Sustainable Financing Strategies for the SMEs: Two Alternative Models

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Outline of presentation

- Motivation, Context and Objectives
- Theoretical Model Framework
- Empirical Estimation methodology
- Results
- Concluding remarks

Motivations, Context and Objectives

- Access to Finance is one of the most significant barriers to the development of Micro, Small and Medium enterprises (MSMEs)
- Various financing methods are applied in many countries to solve their financing problems
- Credit guarantee schemes, business angels, factoring methods, etc., all have their own limitations
- Are there any financing methods that are sustainable?
- In the digital age, new and innovative thoughts, including digital finance, need to emerge
- In this paper, we explore two alternative financing methods
- The motivation comes from a Wholesale Credit Program of Bangladesh implemented by a government agency

Wholesale Credit Program of Bangladesh

- The government agency, SME Foundation, provides funds to the banks at a subsidized interest rate (lower than the market rate)

- Banks are asked to provide loans to SME borrowers with lower interest and without collateral to those who are non-financial beneficiaries (receive training) of SME Foundation

- Loan size is relatively small, considering the govt. fund

- The repayment rate is very high, over 95%

SME Financing Models….

- First, it theoretically tests whether a government agency-based subsidized financing approach can be sustainable by integrating three sectors, the public sector, the banking sector, and the SME sector.

- While the public sector has an objective of increasing the supply of loans to SMEs with low interest, some instruments might be in place so that banks can increase their profitability with credit flowing to good SME borrowers.

- Our theoretical framework provides some insights into this perspective.

SME Financing Models…

- Second, alternatively, it proposes that a blended framework of digital finance with an agency-based approach might produce better results for both banks and SMEs.

- The theoretical underpinning is that limited government funds could lead to moral hazard and selection bias, and therefore the model is not sustainable in the long run.

Model Framework

1. The Government Sector:

- The policy objective of the govt. is to increase the supply of loan to the SME sector with lower interest rate and lower default rate

- Thus, Policy objective Function is:
$$\cup = w_1(L - L^*)^2 + w_2(\rho - \rho^*)^2$$

- The loan demand function for Eq. 1 is:
$$L = \alpha_0 - \alpha_1 r_L + \alpha_2 Y^e$$

Model Framework...

2. SME Sector:

- Production Function (Cobb-Douglas)

$$Y = F(N, k) = F\big(N, K(\rho)\big) = N^{\alpha}[k(\rho)]^{1-\alpha}$$

Profit function: $\pi = P.Y\big(N, K(\rho)\big) - wN - r.k$

- The log-linear form of loan demand is thus

$$l^{d} = k(\rho) = -\beta r + \gamma(1 - \propto)P.Y(\rho)$$

With interventions, loan demand will be

$$l^{d*} = -\beta r^{*} + \gamma(1 - \alpha)\, P.Y(\rho^{*})$$

Model Framework...

3. Banking Sector

- Max. $\pi^b = r_l L^S - \rho(g)L^S - r_D(L^S - A) - C(L^S, D)$ (10)

$$S.t. \; balance \; sheet \; of \; a \; bank: L^S = D + \bar{A}$$

- The cost function of a bank is:

$$C(L^S, D) = C_1(L^S)^2 + C_2(D)^2 + C_3(D.L^S)$$

Loan supply function is:

$$L^S = \frac{1}{2C_1}[r_l - \rho(g, MC) - r_D - 2C_1 L^S - C_3 D]$$

Finally, after interventions,

- $\pi^* = r_L L^* - \rho^*(g, MC) L^* - r_{D*}(L^* - A) - C^*$ (13)

- Then solving $\frac{\partial \pi^*}{\partial L^*} = 0$, the desired loan is L^*

- $L^* = \frac{1}{2C_1}[r_L - \rho^*(g, MC) - r_D - C_3 D^*]$ (14)

