LETTERS SECTION

Distance still matters: Local bank closures and credit availability

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Abstract

In recent years, commercial banks have substantially reduced the number of their branch offices. We address the question of whether or not the increased distance to lenders caused by branch office closures translates into a lower credit supply for small and medium sized enterprises (SMEs). We use a unique dataset based on 33,000 loan contracts from a state-owned Swedish bank designed to support credit-constrained SMEs, and relate loan size and the interest rate to the number of nearby commercial bank offices. We use an IV strategy to account for potential endogeneity of the number of banks in a region. In line with previous studies, we find that interest rates increase with distance, while loan size decreases with distance. Thus, a larger number of local bank offices increases the local credit supply, and thereby reduces credit constraints of nearby SMEs.

KEYWORDS
credit constraints, relationship banking, small business, state-owned bank

JEL CLASSIFICATION
G28; H81; L26; L52; O38

1 | INTRODUCTION

The substantial reduction in the number of branch offices maintained by commercial banks observed in many countries has engendered widespread concerns related to financing opportunities faced by small and medium sized enterprises (SMEs; Saunders & Steffen, 2011). This reduction increases the physical distance between lenders and borrowers, which could hamper the flow of soft and/or unverifiable information that facilitates lending operations (Agarwal & Hauswald, 2010; Inderst & Mueller, 2007). These negative effects could, however, be countered by an increased reliance on hard information (Petersen & Rajan, 2002) and contractual covenants (Hollander & Verriest, 2016; Knyazeva & Knyazeva, 2012).

Agarwal and Hauswald (2010), Backman and Wallin (2018), and Nguyen (2019), for example, have presented empirical evidence of a negative relationship between the availability of credit and the distance from potential lenders. Technological improvements do, however, facilitate bank loans to more distant customers (Milani, 2014; Petersen & Rajan, 2002). Hence, the question of whether or not reductions in the number of bank offices creates limited credit availability for SMEs remains empirically unsettled.

In the present paper, we investigate the effects of the density of banks in different geographic areas by using a unique firm-level dataset on loans granted by Almi, a state-owned Swedish bank whose institutional role is to reduce the credit constraints faced by SMEs by co-financing projects with commercial banks.[1] The dataset contains detailed information on 33,000 Almi loan contracts to Swedish firms during the period 2001–2016 (excluding the year 2011). In order to not crowd-out private credit supply, an Almi loan typically has a slightly higher interest rate than the rate charged by the co-lending commercial bank (or banks).[2] The size of an Almi loan is usually proportional to that of the corresponding commercial bank. The fact that Sweden plays a leading role in the development and adoption of digital technologies for financial services, provides an interesting context for our study (OECD, 2018).

This firm-level dataset allows us to test if the local density of commercial banks in different areas impacts SMEs' access to credit. We are able to compare interest rates and loan sizes made by Almi to firms, as well as the likelihood of defaults, and use an IV strategy to account for endogeneity of the number of local bank offices. We find that SMEs based in areas with a greater number of bank offices and/or bank employees typically received larger Almi loans and faced lower rates of interest over the period considered. Moreover, we find that firms in regions with greater bank density were slightly more likely to default on their loans. These findings suggest that the geographical distance between firms and the lending bank still matters.

Our results substantiate the notion that borrowers benefit from being proximate to a bank. These benefits arise from the fact that proximate banks have greater access to soft information about the loan applicants. Increased competition between local banks is another mechanism that drives the results of our study. Our findings indicate that the presence of local banks, working in conjunction with the state-owned bank, can reduce the financial constraints of SMEs. Furthermore, if an SME is considering a new location, the managerial team should take into account the benefits of being proximate to a local bank.

