level of prices charged. Applying standard economic theory to the banking industry in a model where banks have some monopoly power, it suggests that low inter-bank competition entails lower demand elasticities, which in turn widens the equilibrium markup rate on loans (Freixas & Rochet, 2008).

A large number of studies have examined the influence of banks' market power on firms' access to credit. Most of them support the *market power hypothesis*. Using bank concentration measures as a proxy for bank market power, Petersen & Rajan (1995) find that young firms in concentrated markets receive more institutional finance than similar firms in competitive markets. Fischer (2000) also finds that higher bank concentration is associated with

improved information flows and better credit access for a cross-section of German manufacturing firms. However, Beck et al. (2004) find the opposite result for a survey of firms in 74 countries, but only where the level of economic development is low. The same result against the *information hypothesis* is found in many other studies that use either structural or non-structural indicators of bank market power index (Carbo-Valverde et al., 2009; Ryan et al., 2014; Chong et al., 2013; Love & Martínez Pería, 2015; Wang et al., 2020).

The effect of bank market power on the cost of credit has been less examined. In their seminal work, Petersen & Rajan (1995) find lower loan rates in concentrated banking markets for young firms. More recently, using a panel of firms from 20 European countries including two structural measures (Herfindahl–Hirschman index and CR3) and two non-structural indicators (Lerner index and H-statistic), Fungavcova et al. (2017) also find that bank competition increases the cost of credit, especially for smaller companies. However, many other studies focusing on a single European country (Sapienza, 2002; Kim et al., 2005; Degryse & Ongena, 2005) or the euro area (Grandi & Bozou, 2022) instead corroborate the *market power hypothesis*.

2.3. Testable predictions

In order to disentangle the two opposing effects of bank market power on firms' funding costs, this paper investigates three testable predictions. As outlined previously, banks with high market power (i.e. lower competitive pressure) have more incentives to invest in information acquisition. By building long-term credit relationships, they can better internalize the cost of these activities and face a lower risk of borrowers switching to another bank (Petersen & Rajan, 1995; Dell'Ariccia & Marquez, 2006). Following the information hypothesis, firms that borrow from banks with high market power are likely to have lower interest rates than firms borrowing from banks with low market power. However, banks can also take advantage of low levels of competition to increase their margins. According to the *market power hypothesis*, weak competition between banks implies lower demand elasticities and leads to higher funding costs (Freixas & Rochet, 2008). Consequently, the first hypothesis can be

broken down into two alternative parts:

(H1a) *Higher bank market power lowers funding costs for borrowing firms.*

(H1b) *Higher bank market power increases funding costs for borrowing firms.*

For the *information hypothesis*, banks with high market power have more incentives to reduce firms' asymmetric information issues by investing in long-term relationships. Conversely, high inter-bank competition can worsen access to finance by reducing banks' rents and jeopardizing their overall incentives to screen opaque borrowers. As a consequence, firms that are exposed to information issues (i.e. small, young and low-quality firms) should benefit from lower interest rates in more concentrated banking markets (Petersen & Rajan, 1995; Di Patti & Dell'Ariccia, 2004). At the same time, under the *market power hypothesis*, banks are likely to charge higher rates for firms that are the most "captive" whose demand elasticity is the lowest such as small, young and financially fragile firms that cannot diversify their lending. The second hypothesis is therefore divided into two alternative parts:

(H2a) *Higher bank market power is relatively more beneficial to borrowing firms most exposed to informational asymmetries.*

(H2b) *Higher bank market power is relatively more detrimental to borrowing firms most exposed to informational asymmetries.*

The *information hypothesis* builds on the role of relationship lending in mitigating informational asymmetries. Relationship lending can be defined as the "provision of financial services by a financial intermediary" that *(i)* invests in obtaining customer-non-public-specific information; *(ii)* assesses the profitability of this information through multiple interactions with the same client over time and across products (Boot, 2000). Relationship lenders rely primarily on qualitative information on borrowers' characteristics. Yet, not all banks are equal regarding this lending technology. For instance , small banks are typically viewed as superior at using soft information because such information is easier to communicate within a small organizational structure (Berger & Udell, 2002; Stein, 2002; Berger et al., 2005;

Canales & Nanda, 2012; Berger et al., 2017). The same argument can be made for cooperatives banks insofar as a bank owned and managed by its members can take advantage of inside information to set its interest rates (Angelini et al., 1998). By increasing the marginal rent of relationship-specific investments, lower inter-bank competition may be beneficial to the production of soft information by relationship lenders (Ogura, 2010). However, private information produced during a bank-borrower relationship can also create ex post monopoly rents for the bank, and thus affect loan pricing and investment efficiency over the duration of the relationship citepsharpe1990asymmetric,rajan1992insiders. Against this background, a relationship bank that evolves in a more concentrated credit market may charge higher rates to increase its rent as the firm ability to diversify its lending is lower (Beatriz et al., 2018). For these reasons, the third hypothesis can be split into two alternative hypotheses:

(H3a) *Higher bank market power is relatively more beneficial to firms borrowing from a relationship bank.*

(H3b) *Higher bank market power is relatively more detrimental to firms borrowing from a relationship bank.*

3. Data

I draw on five different databases provided by the Banque de France and the French banking supervisor (ACPR). Table 3 shows statistics regarding variables of interest. I end up with more than 55,406 firms representing 232,576 observations.

3.1. Loan-level variables

Core data come from the loan-to-loan M-CONTRAN reporting and provide the interest rates on new corporate loans. This information is collected quarterly on all new loans with attributes on types of loans, borrowing sectors and types of credit institution. Participating credit institutions are selected within a partly rotating panel so as to make up a representative sample of banks. On average over the period 2006–2017, the initial dataset reports about 100,000 new loans each quarter and accounts for 345 different banks representing 75% of the

total amount of corporate credit in 2017. In particular, I focus on both long-term loans (i.e. investment credit or leasing) and short-term loans (i.e. cash credit). As summarised in Table 3, the M-CONTRAN database deal with a large diversity of outstanding amounts, maturities and rates.

3.2. Firm-level variables

I first match the loan-to-loan dataset with firms' balance sheet information coming from the FIBEN company database, which gathers balance sheet data on all companies with a turnover of over EUR 750,000 since 2006. Based on tax documents, firm's information is yearly collected by the Banque de France at the legal entity level (non-consolidated), through a unique national identifier called SIREN. In 2017, this dataset contains individual company accounts for 250,000 firms. These firms represent a third of all companies taxed under the "bénéfice industriel et commercial' or 'bénéfice réel normal" regimes (Kremp & Sevestre, 2013). The database thus covers a large share of the French economy[2]. Above all, a great advantage of FIBEN is that it enables the analyst to focus on non-listed SMEs that are often neglected by American studies based on the Compustat database [3]. Firms whose balance sheet and interest rate variables are incomplete are excluded from the original sample. To account for observable firm heterogeneities, I rely on a traditional set of measures such as the ROA (i.e. the ratio of cash flow over total assets of the firm), liquidity (i.e. the ratio of cash over total assets of the firm), solvency (i.e. the ratio of own funds over total assets of the firm) and variables that typically proxy for the presence of asymmetric information (i.e. the size and the age of the firm)[4].

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2 Note that the dataset is composed of 15% of observations coming from industry, 14% from construction, 50% from trade, 16% from services and 5% from other sectors.

3 In this regard, 80% of firms in the database can be considered as SMEs with respect to the European definition based on the number of employees (less than 250), the turnover (less than EUR 50 million) and total assets (less than EUR 43 million).

4 To minimise the effect of gross outliers, I winsorize variables at the first and 99th percentiles.

3.3. Bank-level variables

Afterwards, I match the database with the French unified reporting system for financial institutions (SURFI) to assess how the strength of a bank's balance sheet is related to corporate interest rates. The bank level database contains financial statements at the non-consolidated level on all commercial and cooperative banks in France over the period 2006 Q1-2017 Q4. My sample ends up containing 154 banks that belong to 46 different banking groups, representing 60% of corporate credit in 2017 Q4. Following the bank balance sheet channel thesis, I control for the heterogeneous bank response to an unexpected adverse shock. I look at traditional indicators of bank financial strength, such as solvency (i.e. bank equity over total assets of the bank), liquidity (i.e. the sum of cash, balances with the central bank, loans and advances to credit institutions and repurchase agreements over total assets of the bank), non-performing-loans and bank size (Kashyap & Stein, 2000; Jiménez & Ongena, 2012). In addition, I add the loan-to-asset ratio to capture the retail-oriented bank business model that is likely to shift credit supply.

