

Hasan, Iftekhar; Jackowicz, Krzysztof; Kowalewski, Oskar; Kozłowski, Łukasz

Working Paper

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Bank of Finland Research Discussion Papers, No. 22/2014

Provided in Cooperation with:

Bank of Finland, Helsinki

Suggested Citation: Hasan, Iftekhar; Jackowicz, Krzysztof; Kowalewski, Oskar; Kozłowski, Łukasz (2014) : Bank ownership structure, SME lending and local credit markets, Bank of Finland Research Discussion Papers, No. 22/2014, ISBN 978-952-6699-96-7, Bank of Finland, Helsinki, <https://nbn-resolving.de/urn:nbn:fi:bof-201411183251>

This Version is available at:

<https://hdl.handle.net/10419/212297>

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Iftekhar Hasan – Krzysztof Jackowicz – Oskar Kowalewski –
Łukasz Kozłowski

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Bank Ownership Structure, SME Lending And Local Credit Markets

Iftekhar Hasan^{*}

Fordham University and Bank of Finland

Krzysztof Jackowicz

Department of Banking and Insurance, Kozminski University

Oskar Kowalewski

Institute of Economics of the Polish Academy of Sciences (INE PAN)

Łukasz Kozłowski

BGŻ SA

Abstract

In this paper, by employing a novel approach, we study the relationship between bank type and small-business lending in a post-transition country. Using a unique dataset on bank branches and firm-level data, we find that local cooperative banks lend more to small businesses than do large domestic banks and foreign-owned banks, even when controlling for the financial situation of the cooperative banks. Additionally, our results suggest that cooperative banks provide loans to small businesses at lower costs than foreign-owned banks or large domestic banks. Finally, we show that small and medium-sized firms perform better in counties with a large number of cooperative banks than in counties dominated by foreign-owned banks or large domestic banks. Our results are important from a policy perspective, as they show that foreign bank entry and industry consolidation may raise valid concerns for small firms in developing countries.

JEL classification: G21, G28

Keywords: *small-business lending, cooperative banks, foreign banks, post-transition countries*

^{*}Corresponding author: Iftekhar Hasan, GBA-Fordham University, 5 Columbus Circle, 11th Floor, New York, NY 10019, email: ihaan@fordham.edu

1. Introduction

The successful transition of the Central and Eastern Europe (CEE) countries from planned economies toward market-oriented economies would not have been possible without the increasing number of small and medium-sized enterprises (SME), which today constitute more than 95% of all companies in the region. The growth of the small businesses was mainly supported by banks, their primary sources of funding, as the financial structure of the CEE countries is mainly bank-based and the capital markets are still underdeveloped relative to developed countries. Simultaneously, the ownership structure in the CEE banking sectors also underwent a transformation from being dominated by government ownership to being mainly controlled by foreign-owned entities, the latter's shares varying from 30% in Slovenia to 99% in the Baltic States (Hasan et al. 2013). The remaining banks are either government-controlled or small domestic private banks, which include the local cooperative banks. According to Berger et al. (2005), having large multinational banks in a developing economy can be beneficial, as they are more likely to be financially sound and stable. Conversely, foreign banks may also crowd out smaller domestic banks from the local markets, so that, the supply of loans to small businesses could be negatively affected. Therefore, the increasing role of foreign banks in post-transition countries may negatively impact the lending to small businesses. However, surprisingly, little is known about bank lending to small businesses in post-transition countries. In this paper, we provide new empirical evidence on the relationship between bank ownership and lending to SME firms in one of the CEE post-transition countries.

To study the lending-ownership relationship, we match SME firm-level data with a comprehensive dataset on all bank branches in Poland for the years 2008-2012. In this period, the Polish banking system consisted on average of 55 foreign-owned banks and four government-owned banks, which controlled approximately 70% and 20% of the total banking

assets, respectively. The remaining banks in the market were three medium-sized private domestic banks and nearly 600 small, local cooperative banks. In the regression, we additionally matched our data with the financial statements of the local cooperative banks, allowing us to control for the financial situation of the cooperative banks, which may determine their lending behavior (Berger, Hasan, and Klapper, 2004).

This study covers the period of the financial crisis of 2008. During this period, foreign banks decreased their lending level in CEE countries due to problems in their home countries (Cull and Martínez Pería, 2013). Moreover, Popov and Udell (2012) documented that during the recent financial crisis, SME firms faced difficulties in accessing financing in CEE countries. Hence, the Polish banking sector presents a good testing ground for examining the impact of bank type and ownership on small-business lending in local markets, especially during the crisis.

The objective of the study is two-fold. First, we analyze the impact of bank ownership on small-business lending in local markets. Second, we test whether the existing type of local banking structures determine the profitability and growth of SME. Our results are statistically robust and economically important. The findings imply a negative association between foreign banks' presence in local markets and lending to small businesses. In contrast, we find the opposite effect related to the lending of cooperative banks to small business. Our results suggest that foreign banks' presence not only limit the access of SME firms to bank loans but it also increases the lending costs. Additionally, we provide empirical evidence that foreign banks' domination of local markets co-exists with lower profitability and growth ratios of SME. Once more, the opposite is true in the case of the cooperative banks. In counties where these banks have a relatively strong position, we observe that the SME firms perform significantly better. As a result, our findings suggest that cooperative banks are important for the development and performance of small businesses in post-transition countries. Hence, our

results are in line with Hakenes et al. (2014), who documented that small regional banks are more effective in promoting local economic growth, especially in underdeveloped regions.

Our paper adds to the growing empirical literature on bank lending to SME firms in two ways. First, we use a novel method, in which we combine a dataset describing the density and distribution of bank branches across the country with SME firm-level data. In the study, we assume that the SME firms are primarily using bank branches near their main location. In a recent study, Presbitero, Udell, and Zazzaro (2014) reported that in Italy, approximately 80% of loans are provided by branches located in the same province as the borrower's domicile. In Poland, the level could be even higher, especially for small businesses, as the banking sector is less developed, although such data are not available. The combination of bank branches and firm-level data allows us to gain new insight into small-business lending, whereas the existing empirical research is mainly based on small-business surveys. Second, we employ data from a European post-transition country, while most empirical studies on small-business lending are based on US data. The few existing European studies are mainly for developed countries, and those dealing with post-transition countries are based only on interviews. Hence, prior to this study, little was known about small-business lending in relatively new markets in post-transition countries. Conversely, these countries represent an interesting testing ground due to the large number of large domestic banks and foreign-owned banks. As a result, we believe that our findings are applicable to most of the emerging markets, and we present important policy implications for small-business lending.

The rest of the paper is organized as follows. In the next section, we review the literature and present our hypotheses. In Section 3, we describe our dataset, the estimation methodology and the variables. In Section 4, we discuss our results, and finally, in Section 5, we draw some concluding remarks.

2. Motivation and the existing literature

This study draws on three related bodies of literature, which we use to build our hypotheses. The first focuses on the importance of relationships in lending to small businesses. According to Petersen and Rajan (1994), relationship lending applies when banks engage in acquiring additional information by interacting with their customers. In contrast, hard lending identifies situations in which banks rely on the borrowers' balance sheets to assess creditworthiness. Stein (2002) argued that the key distinguishing characteristic of small-business lending from other lending activities of banks is that it relies heavily on soft information, which he defines as information that cannot be directly verified by anyone other than the agent who produces it. Using a theoretical model, he documented that large banks have an advantage in transactions based on hard information, while small banks tend to excel in lending based on soft information. Berger et al. (2005) verified this assumption using data for the US and found that large banks lend primarily to larger firms with good accounting records. Conversely, they found that small banks, which rely more on soft information, lend to small businesses. Similarly, De Haas et al. (2010) reported that small banks lend more to SMEs than do large banks in CEE post-transition countries. These results are in line with prior findings that small banks invest a much greater share of their assets in small-business loans than do large banks (Peek and Rosengren, 1998; Strahan and Weston, 1998). Moreover, DeYoung et al. (1999) showed that controlling for a bank's size and age, its proclivity for making small-business loans is also negatively related to the number of branches it has as well as to its being part of a multibank holding company. Similar results were obtained by Hirtle (2007), who found that branches belonging to medium-sized networks are less engaged in small-business lending than are branches of small banks. Lastly, Craig and Hardee (2007) showed that firms in areas dominated by large banks are on average less likely to hold debt than firms in areas with fewer large banks.

The existing results indicate that small, local banks are more likely to have a comparative advantage in relationship lending to small business. In contrast, large non-local banks are more likely to have a comparative advantage in hard-information lending to larger companies. One of the problems with the use of soft information within large banks is their hierarchical structure, which gives a comparative advantage to small institutions with fewer layers of management (Berger and Udell, 2002). However, Berger et al. (2008) reported that opaque small businesses are not more likely to have a community bank as their main bank. One explanation for their results is the role of bank loan officers in producing soft information, as they have direct contact with the borrowers. Uchida et al. (2012) showed that loan officers play an important role in producing soft information. Consistent with the prior literature, they also show that small banks are more active in producing soft information. However, they find that the way that loan officers produce soft information may not be very different across large and small banks, although large banks tend to do less of it. Moreover, they showed that more soft information tends to be accumulated when loan officer turnover is lower and when loan officer contact with the borrower is frequent. Hence, they argued that loan officers at large banks appear to be capable of producing as much soft information as they do at small banks. Large banks, however, do not engage in such production as actively as small banks and, as consequently, lend less to small businesses.

However, Berger and Udell (2006) and de la Torre et al. (2010) argued that large banks may have advantages relative to other financial institutions in small-business financing through economies of scale in processing and usage of information technologies, such as credit scoring. Hence, they may be better able to quantify and diversify the portfolio risks associated with hard-information loans. Uchida et al. (2008) showed that small banks in Japan have a unique qualitative advantage in relationship lending to small businesses. At the same time, however, large banks provide more aggregate lending to small businesses than do small

banks. In a recent study, Berger and Udell (2014) found that large banks have a comparative advantage in lending to small and large, but not medium-sized, firms in the US. In contrast, they reported that small banks have a comparative advantage in relationship lending and that this advantage was strongest for the largest firms. One explanation for their results is the usage of such technology as credit-scoring models, which has less value for the smallest firms. De Young et al. (2008) showed that credit-scoring models mitigate the information problems associated with geographically distant borrowers. However, they report that credit scoring is on average associated with higher default rates. According to the authors, the result implies that scale-related cost reductions associated with automated small-business lending technology increase the profitability of the marginal loan application, which in turn creates incentives for lenders to expand their operations by approving lower-quality applicants. Alternatively, this finding may also indicate that credit-scoring processes simply collect less information, which results in more loan approval errors. However, the authors found the second argument to be less likely. Nevertheless, the results show that changes in the operational structure of large banks and technological innovation may offer them an avenue for increasing small-business lending. Conversely, the results show that higher volumes of small-business loans in larger banks lead to more risk.

