

Do Community Banks Increase New Firms' Access to Credit?

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Importance of New Firms, or 'Startups'

- Create more new jobs each year than any other firm age group (*Kane 2010*)
- Higher rates of employment growth in early years than older firms, conditional on survival (*Haltiwanger, Jarmin, and Miranda 2010*)

Challenges for Startups

- Typically do not survive more than a few years
 - Firm deaths eliminate 40 percent of jobs created within first five years (*HJM 2010*)
- Tend to be credit constrained (*Holtz-Eakin, Joulfaian, and Rosen 1992; Nanda 2011*)
- Lack quantifiable evidence of creditworthiness
- New and small firms with access to formal outside funding less likely to fail (*Robb and Robinson 2010; Lee and Zhang 2010; Mach and Wolken 2011*)

Research Focus

- Does proximity to small local banks, which we term 'Community Banks' (CBs), increase new firms' access to bank capital?
- Study actual startups, most opaque of firms

Literature: Importance of Small Local Banks

- Theory: *CBs more suited to overcome information asymmetry of opaque firms*
 - Knowledge of local area
 - Lower transportation costs
 - Involved in capital allocation process (*Stein 2002*)
- Empirical Support: *Small Banks...*
 - Rely on character of borrower (*Cole, Goldberg, and White 2004*)
 - Use soft information to extend credit to small firms (*Berger et. al. 2005*)
 - Given highest ratings by small firms in meeting credit needs (*Scott 2004*)
 - Large number of other studies with supporting evidence (*see for example Haynes, Ou, and Berney 1999; Cole, Goldberg, and White 2004; Cowan and Cowan 2006; Kittiakarasakum 2010; Scott 2004; Berger, Miller, Petersen, Rajan, and Stein 2005; DeYoung et. al.2010*)

Literature: Distance and Credit Availability

- Theory: *Physical distance from bank increases transactions costs*
 - Transportation (*Elliehausen and Wolken 1990*)
 - Informational (*Petersen and Rajan 2002*)
- Empirical Support: *Distance ...*
 - Decreases likelihood of obtaining credit from bank (*Argawal and Hauswald 2010; Elliehausen and Wolken 1990; Ergugor 2010*)
 - Is smaller if lender is bank, and for more informationally opaque firms (*Peterson and Rajan 2002*)
 - Small vs Large Banks
 - Probability of loans to census tract decreases with distance, 'deterrent effect' stronger for smaller banks (*Brevoort and Hannan 2006*)
 - Recent increases in lending by banks outside of market areas attributed to large banks (*Brevoort 2006*)

Innovations

- Research Q: Does proximity to community banks increase access to credit for the most opaque of firms – ***startups***?
 1. Actual Firm Opacity: Small firm size typical proxy
 2. Novel new panel dataset: Control for whether best firms
 - Survive anyway, and can demonstrate creditworthiness over time
 - Purposefully locate in areas with closer proximity to banks

Hypothesis

- If, as lit suggests
 - CBs gather and employ non-quantifiable information on opaque firms, and
 - Quality of ‘soft’ information decays with distance from bank
- Then we expect that:
 - Start-up firms’ use of bank credit decreases with distance of firm from a CB

Methodology

- A new firm's use of bank credit depends on
 - Proximity to nearest community bank
 - Local banking market characteristics
 - Observable firm and owner characteristics
 - Local economic conditions
- Control for unobservable location and firm characteristics that may also affect distance and bank credit use
- Estimated with linear probability model
 - Adjusted standard errors for serial correlation and heteroscedasticity

Kauffman Firm Survey (KFS)

- Purpose: The study of entrepreneurship and new firm formation
- 4,928 firms that began operations in 2004
- Eight annual surveys, 2004-2011
- Questions on startups' business strategy, offerings, organization, owner characteristics, financial arrangements, and experiences

Our Sample

- *Panel of 2,998 firms*
 - Participated in all eight surveys, or
 - Confirmed to go out of business during sample period
- *Restricted KFS*
 - Categorical variable based on Dun and Bradstreet Commercial Credit Score
 - Firm zip code
- Firm and CBs: Use firm zip code centroid to calculate
 - Distance to the nearest community bank branch
 - Number of bank branches within 10 miles

Other Data Sources

- FDIC Summary of Deposits (SOD)
 - CB Distance/Access: Bank branch locations
 - County's deposit-based Herfindahl-Hirschman Index (HHI)
 - County's share of community banks with majority of deposits in county.
- Moody's Analytics
 - County-level historical house price index
- U.S. Bureau of Economic Analysis
 - County per establishment GDP
 - County per establishment personal income from investments