3.4. Relationship lending variables

To capture the different channels through which relationship lending affects interest rate setting, three proxies are used. The first two proxies comes from the French national credit register which gathers data on credit exposures of all banks operating in France to all firms whose total credit exposure is greater than EUR 25,000. I first compute the relationship length to capture the ability of lenders to accumulate soft information about their borrowers (Boot & Thakor, 2000). The longer the relationship, the more accurate the lenders' knowledge of the borrowers' credit risk. Throughout my analysis, the variable duration corresponds to the elapsed time between the first relationship established between a firm and a bank and the last one. The second variable corresponds to the structure of information available to lenders (i.e. private versus shared information). Like the length of the relationship, single-banking has sometimes been used as a relationship lending measure in the seminal literature (Petersen & Rajan, 1994). Indeed, banks holding a larger share of credit have better access to information

about the borrower (Elsas, 2005). Thus, I considered a firm to be a single-bank firm if it has had a relationship with only one bank since the starting date of the French Credit Register. Consequently, the dummy *single-bank* takes the value of 0 if a firm has had two different relationships in the past, and remains the same even if the firm temporarily borrows from only one bank thereafter. My last relationship lending dummy *Cooperative bank* is a dummy variable for cooperative and mutual banks which are subject to a special regulatory regime and have been shown in the literature to focus on relationship lending (Angelini et al., 1998; Bolton et al., 2016).

3.5. Bank market power variables

To gauge the effect of bank market power on interest rate setting, I rely on both structural and non-structural indicators presented in section 2. I first compute an Herfindahl-Hirschman Index (HHI) and a top 3 concentration ratio (CR3) on a quarterly basis using the *Centralisation Financière Territoriale* (CEFIT) dataset. This original dataset, which covers the 13 French regions, collects monthly information on credit loans and deposits for each individual bank at the regional level. Interestingly, CEFIT breakdowns data by types of borrowers which enables me to collect data on corporate credit only. The HHI corresponds to the sum of the squared market shares of all banks at the regional level whereas the CR3 is the sum of the market shares of the three largest banks operating in a given region. Finally, I take advantage of income statements and balance sheets coming from the supervisory SURFI database to compute the Lerner index of each bank in my sample. The latter represents the extent to which their monopolist's market power allows them to fix a price above the marginal cost, expressed as a fraction of the price. In the case of perfect competition, the value of the index is zero and there is no monopoly power (see the Appendix for more details).

4. Empirical strategy

4.1. Bank market power in France: a new consolidated approach

As presented in section 2, the empirical literature that have been devoted to the effects of bank market power on the cost and availability of credit has brought mixed results. No consensus in favor of the information or the market power hypotheses has emerged. This conflicting results have sometimes been explained by the choice of indicators used to measure market power (Boone, 2008; Carbo-Valverde et al., 2009; Liu et al., 2013) Another crucial methodological aspect that has been little explored so far concerns the scope of the data used to measure market power. Indeed, the indicators used in most empirical studies, whether they are concentration ratios, the Herfindahl-Hirschman index (HHI) or the Lerner index are calculated from unconsolidated data, thus ignoring the very notion of banking groups. The same applies to the structural financial indicators published by the ECB or the Lerner indexes computed by the Worldbank. Using unconsolidated data, Figure 1 shows that the market power of French banks turns out to be lower than their European counterparts. Indeed, while in 2019 the HHI (for credit) is 0.07, that is twice as low as the one of the European Union, the same applies to the Lerner index which amounts to 0.13. Furthermore, over the period available for France, the HHI and the Lerner index have increased by 50% and 30%, respectively, and the same dynamic can be observed in Europe.

However, the use of these indicators implies that the entities of each group exist independently of each other and that the group to which they belong does not exist as such, even though each group draws its market power from the greater or lesser number of subsidiaries that make it up. Calculating market power indicators on the basis of non-consolidated data therefore leads to an underestimation bias. The reason why the measurement of bank market power is based on unconsolidated data stems from the willingness to circumscribe market power within a given geographical area. As consolidated data coming from commercial databases such as SNL or Bankscope do not allow for consolidation at the country level, unconsolidated data are traditionally preferred. The solution to this problem does not lie in the

use of consolidated data at the whole banking group level, since these groups are generally internationalised, this would create an overestimation bias. Yet, it is possible to reconstitute the national scope of activity of French banking groups in order to recalculate the concentration ratio (CR3), the Herfindahl-Hirschman index (HHI) and the Lerner index. This work is only possible thanks to the use of granular banking data made available by central banks and supervisory authorities. In December 2017, there were 193 banking groups for 442 banks operating in France.

After associating all the banks with their banking group, I first reconstruct the consolidated credit share of each banking group in France during the period 2006–2017. Using the CEFIT database, I am able to compute the HHI and the CR3 for each of the 13 French regions. For this purpose, I aggregate the outstanding amount of credit to non-financial corporation of each banking group at the regional level. On the one hand, when it comes to the Lerner index, I aggregate the assets of each subsidiary (taking care to restate intra-group transactions to avoid double counting[5]) to recompose the aggregated assets of each banking group. On the other hand, I add up the income and expenses of all banks that belong to the same banking group[6]. Then, using these recomposed assets, incomes and expenses with the correct level of consolidation, I am able to recalculate the ratios needed to estimate the marginal cost of the banking groups involved in the Lerner index.

The results presented in Figure 2 shed new light on regional comparisons between unconsolidated and consolidated indicators of bank market power. First, concerning structural measures of market power, such as the concentration ratio (CR3), the difference between the average concentration rate calculated from unconsolidated data and my aggregation method on the French perimeter is of the order of 40 percentage points, with a consolidated CR3 of 76 % instead of 35%. A notable exception is the "Île-de-France" region, which contains the

[5] To do so, before summing up the total assets of all banks belonging to the same banking group, I have removed the intra-group debts and receivables from the total assets of each banks.

[6] Note that as there is no information on intra-group incomes or expenses in the SURFI database, I assume that incomes and taxes are computed at the unconsolidated level.

city of Paris, where competition between banking groups appears stronger at both the unconsolidated and the consolidated level with a CR3 of 29% and 57%, respectively. In addition, Figure 3 indicates that the dynamics over the period 2006–2017 is even different. While on a unconsolidated basis the average concentration rate remained stable, the consolidated concentration rate increased by more than 10%, reaching 80% in 2017 compared to 71% in 2006. The consolidated HHI follows the same trend and is more than twice as high as its unconsolidated equivalent in 2017. The same is true for the Lerner index: on a consolidated basis at the national level, its average value is 0.47, that is almost three times as high as the unconsolidated Lerner and both measures increased by around 20% between 2006 and 2017.

Looking at the correlations between structural and non structural measures of bank market power at the regional level, Table 1 shows that the Lerner index is only weakly correlated to HHI or CR3 when using unconsolidated measures. This result is consistent with some studies that have already shown that the Lerner index based on unconsolidated data is frequently uncorrelated with concentration ratios (Maudos & De Guevara, 2004; Carbó et al., 2009). On the contrary, the consolidated Lerner turns out to be strongly correlated with the consolidated structural measures, which reinforces the idea that the scope of the data used is crucial for understanding the relationship between these two families of indicators.

While my unconsolidated estimations of bank market power are in line with what the literature found for France (Weill, 2013; Fungavcova et al., 2017), my consolidated results stress that measures based on unconsolidated data that ignore the existence of banking groups significantly underestimate bank market power. Accordingly, investigating the effect of bank market power on firms' funding costs requires taking into account consolidated indicators that are more precise.

4.2. Identification strategy

Identifying the causal effect of regional banks' market power on interest rate setting entails three main challenges. First, borrowers and lenders' observable and unobservable characteristics may be correlated with measures of regional bank market power. For instance, this

mechanism is particularly at play within regions exhibiting both safer borrowers (or lenders) and higher (or lower) bank market power.

Second, the effect of bank market power on interest rate setting is likely to be correlated with relationship lending variables such as the duration or single banking. As outlined by Sharpe (1990) and Rajan (1992), in an exclusive bank relationship the informationally privileged bank might use its bargaining power over risky firms to extract rents from loan contracts. Hence, according to the existence of these "hold-up" costs, a difference in interest rates may arise between regions with different bank market power.

Finally, the Great Recession has led to more consolidation in the European banking industry (Montes, 2014)[7]. These changes might have an impact on the firms' access to credit. For instance, in local credit markets in which the merger leads to a large increase in concentration, the merged bank decreases the supply of credit both to existing firms and to new firms(Fraisse et al., 2018). More generally, the crisis may have strengthened the market power of the most financially solid banks.

Following Beatriz et al. (2018), I address these identification challenges by using firm and bank fixed effects regressions and including loan, firm, bank and relationship lending variables to account for both time-invariant and time-varying characteristics[8]. Finally, a crisis dummy is added to the model to take into account the impact of the Great Recession.