2 | EMPIRICAL STRATEGY AND RESULTS

2.1 | Data

Our sample of loans is obtained from the Swedish Agency of Growth Policy Analysis (*Tillväxtanalys*) and provides information on the lending activities of the state-owned bank Almi between 2000–2010 and 2012–2016.[3] The number of commercial bank offices in each Swedish municipality in each year is calculated using data from Statistics Sweden (SCB). There are 290 municipalities in Sweden, and the number of commercial bank offices in a municipality ranges from one to several hundred.[4] Firm-level information, such as sales, number of employees and industry, is

TABLE 1 Summary statistics for Almi loans

	Observations	Mean	Median	SD	Min	Max
Borrowing firms' no. employees	33,389	3.9	1	9.59	0	232
Borrowing firms' net sales (000)	33,389	3,808	905	12,951	0	670,135
Loan amount from state-owned bank (000)	33,389	457	212	807	1	25,759
Loan amount from commercial bank (000)	33,389	1,017	229	3,319	0	147,468
Interest rate on Almi loan %	33,322	7.3	8	1.9	0	15
Borrowing firms' age (years)	22,149	2.6	0	5.15	0	30

Notes: Almi = state-owned bank. All monetary variables inflation adjusted using CPI.

added to the loan sample by utilizing an employer–employee dataset of all Swedish firms between 2000–2016 from SCB. Table 1 reports the summary statistics of the loans in our sample.

2.2 | Regression results

We regress the interest rate of the loan and the loan amount on the number of bank offices in the firm's municipality in the year when the loan was granted. Formally, we estimate

$$Y_{it} = \alpha + \beta X_{it} + \gamma n_{jt} + \tau_t + \delta_k + \phi_j + \varepsilon_{it} \qquad (1)$$

where Y_{it} is either the interest rate or loan size of loan i, X_{it} is a vector of control variables related to loan i, n_{jt} is the number of bank offices or number of bank employees in municipality j at year t, τ_t is a year fixed effect, δ_k is an industry fixed effect, ϕ_j is a municipality fixed effect, α is the constant, and ε_{it} denotes the error term.

Because we employ panel fixed effects regressions, we utilize the within region variation of the number of banks, which corresponds to the change in the number of bank offices within each municipality. This is possible due to the relatively long panel data and sufficiently large changes in the number of banks offices over time, as illustrated in Figure A1 in the Appendix.

The interest rates charged by Almi and those charged by the co-lending banks are typically related. Lower rates can indicate lower informational asymmetries and/or increased competitive pressure faced by the lenders. Loan sizes can also be a result of informational asymmetries and/or increased competitive pressure.

A potential concern is that a decrease in the number of bank offices in a municipality could be related to a lack of growth opportunities, and reflect an anticipated lower credit demand of local SMEs. To address this potential endogeneity issue caused by reverse causality, we perform IV estimations with regional level instrumental variables. Regional level IVs for local bank presence in a loan level regression are assumed to satisfy the exclusion restriction. The number of bank offices in municipality i in year t is instrumented with the respective municipality's population size of the respective municipality and the municipality's gross regional product (GRP). The number of bank employees is instrumented with regional GRP per capita, the number of bank offices in the surrounding municipalities and with GRP growth. For comparison, we present both OLS regressions and IV-GMM regressions using these instruments. In all regressions, the vector X_{it} controls for net sales (in log), firm age, a firm's judicial type, loan type, number of employees and include municipality, year and industry fixed effects. In the regressions with interest rate as the dependent variable, we additionally control for loan size.

The results presented in Table 2 show that both the number of banks and the number of bank employees (denoted by n_{jt} in (1)) have a negative effect on the interest rate charged by Almi, as well as a positive impact on loan size. In other words, an increase in the number of bank offices and/or bank employees is associated with a lower interest