The second strand of studies examines the effects of domestic versus foreign banks on access to credit. In line with the previously reported findings, this strand of research shows that foreign banks are less likely to lend to small businesses than are domestically owned banks. One explanation for this result is that foreign-owned banks are large and often headquartered at a considerable distance from local small businesses. Consequently, foreign-owned banks, in their lending decisions, rely more on hard information, similar to large domestic banks. Using a dataset on Argentinean business debtors, Berger et al. (2001) provided the first evidence that large banks and foreign banks tend to provide less credit to

informationally opaque small firms. However, the results for foreign banks hold only for those that are headquartered in geographically distant nations. Using bank-level data, Clarke et al. (2005) confirmed that large domestic banks and foreign-owned banks are more likely to lend less to small businesses than are small domestic banks in Latin American countries. For Chile and Colombia, however, the authors showed that large foreign banks actually lend slightly more to SMEs than do large domestic banks. In addition, in both Argentina and Chile, SME credit has been growing faster at foreign banks with a large local presence than at large domestic banks. Moreover, they also find that public banks do not surpass private banks in the extent to which they lend to small businesses. According to the authors, foreign banks were able to increase lending to small businesses due to greater employment of new technologies, including scoring models. Similar conclusions were presented for CEE countries by Haas and Naaborg (2006), who interviewed a large number of foreign bank managers. They found that foreign banks focused almost exclusively on large foreign and local corporate clients in post-transition countries. In the medium-term, however, they began to increase their lending to small business. The authors argued that foreign banks increased their SME lending due to competitive pressure and because of their improved ability to screen and monitor smaller firms. In a later paper, however, De Haas et al. (2010) showed that foreign banks lend relatively more to foreign firms than do domestic banks. They also found that foreign banks focus more on households, especially in the form of mortgage lending. However, they did not provide any evidence that foreign banks lend more to small firms in CEE countries. In addition, Gormley (2010) showed that the entry of foreign banks into Indian local markets resulted in a decline in credit access for smaller firms. Foreign banks increased overall lending during this period, but the new loans were primarily targeted at the most profitable firms. The observed reallocation of credit occurred within one to two years of the entry of a foreign bank in the Indian local markets. The observed decline in loans was greater among

smaller firms and firms with fewer tangible assets and appeared to persist over time. As a result, whether foreign banks indeed increased their lending to small businesses in emerging markets is still an open question. Based on the existing evidence, we formulate the following hypothesis:

Hypothesis 1: *Local cooperative banks provide more loans to SME firms than do other banks*

The third and final strand of the literature concerns the cost and contract terms of loans to small businesses. Most of these studies concentrate on the impact of the duration of the banking relationship with small firms on the loan conditions. We may assume, however, that the relationship between small firms and cooperative banks is significantly longer than that between small firms and foreign banks. Hence, the results of these empirical studies may also be relevant to our research.

The existing empirical results concerning the impact of banking relationships on loan conditions is mixed. On one hand, using US data, Petersen and Rajan (1994) showed that small firms with longer and stronger banking relationships have more favorable credit contract terms and are less likely to use expensive trade credit. Similarly, Berger and Udell (1995) provided evidence that small firms with longer banking relationships pay lower interest rates on credit lines and are less likely to pledge collateral. In a later study, however, Berger et al. (2007) showed that the rates on small-business loans are not significantly affected by the size of the lending bank when the market structure is taken into account. In other words, the inclusion of the market size structure of the bank in the loan price regression eliminated the significance of the relationship between lending bank size and loan premiums on small-business loans.

On the other hand, Elsas and Krahnen (1998) found no effects on loan rates to small businesses in Germany. Moreover, they find that credit margins are largely unaffected by the nature of the borrower-lender relationship. In contrast, Degryse and Van Cayseele (2000)

reported that the loan rate for Belgian small firms increases with the duration of the relationship with the bank. According to Boot (2000), one explanation for these results is that the European banking sector is more consolidated and fewer credit alternatives, such as capital markets, exist for borrowers. Zarutskie (2006), however, demonstrated that after the deregulation initiated by the Riegle-Neal Act, young enterprises suffered most in terms of scale of operations and ability to contract debt in the US. Consequently, deregulation and increased competition may have a negative impact on small-business lending. Hence, the effect on loan costs and terms to small business is ambiguous. Nevertheless, we follow the US findings and use them as the basis of our hypothesis.

Hypothesis 2: Local cooperative banks lend to SME firms at lower costs compared to banks

In general, small businesses rely on banks for credit to a greater extent than do large businesses. Moreover, the existing research suggests that small businesses benefit more from relationships with small banks than with large or foreign banks in terms of credit availability. Additionally, most of the studies document that banking relationships not only facilitate access to financing but also result in lower interest rates and relaxed collateral requirements for small businesses. Access to financing and the related terms may have an impact on small-business performance, especially during a financial crisis. Peek and Rosengren (1998) showed that the mergers of commercial banks tended to reduce lending to small businesses more than to other borrowers. Similarly, Bonaccorsi di Patti and Gobbi (2007) found that new entries into Italian local banking markets resulted in less access to bank loans for small firms. Meanwhile, Ryan et al. (2014) argued that the restructuring of the European banking sector after the financial crisis of 2008 may lead to an increase in financing constraints for SME firms. According to the authors, such a credit crunch may inevitably lead to lower investment and smaller potential output. Additionally, Presbitero et al. (2014) documented that in Italy, the credit crunch was more pronounced in provinces with a large share of branches owned by

distantly managed banks during the recent crisis. They reported that financially healthier firms in functionally distant credit markets were more strongly affected than those in markets populated by less distant banks. Hence, based on these studies, we formulate our final hypothesis:

Hypothesis 3: *Small firms located in counties with a higher number of cooperative banks tend to have lower financing investment sensitivity and adopt higher or more aggressive financing and investment strategies, resulting in higher sales volumes.*

3. Data set and model construction

For the purpose of our study, datasets from different sources were combined. First, we used a comprehensive dataset on all bank branches in Poland in the 2008-2012 period. The data were provided by Inteliace Research, an independent company that provides tailored consulting and research on banking markets. For each branch, a zip code was available; thus, it was easy to assign a local administration unit in which the bank branch operates. We decided to analyze bank branches on the county level¹. In 2012, there were 379 counties in Poland, including 65 city-counties. We did not go further, i.e., to lower levels of territorial units, for two reasons. First, city-counties are generally not divided into other units of local administration. Second, a commune, which constitutes the third and lowest uniform level of local administration, is usually a very small territorial unit, and in terms of bank loans to SMEs, we expect that bank branches from a commune serve a significant group of clients from neighboring communes, especially in rural zones². Thus, analyzing the access to bank loans of companies from a given commune with respect to a structure of branches only from this territorial unit would be problematic.

¹ In Poland, the equivalent to a county, district or prefecture in other countries is a *powiat*, which is the second level unit of local government and administration.

² In Polish, a commune is a *gmina*.

After assigning the branches to counties, we categorized the former into four groups by owner. We distinguished branches of a) foreign-owned banks, b) government-controlled banks, c) domestic cooperative banks, and d) other domestic banks. Domestic cooperative banks in Poland are mostly comparatively small entities that operate in local markets; therefore, their characteristics and local market share are especially interesting with respect to the local bank loan market and SMEs' access to bank loans. Conversely, banks in the other groups are mostly large ones with extensive, country-wide branch networks. As for the group of foreign-owned banks, we decided to exclude entities that do not build branch networks and operate their businesses through just a few offices located across the country. These are mostly foreign banks, which are often not incorporated in Poland. Such banks usually do not serve SME clients and are located only in large cities, almost always in Warsaw. Their extensive network of branches makes their market share, as measured using the number of branches, insignificant from the perspective of our study. Finally, the dataset for branches was combined with information on county populations in each year, provided by the Polish Central Statistical Office. This allowed us to calculate the branch densities in each county, measured as the number of branches per thousand inhabitants in the county. In addition, each county was characterized by a branch share for banks from each of the four bank groups. Figures 1 and 2 present respectively the distribution of cooperative and foreign bank branches across counties in 2012, respectively. As observed, the share of cooperative bank branches in some of the counties is significant, with control over more than 70% of the market. In contrast, foreign-owned banks dominated only a few counties, most of which are large or middle-sized towns in Poland. The descriptive statistics for the dataset on branches are presented in Table 1.

[Figure 1]

[Figure 2]

[Table 1]

In our study, we decided to concentrate solely on SME firms, as larger companies are much less likely to be served only by local bank markets. It should be remembered that our branch data span the period 2008 to 2012. But due to our intention to use lagged independent variables in our panel models, we examined yearly financial statements for the period 2006-2012 from the Amadeus database. To identify SMEs, we followed the definition of the European Commission, which is also used by Eurostat, according to which SMEs are defined as having less than 250 persons employed and an annual turnover of up to EUR 50 million or a balance sheet total of no more than EUR 43 million. We excluded companies that did not meet those criteria in at least one year during the period 2006-2012. In addition, we restricted our sample to companies from sections A-C and F-I of the NACE Rev. 2 industry classification, which means that we excluded financial institutions; utilities; industries dominated by the public sector; professional, scientific, technical, and administrative activities; and other industries that usually do not rely on bank loans as an important source of financing. Furthermore, to make the financial statements as comparable as possible, we selected only the unconsolidated statements and only those statements for companies reporting under the local GAAP that were still active on the last date covered by our database. Finally, our dataset on companies is composed of 290,371 records for 61,883 SMEs. Information on industry coverage is included in Table 2, which, for brevity, presents the data on the highest level of the NACE Rev. 2 classification. We see that the SMEs were mostly concentrated in three sectors: manufacturing, construction of buildings, and the wholesale and retail trade and repair of motor vehicles and motorcycles. These industries account for 87% of the observations in our dataset.