4.3. Econometric specifications

The specification I estimate is at the new loan level:

$$i_{jbrt} = \beta_1 M_{rt} + \beta_2 L_{ibt} + \beta_3 F_{jt-1} + \beta_4 B_{bt-1} + \beta_5 R_{ibt} + \beta_6 Crisis_t + \alpha_i + \gamma_b + \lambda_t + \epsilon_{ibrt} \qquad (1)$$

Where i_{jbrt} is the new loan interest rate granted by bank b to firm j located in region r at

[7] In France, the second largest banking group (BPCE) was created in 2009

[8] Note that, contrary to the use of the within-firm estimator in the seminal work of Khwaja & Mian (2008), my fixed effects methodology does not control for all observed and unobserved time-varying firm heterogeneity.

time t. M is my measure of Bank market power that is computed either at the unconsolidated or the consolidated level. L, F, B and R are respectively matrices of loan, firm, bank and relationship lending controls, while the *Crisis* dummy takes the value 1 from 2009 to 2012 and 0 otherwise. α_i, γ_b, and λ_t are respectively firm, bank, and time fixed effects.

Changes in banks' pricing could influence some of the firm and bank characteristics and raise endogeneity issues. On the one hand, firms' current and past balance sheets are significant determinants of loan pricing. On the other hand, interest rates charged by banks affect firms' cash flows and financial wealth. To prevent such an endogeneity bias, I use lagged firm- and bank-level variables which eliminate reverse causality[9].

5. Results

5.1. The effect of unconsolidated and consolidated market power on interest rate setting

To assess the effect of bank market power on interest rate setting, I first estimate the baseline equation 1 using my three unconsolidated indicators. Results are reported in Table 4. *Ceteris paribus*, I find that neither structural or non-structural measures of bank market power influence the cost of credit, thus suggesting that both the information and the market power hypotheses are irrelevant. However, when these unconsolidated measures are replaced by consolidated ones in Table 5, the coefficients associated with the HHI, the CR3 and the Lerner become all positive and significant. Supporting the *market power hypothesis* (H1b), these findings indicate that bank market power increases firms' funding costs when banking group structures are included in the analysis. Notably, both structural and non-structural measures lead to the same conclusion, indicating that the results are not driven by the difference between structural and non-structural measures of bank market power.

To see the economic significance of the main results reported in column (1) of Table 5, a one unit increase in the HHI increases the interest rate by more than 1 basis point.

[9] As the FiBEN and SURFI databases provide yearly and quarterly information, respectively, note that firm variables are lagged by one year whereas bank variables are lagged by one quarter.

Consequently, a change by one standard deviation (i.e., 5) increases the cost of credit by 8 basis points. Switching to relative change, as the average average interest rate equals 4.44 %, the estimated semi-elasticities amounts to an increase of 1.8%. Similarly, the results in column (2) of Table 5 imply that for the same change in CR3 (i.e. one standard deviation), the cost of credit changes by 7 basis points or 1.6% from the mean. Furthermore, the coefficient of the Lerner index in column (3) is even stronger: a change by one standard deviation (i.e., 3) leads to an increase of 41 basis points in the cost of credit, which amounts to a 9.45% change from the mean. In a low interest rate environment, these effects can be considered as economically relevant.

Turning to the other explanatory variables, one should note that all the coefficients associated with firm variables (with the exception of firm age) are significantly negative, in line with the intuition that firms that are bigger, more liquid, more solvent and more profitable are likely to have lower cost of funding. Regarding loan controls, as expected, a higher amount of credit granted decreases the cost of credit, while adjustable rate has the opposite effect. Interestingly, single-banked firms are charged higher rates. This might be explained by the fact that private information produced during a bank-borrower relationship can also create ex post monopoly rents for the bank, and thus affect loan pricing and investment efficiency over the duration of the relationship (Sharpe, 1990; Rajan, 1992). Finally, only one bank control turns out to be significant in the main regressions: banks with higher liquid assets (i.e. higher reserves) tend to charge higher rates. Although beyond the scope of this paper, this result could be explained by the effect of the negative interest rate policy (NIRP), implemented by the ECB since 2014, on the supply of credit through the 'retail deposit channel': as banks are generally reluctant to apply negative rates to retail deposits, the NIRP may reduce banks' net interest margins and profits, eroding their capital and reducing their lending capacity (Eggertsson et al., 2019; Heider et al., 2019; Sims & Wu, 2021).

5.2. Do banks with greater market power charge higher rates to some firms than others ?

I next focus on firm heterogeneity to better understand the differential effect of bank market power according to firms' creditworthiness. Following the *market power hypothesis*, banks are likely to charge higher rates for firms that are the most "captive" and whose demand elasticity is the lowest such as small, young and financially fragile firms that cannot diversify their lending. Conversely, for the *information hypothesis*, higher bank market power will be relatively more beneficial (or less detrimental) to borrowing firms most exposed to informational asymmetries. To test these two alternatives hypotheses, I add interactions terms between firms controls that are supposed to capture both financial soundness and informational opacity and my different measures of bank market power. Table 6 presents the results. For every measure of bank market power (i.e. unconsolidated or consolidated), I find that the magnitude of the interest rate increase due to bank market power is significantly higher for firms that are smaller in size. Most importantly, those effects are higher for my three consolidated indicators. Moreover, column (4) and (5) also indicate that firms with a lower profitability ratio experience a higher increase in interest coming from higher bank market power but only for my two structural measures. In addition, there is no significant evidence that bank market power is more detrimental to younger, more liquid and solvent firms. These results provide additional support in favor of the *market power hypothesis* (H2b).

5.3. Do Relationship lending mitigate or strengthen the effects of bank market power?

In this section, I wonder whether higher bank market power is relatively more beneficial to firms borrowing from banks with a comparative advantage in relationship lending. To test this hypothesis, I interact my main measures of bank market power with four variables that are supposed to capture relationship lending: the size of the bank, single banking relationships, cooperative banks and the relationship length between a bank and its borrower. Estimations are reported in Table 7. Interestingly, no interaction coefficient is both significant and negative, which supports the *market power hypothesis*. Bank market power is found to have no differential effect according to the size of a bank, the existence of a single banking

relationship or cooperative banking. Besides, the last three columns associated with consolidated measures of bank market power show that firms exhibiting a higher relationship length with their bank are more affected by the increase in interest rate due to bank market power. In other words, the informational rent that a bank extracts in the long run reinforces its bargaining power to charge higher rates in regions where bank competition is already lower. These results support the *market power hypothesis* (H3b) according to which higher bank market power is relatively more detrimental to firms borrowing from a relationship bank.

5.4. Is there a differential effect of bank market power according to loan maturity or the business cycle?

Loans are heterogeneous by nature (maturity, outstanding amount, adjustable rate). I therefore investigate whether the effect of bank market power on interest rate setting depends on loan maturity. Following the *information hypothesis*, as long-term loans imply more monitoring and information-intensive processes, relationship lenders with higher market power are more likely to make use of their information advantage to charge lower rates on those types of loans. To assess this potential complementary, I interact my indicators of bank market power with a dummy variable that takes the value 1 if loan maturity is higher than one year and 0 otherwise. Estimates in Columns (1), (2) and (3) of Table 8 show that granting long term loans does not reduce the cost of credit as market power increases at the unconsolidated level. On the contrary, the positive and significant coefficients of columns (4) and (5) indicate that the adverse effect of bank market power on interest rate is even higher for information intensive loans, but only for consolidated structural measures. This again refutes the *information hypothesis* and suggests that bank market power is likely to have serious implications, as long-term loans finance investment and are therefore particularly important for economic growth.

Finally, Table 9 interacts measures of bank market power with a crisis dummy that takes the value 1 over the period 2009-2012 and 0 otherwise to gauge the differential effect of the

Great Recession according to bank market power[10]. Building on the *market power hypothesis*, the rationale is that soft information acquired by relationship lenders during good times gives them an informational advantage that increases in relative terms during a financial crisis, when firms are less likely to diversify their borrowing. For instance, despite the rise in loan spreads in bad times, firms with access to public debt markets pay lower spreads, and spreads increase significantly less during recessions (Santos & Winton, 2008). However, no significant interaction coefficient is found for both unconsolidated and consolidated measures of bank market power.

6. Robustness

In this last section, I check the robustness of my main findings in several ways. First, I construct alternative measures of Bank market power. The CEFIT database that I use to compute my two structural measures of bank market power allows me to collect the amounts of deposits of non-financial companies collected by banks at the regional level.Therefore, I use this information to compute alternative HHI and CR3 instead of outstanding amounts of credit. Results are presented in Table 10: the two coefficients related to alternative structural indicators are also positive and significant although the magnitude of their effects is smaller. Nevertheless, these results corroborate my main estimations and thus provide additional support for the *market power hypothesis*.