Summary Statistics

Use of Credit		Bank Market Characteristics	
Bank Credit			
Used a Bank Loan to Finance Annual Operations, No CC	0.17 (0.01)	Distance to Nearest Community Bank Branch (miles)	2.01 (0.11)
Used a Personal Loan to Finance Annual Operations, No CC	0.13 (0.01)	Distance to Nearest CB - Scaled (Per Establishment Sq Mi Land Area	0.001 (0.001)
Used a Business Bank Loan to Finance Annual Operations, NO CC	0.06 (0.00)	Share of Community Banks in County with 50% or More of	0.46 (0.01)
Used a Business Line of Credit to Finance Annual Operations, No CC	0.13 (0.01)	Number of Bank Branches in 10 Mi (Per County Establishments)	0.01 (0.00)
Credit Cards			
Used a Business Credit Card to Finance Annual Operations	0.50 (0.01)	Herfindhal-Hirschman Index, Bank Deposits	220.00 (11.0)
Used a Personal Credit Card to Finance Annual Operations	0.38 (0.01)	Number of Firm Year Observations	17287

Other variables include: legal form of organization; whether firm based at home; has employees; has intellectual property; offers products, services, or both; industry; whether firm's owner believes firm has competitive advantage; age, age-squared, sex, race and ethnicity; whether owner has prior experience in industry; number of hours worked per week on avg on behalf of firm

Table 2: Any Bank Loan, All Firms

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Distance to Nearest Community Bank Branch</i>	-0.013***	-0.019***	-0.016***	-0.017***	-0.013*	-0.004*
<i>(Per Establishment/Square Mile Land Area)/mill</i>	(0.002)	(0.002)	(0.004)	(0.004)	(0.007)	(0.002)
Share of Community Banks in County with 50% or More of Deposits Inside County	0.057** (0.025)	0.031 (0.026)	0.018 (0.024)	0.038 (0.024)		-0.006 (0.044)
Number of Bank Branches within 10 Miles (Per County Establishments)	-0.041 (0.144)	-0.010 (0.150)	0.020 (0.135)	0.064 (0.136)	-0.069 (0.096)	-0.153 (0.095)
Herfindhal-Hirschman Index, Bank Deposits	-27.178** (12.851)	-19.847 (12.974)	-13.775 (13.110)	23.364 (16.125)		3.357 (28.680)
=1 if Credit Score Between 30th and 70th Percentile			-0.031** (0.013)	-0.029** (0.013)	-0.016 (0.012)	-0.004 (0.011)
=1 if Credit Score Lower than 30th Percentile			-0.049*** (0.015)	-0.047*** (0.015)	-0.036** (0.015)	-0.022 (0.015)
=1 if Not Rated Due to High Risk, Inclu. Bankruptcy			-0.066** (0.032)	-0.068** (0.032)	-0.034 (0.032)	-0.036 (0.038)
=1 if No Credit Score			-0.021 (0.017)	-0.019 (0.017)	-0.010 (0.016)	-0.022 (0.016)
Year FEs	N	Y	Y	Y	Y	Y
Other Time-Varying Firm Controls	N	N	Y	Y	Y	Y
Time-Invariant Firm Controls	N	N	Y	Y	Y	N
Industry FEs	N	N	Y	Y	Y	N
Time-Varying County Controls	N	N	N	Y	N	Y
County FEs	N	N	N	N	Y	N
Firm FEs	N	N	N	N	N	Y
N	17181.000	17181.000	16465.000	16465.000	16513.000	16841.000
R2	0.002	0.011	0.072	0.076	0.235	0.020
Standard errors in parentheses: * p<0.10, ** p<0.05, *** p<0.01						

Table 3: Effect of Nearest CB Distance on Any Bank Loan

	(1)	(2)	(3)	(4)	(5)	(6)
<i>A. Urban Firms Only</i>	-0.013***	-0.019***	-0.016***	-0.016***	-0.012*	-0.004*
	(0.002)	(0.002)	(0.004)	(0.004)	(0.007)	(0.002)
N	16186.000	16186.000	15496.000	15496.000	15534.000	15864.000
<i>B. Rural Firms Only</i>	-772.130	-620.661	-470.310	-84.862	2520.281	1469.551
	(658.289)	(617.933)	(618.709)	(670.551)	(3334.096)	(3427.074)
N	995.000	995.000	969.000	969.000	979.000	977.000
Other County Banking Market Controls	Y	Y	Y	Y	Y	Y
Year FEs	N	Y	Y	Y	Y	Y
Time-Varying Firm Controls	N	N	Y	Y	Y	Y
Time-Invariant Firm Controls	N	N	Y	Y	Y	N
Industry FEs	N	N	Y	Y	Y	N
Time-Varying County Controls	N	N	N	Y	N	Y
County FEs	N	N	N	N	Y	N
Firm FEs	N	N	N	N	N	Y

Standard errors in parentheses: * p<0.10, ** p<0.05, *** p<0.01

Notes: Each cell represents a separate estimation.