[Table 2]

The last source of data used in our analyses consisted of the yearly financial statements of cooperative banks for period 2008-2012. We examined statements for 364 entities from the largest union of cooperative banks in Poland, which in 2012 was present in 285 of 379 counties (75%) and comprised two-thirds of the cooperative banks in Poland. Banks from that union mostly operate in the central-eastern and southern parts of the country. In contrast, cooperative banks from the other large union, not covered by our data, constitute approximately one third of the sector's entities and are located mostly in the northwestern and central part of Poland. The territorial structure of banks from these two unions and the fact that we have complete data for the larger union led us to assume that we could build a good proxy for the whole cooperative banking sector, at least in central-eastern and southern counties of Poland, using only the larger union.

To reflect the financial situation of cooperative banks in individual counties, we applied the following strategy. First, we calculated various characteristics of cooperative banks in each year, including the following: natural logarithm of assets (*COOP_LNA*), ratio of loans to assets (*COOP_LOANS*), net profit to assets (*COOP_ROA*), equity coverage ratio (*COOP_EQUITY*), and overheads to net operating income (*COOP_OVERH*). We treat those variables as experimental because their impact on SMEs' access to bank loans could not be easily forecasted. After determining the characteristics on the bank level, we calculated the weighted average of those measures at the county level, using the number of branches of each cooperative bank in a county its weight. Descriptive statistics for the calculated average cooperative bank measures for the counties are presented in Table 3.

[Table 3]

Data from the previously mentioned sources were joined in the following manner. To each individual SME in each year, the following sets of information were matched: a) characteristics of the SME, including financial ratios based on the balance sheet and profit

and loss account; b) bank market structure in the county in which the SME was incorporated; and c) average characteristics of cooperative banks operating in the county in which the SME was incorporated. As previously stated, the dataset on companies consists of 290,371 observations for the years 2006-2012. For 226,298 of those observations, we have non-missing values for bank market structure in a county (information available only for 2008-2012), and for 170,129 observations, we have non-missing values on average characteristics of cooperative banks operating in a county (available for 2008-2012 but only for counties in which the largest union of cooperative banks was present). Having combined the data, we defined the variables as presented in Table 4.

[Table 4]

Table 5 gives the descriptive statistics for the variables from the first group, i.e., the characteristics of the SMEs included in our analysis. The ratios and measures for that group are used as control variables in regressions analyzing the impact of a bank market structure in a county on SMEs' access to loans, profitability and growth. Furthermore, variables from the third group, i.e., the average characteristics of cooperative banks in the counties, help us identify the profiles of cooperative banks that more eagerly serve SME clients with respect to bank loans.

[Table 5 here]

To test our hypotheses on the impact of bank branch structure in counties on SMEs' access to loans, profitability and growth, we applied the GLS estimator with random effects with additional dummies for each combination of year and industry group. It should be noted that using the fixed-effects estimator with a few tens of thousands of company dummies would be computationally problematic. When grouping industries, we took into account the number of observations for each industry. Finally, we obtained 17 industry groups. Each section of the NACE Rev 2 classification constituted a separate industry group with the

exception of manufacturing, within which we identified 10 industry groups, and the wholesale and retail trade and repair of motor vehicles and motorcycles, within which we identified two separate industry groups.

The general construction of our panel models is illustrated by equations (1), (2), and (3):

$$DEP_{it} = f(CONTROL_{it,it-1}; TIME_t \times INDUSTRY_k) \quad (1)$$

$$DEP_{it} = f(CONTROL_{it,it-1}; BRANCHES_{mt}; TIME_t \times INDUSTRY_k) \quad (2)$$

$$DEP_{it} = f(CONTROL_{it,it-1}; COOP_{mt,mt-1}; TIME_t \times INDUSTRY_k) \quad (3)$$

where DEP_{it} is the particular dependent variable calculated for company i in period t : constituted by its bank liabilities ($BANK_LIAB$), interest costs (INT_COST), financial expenses (FIN_COST), gross profit/loss on sales ($GROSS_PR_S$), investments in tangible assets ($INVEST$) or sales growth rate ($SALES_GR$). In addition, $CONTROL_{it,it-1}$ is a set of firm-specific variables for period t or $t-1$, $BRANCHES_{mt}$ is a set of variables describing the bank branch structure in period t in county m , and $COOP_{mt,mt-1}$ is a set of average characteristics of cooperative banks operating in the county in which firm i is registered, measured at period t or $t-1$. Finally, $TIME_t \times INDUSTRY_k$ is a set of dummy variables designed to reflect the specific conditions in industry group k during period t .

It is worth noting that the final number of observations may differ from one model specification to another. First, specification (1) does not require information on bank branches, and thus its estimations need not be restricted to the period 2008-2012. Second, in the case of all specifications, the use of lagged variables shortens the time span. Third, missing values reduce the number of observations unequally for all variables.

4. Empirical results

4.1. Branch structure and SMEs' access to loans

In Table 6, we address the first research question of whether branch structure in a county influences SMEs' access to loans. The econometric properties of models are

satisfactory, allowing for statistical inference. The sets of explanatory variables are jointly statistically significant at levels below 1%. In all specifications, the same can be stated with regard to all control variables when treated individually.

[Table 6]

The control variables generally affect the dependent variable (*BANK_LIAB*) in the expected directions. Larger companies (*LNA*) that are able to offer valuable collateral (*COLLAT*) when contracting debt report higher shares of bank liabilities in total liabilities. As expected, quick asset turnover (*TAT*) has a negative effect on the dependent variable, while high profitability, measured as EBIT to total assets (*EBIT_A*), facilitates access to bank loans. Finally, higher levels of cash in total assets (*CASH*) and shareholders' capital (*EQUITY*) reduce a company's need for financing through bank loans.

As for the branch structure, we observe negative coefficients for variables representing the presence of foreign-owned banks in a county and positive coefficients for variables identifying the presence of cooperative banks. It is worth stressing that all of these coefficients are statistically significant at levels below 1%. We conclude that an increase in the share of branches of foreign-owned banks in all branches in a county as well as an increase in the density of those branches limits the access of SMEs to bank loans.

In the case of cooperative banks, we see strong evidence for the opposite situation. We find that a substantial presence of cooperative banks in a county relates to a large share of bank liabilities in the total financing of SMEs. These results confirm Hypothesis 1, as cooperative banks are single-unit banks and thus much smaller than foreign-owned banks. The results are also economically significant, as shown in Figure 3.

[Figure 3]

With regard to the distribution of variables describing branch structure, if we move a hypothetical SME from a county at the 5th percentile to a county at the 95th percentile, we see

that the ratio of bank liabilities to total liabilities changes on average by 9.1%, 4.6%, 22.0%, and 38.8% of the dataset mean when the percentiles are determined based on *FGN_SHARE*, *COOP_SHARE*, *FGN_DENS*, and *COOP_DENS*, respectively.

For other bank types, the results are more ambiguous. In the case of the group of other domestic banks, only the coefficient for the branch-share variable is positive and significant, and only at the 10% level. Furthermore, for government-owned banks, we find no evidence of an influence of the branch share on SMEs' ratio of bank liabilities to total financing, but the coefficient for branch density is negative and statistically significant at a level below 1%. Bearing in mind that this group of banks is dominated by one entity, which is also the largest bank in Poland, the results for the branch density of government-controlled banks compared to that of foreign-owned banks are not surprising. The largest government-controlled bank and large foreign-owned network banks most likely have similar automated credit procedures that cannot take into account as many qualitative, immeasurable, and local factors as the much smaller cooperative banks can in credit analyses. Indeed, the results confirm that cooperative banks rely more on soft information and thus provide more loans to opaque small businesses, which is again in line with Hypothesis 1.

An additional channel through which SMEs' access to loans can be restrained is excessively high interest rates demanded by banks. We address this issue in Table 7 and Table 8, which report variations in interest costs (*INT_COST*) and financial expenses (*FIN_COST*), respectively. In all specifications, the sets of explanatory variables are jointly statistically significant at levels below 1%. Nevertheless, more control variables as well as more variables connected with branch structure are individually statistically significant in the specifications explaining financial expenses. This may be a result of the larger observation sets included in those estimations, as there are approximately 60% more observations in this case than in the specifications for the interest costs.

The results presented in Table 7 and Table 8 are generally consistent. Lower interest costs and financial expenses are borne by larger companies (*LNA*), which provide valuable collateral (*COLLAT*) and have a strong capital base (*EQUITY*), better profitability ratios (*EBIT_A*), and higher shares of cash and cash equivalents in total assets (*CASH*). The only difference in the results is in asset turnover ratios (*TAT*). The coefficient shows that higher *TAT* values increase the interest costs but decrease the financial costs. Lastly, it should be stated that most of the coefficients for the control variables are statistically significant and mostly at levels below 1%, with the exceptions of *CASH* and *EQUITY*, which are statistically insignificant in eight out of nine specifications for interest costs.

[Table 7]

[Table 8]

Concerning the coefficients for the branch-structure variables, we see strong statistical evidence for the unfavorable influence of a high share of foreign-owned bank branches and their high density on interest costs (significance at the 5% level) and financial expenses (significance at levels below 1%). Moving from the 5th-percentile county to the 95th-percentile county within the distribution of the variable describing foreign-owned bank branches' share, interest rates and financial expenses increase on average by 24 bps and 7.3% of the dataset mean, respectively. Conversely, when a comparable move within the distribution of the foreign-owned bank branch density is considered, we get increases of approximately 60 bps and 13.8% of the dataset mean, respectively. In summary, in the specifications for SMEs' interest costs and financial expenses, the unfavorable impact of foreign-owned bank branches seems to be less economically significant than in the specifications for SMEs' bank liabilities.

The results for cooperative banks are the opposite of those for the foreign-owned banks. The specification for interest costs in Table 7 yields a negative and statistically significant coefficient for branch share at the 5% level, and the models of financial expenses in Table 8

yield negative and statistically significant coefficients for both branch share and branch density at levels below 1%. Only the coefficient for branch density in the specification for interest costs remains statistically insignificant, although it is still negative. The economic significance of these results is slightly weaker than that for foreign-owned banks. Taking into account the distribution of the variable describing the share of cooperative banks' branches, the interest rates and financial costs borne by SMEs in counties at the 95th percentile are lower than those in counties at the 5th percentile by an average of 12 bps and 4.2% of the dataset mean, respectively. A similar shift within the branch-density distribution would result in a decrease in financial expenses of 39.4% of the dataset mean³.