Second, I test the simultaneous inclusion of one structural measure and one non-structural measure of bank market power in the estimations in Table 11. To study the potential complementary between these two families of indicators, I test alternatively different measures of bank market power, which can be structural and non-structural. Indeed, one can wonder whether these two types of indicators are capturing the same dimension or can be considered as substitutes. To this end, I re-estimate equation 1 in which I include together one structural measure (CR5 or HHI) and the Lerner index. Interestingly, I observe that the effect of

[10] See Beatriz et al. (2018) for more justifications of this time interval for the French case

bank market is not significant anymore at both the unconsolidated and the consolidated levels. Consistent with the high correlation between structural and non-structural consolidated measures documented in section 4, these results suggest that these two types of indicators can be viewed as substitutes and capture almost the same dimension of banks' market power.

Third, I investigate the possible non-linearity in the relationship between bank market power and cost of credit. To this end, I include the squared term for the bank market power measure in the main estimations. The coefficients associated with the squared term do not appear significant for my three measures at both the unconsolidated and the consolidated level, which do not support a nonlinear relationship[11]. Thus, the analysis of the nonlinear relation suggests that the adverse effect of bank market power on the cost of credit does not depend on a certain level of bank concentration or competition.

Fourth, as I have previously found that bank market power is relatively more detrimental to small and less profitable firms, one can wonder whether these results hold when using alternative measures of firm riskiness. To answer this question, I interact my three indicators of bank market power (unconsolidated and consolidated) with a dummy that accounts for firm credit risk: the "speculative grade" of the Banque de France rating system. This rating category assesses a firm's ability to meet its financial commitments over a three-year horizon as weak or worse. The results are shown in Table 12. Overall, the interaction term turns out to be positive and significant but only for consolidated indicators, which confirms the *market power hypothesis*.

Fifth, one should also wonder why bank market power is better measured with consolidated data given that banks that belong to the same banking group can compete with each other. Considering a loan from Banque populaire du Nord to a given firm, is it more relevant to consider the Lerner index of BPCE group or of Banque populaire du Nord? The answer is not straightforward. Hence, to control for this intragroup competition while using consolidated measure of bank market power power, I include each unconsolidated equivalent in the

[11] Results are not presented but are available upon request.

main regression which leaves my main results unchanged [12].

Finally, in order to account for the potential reverse causality coming from the *Outstanding amount* regressor, I re-estimate equation 1 using an instrumental variable strategy. I argue that current assets, which consists of inventories and accounts receivable, capture positive demand shocks that are correlated with the current demand for credit at firm level. Controlling for non-linearities, I also add a quadratic form in the specification. However, I presume that these variables are not correlated with the level of interest rates (i.e. with the error term). To ensure that my instruments are valid, I run a battery of statistical tests[13]. The results of the instrumental variables estimations are shown in Table 13. In the first stage, for all regressions, the coefficient of current assets has a non-linear effect on the outstanding amount of credit. The linear term alone is significantly negative and the squared term is significantly positive. In the second stage, the coefficient of the outstanding amount of credit is still negative but no longer significant and I find the same results with regard to the adverse effect of bank market power at the consolidated level.

7. Conclusion

In this paper, I analyzed the impact of bank market power on the cost of credit using a panel of more than 55,000 French firms covering the 2006-–2017 period. The *information hypothesis* highlights the benefits of low competition owing to the incentives of banks to invest in soft information, while the *market power hypothesis*, in contrast, emphasizes the virtues of competition on the level of prices charged. The empirical literature that has examined this issue has brought mixed results. Yet, all of these studies are based on unconsolidated data. Indeed, the indicators used in most empirical studies are calculated from unconsolidated data, thus ignoring the very notion of banking groups. After associating all the French

[12] Results are not presented but available upon request.

[13] In this regard, the Hansen J-statistic implies that we cannot reject the null hypothesis that all instruments are exogenous, while the Kleibergen-Paap statistic indicates that our instruments are relevant. Besides, implementing the tests recommended by Baum et al. (2007), I can also reject the null hypothesis of weak instruments when I do not accept an actual test size above 10% (results available upon request).

banks with their banking group, I fill this gap by considering three consolidated structural and non-structural measures of bank market power.

My main finding is that bank market power increases firms' funding costs in line with the *market power hypothesis*. My baseline estimations indicate a positive relation between bank market power and the cost of credit for the three consolidated measures, while unconsolidated ones turn out to have no effect. Looking at firm heterogeneity, I find that the effect of bank market power on interest rate is detrimental precisely where the *information hypothesis* predicts it should be most beneficial. Indeed, risky firms that are smaller and less profitable are charged higher rates as bank market power increases. Invalidating the *information hypothesis*, I observe that not only firms exhibiting a higher relationship length with their bank suffer more from the increase in interest rate due to bank market power but also that the adverse effect of bank market power is mostly concentrated on long-term loans that are more information intensive.

These findings have direct policy implications. Since the creation of the banking union in 2014, the ECB has sought to encourage cross-border mergers in order to improve the effectiveness of its monetary policy by creating more integrated banking systems in Europe. However, this cross-country banking consolidation may significantly increase the market power of individual banking groups. More recently, the COVID-19 pandemic has led to the announcement of several domestic merger announcements that could reinforce bank concentration in Europe. Against this background, this paper questions these developments that may result in overall higher funding costs, especially for financially constrained borrowers such as SMEs, thus reducing economic growth and employment given the critical role of these firms in Europe. On this point, on should note that France is one the European countries where market financing for the largest SMEs is developing the most, which may mitigate the effects of the increased market power of banks on this category of firms. The vices of greater bank market power, however, need to be put into perspective with its costs and benefits on financial stability, which goes beyond the scope of this research. My consolidated analysis of bank

market power could be extended to other countries with strong banking groups to see if the same conclusions are found. Further analysis should be done to study the real effects of bank market power, for example in terms of investment, employment and firm profitability.

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Appendix: Estimating the Lerner Index

The Lerner Index used to measure market power of a given bank is computed using the following formula:

$$Lerner_{bt} = \frac{P_{bt} - MC_{bt}}{P_{bt}} \tag{2}$$

Where $_b$ stands for banks, $_t$ for year. The price of output P_{bt} is proxied as the ratio of total income to total assets while the marginal cost MC_{bt} is obtained by estimating a translogarithmic cost function with one output (total asset), and three proxies for input prices (labor, borrowing and capital). As in Demirguc-Kunt & Martínez Pería (2010), I estimate the following model:

$$\ln(TC)_{bt} = \alpha_0 + \alpha_1 \ln y_{bt} + \alpha_2 0.5(\ln y_{bt})^2 + \sum_{j=1}^{3} \beta_j \ln w_{btj} + \sum_{j=1}^{3}\sum_{k=1}^{3} \beta_j k \ln w_{btj} \times \ln w_{btk} \tag{3}$$

$$+0.5 \sum_{k=1}^{3} \gamma_j \ln w_{btj} \times \ln y_{bt} + Trend_t(\sigma_1 + \sigma_2 Trend_t + \sigma_3 \ln y_{bt} + \sum_{j=1}^{3} \sigma_4 \ln w_{btj}) + \epsilon_{bt}$$

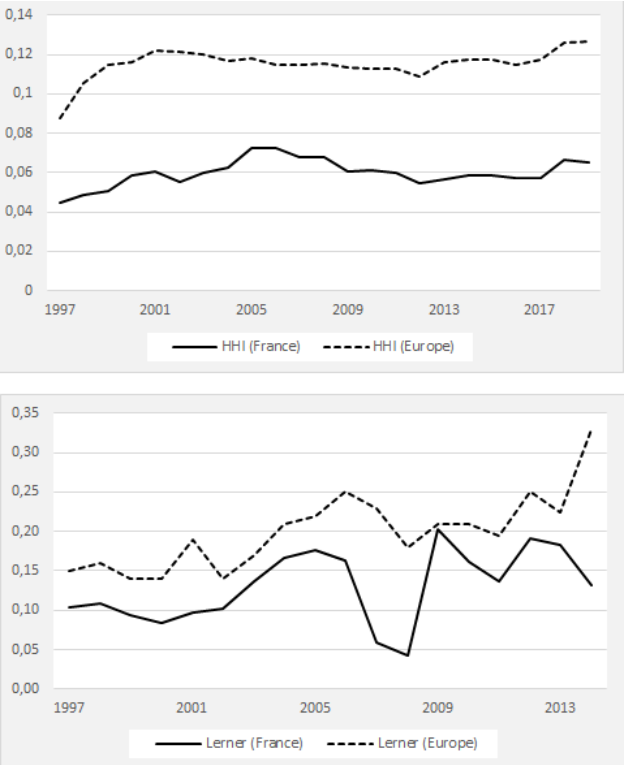
where $_b$ stands for banks, $_t$ for years and $_j$ for input prices. TC denotes total costs (sum of total interest paid and operating costs), y total banking assets, w1 labor price (staff expenses divided by total assets), w2 the price of physical capital (non-interest expenses divided by total assets) and w3 the price of borrowed funds (total interest paid divided by customer and short term funding). I also include a *Trend* to capture the influence of technical change leading to shifts in the cost function over time. Following the literature, two different estimations are done under the restrictions of symmetry and degree one homogeneity in the price of inputs. Regarding my question of interest, I estimate model 3 at both the unconsolidated and the consolidated banking data level representing 442 banks and 193 banking groups, respectively

