Finance Constraints and Firm Transition in the Informal Sector: Evidence from Indian Manufacturing

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BACKGROUND AND MOTIVATION

- The majority of firms in developing countries are informal household enterprises, where are very small firms which exclusively employ workers from within the household itself.
- These firms tend to be the least productive among all firms in the manufacturing sector and the individuals that own, manage and work in these enterprises comprise a large proportion of the urban working poor in developing countries.
- For many informal household enterprises, the transition to larger enterprises in the informal sector could be a route out of poverty, as well as providing employment for a large proportion of unskilled workers in urban and semi-urban areas. Yet few family firms make this transition to larger enterprises in the informal sector.

Relationship between Labour Productivity and Size



WHAT EXPLAINS THE LACK OF TRANSITION?

- Much of the literature on informal firms in developing countries has focused on the transition of these firms to the formal sector.
- Much less attention to transition of firms within the informal sector from being pure household enterprises to larger enterprises which combine both family and non-family workers.
- In this paper, we focus on the role of credit constraints.

CREDIT CONSTRAINTS

- While finance constraints on investment and firm growth have been found to be present for small firms, both in developed and developing countries, we would expect that finance constraints would be particularly important for firms in the informal sector.
- Information problems are more likely to be present for informal firms which do not have credit histories and adequate collateral to offer to lenders, especially banks and co-operative societies.

OUR OBJECTIVE

- We focus on three types of firms in the informal sector: pure household enterprises (PHE), to slightly larger enterprises which use both family and non-family labour, which we call mixed household enterprises (MHE), to larger enterprises which employ mostly non-family labour, which we call non-household enterprises (NHE).
- HOW IMPORTANT ARE CREDIT CONSTRAINTS IN THE LIKELIHOOD THAT PHES CAN BECOME MHES AND MHES BECOME NHES?
- We use a firm-level data-set drawn from the nationally representative surveys of the informal manufacturing sector for the years 2000-01, 2005-06 and 2010-11 that includes information on the presence of finance constraints self-reported by firms. We supplement our analysis with panel data of 364 districts from 1995-2010.

PHEs, MHEs and NHEs



Average Labour Productivity by Enterprise Type



RELATED LITERATURE

- Strong empirical evidence that shows a positive relationship between increased access to finance and firm growth (Rajan and Zingales, 1998; Demirgüç-Kunt and Maksimovic, 1998), with small firms are financially more constrained than large firms.
- Beck et al. (2005) show that financing constraints reduce firm growth by 6 percentage points, on average, for large firms but by 10 percentage points in the case of small firms.
- Banerjee and Duflo (2004) analyze detailed loan information on 253
 Indian SMEs' before and after they became eligible for a directed
 subsidized lending program and find that the additional credit resulted in
 a proportional increase in sales reflecting its impact on growth.
- However, all these papers study the role of finance constraints on small firm growth in the formal sector.

FINANCIAL POLICIES IN INDIA

- 1969-1991: Social control of banking: Priority sector lending requirements (mandated lending to small firms, agriculturalists)
- From 1977 to 1991, strictly enforced branch licensing policy where the RBI restricted banks from opening branches in urban and metropolitan areas. Instead, the thrust of branch expansion was mostly to the 'underbanked' districts in rural and semi-urban areas.
- In 1991, financial liberalisation: relaxation of branch licensing policies by the RBI, with banks now allowed to close down loss-making rural and semi-urban branches as well as open branches in regions where there were already a large presence of bank branches.
- Burgess and Pande (2005) show that while from 1977 to 1990, there was a rapid expansion of bank branches in financial underdeveloped states (leading to a fall in rural poverty), but that there was a dramatic reversal in the regional dispersion of commercial banks since 1990, especially in rural under-banked areas.
- But priority sector lending requirements still in effect.