The results for government-controlled banks are similar to those for foreign-owned banks. In all specifications for SMEs' interest costs as well as their financial expenses, we obtained positive coefficients. One of the coefficients (*GOV_DENS* in the financial expenses model) is statistically significant at levels below 1%, and two (*GOV_DENS* in the specification for interests costs, and *GOV_SHARE* in the specification for financial expenses) are statistically significant at the 5% level. We did not find any statistical evidence for one coefficient (*GOV_SHARE* in the interest cost model). The similarity of these results to those for foreign-owned banks may again be related to the potential similarity of credit procedures for large network banks.

Finally, the results for the group of other domestic banks are ambiguous and unstable. The coefficients change sign from one specification to another, and statistical significance at the 10% level is only observed in one case. In summary, we find that smaller cooperative banks provide bank loans on better terms than large and foreign-owned banks, which is in line with Hypothesis 2.

4.2. Branch structure and SMEs' profitability and growth ability

³ Here, we do not interpret estimations for *COOP_SHARE* within the interest cost model because the obtained coefficient is statistically insignificant.

Having analyzed the impact of branch structure on SMEs' access to bank loans, we try to relate it to companies' profitability ratios and growth abilities. Table 9 presents the results for the models describing the ratio of gross profit to sales (*GROSS_PR_S*), while Table 10 and Table 11 include specifications for the growth rates of tangible fixed assets (*INVEST*) and sales (*SALES_GR*), respectively. As in the previous specifications, the econometric properties of the models are satisfactory, allowing for statistical inference. The sets of explanatory variables are jointly statistically significant at levels below 1%, and the coefficients for most of the control variables are individually statistically significant at levels below 1%. Only the long-term leverage ratio (*LT_LIAB*) in the models describing the growth rates of tangible assets is exceptional in having statistically insignificant coefficients.

The estimation results from Table 9 show that higher profitability ratios are reported on average for larger companies (*LNA*) with higher historical asset growth rates (*ASSET_GR*) and higher asset turnover ratios (*TAT*). Conversely, higher leverage (*LT_LIAB*) as well as higher shares of fixed assets and receivables in total assets (*FIX_A* and *REC*) negatively impact profitability as measured by gross profit on sales.

[Table 9]

In the case of models explaining the growth rate of tangible assets in Table 10, we find evidence of a positive influence for larger company size, profitability on sales, asset turnover, and available cash, and a negative influence for a higher ratio of fixed assets to total assets, which is not surprising because companies with high shares of fixed assets do not usually expand further to any significant extent.

[Table 10]

Based on the results in Table 11, we conclude that higher sales growth is observed on average for smaller companies with higher leverage and with an asset structure dominated by receivables rather than fixed assets. The negative coefficient for the *TAT* variable can be

explained by the fact that asset turnover that is already rapid cannot be easily improved through increased sales. Finally, a negative coefficient for EBIT to sales may suggest that higher sales growth rates are more characteristic of comparatively young, prospective companies that are still on their way to achieving optimal size and profitability ratios.

[Table 11]

The estimation results for variables describing branch structure are generally consistent and stable. We find strong evidence that in counties where foreign-owned banks are dominant, the SMEs reported lower profitability on sales, lower growth rates of tangible assets and lower sales growths. We reach these conclusions based on the coefficients for *FGN_SHARE* and *FGN_DENS*, which in all specifications are negative and statistically significant at levels below 1%. Relating to the distribution of *FGN_SHARE* across counties, we can state that a move from a county at the 5th percentile to a county at the 95th percentile leads to decreases in gross profit on sales, growth rate of tangible assets, and sales growth of 0.6, 5.3, and 1.9 percentage points, respectively. This effect is even more evident when we refer to *FGN_DENS*, in which case the above mentioned variables decrease by 1.9, 12.2, and 4.6 percentage points, respectively. Taking into account the results obtained previously for *BANK_LIAB*, we infer that the capital allocation of foreign-owned banks was not optimal in the study period, as those banks limited the access to capital in counties where SMEs grew faster and reported higher profitability. One explanation for these results is that foreign-owned banks do not have superior screening abilities and thus are not able to identify profitable SEM firms.

As regards to *COOP_SHARE* and *COOP_DENS*, we find that SME performed better in counties in which cooperative banks dominated. All of the estimated coefficients for those variables are positive and statistically significant at levels below 1%. When we analyze the effect of a hypothetical move from the 5th-percentile county to the 95th-percentile county in

terms of share of cooperative banks' branches, we obtain increases in gross profit on sales, growth rate of tangible assets, and sales growth of 0.3, 2.6, and 10.6 percentage points, respectively. For the distribution of cooperative banks' branch density in counties, such a move would increase the corresponding ratios even more, by 3.4, 24.2 and 10.6 percentage points, respectively. The results confirm Hypothesis 3, as we find that SMEs perform better in local markets dominated by cooperative banks than in counties in which foreign-owned banks are present. In counties where cooperative banks are dominant, we find that SMEs have higher leverage through bank loans, generate higher profits, invest more in tangible assets, and increase their sales more rapidly.

For other bank types, the estimation results are more ambiguous. For government-controlled banks as well as the group of other domestic banks, we found no evidence of a relationship between branch share or branch density and SMEs' gross profit on sales. Nevertheless, specifications describing the growth rate of tangible assets and sales growth suggest that banks of both types located their assets in counties where the companies grew more slowly. In all models, the estimated coefficients for other domestic banks are negative and statistically significant at levels below 1% in three of four specifications or at the 5% level. Furthermore, coefficients related to the branch structure of government-controlled banks are also negative but statistically significant in three of four specifications, once at levels below 1% and twice at the 5% level. Hence, we find only weak evidence that SMEs performed worse in counties dominated by government-controlled banks and other domestic private-owned banks.⁴

4.3. Characteristics of cooperative banks and SMEs' access to bank loans

The final part of our empirical study is comprised of an analysis of the relationship between SMEs' access to bank loans and the average characteristics of cooperative banks

⁴ For details on government-owned banks' lending patterns, especially during the crisis, see Brei and Schclarek (2013) and Önder and Özyıldırım (2013),

operating in the given counties. Table 12 presents specifications for leverage through bank loans (*BANK_LIAB*), and Table 13 and Table 14 concern models for interest costs (*INT_COST*) and financial expenses (*FIN_COST*), respectively. Again, in all specifications, the estimated coefficients are jointly statistically significant. As for the control variables, the signs of the coefficients, their levels, and their statistical significance generally mimic those reported for the specifications that included variables describing branch structure (Table 12 vs. Table 6, Table 13 vs. Table 7, and Table 14 vs. Table 8).

[Table 12]

[Table 13]

[Table 14]

In the case of variables describing the average characteristics of cooperative banks that operate in the given counties, we see no statistically significant relationship between the variables and the interest costs borne by SMEs. Nevertheless, from specifications (55) and (58), we conclude that the SMEs' ratio of bank liabilities to total liabilities is higher in counties where cooperative banks are generally smaller (*COOP_LNA*) and have higher equity to asset ratios (*COOP_EQUITY*). It is noteworthy that these results are in line with those for the specifications in which branch structure is represented by explanatory variables.

From the estimations presented in Tables 12-14, we concluded that a more substantial presence of cooperative banks in a county increases access to bank loans, while a significant presence of foreign-owned banks curbs it. Taking into account that cooperative banks are much smaller than foreign-owned ones and operate locally, we can state that the existence of small players in local bank loan markets is advantageous for SMEs. Within specifications (58) and (68), we additionally proved that even for those small players, i.e., cooperative banks, “goodies” and “baddies” from the perspective of SME lending can be identified. Thus, all of the estimation results generally favor a high degree of granulation of the bank loan market,

which can be naturally obtained by encouraging the presence of smaller cooperative banks and reducing the presence of large network banks.

5. Concluding remarks

This paper examines the impact of bank type and ownership on small-business lending in a post-transition country. In this study, we combine a unique dataset on bank branches with SME firm-level data, which allows us to provide new evidence concerning small-business lending. Moreover, in the panel regression, we control for the situation of cooperative banks, which may determine the lending to SME in local markets

Our empirical results show that business lending to SME firms increases and reaches higher levels in counties with large numbers of local cooperative banks than in counties with large domestic banks or foreign-owned banks. We argue that this result indicates that cooperative banks using soft information provide more loans to SME firms than do large domestic or foreign banks. Consequently, our results confirm that local cooperative banks are important for the development of SME firms in post-transition economies. We do not find any evidence that large domestic banks or foreign-owned banks using hard-information technologies, such as small-business credit scoring and fixed-asset technologies, better serve SME firms or are able to identify more profitable entities.

In addition, we find that cooperative banks not only provide more loans to SME firms but also provide these loans at lower costs than do large domestic and foreign-owned banks. Hence, it is not surprising that we find that SME firms are more profitable, have higher leverage through bank loans, and have invested more in tangible assets in counties with a large number of cooperative banks. In contrast, we find that a larger number of foreign-owned banks in a country has a negative impact on profitability, leverage, and investment of SME

firms. Consequently, our results suggest once more that cooperative banks encourage the development of SME firms in post-transition countries.

Our study covers the years 2007-2012 and thus includes the period of the financial crisis of 2008. During the financial crisis, some of the foreign banks were forced to reduce lending abroad due to problems faced by the parent banks in their home markets. Although we do not find evidence that foreign banks reduced lending, our results indicate that cooperative banks are important for the development of SME enterprises. Moreover, our results are in line with the findings of Hakenes et al. (2014), who documented that small regional banks can give local entrepreneurs a competitive edge and promote local economic growth, especially in underdeveloped regions, such as the CEE post-transition countries.

Conversely, the financial crisis period may influence our results, and foreign banks' lending to SME firms may have been more extensive prior to the crisis. We find, however, that large domestic private and government-owned banks lend less and at higher costs to SME firms than do cooperative banks. Consequently, we assume that our results are not influenced by the crisis period.

Our contribution may have important policy implications for the effects of banking deregulation and industry consolidation on the availability of credit to small businesses in emerging economies. The current research suggests that large banks may have a comparative advantage in lending to smaller firms using hard-information technologies, such as credit-scoring or fixed-asset lending (Berger and Udell, 2011). Therefore, the authors argue that foreign bank entry or industry consolidation may not reduce credit availability to the smallest firms. However, our results show the opposite and confirm that small banks are important for local SME firms and thus for local economic growth.

As we are not able to establish any causal relationship between bank type and small-business lending, this is a conjecture that would greatly benefit from further empirical

investigation. Nevertheless, from a policy perspective, our results suggest that foreign bank entry and industry consolidation may raise valid concerns for small firms in post-transition countries.