[14]. These two samples are extracted from the French SURFI database covering the 2006 - 2017 period[15]. The estimations are carried out with bank-fixed effects. Finally the estimated coefficients are employed to derive the marginal cost MC_{bt} :

$$\widehat{MC_{bt}} = \frac{TC_{bt}}{y_{bt}}\left(\hat{\alpha}_1 + \hat{\alpha}_2 \ln y_{bt} + 0.5 \sum_{j=1}^{3} \hat{\gamma}_j \ln w_{btj} + \hat{\sigma}_3 Trend_t\right) \tag{4}$$

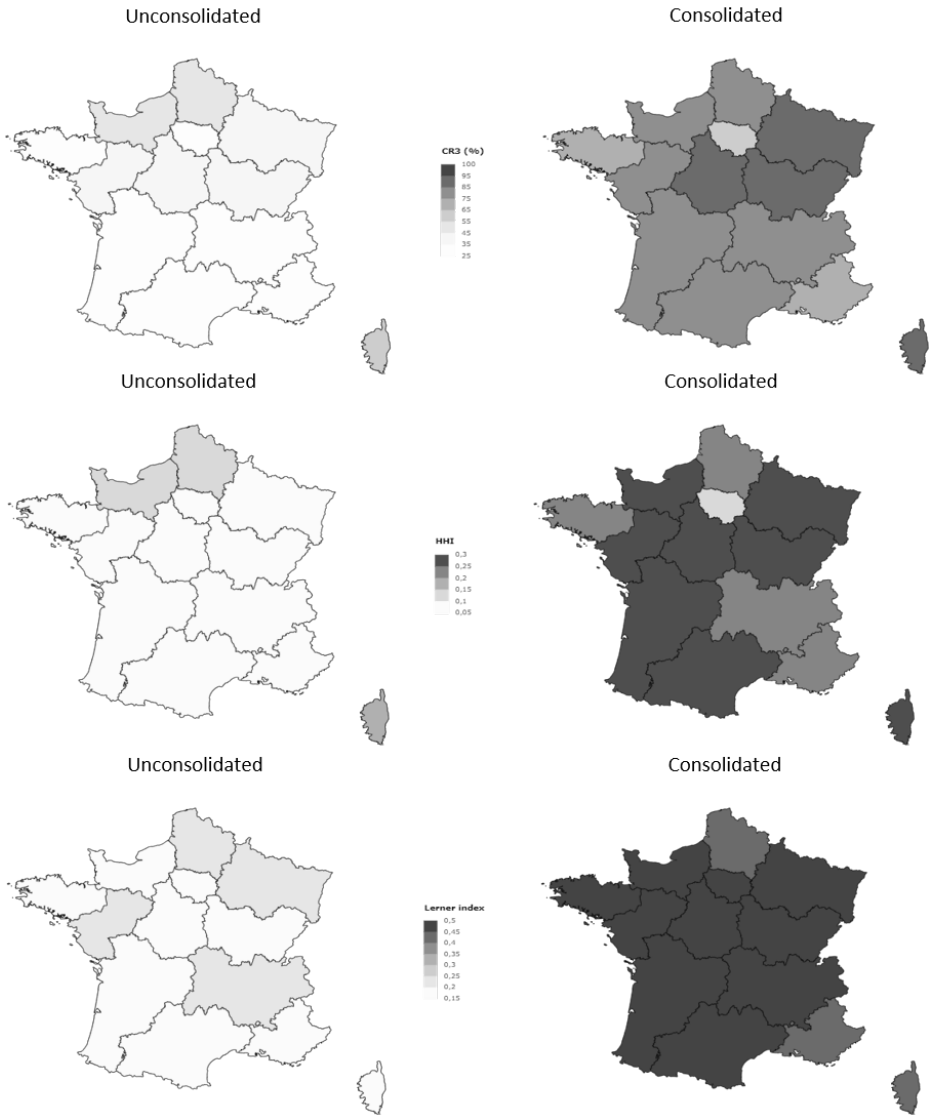
[14] See section 4 for more details.
[15] See section 3 for more details on this database.

Figure 1: Comparisons of bank market power between France and Europe



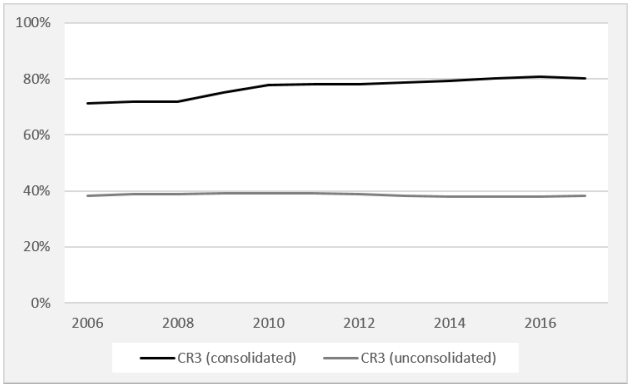
Notes: The Herfindahl-Hirschman index (HHI) on total credit comes from the structural financial indicators of the European Central Bank while the Lerner index is provided by the World Bank which uses the Demirguc-Kunt & Martínez Pería (2010)'s methodology.

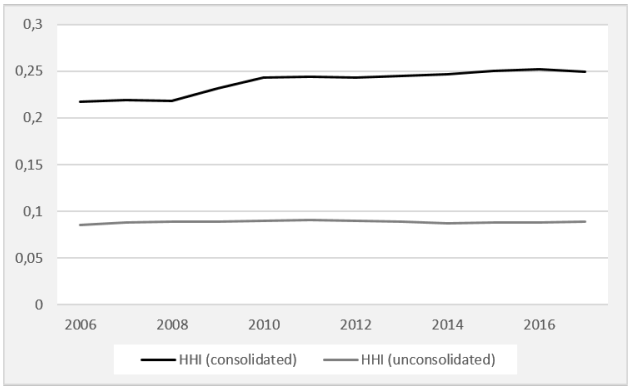
Figure 2: Regional comparisons between unconsolidated and consolidated indicators of bank market power

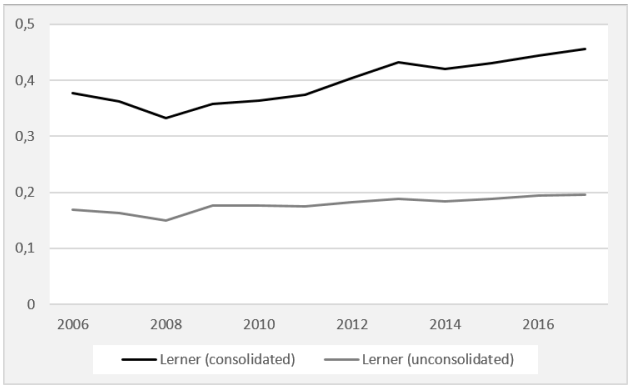


Notes: All the definitions of the indicators are summarized in Table 2. Based on the year 2017, calculations are made using the CEFIT and the SURFI databases (Banque de France). The Herfindahl-Hirschman index (HHI) and the sum of the market shares of the top 3 banks (CR3) build on credit distribution at the regional level while the Lerner index is the average Lerner index of all banks operating in a given region. See section 4 for more methodological details on these indicators.

Figure 3: Evolution of the unconsolidated and consolidated indicators of bank market power







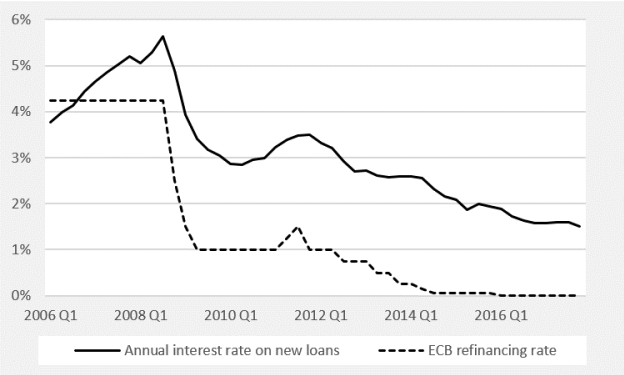
Notes: All the definitions of the indicators are summarized in Table 2. Calculations are made using the CEFIT and the SURFI databases (Banque de France). The Herfindahl-Hirschman index (HHI) and the sum of the market shares of the top 3 banks (CR3) build on credit distribution at the regional level while the Lerner index is the average Lerner index of all banks operating in a given region. See section 4 for more methodological details on these indicators.