Econometric Methodology

We use an ordered probit model:

$$e_{j,i,d,t}^{*} = \alpha_{0} + \alpha_{1} FIN_{j,i,d,t} + \sum_{k>1} \alpha_{k} X_{j,i,d,t} + \sum_{m>1} \lambda_{m} Z_{,d,t} + \gamma_{i} + \delta_{t} + \varepsilon_{j,i,d,t}$$

e = 1 if $e^* = PHE$, e=2 if $e^* = MHE$ and e=3 if $e^* = NHE$

FIN is the measure of finance constraint that a particular firm faces

X is a vector of firm-specific controls

Z is a vector of district-specific controls

 γi are industry specific fixed effects and δt are the year specific dummies

Access to Finance

We use a direct measure to capture the firm's finance constraint

Whether the firm faced any constraint on its borrowing in the last year (CAPSHOR); self-reported.

CAPSHOR takes the value 1 if the firm faces a constraint and 0 if it does not face a constraint

Firm Specific Controls

LOCATION - whether the firm is located in rural or urban areas

REGIS – whether the firm has registered under any act/authority(e.g. Shops and Establishments, Municipal Corporation/Panchayat, VAT/Sales Tax, Provident Fund, Employees State Insurance Corporation Acts)

LINKAGE - whether the firm is working under contract for another firm.

ASSISTANCE – whether the firm received any assistance from the government towards training and marketing

STATUS – whether the firm is expanding in the past three years (self-reported)

ELEC - whether the firm has access to electricity

ACMAINT – whether the firm maintains any account (book-keeping)

District Specific Controls

URBAN - level of urbanisation in the district as measured by the share of urban population in total population

PRIMEDU - proportion of individuals who are educated at primary level or below

MIDGRADEDU - proportion of individuals educated at secondary level and above

SHSCSTPOP - represents the proportion of SC/ST population in total population (to capture social backwardness)

District Level Estimation – Test for Robustness

We test for the role of finance constraints using districts as units of analysis

We estimate

$$s_{d,t} = \alpha_0 + \alpha_1 FIN_{d,t} + \sum_{m>1} \lambda_m Z_{,d,t} + \varepsilon_{d,t}$$

s is the share of MHEs and NHEs in total enterprises, d is district and t is time.

FIN is measured by bank offices per capita, bank accounts per capita, bank amount per capita and bank credit per capita alternately

Z is the vector of district level controls, and year dummies, as in the firm level estimation

ENDOGENEITY CONCERNS

Endogeneity of Firm Specific and District Specific Finance Constraints

Reverse Causality can work both ways – NHEs need external finance to purchase machines and hire workers; larger firms more likely to receive loans.

As instruments, we choose variables that capture the Supply Side of Financial Intermediation.

INSTRUMENTAL VARIABLES

- The likelihood that a bank or co-operative will place a branch in the district.
- DISTANCE distance of the district from the state capital
- TRANSPORT whether there is a national highway or a broad gauge line passing through the district (0/1)
- COLLGVILLG the proportion of towns/villages in the district that has institutions of higher education

Data

Surveys on the unorganized manufacturing sector by the NSSO

Unit level data for three years, 2000-01, 2005-06, and 2010-11

Our pooled dataset has 294,736 firms, across 22 industries, 364 districts, 15 major Indian states and three years

District level data for four years, 1994-95, 2000-01, 2005-06 and 2010-11

Panel Data for 364 districts

Data on district level control variables are obtained from the 2001 Census.

District level finance variables are drawn from Basic Statistical Returns of Scheduled Commercial Banks in India, RBI

Loan Share by Source and Enterprise Type, 2000-01-2010-11

Source of Loan (per	2000-01			2005-06			2010-11		
cent)	PHE	MHE	NHE	PHE	MHE	NHE	PHE	MHE	NHE
Term lending									
institutions, banks and	60.4	69.7	70.1	47.7	57.9	58.6	58.9	69.8	72.5
societies									
Other institutional									
agencies	2.3	2.6	4.7	4.3	5.7	7.1	1.6	2.9	1.0
(microfinance)									
Money lenders	21.0	11.3	9.5	16.5	12.9	10.0	25.3	16.8	13.3
Business partner(s)	0.2	2.3	2.4	2.2	2.1	7.2	0.1	0.3	2.7
Suppliers /	26	1 0	2 0	2 0	2 0	2.2	25	28	1.0
contractors	2.0	1.7	2.)	2.0	2.0	۷۰۷	2.3	2.0	1.0
Friends and relatives	12.1	10.8	7.4	21.0	10.6	8.2	9.6	6.3	7.0
Others	1.4	1.4	3.1	6.2	8.9	6.7	2.1	1.0	2.6
Average Loan									
Obtained (in constant	144.2	686.0	3019.6	180.1	741.6	7974.2	207.4	756.7	4604.3
rupees)									