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Figure 1.

Distribution of cooperative bank branches across the counties of Poland in 2012

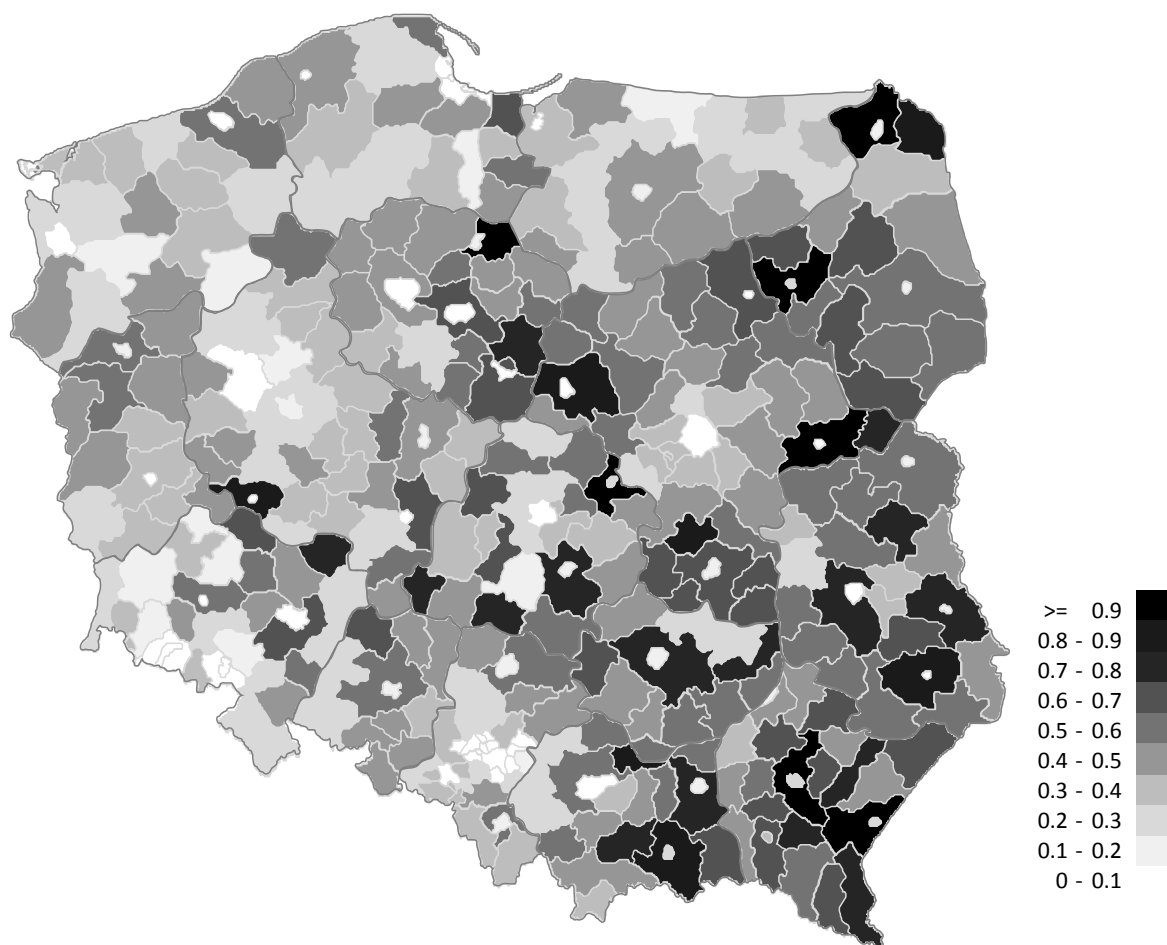


Figure 2.

Distribution of foreign bank branches across the counties of Poland in 2012

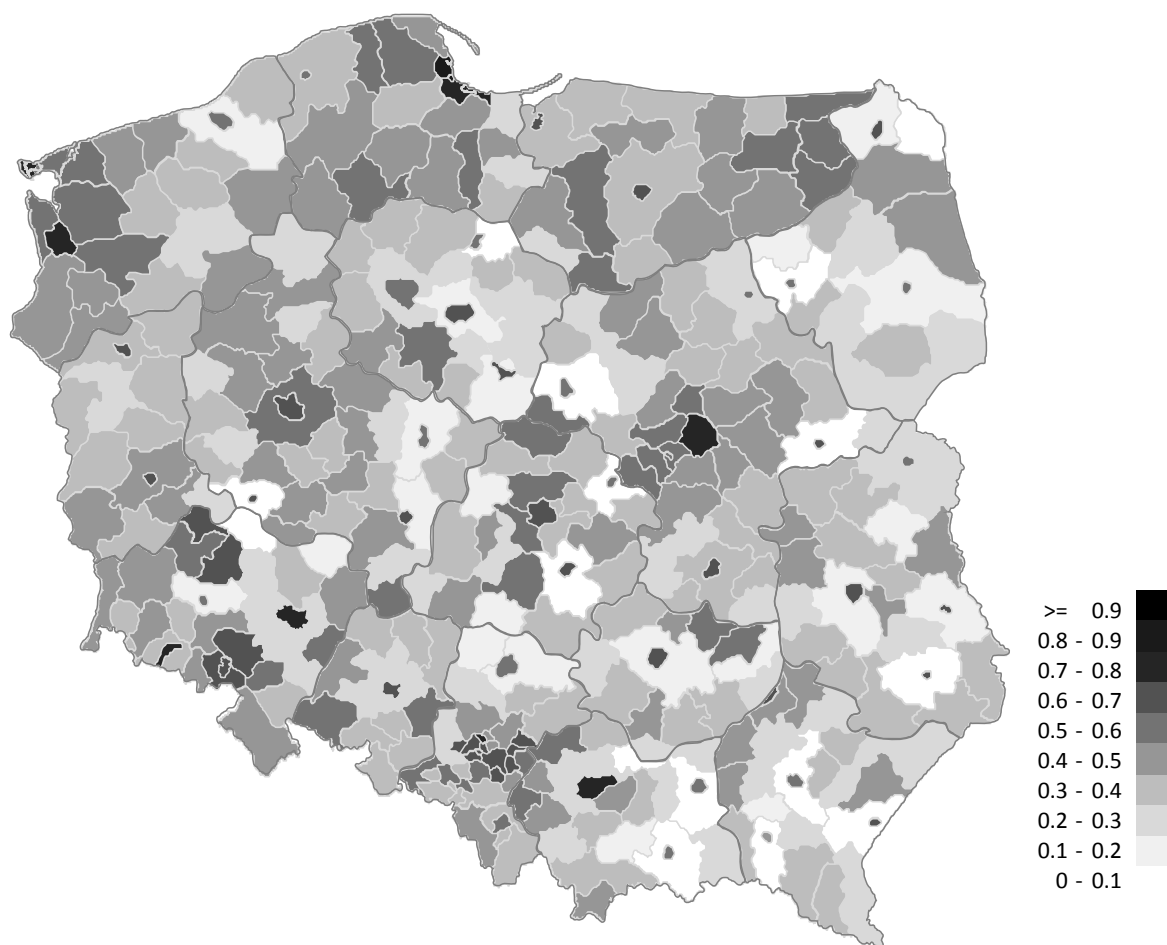


Table 1.

Bank branches in the counties of Poland (2008-2012)

	Mean	Median	St. dev.	Min	5 th perc.	95 th perc.	Max
<i>Share of branches of a given bank type in all branches in a county</i>							
foreign-owned	36.4%	36.4%	16.6%	0.0%	8.3%	63.6%	83.3%
government-controlled	20.8%	20.0%	10.9%	0.0%	5.7%	40.1%	70.0%
cooperative	39.6%	38.9%	22.5%	0.0%	4.3%	77.8%	100.0%
other domestic	3.6%	3.5%	3.5%	0.0%	0.0%	9.8%	21.1%
<i>Number of branches of a given bank type divided by county per 1000 inhabitants</i>							
foreign-owned	0.147	0.129	0.098	0.000	0.019	0.359	0.523
government-controlled	0.080	0.073	0.051	0.000	0.016	0.174	0.390
cooperative	0.134	0.129	0.071	0.000	0.018	0.254	0.450
other domestic	0.015	0.013	0.016	0.000	0.000	0.047	0.078
<i>Number of branches of a given bank type in a county</i>							
foreign-owned	18.9	10	46.0	0	1	54	760
government-controlled	8.8	5	14.3	0	1	25	207
cooperative	10.7	9	6.2	0	3	22	43
other domestic	1.9	1	4.1	0	0	6	80

Table 2.

Industry distribution of SMEs (2006-2012)

NACE Rev. 2 section and industry name	observations	companies	% of total assets
Agriculture, forestry and fishing	2,463	11,147	3.4%
Mining and quarrying	426	1,785	1.1%
Manufacturing	15,863	78,619	30.9%
Construction of buildings	11,071	47,453	22.6%
Wholesale and retail trade and repair of motor vehicles and motorcycles	26,530	127,334	34.6%
Transportation and storage	3,427	15,725	4.6%
Accommodation and food service activities	2,103	8,308	2.7%
All industries	6,1883	290,371	100.0%

Table 3.

Average characteristics of cooperative banks in the counties of Poland

	Mean	Median	St. dev.	5 th perc.	95 th perc.
COOP_EQUITY	11.1%	10.7%	3.0%	7.4%	16.4%

COOP_LOANS	87.0%	89.7%	8.2%	70.9%	94.7%
COOP_ROA	1.2%	1.2%	0.5%	0.6%	2.1%
COOP_OVERH	65.5%	65.5%	7.3%	53.9%	77.5%
COOP_LNA	18.713	18.583	0.859	17.493	20.408

Table 4.