Table 1: Correlation between structural and non-structural measures of bank market power

	Unconsolidated		Consolidated	
	HHI	CR3	HHI	CR3
HHI				
CR3	0.911		0.948	
	(0.000)		(0.000)	
Lerner	0.079	0.123	0.871	0.865
	(0.000)	(0.000)	(0.000)	(0.000)

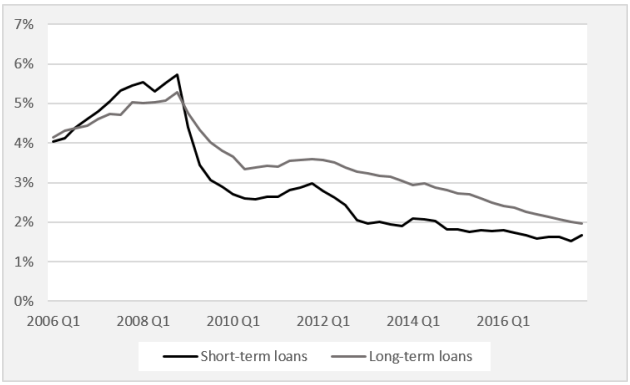
Notes: The table reports correlations between structural measures of bank market power (HHI, CR3) at the regional level and the regional average of the Lerner index. All indicators are computed at the regional-quarter level and are defined so that an increase in the metric corresponds to higher market power (i.e. higher concentration or lower competition). See section 4 for more methodological details on these indicators. P-values are reported in parentheses.

Figure 4: Annual interest rate on new business loans and ECB refinancing rate



Sources: The annual interest rate on new business loans comes from the M-Contran database (Banque de France) while the ECB refinancing rate comes from the Banque de France online database (Webstat).

Figure 5: Annual interest rate on new business loans according to loan maturity



Notes: The annual interest rates on short-term and long-term business loans come from the M-Contran database (Banque de France). The category *Short-term loans* refers to loans with a maturity lower than one year while the category *Long-term loans* represents loans whose maturity is higher than one year.

Table 2: Variables definitions

	Definition
Bank market power variables	
Unconsolidated HHI	The unconsolidated Herfindahl-Hirschman Index on credit at the regional level.
Consolidated HHI	The consolidated Herfindahl-Hirschman Index on credit at the regional level.
Unconsolidated CR3	The sum of the credit market shares of the top 3 regional banks.
Consolidated CR3	The sum of the credit market shares of the top 3 regional banking groups.
Unconsolidated Lerner Index	Unconsolidated measure of market power in the banking market that compares output pricing and marginal costs (i.e. markup). See appendix A.
Consolidated Lerner Index	Consolidated measure of market power in the banking market that compares output pricing and marginal costs (i.e. markup). See appendix A.
Loan variables	
Interest rate on new loans	The Narrowly Defined Effective Rate (NDER) of a new loan.
Maturity	The number of month at which the final repayment of a loan is due.
Outstanding amount	The amount of euros granted.
Adjustable rate	A dummy that takes the value 1 whether the interest rate is adjustable and 0 otherwise.
Firm variables	
Capital ratio	The ratio of own funds over total assets of the firm.
Cash ratio	The ratio of cash holdings over total assets of the firm.
ROA	The ratio of cash flow over total assets of the firm.
Age	The number of years since funding.
Ln(total assets)	The log of the total assets of the firm.
Bank variables	
Capital ratio	The ratio of own funds over total assets of the bank.
Liquidity ratio	The ratio of liquid assets (central bank, interbank claims and cash) over total assets of the bank.
ROA	The total net income over total assets of the bank.
LTA	The Loan To Assets ratio of the bank.
NPLR	The non performing loan ratio of the bank.
Ln(total assets)	The log of the total assets of the bank.
Relationship lending variables	
Duration	The elapsed time between the first relationship established between a firm and a bank and the last one.
Single-banked	A dummy that takes the value 1 whether the firm is single-banked and 0 otherwise.
Cooperative bank	A dummy that takes the value 1 whether the bank is a cooperative bank and 0 otherwise.
Business cycle	
Crisis	A dummy that takes the value 1 over the period 2009-2012 and 0 otherwise.

Table 3: Summary statistics

	Mean	Median	Sd	Min	Max
Dependent variable					
Interest rate on new loans (%)	4.44	4.24	2.88	0.51	12.28
Bank competition variables					
Unconsolidated HHI (base 100)	7.49	7.20	1.72	5.18	21.11
Consolidated HHI (base 100)	22.55	24.68	5.03	14.35	28.56
Unconsolidated CR3 (%)	35.08	33.65	5.66	27.11	71.71
Consolidated CR3 (%)	74.02	77.56	10.02	56.68	87.81
Unconsolidated Lerner (base 100)	17.95	18.25	1.70	7.74	20.47
Consolidated Lerner (base 100)	41.90	47.33	3.05	37.15	48.05
Credit controls					
Outstanding amount (*thousand euros*)	283	32	959	1	7500
Outstanding amount (*log*)	10.62	10.38	1.99	6.90	15.83
Maturity (*months*)	31.17	36	29.99	1	121
Adjustable rate (*0/1*)	0.27	0	0.44	0	1
Firm controls					
Age (*years*)	22.84	19	16.90	2	92
Total assets (*log*)	8.18	7.84	1.59	5.82	13.81
Total assets (*thousand euros*)	28,340	2,554	120,845	340	998,500
Capital ratio (%)	24.76	23.06	16.13	0	71.48
ROA (%)	4.07	4.19	9.41	-30.79	30.35
Cash ratio (%)	8.78	4.61	10.73	0	50.82
Bank control					
Total assets (*log*)	16.12	15.88	1.67	12.82	29.29
Total assets (*billion euros*)	76.55	8.02	231	0.37	1,112
Capital ratio (%)	8.31	6.89	5.70	1.02	29.29
Liquidity ratio (%)	15.39	12.16	13.43	0.16	59.08
ROA (%)	0.72	0.56	1.04	-2.21	5.32
NPLR (%)	2.85	2.32	2.43	0	12.42
LTA (%)	40.92	41.65	25.49	0.54	84.73
Relationship lending controls					
Duration (*Quarters*)	17.46	15	12.80	1	48
Single-banked (*0/1*)	0.18	0	0.38	0	1
Cooperative banks (*0/1*)	0.36	0	0.36	0	1
Business cycle					
Crisis (*0/1*)	0.32	0	0.46	0	1

Table 4: Bank market power at the unconsolidated level

	Dependent variable = Cost of credit		
	(1)	(2)	(3)
Bank market power			
Herfindahl$_t$	0.010		
	(0.020)		
CR3$_t$		0.001	
		(0.005)	
Lerner$_t$			0.013
			(0.015)
Loan controls			
Maturity$_t$	0.009***	0.009***	0.009***
	(0.002)	(0.002)	(0.002)
Oustanding amount(log)$_t$	-0.172**	-0.172**	-0.172**
	(0.064)	(0.064)	(0.064)
Adjustable rate$_t$	0.242***	0.242***	0.243***
	(0.074)	(0.073)	(0.075)
Firm controls			
Total assets (log)$_{t-1}$	-0.102**	-0.102**	-0.102**
	(0.039)	(0.039)	(0.039)
Capital ratio$_{t-1}$	-0.004**	-0.004**	-0.004**
	(0.002)	(0.002)	(0.002)
Cash ratio$_{t-1}$	-0.003***	-0.003***	-0.003***
	(0.001)	(0.001)	(0.001)
ROA$_{t-1}$	-0.004**	-0.004**	-0.004**
	(0.001)	(0.001)	(0.001)
Age$_t$	0.007	0.007	0.007
	(0.006)	(0.006)	(0.006)

Notes : Continues on the next page.

Table 4: Bank market power at the unconsolidated level (continued)

	Dependent variable = Cost of credit		
	(1)	(2)	(3)
Bank controls			
Total assets (log)$_{t-1}$	-0.273	-0.272	-0.271
	(0.249)	(0.250)	(0.248)
Capital ratio$_{t-1}$	-0.003	-0.003	-0.002
	(0.011)	(0.011)	(0.011)
Liquidity ratio$_{t-1}$	0.016***	0.016***	0.016***
	(0.003)	(0.003)	(0.003)
ROA$_{t-1}$	-0.006	-0.006	-0.006
	(0.015)	(0.015)	(0.015)
NPLR$_{t-1}$	-0.009	-0.009	-0.009
	(0.047)	(0.047)	(0.047)
LTA$_{t-1}$	-0.006	-0.006	-0.006
	(0.008)	(0.008)	(0.008)
Relationship lending			
Duration$_t$	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)
Single-bank$_t$	0.039**	0.039**	0.039**
	(0.016)	(0.016)	(0.018)
Cooperative bank$_t$	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)
Business Cycle			
Crisis$_t$	-1.007***	-1.004***	-1.023***
	(0.152)	(0.156)	(0.150)
Firm, bank and time fixed effects	Yes	Yes	Yes
Obs.	232,576	232,576	232,576
Number of firms	55,406	55,406	55,406
adj. R2	0.829	0.829	0.829

Notes : This table shows the regression results of a within estimation of equation 1 for the unconsolidated measures of bank market power. The definitions of the variables are summarized in Table 2. All regressions include loan, firm, bank and and relationship lending controls as well as firm, bank and time fixed effects (coefficients are not reported but available upon request). The Hausman test rejects the null hypothesis of random effect estimator consistency. Standard errors (in brackets) are triple clustered at firm, bank and regional level and are heteroscedasticity consistent. *, ** and *** indicate significance levels at 10%, 5% and 1% respectively.

