Local Financial Development, Access to Credit and SMEs' Performance: Evidence from Bangladesh

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Context

- SMEs growth and operations are largely affected by lower access to formal credit.

- In Bangladesh, 68.6% of small enterprises and 44.7% of medium enterprises are constrained by finance (Vila 2013)

- Market imperfections, asymmetry of information, institutional deficiencies and lower level of financial development are some of the supply side constraints (Beck et al. 2006; Yoshino and Taghizadeh-Hesary 2015)

- Local financial development and financial inclusion could ease access to finance (Fafchamps and Schundeln, 2013)

- This paper tests whether local financial development through bank branch networks expansion could improve access to credit and SMEs performances.

Local financial development and SMEs Access to Finance

- Bank competition hypothesis: higher number of branches in a local area increase competition to find good borrowers

- This will reduce interest rates and relax collateral requirements

- Facilitates relationship banking, reduces asymmetry of information which reduces default risk

- Provide access to various financial services, such as overdraft (OD) facilities, trade or cash credit (TC or CC), financial obligation against deposits etc.

Local financial development and SMEs Access to Finance: Bangladesh

- **SMEs in Bangladesh**:
- Over 97% of ind units belong to SMEs
- The share of SMEs in total manufacturing employment is 41% and manufacturing value added is about 53%
- SMEs' contribution to GDP is about 25% (ADB 2015)
- Average credit gap per enterprise BDT13,26,000 (IFC, 2013)
- About 50% SMEs get finance from banks

- **Financial Development:**
- The number of branches per 1000 sq. km was 70 in 2014
- 57 banks
- SMEs in Bangladesh have been paying a 6–7% higher interest rate than the market rate
- About 60% adults having a bank account (incl. farmers account)
- Deposit to GDP ratio-50% and loan to GDP ratio- 42%

Theoretical Model for Banks: Loan Supply Function

- Bank's profit equation: $\pi^B = r_l L^S - \rho(b)L^S - r_d d - C(L^S, b, d)$
  Subject to: Balance Sheet of Bank $L^S = d$

- Bank's cost function:

$$C(L^S, b, d) = c_1(L^S)^2 + c_2(b)^2 + c_3(d)^2 + c_4(d * L^S)$$

Assuming that loan supply is equal to deposit, therefore we rewrite Eq.3 as per Eq.4:

- $\pi^B = r_l L^S - \rho(b)L^S - r_d L^S - [c_1(L^S)^2 + c_2(b)^2 + c_3(d)^2 + c_4(d * L^S)]$

- FOC: $\dfrac{\partial \pi^B}{\partial L^S} = (r_l - \rho(b) - r_d) - 2c_1(L^S) + c_4 * d = 0$

- Finally, $L^S = \dfrac{1}{2c_1}(r_l - \rho(b) - r_d) + \dfrac{c_4}{2c_1}d$ ....(A)

Theoretical Model for SMEs: Loan Demand Function

- SME (borrower) production function:

- $Y = F(N, K) = F\big(pop, K(\rho, b)\big) = (pop)^{\alpha}\big(K(\rho, b)\big)^{1-\alpha}$

- In the next step, we write the profit equation of the firm (SME)

- $\pi^{F} = P.Y\left((pop)\big(K(\rho, b)\big)\right) - w.pop - r_l.K$

- $\dfrac{\partial \pi^{F}}{\partial L^d} = P.(1 - \alpha)\dfrac{Y\big((pop)\,(K(\rho,b))\big)}{K} - r_l = 0$

- $L^d = \dfrac{P.(1-\alpha).Y\big((pop)\,(K(\rho,b))\big)}{r_l}$

- $L^d = -\beta r_l + \gamma(1 - \alpha)\{\, a_1(pop), a_2(\rho), a_3(b)\}.....(B)$

Estimation of Loan Demand and Supply Function: SUR Results

		Model-1	Model-2
Loan Supply function			
	Collateral (Yes=1, No=0)	0.03 (0.066)	0.03 (0.075)
	Spread (r_l-ρ-r_d)	0.10 (0.033)***	0.10 (0.028)***
	Const.	7.20 (0.11)***	7.19 (0.11)***
	Chi-square (χ^2)	7.53***	7.58***
Loan demand function			
	Log (population density)	0.002 (0.01)	0.003 (0.02)
	Bank branch growth rate (2010-2012)	--	0.07 (0.21)
	Log (ρ)	-0.14 (0.04)***	-0.15 (0.04)***
	Log (1/r)	-0.44 (0.17)***	-0.45 (0.17)***
	Constant	6.38 (0.359)***	6.35 (0.11)***
	Chi-square (χ^2)	5.93**	6.02**

Local Fin Dev and SMEs Performances: Data, Variables and Estimation Strategy

- INSPIRED SME Manufacturing Survey, 2013

- Firms: 1084

- Geographical locations: 72 thanas of 16 districts

- Bank branch data: 2010-2012 (Bangladesh Bank)

- Thana characteristics: HIES and Census combined

Estimation Strategy

- Bank branch placement is endogenous to firm growth

- IV regression is applied

- Population density in a *thana* and distance to Dhaka from the *thana* as instruments of bank branch growth.

- Also consider a lagged number of bank branches (e.g. branches in 2010) in a *thana* and per capita loan in a *thana* in 2010 as instruments because the existing condition affects future branch expansion decisions.

- All the instruments are significant and negative, indicating that a lower number of branches and lower level of per capita loan in a *thana* prompted the authority to expand branches

First Stage Regression Results

	Growth of branches (2010–2012)
Log (distance)	-1.61** (0.78)
Log (pop.density)	-2.36 (0.85)***
Log (branches_2010)	-2.08 (1.07)**
Sector	Yes
Other firm characteristics	Yes
Constant	46.20 (11.29)***
SW Chi-sq(3) (under identification test)	10.18***
SW F(3, 69) (weak id. test)	3.28
N	1083
Cluster	70
F-test of ex. instruments: F(3, 69)	3.28**

IV Regression Results

	(1)	(2)	(3)	(4)
	Log (revenue in 2012)	Log (revenue in 2012)	Log (productivity)	Log (productivity)
Branch growth	0.030**	0.023**	0.026**	0.030***
(2010–2012)	(0.013)	(0.011)	(0.011)	(0.011)
Observations	1,083	1,083	1,035	1,035
R-squared	0.535	0.541	0.174	0.149
Underidentification test: $\chi^2(3)$	6.38***	7.01**	8.307**	7.45**
Weak identification test: K-paap rk Wald F	4.36	3.28	9.07	3.57
Overidentification test: $\chi^2(2)$	0.38	1.14	2.22	0.84
Endogeneity test $\chi^2(1)$	3.65**	2.71*	2.66*	3.61**
Excluded instruments	Log(distance, log (population density)	Log(distance, log (population density), log (bank branch in 2010)	Log(distance, log (population density)	Log(distance, log (population density), log (bank branch in 2010)

Results and Conclusions

- Bank branch growth is positive and significant to firm output and labor productivity.

- A 1% growth of bank branches in a *thana* will increase firms' output as well as labor productivity by about by 2–3%.

- The findings are consistent with our theoretical framework

- The probability of default risk reduces with branch network expansion and therefore better firms get access to credit at a reasonably lower rate.

- Thus, easy access to loans improves the firms' revenue and productivity and makes them more competitive.
- The findings of this study call for specific plans and incentive mechanisms for formal banks to expand their services to more subnational disaggregated level.

THANK YOU