Summary Statistics - Firm Level Analysis

Variables	Ν	Mean	SD	Min	Max
ENTYP	294736	1.448988	0.682141	1	3
CAPSHOR	294736	0.362307	0.480668	0	1
SECTOR	294736	0.542343	0.498205	0	1
REGIS	294736	0.232588	0.422482	0	1
CONTRACT	294736	0.200227	0.400171	0	1
ASSISTANCE	294736	0.004794	0.069074	0	1
STATUS	294736	0.226029	0.418259	0	1
ELEC	294736	0.233097	0.422804	0	1
ACMAINT	294736	0.073832	0.261498	0	1
URBAN	294736	0.34537	0.396945	0	1
SHSCSTPOP	294736	0.231766	0.117352	0.026295	0.942542
PRIMEDU	294736	0.292051	0.060837	0.14919	1
MIDGRADEDU	294736	0.261882	0.105644	0.068002	0.964556

Firm Characteristics by Enterprise Type







SHSCSTPOP

MHE

NHE

.25

Ņ

.05 0

PHE

mean .15 ς.

















Results: Ordered Probit Regression Estimates

Variables	Model1	Model2	Model3	Model4	Model5
CADELLOD	-0.021*	-0.095*	-0.090*	-0.076*	-0.053*
CAPSHUK	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)
Firm-specific Control	Y	Y	Υ	Y	Y
Variables					
District-specific Control	Y	Y	Y	Y	Y
Variables					
Industry Dummies	Ν	Y	Υ	Y	Y
Year Dummies	Ν	Ν	Y	Y	Y
Ν	294736	294736	294736	294736	294736
Pseudo R2	0.00	0.04	0.04	0.19	0.20
Log Likelihood	-251789.12	-240982.68	-240978.81	-204541.98	-202698.97

Firm-specific Control Variables: LOCATION, REGIS, LINKAGE, ASSISTANCE, STATUS, ELEC, ACMAINT District-specific Control Variables: URBAN, SHSCSTPOP, PRIMEDU, MIDGRADEDU

Marginal Effects: Ordered Probit Model

Variables	P(entyp = 1)	P(entyp =2)	P (entyp = 3)
CAPSHOR	0.0188***	-0.0128***	-0.0061***
CAPSIION	(0.0021)	(0.0014)	(0.0007)
LOCATION	-0.0562***	0.0381***	0.0181***
LOCATION	(0.0019)	(0.0013)	(0.0006)
PECIS	-0.3851***	0.2042***	0.1809***
NLO13	(0.0022)	(0.0012)	(0.0015)
CONTRACT	-0.0629***	0.0412***	0.0216***
CONTRACT	(0.0026)	(0.0016)	(0.0009)
ASSISTANCE	-0.0459***	0.0299***	0.0160***
ASSISTANCE	(0.0152)	(0.0095)	(0.0056)
	-0.0974***	0.0630***	0.0344***
51A105	(0.0021)	(0.0013)	(0.0008)
FIFC	-0.1309***	0.0833***	0.0476***
ELEC	(0.0023)	(0.0014)	(0.0009)
ΔΟΜΔΙΝΤ	-0.3195***	0.1603***	0.1592***
	(0.0034)	(0.0012)	(0.0025)
UPRAN	-0.0498***	0.0336***	0.0161***
	(0.0023)	(0.0015)	(0.0007)
SHSCSTPOP	0.1397***	-0.0944***	-0.0453***
5115051101	(0.0085)	(0.0058)	(0.0028)
PRIMEDI	0.0674***	-0.0456***	0219***
	(0.0156)	(0.0105)	(0.0051)
MIDCRADEDU	-0.3286***	0.2221***	0.1065***
WIDGRADEDU	(0.0103)	(0.0070)	(0.0034)