A Blended Approach of Digital Financing

- (i) instead of providing funds to the banks, the government will provide a credit risk analysis of the respective SMEs through scores, and
- (ii) the banks will employ a digital platform to disburse credits to SMEs using a digital platform.
- $\rho_{ICT} = (g_{CRD}, MC_{ICT})$
- Eq. 14 will now take the form
- $L^*_{ICT} = \dfrac{1}{2C_{1(ICT)}}[r_L - \rho^*(g_{CRD}, MC_{ICT}) - r_D - C_3 D^*]$ (16)

Empirical Illustration from the CWS Program

- A survey data of 526 SMEs are considered (survey in 2018)

- In total, 101 firms are CW beneficiary

- We consider the access of firms to CW program for the years 2013-2017

- First, we adopt an estimation strategy involving firms that received CW loans in different years over the 2013-2017 period within the cluster.

- Out of 104 CW beneficiaries, 8 firms received credit in 2013, 11 firms in 2014, 37 firms in 2015, 31 firms in 2016, and 17 firms in 2017

Empirical Illustration

- As different firms receive treatment in different time points, it allows us to use the DID approaches

- We first run the following difference-in-difference regression.

- $Y_{it} = \beta_0 + \beta_1 Time_t + \beta_2 Treatment_i + \beta_3 Time_t * Treatment_{it} + X_{it} + u_{it}$

Impact of CW on firm performances

VARIABLES	(1) Log (sales revenue) (only treated firms)	(2) Log (sales revenue) (all SMEF beneficiaries)	(3) Profit (only treated firms)	(4) Profit (all SMEF beneficiaries)	(5) Log (productivity) (only treated firms)	(6) Log (productivity) (all SMEF beneficiaries)
Time	-2.817***	-3.205***	-0.088***	-0.129***	-2.523***	-2.540***
	(0.238)	(0.101)	(0.007)	(0.012)	(0.291)	(0.209)
Treated	0.160	0.179**	0.016**	0.020	0.098	0.080
	(0.136)	(0.088)	(0.008)	(0.015)	(0.122)	(0.077)
Diff-in-diff	3.047***	3.422***	0.061***	0.101***	2.632***	2.616***
(Time*treated)	(0.268)	(0.134)	(0.012)	(0.020)	(0.306)	(0.224)

Assessing spillover benefits of the CW program

- Whether CW program participation has any impact on firms access to loan from other sources

$$F_i = \beta\, C_i + \gamma X_i + \varepsilon_i$$

Where F_i represents financing indicators such as loan, interest rate, or finance gap, C_i represents a firm i's access to the CW program (1 if a firm gets credit under the CW program), and X_i is a set of firm-level characteristics. β and γ are unknown parameters to be estimated, and ε_i is a zero-mean disturbance term.

Impact of CW on other Loan access

VARIABLES	(1) Log (bank loan in 2017)	(2) Log (total loan in 2017)	(3) Ratio of bank loan over CW loan	(4) Log (finance gap)	(5) Log (interest rate in 2017)
CW (1 = beneficiary, 0=non-beneficiary)	-0.332	2.840***	0.113*	-0.594***	-0.022
	(-0.75)	(3.95)	(1.60)	(-3.74)	(-1.37)

Summary and Conclusions

- A sustainable financing strategy for SMEs should aim to enhance the supply of loanable funds to banks with a provision to identify good borrowers, which reduces transaction costs and default risks of banks.

- This purpose is being served by the CW program.

- However, the CW program works better because of its low coverage and low scalability. This also allows banks to apply a joint-liability approach.

- But the challenge lies with scaling up the program where joint liability may or may not work if firms are not located in a cluster or clientele.

- In that situation, the role of the organization that will be in charge of SME financing will be crucial, particularly in identifying the borrowers.

- Further, choosing beneficiaries by an agency like SME Foundation might involve certain risks of moral hazard and politicization of the program.

- To address the problem, in this paper a model of digital finance with support from a dedicated government agency with credit scores of SMEs is suggested.

Thank You