Table 5: Bank market power at the consolidated level

	Dependent variable = Cost of credit		
	(1)	(2)	(3)
Bank market power			
Herfindahl$_t$	0.016***		
	(0.005)		
CR3$_t$		0.014***	
		(0.003)	
Lerner$_t$			0.137**
			(0.047)
Loan controls			
Maturity$_t$	0.009***	0.009***	0.009***
	(0.002)	(0.002)	(0.002)
Oustanding amount(log)$_t$	-0.172**	-0.172**	-0.172**
	(0.064)	(0.064)	(0.065)
Adjutable rate$_t$	0.242***	0.243***	0.242***
	(0.072)	(0.072)	(0.073)
Firm controls			
Total assets (log)$_{t-1}$	-0.102**	-0.102**	-0.102**
	(0.039)	(0.039)	(0.039)
Capital ratio$_{t-1}$	-0.004**	-0.004**	-0.004**
	(0.002)	(0.002)	(0.002)
Cash ratio$_{t-1}$	-0.003***	-0.003***	-0.003***
	(0.001)	(0.001)	(0.001)
ROA$_{t-1}$	-0.004**	-0.004**	-0.004**
	(0.001)	(0.001)	(0.001)
Age$_t$	0.007	0.006	0.007
	(0.006)	(0.006)	(0.006)

Notes : Continues on the next page.

Table 5: Bank market power at the consolidated level (continued)

	Dependent variable = Cost of credit		
	(1)	(2)	(3)
Bank controls			
Total assets (log)	-0.272	-0.274	-0.273
	(0.247)	(0.247)	(0.250)
Capital ratio$_{t-1}$	-0.002	-0.003	-0.003
	(0.011)	(0.011)	(0.011)
Liquidity ratio$_{t-1}$	0.016***	0.016***	0.016***
	(0.003)	(0.003)	(0.003)
ROA$_{t-1}$	-0.006	-0.006	-0.006
	(0.015)	(0.015)	(0.015)
NPLR$_{t-1}$	-0.009	-0.009	-0.009
	(0.047)	(0.047)	(0.047)
LTA$_{t-1}$	-0.006	-0.006	-0.006
	(0.008)	(0.008)	(0.008)
Relationship lending			
Duration$_t$	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)
Single-bank$_t$	0.040**	0.040**	0.040**
	(0.016)	(0.016)	(0.016)
Cooperative bank$_t$	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)
Business Cycle			
Crisis$_t$	-1.025***	-1.043***	-1.020***
	(0.152)	(0.150)	(0.151)
Firm, bank and time fixed effects	Yes	Yes	Yes
Obs.	232,576	232,576	232,576
Number of firms	55,406	55,406	55,406
adj. R2	0.829	0.829	0.829

Notes : This table shows the regression results of a within estimation of equation 1 for the consolidated measures of bank market power. The definitions of the variables are summarized in Table 2. All regressions include loan, firm, bank and and relationship lending controls as well as firm, bank and time fixed effects (coefficients are not reported but available upon request). The Hausman test rejects the null hypothesis of random effect estimator consistency. Standard errors (in brackets) are triple clustered at firm, bank and regional level and are heteroscedasticity consistent. *, ** and *** indicate significance levels at 10%, 5% and 1% respectively.

Table 6: Bank market power and firm heterogeneity

	Dependent variable = Cost of credit					
	Unconsolidated			Consolidated		
	HHI	CR3	Lerner	HHI	CR3	Lerner
	(1)	(2)	(3)	(4)	(5)	(6)
Bank market power$_t$	0.017	0.004	0.046	0.016*	0.015**	0.232**
	(0.014)	(0.004)	(0.016)	(0.007)	(0.003)	(0.077)
Bank market power$_t$ x Total assets (log)$_{t-1}$	-0.032**	-0.006**	-0.027***	-0.034***	-0.009***	-0.106***
	(0.014)	(0.002)	(0.001)	(0.003)	(0.002)	(0.002)
Bank market power$_t$ x Capital ratio$_{t-1}$	-0.001	-0.001	0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Bank market power$_t$ x Cash ratio$_{t-1}$	0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)
Bank market power$_t$ x ROA$_{t-1}$	-0.001	-0.001	-0.001	-0.001*	-0.001*	-0.001
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Bank market power$_t$ x Age$_{t-1}$	0.002	0.001	0.001	0.001	0.001	0.001
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
All time-varying controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm, time and bank fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	232,576	232,576	232,576	232,576	232,576	232,576
Number of firms	55,406	55,406	55,406	55,406	55,406	55,406
Adj. R2	0.829	0.829	0.829	0.829	0.829	0.829

Notes : This table shows the regression results of a within estimation that interacts bank market power with variables that capture firms heterogeneity. While columns (1), (2) and (3) include unconsolidated measures of bank market power, columns (3), (4) and (5) focus on consolidated measures. The definitions of the variables are summarized in Table 2. All regressions include loan, firm, bank and and relationship lending controls as well as firm, bank and time fixed effects (coefficients are not reported but available upon request). The Hausman test rejects the null hypothesis of random effect estimator consistency. Standard errors (in brackets) are triple clustered at firm, bank and regional level and are heteroscedasticity consistent. *, ** and *** indicate significance levels at 10%, 5% and 1% respectively.

Table 7: Bank market power and relationship lending

	Dependent variable = Cost of credit					
	Unconsolidated			Consolidated		
	HHI	CR3	Lerner	HHI	CR3	Lerner
	(1)	(2)	(3)	(4)	(5)	(6)
Bank market power	0.014	0.003	0.004	0.015*	0.014*	0.102**
	(0.021)	(0.004)	(0.032)	(0.003)	(0.003)	(0.035)
Bank market power x Total assets (log)$_{t-1}$	-0.003	-0.001	-0.009	-0.004	-0.001	0.001
	(0.003)	(0.002)	(0.009)	(0.002)	(0.001)	(0.012)
Bank market power x Single-bank$_t$	0.001	-0.001	0.020	-0.002	-0.098	0.001
	(0.006)	(0.001)	(0.014)	(0.003)	(0.147)	(0.035)
Bank market power x cooperative bank$_t$	-0.051	-0.001	-0.069	-0.010	-0.009	-0.090
	(0.029)	(0.000)	(0.033)	(0.012)	(0.007)	(0.099)
Bank market power x Duration$_t$	0.001	-0.001	0.001	0.001*	0.001*	0.003**
	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
All time-varying controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm, time and bank fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	232,576	232,576	232,576	232,576	232,576	232,576
Number of firms	55,406	55,406	55,406	55,406	55,406	55,406
Adj. R2	0.829	0.870	0.829	0.829	0.829	0.829

Notes : This table shows the regression results of a within estimation that interacts bank market power with variables that capture relationship lending. While columns (1), (2) and (3) include unconsolidated measures of bank market power, columns (3), (4) and (5) focus on consolidated measures. The definitions of the variables are summarized in Table 2. All regressions include loan, firm, bank and and relationship lending controls as well as firm, bank and time fixed effects (coefficients are not reported but available upon request). The Hausman test rejects the null hypothesis of random effect estimator consistency. Standard errors (in brackets) are triple clustered at firm, bank and regional level and are heteroscedasticity consistent. *, ** and *** indicate significance levels at 10%, 5% and 1% respectively.