Variables and their definitions

A. SME characteristics	
LNA	Natural logarithm of total assets in constant prices
CASH	Ratio of cash and cash equivalent to total assets
REC	Ratio of receivables to total assets
COLLAT	Ratio of tangible fixed assets to total assets, i.e., the share of assets that can be easily used as loan collateral
FIX_A	Ratio of fixed assets to total assets
EQUITY	Ratio of shareholders' funds to total liabilities
BANK_LIAB	Ratio of bank liabilities to total liabilities
LT_LIAB	Ratio of non-current liabilities to total liabilities
TAT	Ratio of sales to total assets
ASSETS_GR	Growth rate of assets in constant prices
SALES_GR	Growth rate of sales in constant prices
EBIT_A	Operating profit/loss to total assets
EBIT_S	Operating profit/loss to sales
GROSS_PR_S	Gross profit/loss to sales
INT_COST	Interest paid to average bank liabilities per year
FIN_COST	Financial expenses to average assets per year
INVEST	Growth rate of tangible fixed assets in constant prices
B. Bank market structure in a county	
FGN_SHARE	Share of branches of foreign-owned banks in a county in all bank branches in the county
GOV_SHARE	Share of branches of government-controlled banks in a county in all bank branches in the county
COOP_SHARE	Share of branches of cooperative banks in a county in all bank branches in the county
DOM_SHARE	Share of branches of other domestic banks in a county in all bank branches in the county
FGN_DENS	Number of branches of foreign-owned banks in a county divided by county population in thousands
GOV_DENS	Number of branches of controlled banks in a county divided by county population in thousands
COOP_DENS	Number of branches of cooperative banks in a county divided by county population in thousands
DOM_DENS	Number of branches of other domestic banks in a county divided by county population in thousands
C. Average characteristics of cooperative banks operating in a county	
COOP_EQUITY	Ratio of equity of assets

COOP_LOANS	Ratio of loans to assets
COOP_ROA	Net profit to assets
COOP_OVERH	Overheads to operating income
COOP_LNA	Natural logarithm of assets

Note: Averages for cooperative banks are calculated as weighted by the number of branches of a given bank in a county.

Table 5.

Descriptive statistics for SMEs in the dataset (2006-2012)

	Mean	Median	St. dev.	5 th perc.	25 th perc.	75 th perc.	95 th perc.
LNA	9.956	10.081	1.778	6.760	8.944	11.158	12.620
CASH	15.6%	7.2%	20.5%	0.2%	1.9%	20.9%	61.6%
REC	32.0%	26.7%	25.0%	1.2%	11.5%	47.6%	82.2%
COLLAT	28.7%	21.8%	26.1%	0.2%	5.5%	46.5%	80.4%
FIX_A	29.9%	22.7%	27.7%	0.0%	4.8%	49.4%	84.9%
EQUITY	50.6%	49.7%	27.3%	7.5%	28.1%	73.0%	95.7%
BANK_LIAB	10.8%	0.0%	17.4%	0.0%	0.0%	16.4%	48.3%
LT_LIAB	8.2%	0.0%	16.3%	0.0%	0.0%	8.5%	44.2%
TAT	239.2%	198.7%	183.1%	17.3%	111.4%	319.3%	618.0%
ASSETS_GR	6.5%	-0.4%	40.2%	-41.6%	-11.4%	15.9%	76.0%
SALES_GR	3.9%	-0.8%	43.8%	-56.0%	-15.6%	16.1%	76.2%
EBIT_A	8.1%	6.6%	21.0%	-23.6%	0.1%	16.7%	42.5%
EBIT_S	3.1%	3.4%	21.2%	-20.3%	0.5%	8.9%	27.0%
GROSS_PR_S	2.3%	2.8%	21.5%	-22.3%	0.2%	8.2%	25.9%
INT_COST	12.3%	9.0%	11.0%	1.8%	5.9%	14.7%	35.5%
FIN_COST	2.8%	1.7%	3.7%	0.1%	0.6%	3.5%	9.8%
INVEST	13.7%	-6.5%	98.1%	-55.5%	-18.6%	9.8%	143.4%

Table 6.Impact of branch structure in a county on SMEs' bank liabilities (*BANK_LIAB*)

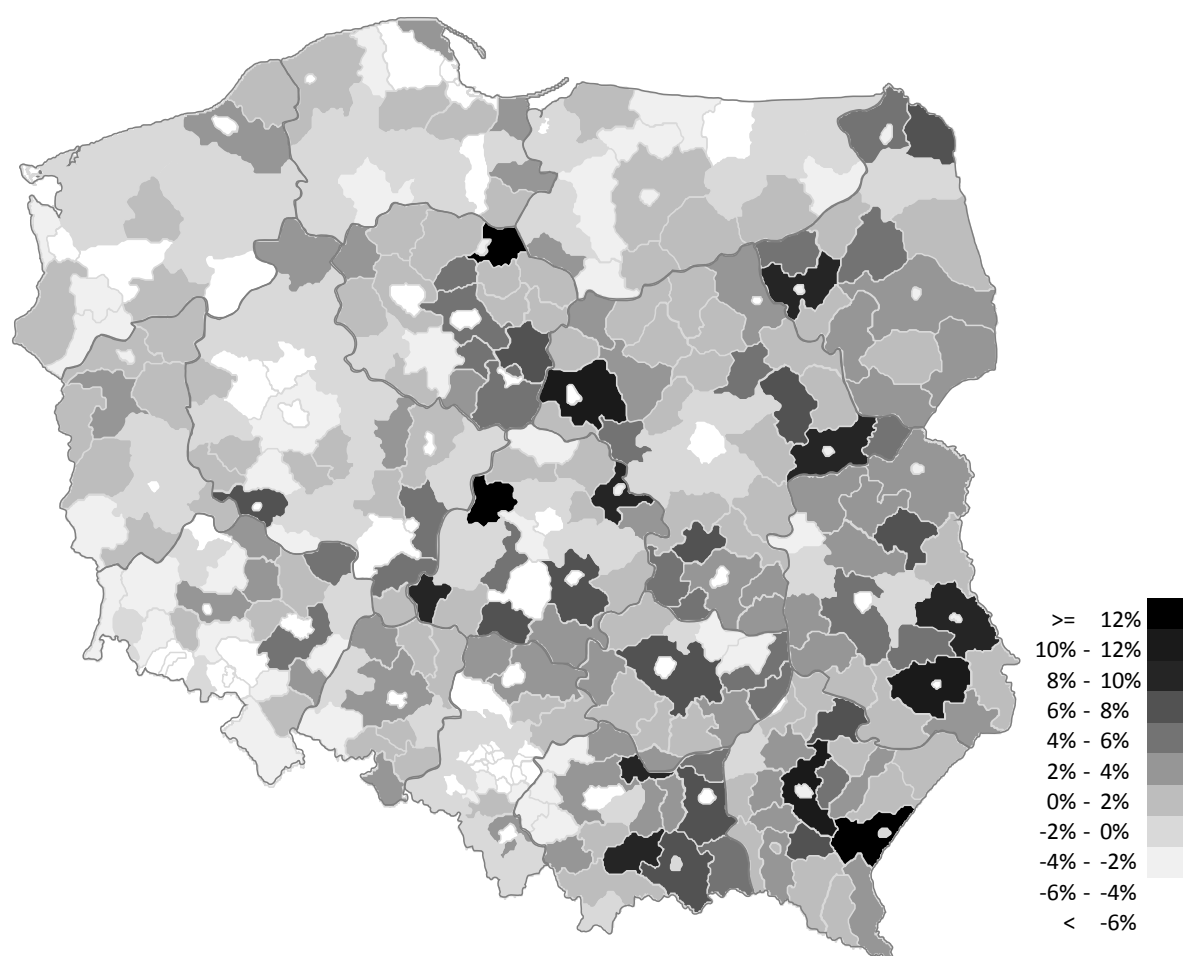
	1	2	3	4	5	6	7	8	9
COLLAT(-1)	0.087 *** (0.002)	0.086 *** (0.002)	0.088 *** (0.002)	0.086 *** (0.002)	0.088 *** (0.002)	0.085 *** (0.002)	0.088 *** (0.002)	0.086 *** (0.002)	0.088 *** (0.002)
CASH(-1)	-0.028 *** (0.002)	-0.031 *** (0.002)	-0.031 *** (0.002)	-0.031 *** (0.002)	-0.031 *** (0.002)	-0.031 *** (0.002)	-0.031 *** (0.002)	-0.031 *** (0.002)	-0.031 *** (0.002)
EQUITY(-1)	-0.146 *** (0.002)	-0.147 *** (0.002)	-0.147 *** (0.002)	-0.147 *** (0.002)	-0.147 *** (0.002)	-0.147 *** (0.002)	-0.147 *** (0.002)	-0.147 *** (0.002)	-0.147 *** (0.002)
EBIT_A(-1)	0.014 *** (0.002)	0.015 *** (0.002)	0.015 *** (0.002)	0.015 *** (0.002)	0.015 *** (0.002)	0.015 *** (0.002)	0.015 *** (0.002)	0.015 *** (0.002)	0.015 *** (0.002)
TAT(-1)	-0.003 *** (0.000)	-0.003 *** (0.000)	-0.003 *** (0.000)	-0.003 *** (0.000)	-0.003 *** (0.000)	-0.003 *** (0.000)	-0.003 *** (0.000)	-0.003 *** (0.000)	-0.003 *** (0.000)
LNA	0.014 *** (0.000)	0.013 *** (0.000)	0.013 *** (0.000)	0.013 *** (0.000)	0.013 *** (0.000)	0.013 *** (0.000)	0.013 *** (0.000)	0.013 *** (0.000)	0.013 *** (0.000)
FGN_SHARE		-0.029 *** (0.003)							
GOV_SHARE			0.007 (0.006)						
COOP_SHARE				0.021 *** (0.003)					
DOM_SHARE					0.027 * (0.014)				
FGN_DENS						-0.043 *** (0.005)			
GOV_DENS							-0.029 *** (0.011)		
COOP_DENS								0.057 *** (0.009)	
DOM_DENS									0.045 (0.031)
Constant	0.049 ***	0.065 ***	0.052 ***	0.046 ***	0.052 ***	0.060 ***	0.056 ***	0.048 ***	0.053 ***

	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Observations	170276	147651	147651	147651	147651	147651	147651	147651	147651
Wald (joint)	14200,0 ***	12500,0 ***	12410,0 ***	12460,0 ***	12410,0 ***	12500,0 ***	12420,0 ***	12450,0 ***	12410,0 ***
R ²	0.094	0.095	0.094	0.095	0.094	0.095	0.094	0.094	0.094

Note: Values in parentheses after variable names are number of lags. All models include time x industry group dummies. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors are given in parentheses.

Figure 3.

Expected change in county-specific loan usage resulting from differences in cooperative bank market shares⁶



⁶ The expected change in loan usage is determined as follows. First, we calculate the difference between cooperative bank branches' share in a given county and the mean value of cooperative banks' market share in Poland. Second, we multiply this difference by the estimated coefficient describing the impact of cooperative bank branch share on the SME access to bank financing. Third, we scale the result by the mean share of bank liabilities in total financing observed in a given county.