TABLE 2 OLS and IV-GMM results

	OLS				IV-GMM			
	Rate	Loansize	Rate	Loansize	Rate	Loansize	Rate	Loansize
Banks per municipality	−0.026***	0.0022**			−0.33***	0.049***		
	(0.0030)	(0.0010)			(0.035)	(0.011)		
Bank emp. per municipality			−0.00023***	0.0000030			−0.0037***	0.00027***
			(0.000020)	(0.0000060)			(0.00046)	(0.000059)
Net sales (log)	0.023**	0.13***	0.023**	0.13***	0.017*	0.13***	0.016*	0.13***
	(0.0090)	(0.0075)	(0.0091)	(0.0075)	(0.0092)	(0.0062)	(0.0097)	(0.0065)
6–10 emp.	−0.080***	0.14***	−0.076***	0.14***	−0.082***	0.13***	−0.050*	0.13***
	(0.027)	(0.020)	(0.027)	(0.020)	(0.027)	(0.016)	(0.029)	(0.017)
11–50 emp.	−0.20***	0.45***	−0.20***	0.45***	−0.22***	0.43***	−0.21***	0.44***
	(0.036)	(0.028)	(0.036)	(0.029)	(0.036)	(0.024)	(0.039)	(0.025)
51–250 emp.	−0.36***	1.07***	−0.35***	1.07***	−0.49***	1.07***	−0.47***	1.08***
	(0.10)	(0.054)	(0.10)	(0.054)	(0.084)	(0.053)	(0.094)	(0.053)
Firm age	−0.0065***	0.000089	−0.0066***	0.000069	−0.0058***	0.00066	−0.0070***	0.00094
	(0.0017)	(0.0012)	(0.0018)	(0.0012)	(0.0018)	(0.0012)	(0.0018)	(0.0012)
Loansize (log)	−0.20***		−0.21***		−0.23***		−0.21***	
	(0.021)		(0.021)		(0.018)		(0.019)	
Constant	6.63***	5.38***	6.52***	5.40***				
	(0.30)	(0.15)	(0.29)	(0.15)				
Observations	19,045	19,088	19,045	19,088	18,388	18,431	18,389	18,432
Hansen J test					6.05	3.87	5.99	2.03
p-Value					.048	.14	.050	.36
Hausman endog test					0.040	3.02	5.71	1.59
p-Value					.84	.082	.017	.21

Notes: Dependent variables: Interest rate and log of loan principle. Cluster robust SE at municipality level. Year, industry and municipality fixed effects. IVs for no. of banks: Population size and GRP growth. IVs for no. of bank employees: number of banks in surrounding municipalities in the same region, GRP/Pop, GRP growth. Categorical variables are partialled out in the IV-GMM estimations, therefore no constant is reported.

*$p < .1$; **$p < .05$; ***$p < .01$.

TABLE 3 GMM estimation specification tests

	IV-GMM			
	Rate	Rate	Loansize	Loansize
Kleibergen-Paap rk LM statistic) (robust)	332.2***	543.8***	330.9***	542.3***
Kleibergen-Paap rk Wald *F* statistic (robust)	116.7***	163.6***	116.1***	163.4***
Observations	18,388	18,389	18,431	18,432

Notes: Kleibergen-Paap rk LM test has H0: excluded instruments are relevant, Kleibergen-Paap rk Wald *F* test has H0: weak instruments.
*$p < .1$; **$p < .05$; ***$p < .01$.

TABLE 4 Probit and IV probit estimations of likelihood of loan default, marginal effects

	Probit	Probit	IV—Probit	IV—Probit
Banks per municipality	0.00046		0.067**	
	(0.00051)		(0.030)	
Bank emp. per municipality		0.00000046		0.00080***
		(0.00000031)		(0.00021)
Net sales (log)	−0.0095***	−0.0089***	−0.086***	−0.084***
	(0.0016)	(0.0016)	(0.016)	(0.016)
−10 emp.	−0.0010	−0.00033	−0.026	−0.046
	(0.0057)	(0.0055)	(0.057)	(0.057)
−50 emp.	0.012	0.012	0.089	0.076
	(0.0079)	(0.0076)	(0.068)	(0.068)
−250 emp.	0.0098	0.013	0.11	0.094
	(0.019)	(0.019)	(0.17)	(0.16)
Firm age	−0.00066*	−0.00070*	−0.0054	−0.0049
	(0.00038)	(0.00036)	(0.0036)	(0.0036)
Loansize (log)	0.0081***	0.0081***	0.083***	0.085***
	(0.0025)	(0.0023)	(0.024)	(0.024)
Almi's interest rate	0.0067***	0.0060***	0.080***	0.076***
	(0.0014)	(0.0013)	(0.014)	(0.013)
Observations	17,321	18,733	16,772	16,772
Pseudo R^2	0.10	0.079		
Log-likelihood	−3,358.5	−3,526.6	−48,515.5	−125,829.7
χ^2 test H0: Exogeneity			4.20**	13.5***
p-Value			.041	.00024
ρ			−0.228**	−0.294***
			(0.107)	(0.076)