Table 8: Concentration and loan maturity

	Dependent variable = Cost of credit					
	Unconsolidated			Consolidated		
	HHI	CR3	Lerner	HHI	CR3	Lerner
	(1)	(2)	(3)	(4)	(5)	(6)
Bank market power$_t$	-0.022	-0.009	0.109	-0.024	-0.007	0.069
	(0.027)	(0.005)	(0.201)	(0.025)	(0.005)	(0.118)
Bank market power$_t$ x Long term loan$_t$	0.047	0.015	0.110	0.045***	0.018**	0.104
	(0.028)	(0.008)	(0.005)	(0.044)	(0.012)	(0.113)
All time-varying controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm, time and bank fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	232,576	232,576	232,576	232,576	232,576	232,576
Number of firms	55,406	55,406	55,406	55,406	55,406	55,406
Adj. R2	0.831	0.831	0.831	0.831	0.831	0.831

Notes : This table shows the regression results of a within estimation that interacts bank market power with a dummy variable that stands for long term loans. The latter takes the value 1 if the new loan maturity is higher than 1 year and 0 otherwise. While columns (1), (2) and (3) include unconsolidated measures of bank market power, columns (3), (4) and (5) focus on consolidated measures. The definitions of the variables are summarized in Table 2. All regressions include loan, firm, bank and and relationship lending controls as well as firm, bank and time fixed effects (coefficients are not reported but available upon request). The Hausman test rejects the null hypothesis of random effect estimator consistency. Standard errors (in brackets) are triple clustered at firm, bank and regional level and are heteroscedasticity consistent. *, ** and *** indicate significance levels at 10%, 5% and 1% respectively.

Table 9: Concentration and business cycle

	Dependent variable = Cost of credit					
	Unconsolidated			Consolidated		
	HHI	CR3	Lerner	HHI	CR3	Lerner
	(1)	(2)	(3)	(4)	(5)	(6)
Bank market power$_t$	0.005	0.001	0.011	0.015**	0.014***	0.145**
	(0.020)	(0.005)	(0.015)	(0.004)	(0.001)	(0.052)
Bank market power$_t$ x Crisis$_t$	0.002	-0.010	0.021	0.006	0.003	0.064
	(0.006)	(0.002)	(0.023)	(0.007)	(0.003)	(0.041)
All time-varying controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm, time and bank fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	232,576	232,576	232,576	232,576	232,576	232,576
Number of firms	55,406	55,406	55,406	55,406	55,406	55,406
Adj. R2	0.829	0.829	0.829	0.829	0.829	0.829

Notes : This table shows the regression results of a within estimation that interacts bank market power with a dummy variable that captures the Great Recession. While columns (1), (2) and (3) include unconsolidated measures of bank market power, columns (3), (4) and (5) focus on consolidated measures. The definitions of the variables are summarized in Table 2. The definitions of the variables are summarized in Table 2. All regressions include loan, firm, bank and and relationship lending controls as well as firm, bank and time fixed effects (coefficients are not reported but available upon request). The Hausman test rejects the null hypothesis of random effect estimator consistency. Standard errors (in brackets) are triple clustered at firm, bank and regional level and are heteroscedasticity consistent. *, ** and *** indicate significance levels at 10%, 5% and 1%

Table 10: Robustness check: alternative structural measures of bank market power

	Dependent variable = Cost of credit			
	Unconsolidated		Consolidated	
	HHI (deposit)	CR3 (deposit)	HHI (deposit)	CR3 (deposit)
	(1)	(2)	(3)	(4)
Bank market power$_t$	0.005	0.001	0.009**	0.006*
	(0.011)	(0.005)	(0.003)	(0.002)
All time-varying controls	Yes	Yes	Yes	Yes
Firm, time and bank fixed effects	Yes	Yes	Yes	Yes
Observations	232,576	232,576	232,576	232,576
Number of firms	55,406	55,406	55,406	55,406
Adj. R2	0.829	0.829	0.829	0.829

Notes : This table shows the regression results of a within estimation of equation 1 using alternative structural measures of bank market power based on non-financial corporations' deposits at the regional level. While columns (1), (2) include unconsolidated measures of bank market power, columns (3), (4) focus on consolidated measures. The definitions of the variables are summarized in Table 2. All regressions include loan, firm, bank and and relationship lending controls as well as firm, bank and time fixed effects (coefficients are not reported but available upon request). The Hausman test rejects the null hypothesis of random effect estimator consistency. Standard errors (in brackets) are triple clustered at firm, bank and regional level and are heteroscedasticity consistent. *, ** and *** indicate significance levels at 10%, 5% and 1%

Table 11: Robustness check: Estimations including structural and non-structural measures of bank market power.

	Dependent variable = Cost of credit			
	Unconsolidated		Consolidated	
	(1)	(2)	(3)	(4)
HHI_t	0.009		0.004	
	(0.020)		(0.017)	
$CR3_t$		0.001		0.004
		(0.005)		(0.004)
$Lerner_t$	0.014	0.013	0.123	0.103
	(0.015)	(0.019)	(0.167)	(0.085)
All time-varying controls	Yes	Yes	Yes	Yes
Firm, time and bank fixed effects	Yes	Yes	Yes	Yes
Observations	232,576	232,576	232,576	232,576
Number of firms	55,406	55,406	55,406	55,406
Adj. R2	0.829	0.829	0.829	0.829

Notes : This table shows the regression results of a within estimation of equation 1 using both structural and non-structural measures of bank market power. While columns (1) and (2) include unconsolidated measures of bank market power, columns (3) and (4) focus on consolidated measures. The definitions of the variables are summarized in Table 2. All regressions include loan, firm, bank and and relationship lending controls as well as firm, bank and time fixed effects (coefficients are not reported but available upon request). The Hausman test rejects the null hypothesis of random effect estimator consistency. Standard errors (in brackets) are triple clustered at firm, bank and regional level and are heteroscedasticity consistent. *, ** and *** indicate significance levels at 10%, 5% and 1%

Table 12: Robustness check: alternative measure of firm riskiness

	Dependent variable = Cost of credit					
	Unconsolidated			Consolidated		
	HHI	CR3	Lerner	HHI	CR3	Lerner
	(1)	(2)	(3)	(4)	(5)	(6)
Bank market $power_t$	0.010	0.001	0.012	0.015***	0.013***	0.133**
	(0.020)	(0.005)	(0.013)	(0.005)	(0.003)	(0.066)
Bank market $power_t$ x Risky $firm_{t-1}$	0.004	-0.003	0.037	0.023***	0.011***	0.136**
	(0.023)	(0.006)	(0.021)	(0.005)	(0.002)	(0.045)
All time-varying controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm, time and bank fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	232,576	232,576	232,576	232,576	232,576	232,576
Number of firms	55,406	55,406	55,406	55,406	55,406	55,406
Adj. R2	0.830	0.830	0.830	0.830	0.830	0.830

Notes : This table shows the regression results of a within estimation that interacts bank market power with a dummy variable that captures firm riskiness. The latter is based on the "speculative grade" of the Banque de France rating system. While columns (1), (2) and (3) include unconsolidated measures of bank market power, columns (3), (4) and (5) focus on consolidated measures. The definitions of the variables are summarized in Table 2. All regressions include loan, firm, bank and and relationship lending controls as well as firm, bank and time fixed effects (coefficients are not reported but available upon request). The Hausman test rejects the null hypothesis of random effect estimator consistency. Standard errors (in brackets) are triple clustered at firm, bank and regional level and are heteroscedasticity consistent. *, ** and *** indicate significance levels at 10%, 5% and 1% respectively.

Table 13: Robustness check: IV estimation (consolidated indicators of bank market power)

	HHI		CR3		Lerner	
Dependent variable	Oustanding amount (log)	Cost of credit	Oustanding amount(log)	Cost of credit	Oustanding amount(log)	Cost of credit
	(1)	(2)	(3)	(4)	(5)	(6)
HHI_t	-0.009	0.013**	-0.005		-0.036	
	(0.006)	(0.006)	(0.004)		(0.048)	
$CR3_t$				0.013***		
				(0.003)		
$Lerner_t$						0.131***
						(0.040)
Oustanding amount $(log)_t$		-0.285		-0.251		-0.281
		(0.407)		(0.408)		(0.405)
Gross current $assets(log)_t$	-0.146**		-0.145**		-0.148**	
	(0.073)		(0.071)		(0.071)	
Gross curent $assets(log)^2{}_t$	0.012**		0.012**		0.012**	
	(0.005)		(0.005)		(0.005)	
All time-varying controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm, time and bank fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Kleibergen-Paap statistic		7.682**		7.582**		7.606**
Hansen J statistic		0.037		0.049		0.033
Observations	232,576	232,576	232,576	232,576	232,576	232,576
Number of firms	55,406	55,406	55,406	55,406	55,406	55,406

Notes : This table shows the IV estimation of a within estimation of equation 1. Column (1) and column (2) correspond to the first and second stage, respectively. The instrument *Gross current assets* represents the sum of accounts receivable and inventories. The definitions of the variables are summarized in Table 2. All regressions include firm, bank, market and loan controls as well as firm, bank and time fixed effects (coefficients are not reported but available upon request). The Hansen J statistics implies that we cannot reject the null hypothesis that all instruments are exogenous, while the Kleibergen-Paap rk Wald F statistic indicates that my instruments are relevant. Standard errors (in brackets) are triple clustered at firm-level, bank-level and regional-level and are heteroscedasticity consistent. *, ** and *** indicate significance levels at 10%, 5% and 1% respectively.

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