Table 7.Impact of branch structure in a county on SME interest costs (*INT_COST*)

	10	11	12	13	14	15	16	17	18
COLLAT(-1)	-0.022 *** (0.002)	-0.021 *** (0.002)	-0.022 *** (0.002)	-0.021 *** (0.002)	-0.022 *** (0.002)	-0.021 *** (0.002)	-0.022 *** (0.002)	-0.022 *** (0.002)	-0.022 *** (0.002)
CASH(-1)	-0.008 ** (0.003)	-0.002 (0.004)	-0.002 (0.004)	-0.002 (0.004)	-0.002 (0.004)	-0.002 (0.004)	-0.002 (0.004)	-0.002 (0.004)	-0.002 (0.004)
EQUITY(-1)	-0.002 (0.002)	-0.001 (0.002)	-0.001 (0.002)	-0.001 (0.002)	-0.001 (0.002)	-0.001 (0.002)	-0.001 (0.002)	-0.001 (0.002)	-0.001 (0.002)
EBIT_A(-1)	-0.015 *** (0.003)	-0.017 *** (0.003)	-0.017 *** (0.003)	-0.017 *** (0.003)	-0.017 *** (0.003)	-0.017 *** (0.003)	-0.017 *** (0.003)	-0.017 *** (0.003)	-0.017 *** (0.003)
TAT(-1)	0.003 *** (0.000)	0.003 *** (0.000)	0.003 *** (0.000)	0.003 *** (0.000)	0.003 *** (0.000)	0.003 *** (0.000)	0.003 *** (0.000)	0.003 *** (0.000)	0.003 *** (0.000)
LNA	-0.008 *** (0.000)	-0.008 *** (0.000)	-0.008 *** (0.000)	-0.008 *** (0.000)	-0.008 *** (0.000)	-0.008 *** (0.000)	-0.008 *** (0.000)	-0.008 *** (0.000)	-0.008 *** (0.000)
FGN_SHARE		0.007 ** (0.003)							
GOV_SHARE			0.005 (0.005)						
COOP_SHARE				-0.005 ** (0.003)					
DOM_SHARE					-0.028 * (0.014)				
FGN_DENS						0.011 ** (0.004)			
GOV_DENS							0.024 ** (0.010)		
COOP_DENS								-0.008 (0.008)	
DOM_DENS									-0.045 (0.030)
Constant	0.178 ***	0.190 ***	0.192 ***	0.195 ***	0.194 ***	0.191 ***	0.191 ***	0.194 ***	0.194 ***

	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Observations	89196	76863	76863	76863	76863	76863	76863	76863	76863
Wald (joint)	884.1 ***	826.1 ***	821.5 ***	825.5 ***	824.5 ***	826.8 ***	827.0 ***	821.7 ***	823.0 ***
R ²	0.062	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059

Note: Values in parentheses after variable names are number of lags. All models include time x industry group dummies. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors are given in parentheses.

Table 8.Impact of branch structure in a county on SME financial expenses (*FIN_COST*)

	19	20	21	22	23	24	25	26	27
COLLAT(-1)	-0.001 *** (0.000)	-0.001 ** (0.001)	-0.002 *** (0.001)	-0.001 ** (0.001)	-0.002 *** (0.001)	-0.001 *** (0.001)	-0.002 *** (0.001)	-0.001 *** (0.001)	-0.002 *** (0.001)
CASH(-1)	-0.002 *** (0.001)	-0.003 *** (0.001)	-0.002 *** (0.001)	-0.003 *** (0.001)	-0.002 *** (0.001)	-0.003 *** (0.001)	-0.002 *** (0.001)	-0.002 *** (0.001)	-0.002 *** (0.001)
EQUITY(-1)	-0.027 *** (0.000)	-0.028 *** (0.000)	-0.028 *** (0.000)	-0.028 *** (0.000)	-0.028 *** (0.000)	-0.028 *** (0.000)	-0.028 *** (0.000)	-0.028 *** (0.000)	-0.028 *** (0.000)
EBIT_A(-1)	-0.001 ** (0.001)	-0.002 *** (0.001)	-0.002 *** (0.001)	-0.002 *** (0.001)	-0.002 *** (0.001)	-0.002 *** (0.001)	-0.002 *** (0.001)	-0.002 *** (0.001)	-0.002 *** (0.001)
TAT(-1)	-0.001 *** (0.000)	-0.001 *** (0.000)	-0.001 *** (0.000)	-0.001 *** (0.000)	-0.001 *** (0.000)	-0.001 *** (0.000)	-0.001 *** (0.000)	-0.001 *** (0.000)	-0.001 *** (0.000)
LNA	-0.001 *** (0.000)	-0.001 *** (0.000)	-0.001 *** (0.000)	-0.001 *** (0.000)	-0.001 *** (0.000)	-0.001 *** (0.000)	-0.001 *** (0.000)	-0.001 *** (0.000)	-0.001 *** (0.000)
FGN_SHARE		0.006 *** (0.001)							
GOV_SHARE			0.003 ** (0.001)						
COOP_SHARE				-0.005 *** (0.001)					
DOM_SHARE					-0.001 (0.004)				
FGN_DENS						0.007 *** (0.001)			
GOV_DENS							0.008 *** (0.002)		
COOP_DENS								-0.015 *** (0.002)	
DOM_DENS									0.001 (0.007)
Constant	0.048 ***	0.053 ***	0.055 ***	0.057 ***	0.056 ***	0.055 ***	0.055 ***	0.057 ***	0.056 ***

	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Observations	141323	121421	121421	121421	121421	121421	121421	121421	121421
Wald (joint)	4896.0 ***	4604.0 ***	4541.0 ***	4609.0 ***	4536.0 ***	4581.0 ***	4546.0 ***	4597.0 ***	4535.0 ***
R ²	0.082	0.082	0.081	0.082	0.081	0.082	0.081	0.082	0.081

Note: Values in parentheses after variable names are number of lags. All models include time x industry group dummies. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors are given in parentheses.

Table 9.Impact of branch structure in a county on SME gross profit (*GROSS_PR_S*)

	28	29	30	31	32	33	34	35	36
LNA(-1)	0.009 *** (0.001)	0.009 *** (0.001)	0.009 *** (0.001)	0.009 *** (0.001)	0.009 *** (0.001)	0.009 *** (0.001)	0.009 *** (0.001)	0.009 *** (0.001)	0.009 *** (0.001)
TAT(-1)	0.004 *** (0.000)	0.004 *** (0.000)	0.004 *** (0.000)	0.004 *** (0.000)	0.004 *** (0.000)	0.004 *** (0.000)	0.004 *** (0.000)	0.004 *** (0.000)	0.004 *** (0.000)
LT_LIAB(-1)	-0.041 *** (0.004)	-0.041 *** (0.004)	-0.041 *** (0.004)	-0.041 *** (0.004)	-0.041 *** (0.004)	-0.041 *** (0.004)	-0.041 *** (0.004)	-0.041 *** (0.004)	-0.041 *** (0.004)
ASSETS_GR(-1)	0.015 *** (0.001)	0.015 *** (0.001)	0.015 *** (0.001)	0.015 *** (0.001)	0.015 *** (0.001)	0.015 *** (0.001)	0.015 *** (0.001)	0.015 *** (0.001)	0.015 *** (0.001)
FIX_A(-1)	-0.025 *** (0.003)	-0.027 *** (0.003)	-0.025 *** (0.003)	-0.026 *** (0.003)	-0.025 *** (0.003)	-0.027 *** (0.003)	-0.025 *** (0.003)	-0.026 *** (0.003)	-0.025 *** (0.003)
REC(-1)	-0.019 *** (0.003)	-0.018 *** (0.003)	-0.019 *** (0.003)	-0.018 *** (0.003)	-0.019 *** (0.003)	-0.018 *** (0.003)	-0.019 *** (0.003)	-0.018 *** (0.003)	-0.019 *** (0.003)
FGN_SHARE		-0.019 *** (0.004)							
GOV_SHARE			0.007 (0.008)						
COOP_SHARE				0.012 *** (0.004)					
DOM_SHARE					0.033 (0.021)				
FGN_DENS						-0.034 *** (0.006)			
GOV_DENS							-0.014 (0.014)		
COOP_DENS								0.046 *** (0.011)	
DOM_DENS									-0.011 (0.042)

Constant	-0.067 *** (0.008)	-0.059 *** (0.008)	-0.069 *** (0.008)	-0.071 *** (0.008)	-0.068 *** (0.008)	-0.061 *** (0.008)	-0.066 *** (0.008)	-0.072 *** (0.008)	-0.067 *** (0.008)
Observations	145317	145317	145317	145317	145317	145317	145317	145317	145317
Wald (joint)	704.7 ***	727.2 ***	705.4 ***	716.6 ***	707.2 ***	738.8 ***	705.6 ***	721.1 ***	704.8 ***
R ²	0.019	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.019

Note: Values in parentheses after variable names are number of lags. All models include time x industry group dummies. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors are given in parentheses.