Table 4: Effect of Nearest CB Distance, Urban Firms Only

	(1)	(2)	(3)	(4)	(5)	(6)
		<u>Bank Loans</u>			<u>Credit Cards</u>	
<i>Outcome</i>	<i>Any</i>	<i>Personal for Business Purposes</i>	<i>Business</i>	<i>Business LOC</i>	<i>Business</i>	<i>Personal</i>
<i>Firm Fixed Effects</i>	<i>-0.004*</i> <i>(0.002)</i>	<i>-0.005***</i> <i>(0.002)</i>	<i>-0.000</i> <i>(0.002)</i>	<i>0.000</i> <i>(0.002)</i>	<i>0.011***</i> <i>(0.003)</i>	<i>0.091***</i> <i>(0.003)</i>
Other County Banking Market Controls	Y	Y	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y	Y	Y

Standard errors in parentheses: * p<0.10, ** p<0.05, *** p<0.01

Notes: Each cell represents a separate estimation. All estimations include time-varying county controls, but no time-invariant firm controls.

Interpretation

- Based on
 - Firm FE estimation
 - Mean establishment square mile land area
 - Mean probability of using loan type
 - Moving 0.25 mile away from a CB changes probability of using loan by

Type of Loan Used	Change in Average Probability
Any Bank Loan	-0.68%
Personal Loan	-1.29%
Business Credit Card	0.64%
Personal Credit Card	7.05%

Table 5: Interactions Between Nearest CB Distance and Firm Opacity, Urban Firms Only

	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Bank Loans</i>			<i>Credit Cards</i>		
<i>Outcome</i>	<i>Any</i>	<i>Personal for Business Purposes</i>	<i>Business</i>	<i>Business LOC</i>	<i>Business</i>	<i>Personal</i>
A. County Fixed Effects						
Distance to Nearest CB	14.229	18.855	7.723	-31.735	22.221	-4.947
	(35.229)	(29.367)	(20.972)	(35.697)	(79.812)	(35.968)
=1 if No Credit Score	-38.095	-35.910	-19.765	19.163	52.557	-37.746
*Distance to Nearest CB	(35.788)	(32.410)	(20.818)	(28.411)	(67.953)	(33.886)
B. Firm Fixed Effects						
Distance to Nearest CB	16.196	18.911	8.307	-90.187	-49.641	-29.995
	(20.110)	(18.854)	(13.871)	(56.152)	(59.039)	(28.412)
=1 if No Credit Score	-29.501	-15.712	-25.771	90.849*	84.479	24.741
*Distance to Nearest CB	(26.695)	(22.970)	(19.304)	(54.856)	(66.309)	(31.449)
Other County Banking Market Controls	Y	Y	Y	Y	Y	Y
Year FEs	Y	Y	Y	Y	Y	Y

Standard errors in parentheses: * p<0.10, ** p<0.05, *** p<0.01

Notes: Each cell represents a separate estimation. All estimations with county fixed effects also include time-invariant firm controls, but no time-varying county controls. All estimations with firm fixed effects include time-varying county controls, but no time-invariant firm controls, including no industry fixed effects.

Preliminary Conclusions

- Proximity to nearest CB appears to affect startups usage/access of bank loans
- However, the best firms may purposefully locate near CB branches
- Including County or Firm FEs reduces significance and magnitude of distance effect on bank credit
- Distance effect appears to work through personal loans
- Greater the distance to nearest CB, firms rely more on expensive and impersonal credit cards

Next Steps

- Improving Distance Measure
 - Average distance of nearest 3-5 CB's
 - Distance to nearest CB correlated with distance to nearest non-CB
 - Use characteristics of CBs within distance bands (eg 5, 10 miles)
- Distance & Credit Access: Other Interactions
 - Stratify by bank dependency of firm's industry?
 - Interact with nearest CB's attributes, eg loan portfolio specializations
- Alternative Hypothesis
 - Distance correlated with attributes of sub-area (smaller than county) where firm locates?
 - Maybe try zip code FEs
- Other Outcomes
 - Survival, Employment