Notes: Dependent variable—default of Almi loan, available for years 2013–2016. Marginal effects reported. Endogenous variables: Banks per municipality and Bank employees per municipality. Year, industry and municipality fixed effects. IVs for no. of banks: Population size and GRP growth. IVs for no. of bank employees: number of banks in surrounding municipalities with the same region, GRP/Pop, GRP growth. ρ denotes the correlation of error terms between selection and outcome equation. Cluster robust *SE* reported.
*$p < .1$; **$p < .05$; ***$p < .01$.

rate on Almi loans and with an increase in the supply of Almi credit. Table 2 shows that for 3 out of 4 models the IVs pass the Hansen J-test for overidentification at a 5% level, as well as the Kleibergen-Paap rank test for under-identification, and also reject the weak instruments hypothesis (Table 3). However, it is noteworthy that endogeneity is indicated at a 10% level only by 2 of the 4 models, as implied by the results of the Hausman tests (Table 2).

A remaining question is whether the negative impact on the interest rate and the positive impact on loan size is caused by a lower credit risk for Almi when the number of local private banks increases. Therefore, we investigate whether loan default risk is inversely related to the presence of local private banks. We use probit and IV-probit regressions to explain loan default over the years 2013–2016[5] with the same explanatory variables and IVs as in the previous models. The IV-probit results[6] show that loan default risk is positively related to the number of local private banks and also to the number of local bank employees (Table 4).

Higher interest rates on Almi loans and smaller loan sizes observed in areas with a low density of commercial banks could indicate a weaker competitive pressure faced by the lenders and/or stronger informational asymmetries due to distance to borrowers. Since we find that in areas with lower density of banking services loan default rates are lower, this in turn implies that the key explanation for charging higher interest rates and granting smaller loans in areas with lower bank density is due to a lower competitive pressure, which limits local credit supply. This is in line with the findings of previous research that increased competition increases credit supply (Degryse & Ongena, 2005; Ryan, O'Toole, & McCann, 2014). Distance between lenders and borrowers thus plays a key role for the functioning of local credit markets.

3 | CONCLUSIONS

In this paper, we investigate the effects of the increased distance between SMEs and their potential lending bank caused by the reduction of the number of commercial bank branch offices. A unique dataset allows us to estimate how the number of nearby commercial banks affects the size and interest rates of about 33,000 loan contracts offered by the Swedish state-owned bank, Almi. Based on IV regressions, our findings corroborate previous research (Degryse & Ongena, 2005; Ryan et al., 2014) that a larger number of both local bank offices and bank employees are associated with both lower interest rates and larger loans granted to SMEs. We conclude that competition between local banks is the main driver of our results. In an environment where there is a large number of local banks, the market power of each bank decreases. This forces banks to offer both lower interest rates and an increased credit supply. Another finding of this study that supports our claim about competition is that the likelihood of a loan default significantly increases as number of local banks increase.

In sum, distance still matters for lending to firms. A larger number of local bank branches leads to an increased supply of credit to SMEs, larger loans and lower interest rates. Considering the ongoing reduction of the number of local bank offices observed in recent years, these results suggest that governments and financial supervisory authorities should make efforts to maintain a sufficient number of local banks in order to improve the credit supply to SMEs. SMEs should consider the presence of a suitably large number of local bank branches as one priority in their location decision.

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ENDNOTES

[1] The effects of Almi's activities are analyzed in Kärnä (2020) and Gustafsson and Stephan (2019).