Table 10.Impact of branch structure in a county on SME investments in tangible assets (*INVEST*)

	37	38	39	40	41	42	43	44	45
LNA(-1)	0.007 *** (0.002)	0.007 *** (0.002)	0.006 *** (0.002)	0.007 *** (0.002)	0.006 *** (0.002)	0.007 *** (0.002)	0.006 *** (0.002)	0.007 *** (0.002)	0.006 *** (0.002)
TAT(-1)	0.005 *** (0.002)	0.004 * (0.002)	0.005 *** (0.002)	0.004 ** (0.002)	0.005 *** (0.002)	0.004 ** (0.002)	0.005 *** (0.002)	0.004 ** (0.002)	0.005 *** (0.002)
LT_LIAB(-1)	-0.007 (0.018)	0.005 (0.019)	-0.001 (0.019)	0.004 (0.019)	-0.001 (0.019)	0.005 (0.019)	0.000 (0.019)	0.003 (0.019)	0.000 (0.019)
FIX_A(-1)	-0.582 *** (0.013)	-0.538 *** (0.013)	-0.517 *** (0.013)	-0.533 *** (0.013)	-0.519 *** (0.013)	-0.537 *** (0.013)	-0.519 *** (0.013)	-0.531 *** (0.013)	-0.522 *** (0.013)
EBIT_S(-1)	0.188 *** (0.015)	0.171 *** (0.016)	0.176 *** (0.016)	0.173 *** (0.016)	0.176 *** (0.016)	0.171 *** (0.016)	0.176 *** (0.016)	0.173 *** (0.016)	0.175 *** (0.016)
CASH(-1)	0.100 *** (0.018)	0.114 *** (0.018)	0.107 *** (0.018)	0.111 *** (0.018)	0.107 *** (0.018)	0.114 *** (0.018)	0.107 *** (0.018)	0.110 *** (0.018)	0.107 *** (0.018)
FGN_SHARE		-0.155 *** (0.016)							
GOV_SHARE			0.050 (0.034)						
COOP_SHARE				0.111 *** (0.014)					
DOM_SHARE					-0.325 *** (0.094)				
FGN_DENS						-0.220 *** (0.024)			
GOV_DENS							-0.134 ** (0.059)		
COOP_DENS								0.329 *** (0.046)	
DOM_DENS									-0.856 *** (0.184)
Constant	0.305 ***	0.307 ***	0.231 ***	0.208 ***	0.256 ***	0.281 ***	0.256 ***	0.211 ***	0.257 ***

	(0.039)	(0.038)	(0.039)	(0.038)	(0.038)	(0.038)	(0.038)	(0.038)	(0.038)
Observations	168401	145537	145537	145537	145537	145537	145537	145537	145537
Wald (joint)	3201.0 ***	2516.0 ***	2429.0 ***	2489.0 ***	2439.0 ***	2515.0 ***	2432.0 ***	2479.0 ***	2448.0 ***
R ²	0.027	0.023	0.022	0.023	0.023	0.023	0.022	0.023	0.023

Note: Values in parentheses after variable names are number of lags. All models include time x industry group dummies. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors are given in parentheses.

Table 11.Impact of branch structure in a county on SME sales growth (*SALES_GR*)

	46	47	48	49	50	51	52	53	54
LNA(-1)	-0.026 *** (0.001)	-0.022 *** (0.001)	-0.022 *** (0.001)	-0.022 *** (0.001)	-0.022 *** (0.001)	-0.022 *** (0.001)	-0.022 *** (0.001)	-0.022 *** (0.001)	-0.022 *** (0.001)
TAT(-1)	-0.041 *** (0.001)	-0.039 *** (0.001)	-0.038 *** (0.001)	-0.039 *** (0.001)	-0.038 *** (0.001)	-0.039 *** (0.001)	-0.038 *** (0.001)	-0.038 *** (0.001)	-0.038 *** (0.001)
LT_LIAB(-1)	0.084 *** (0.008)	0.082 *** (0.008)	0.080 *** (0.008)	0.082 *** (0.008)	0.080 *** (0.008)	0.083 *** (0.008)	0.081 *** (0.008)	0.082 *** (0.008)	0.081 *** (0.008)
FIX_A(-1)	-0.044 *** (0.006)	-0.041 *** (0.006)	-0.034 *** (0.006)	-0.040 *** (0.006)	-0.034 *** (0.006)	-0.041 *** (0.006)	-0.035 *** (0.006)	-0.039 *** (0.006)	-0.035 *** (0.006)
EBIT_S(-1)	-0.182 *** (0.006)	-0.184 *** (0.007)	-0.183 *** (0.007)	-0.184 *** (0.007)	-0.183 *** (0.007)	-0.184 *** (0.007)	-0.183 *** (0.007)	-0.183 *** (0.007)	-0.183 *** (0.007)
REC(-1)	0.035 *** (0.006)	0.038 *** (0.006)	0.037 *** (0.006)	0.039 *** (0.006)	0.037 *** (0.006)	0.038 *** (0.006)	0.037 *** (0.006)	0.038 *** (0.006)	0.037 *** (0.006)
FGN_SHARE		-0.057 *** (0.007)							
GOV_SHARE			-0.031 ** (0.015)						
COOP_SHARE				0.050 *** (0.006)					
DOM_SHARE					-0.090 ** (0.042)				
FGN_DENS						-0.083 *** (0.011)			
GOV_DENS							-0.126 *** (0.027)		
COOP_DENS								0.144 *** (0.021)	
DOM_DENS									-0.333 *** (0.082)
Constant	0.528 ***	0.410 ***	0.392 ***	0.369 ***	0.388 ***	0.401 ***	0.396 ***	0.371 ***	0.390 ***

	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Observations	191511	165981	165981	165981	165981	165981	165981	165981	165981
Wald (joint)	4630.0 ***	3788.0 ***	3730.0 ***	3789.0 ***	3732.0 ***	3790.0 ***	3749.0 ***	3776.0 ***	3743.0 ***
R ²	0.057	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044

Note: Values in parentheses after variable names are number of lags. All models include time x industry group dummies. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors are given in parentheses.

Table 12.Impact of cooperative banks' characteristics on SME bank liabilities (*BANK_LIAB*)

	55		56		57		58		59
COLLAT(-1)	0.089 *** (0.003)		0.089 *** (0.003)		0.089 *** (0.003)		0.086 *** (0.002)		0.087 *** (0.002)
CASH(-1)	-0.039 *** (0.003)		-0.039 *** (0.003)		-0.039 *** (0.003)		-0.031 *** (0.003)		-0.031 *** (0.003)
EQUITY(-1)	-0.152 *** (0.002)		-0.152 *** (0.002)		-0.152 *** (0.002)		-0.147 *** (0.002)		-0.146 *** (0.002)
EBIT_A(-1)	0.023 *** (0.002)		0.024 *** (0.002)		0.024 *** (0.002)		0.015 *** (0.002)		0.015 *** (0.002)
TAT(-1)	-0.003 *** (0.000)		-0.003 *** (0.000)		-0.003 *** (0.000)		-0.003 *** (0.000)		-0.003 *** (0.000)
LNA	0.012 *** (0.001)		0.012 *** (0.001)		0.012 *** (0.001)		0.013 *** (0.000)		0.013 *** (0.000)
COOP_EQUITY(-1)	0.086 *** (0.023)								
COOP_LOANS(-1)			0.007 (0.005)						
COOP_ROA(-1)					0.056 (0.076)				
COOP_LNA							-0.006 *** (0.001)		
COOP_OVERH									0.008 (0.007)
Constant	0.061 *** (0.008)		0.065 *** (0.008)		0.070 *** (0.008)		0.166 *** (0.017)		0.055 *** (0.008)
Observations	85457		85457		85457		108581		108581
Wald (joint)	7706.0 ***		7690.0 ***		7691.0 ***		9098.0 ***		9044.0 ***
R2	0.100		0.100		0.100		0.095		0.095

Note: Values in parentheses after variable names are number of lags. All models include time x industry group dummies. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors are given in parentheses.

Table 13.Impact of cooperative banks' characteristics on SME interest costs (*INT_COST*)

	60		61		62		63		64
COLLAT(-1)	-0.023 *** (0.003)		-0.023 *** (0.003)		-0.023 *** (0.003)		-0.022 *** (0.002)		-0.022 *** (0.002)
CASH(-1)	0.008 * (0.005)		0.008 * (0.005)		0.008 * (0.005)		0.001 (0.004)		0.001 (0.004)
EQUITY(-1)	-0.002 (0.003)		-0.002 (0.003)		-0.002 (0.003)		-0.004 (0.002)		-0.004 (0.002)
EBIT_A(-1)	-0.021 *** (0.004)		-0.021 *** (0.004)		-0.021 *** (0.004)		-0.018 *** (0.003)		-0.018 *** (0.003)
TAT(-1)	0.003 *** (0.000)		0.003 *** (0.000)		0.003 *** (0.000)		0.003 *** (0.000)		0.003 *** (0.000)
LNA	-0.008 *** (0.001)		-0.008 *** (0.001)		-0.008 *** (0.001)		-0.008 *** (0.000)		-0.008 *** (0.000)
COOP_EQUITY(-1)	0.023 (0.022)								
COOP_LOANS(-1)			-0.004 (0.006)						
COOP_ROA(-1)					0.089 (0.088)				
COOP_LNA							0.001 (0.001)		
COOP_OVERH									0.001 (0.008)
Constant	0.174 *** (0.008)		0.179 *** (0.009)		0.175 *** (0.007)		0.177 *** (0.015)		0.192 *** (0.009)
Observations	43597		43597		43597		55740		55740
Wald (joint)	557.4 ***		556.7 ***		557.3 ***		608.1 ***		606.7 ***
R-squared	0.055		0.055		0.055		0.059		0.059

Note: Values in parentheses after variable names are number of lags. All models include time x industry group dummies. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors are given in parentheses.

Table 14.Impact of cooperative banks' characteristics on SME financial expenses (*FIN_COST*)

	65	66	67	68	69
COLLAT(-1)	-0.002 *** (0.001)	-0.002 *** (0.001)	-0.002 *** (0.001)	-0.002 *** (0.001)	-0.002 *** (0.001)
CASH(-1)	-0.002 *** (0.001)	-0.002 *** (0.001)	-0.002 *** (0.001)	-0.003 *** (0.001)	-0.003 *** (0.001)
EQUITY(-1)	-0.027 *** (0.001)	-0.027 *** (0.001)	-0.027 *** (0.001)	-0.027 *** (0.001)	-0.027 *** (0.001)
EBIT_A(-1)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.003 *** (0.001)	-0.003 *** (0.001)
TAT(-1)	-0.001 *** (0.000)	-0.001 *** (0.000)	-0.001 *** (0.000)	-0.001 *** (0.000)	-0.001 *** (0.000)
LNA	-0.001 *** (0.000)	-0.001 *** (0.000)	-0.001 *** (0.000)	-0.001 *** (0.000)	-0.001 *** (0.000)
COOP_EQUITY(-1)	0.002 (0.005)				
COOP_LOANS(-1)		-0.001 (0.001)			
COOP_ROA(-1)			-0.016 (0.021)		
COOP_LNA				0.001 *** (0.000)	
COOP_OVERH					-0.001 (0.002)
Constant	0.057 *** (0.002)	0.058 *** (0.002)	0.058 *** (0.002)	0.043 *** (0.004)	0.055 *** (0.002)
Observations	70255	70255	70255	88832	88832
Wald (joint)	3145.0 ***	3145.0 ***	3146.0 ***	3196.0 ***	3185.0 ***
R ²	0.073	0.073	0.073	0.080	0.080

Note: Values in parentheses after variable names are number of lags. All models include time x industry group dummies. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Robust standard errors are given in parentheses.

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