IV Estimates: First Stage OLS and Second Stage Ordered Probit Results

Variables	First Stage (Dep. Var– Capshor)	Second Stage (Dep. Var – entyp)
CAPSHORHAT		-0.243*
		(0.058)
Firm-specific Control Varia	ables	
LOCATION	-0.0003	0.158*
	(0.002)	(0.005)
REGIS	-0.031*	1.033*
	(0.002)	(0.006)
LINKAGE	-0.011*	0.157*
	(0.002)	(0.007)
ASSISTANCE	0.052*	0.153*
	(0.013)	(0.041)
STATUS	-0.010*	0.268*
	(0.002)	(0.006)
ELEC	0.170*	0.394*
	(0.002)	(0.012)
ACMAINT	-0.057*	0.814*
D:	(0.003)	(0.010)
District-specific Control Va	ariables	0.406*
URBAN	-0.04/*	0.126*
	(0.002)	(0.007)
SHSCSTPOP	0.114*	-0.332*
DDIMEDU	(0.008)	(0.025)
PRIMEDU	-0.041^{+}	-0.283**
MIDCRADEDU	(0.014)	(0.047)
MIDGRADEDU	-0.240°	(0.003)
Industry Dummy	(0.010) V	(0.055) V
Vear Dummy	Y	V
N	281606	281606
Instruments	201000	201000
DISTANCE	0.000 2 *	
	(4.66e-06)	
TRANSPORT	-0.013*	
	(0.002)	
COLLGVILLG	-0.285*	
	(0.033)	

District level Analysis

Variables	OLS Results					IV Results			
	1	2	3	4	5	6	7	8	
BKOF	0.0194*				0.0819				
	(0.0119)				(0.0796)				
BKACT		0.0353***				0.2186***			
		(0.0082)				(0.0816)			
BKAMT			0.0266***				0.1548**		
			(0.0062)				(0.0646)		
BKCRDT				0.0303***				0.0950***	
				(0.0052)				(0.0271)	
Constant	0.2259*	0.0984***	-0.1305***	-0.1133***	0.8779	0.4957***	-0.8657**	-0.4093***	
	(0.1257)	(0.0220)	(0.0367)	(0.0260)	(0.8358)	(0.1810)	(0.3698)	(0.1225)	
District-specific	V	V	V	V	V	V	V	V	
Controls	1	1	1	I	1	1	1	1	
Year Dummies	Y	Y	Y	Y	Y	Y	Y	Y	
F Value	55.00	64.95	63.12	65.58	55.88	37.13	36.05	56.94	
R ²	0.2879	0.2998	0.3006	0.3100					
Ν	1420	1420	1420	1420	1440	1440	1440	1440	

Dependent Variable: Share of MHEs and NHEs in total enterprises in district; District-specific Control Variables: URBAN, SHSCSTPOP, PRIMEDU, MIDGRADEDU, ELECVILLAGE

POLICY IMPLICATIONS

- Strong evidence that finance constraints play an important role in firm transition from PHEs, to MHEs, then to NHEs.
- Our results suggest that with the weakening of the branch licensing policy, and as commercial banks withdraw their offices from the more remote regions and districts, difficulty of access to finance from institutional sources could be an important constraint on informal firm growth.
- Need for a counter-vailing set of policy measures that provide incentives for alternate financial intermediaries (coops, regional rural banks) to lend to PHEs and MHEs in as well as a greater emphasis on micro-finance initiatives.

Summary Statistics - District Level Variables

Variables	Ν	Mean	SD	Min	Max
SHMHENHE	1436	0.144446	0.115303	0.000159	0.806688
BKOF	1436	6.47E-05	0.00003	7.86E-06	0.00028
BKACT	1436	0.398895	0.275679	0.033333	2.857369
BKAMT	1436	4683.25	10560.75	127.1635	259990.1
BKCRDT	1436	2677.707	9737.936	75.48553	259337.1
SHSCSTPOP	1436	0.251429	0.132057	0.026295	0.896631
SHURBAN	1436	0.247027	0.258656	0.034835	3.967106
PRIMEDU	1436	0.14474	0.05121	0.059946	0.875199
MIDGRADEDU	1436	0.232987	0.094842	0.068002	0.964556
ELECVILLAGE	1420	0.816473	0.244183	0.056998	1