[2] The commercial bank has priority over Almi in the case of loan default.

[3] Loans fully covered by Almi are not included in the sample. Due to idiosyncrasies of Almi's internal accounting in the year 2011, loans granted in that year are missing.

[4] For a description of the number of bank offices and their distribution, see Figures A1 and A2 in the Appendix.

[5] Years for which we have reliable loan default information.

[6] The χ^2-tests confirm endogeneity of the main variables of interest at a 10% level for both models.

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APPENDIX
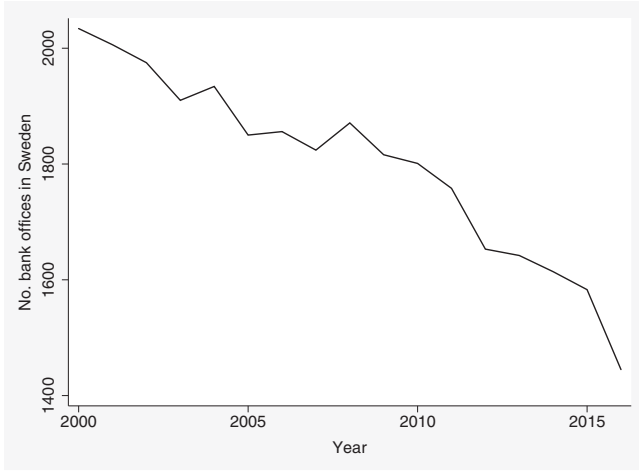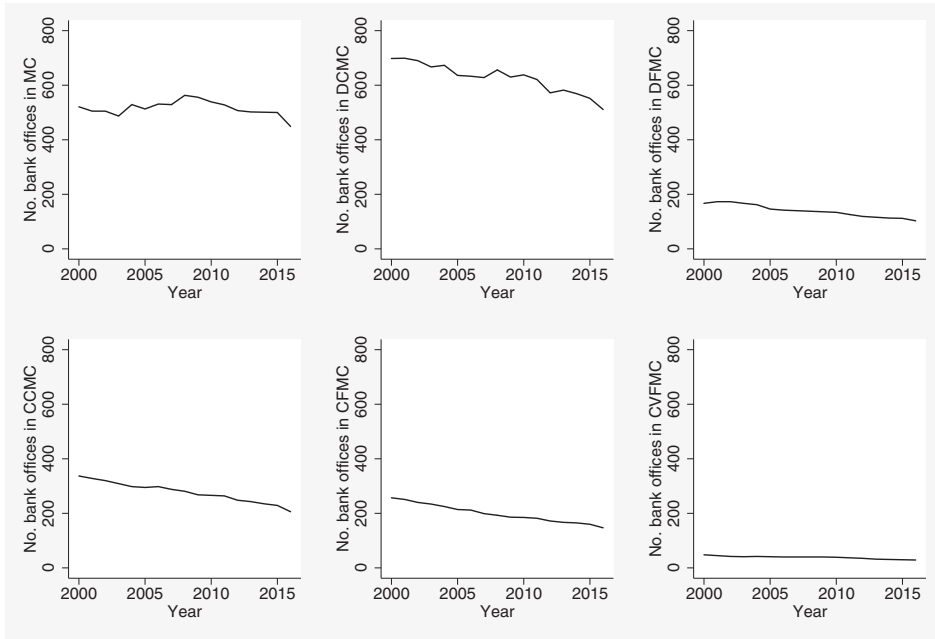
BANK OFFICES STATISTICS

FIGURE A1 Number of bank offices in Sweden, 2000–2016

Banks per region type

FIGURE A2 Number of bank offices per region type in Sweden, 2000–2016. *Notes:* The definition of region types is due to The Swedish Agency for Economic and Regional Growth. Region types: MC = major city, DCMC = dense municipality close to major city, DFMC = dense municipality far away from MC, CCMC = countryside municipality close to MC, CFMC = countryside municipality far away from MC, CVFMC = countryside municipality very far away from MC