

FINANCIAL DEVELOPMENT AND OCCUPATIONAL CHOICE: EVIDENCE FROM INDIA

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- Informal sector firms account for 30-40% of GDP, employ $> 50\%$ of labor force in developing countries (World Bank Enterprise Survey).
- 94% of Indian workforce in informal sector “household enterprises”.
- 1.4 average number of workers in household firms.
- “These units typically operate at a low level of organization, with little or no division between labor and capital as factors of production and on a small scale,” (NSSO, 2000).

Examples of informal sector activities in India

- Agriculture: landless labourers, small farmers, traditional artisans, animal husbandry, fishermen, shippers.
- Industry: workers in brick-kilns, construction, beedi-making, incense stick
- Services: workers in local transport, shops, domestic servants, community services like street cleaning, street vendors, garbage collectors
- At home: garment workers artisans or craft producers, domestic workers
- Formal sector refers to registered entities for which statistics are available regularly from budget documents and reports



Contrasting views of informal sector

- Untapped entrepreneurial resource inhibited by lack of access to finance, regulation (de Soto, 1989, 2000).
 - Sri Lankan microenterprises' return to capital of 55-63% per year (de Mel, Mckenzie, and Woodruff, 2009).
 - Targeted credit to informal firms reduces poverty (Bruhn and Love, 2014).
- Unproductive endeavors providing subsistence employment (Lewis, 1954, Rauch, 1991).
 - 20% of value added of formal firms (La Porta and Shleifer, 2008).
 - Do not transition into formal sector, rarely expand, have lower growth (de Mel et al., 2009, Karlan and Zinman, 2011).
 - Micro-credit does not increase likelihood of starting a new business or profitability of self-employment (Banerjee et al., 2013), suggesting that these are not productive firms (Duflo et al., 2014).

In a developing economy where majority of workers are in the informal sector:

- Does financial development encourage self-employment?
- Or, does it accelerate shift to larger firms?
- Use variation in access to bank credit across regions to examine individuals' occupational choice between self-employment in informal versus wage-employment in formal sector.

More bank branches in a district associated with

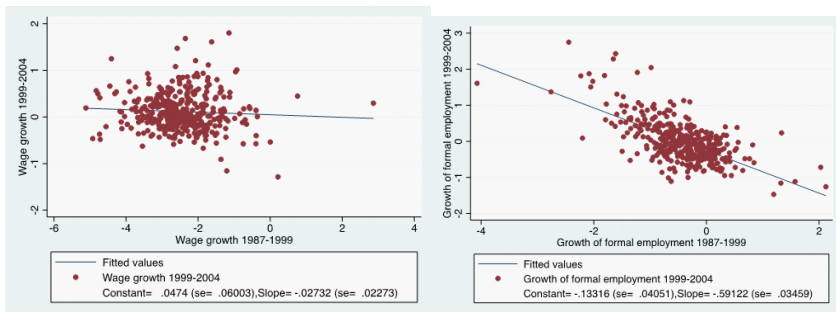
- Decrease in likelihood of being a household enterprise employer, employee.
- Increase in likelihood of being employed in a formal sector firm.
- Increase in average wages.
- Effects are greater for more educated workers, men, and forward castes, but also present for women and scheduled castes.
- Increase in loans, employment, productivity and wages in service sector firms.

- Data on occupational choice from two nationally representative surveys of over 1 million individuals from 1999 and 2004.
 - Round 55 (1999) and round 61 (2004) of Employment-Unemployment survey.
- Data on 400,000+ service sector firms from two nationally representative surveys from 1999 and 2005.
 - Round 57 (1999) and Round 63 (2005) of the NSS service surveys.
- Variation in the number of government-owned bank branches (and credit) across Indian districts in 1991.
 - 588 districts in banking data matched to 465 districts in Employment-Unemployment Surveys and 364 districts in Services Surveys.

Identification strategy

- Use location of *government* bank branches in 1991.
 - Until 1990 bank branch expansion driven by 4:1 policy and Bank Licensing Policy (BLP).
 - Banks could get a license to open a branch in an already banked location if also opened branches in 4 unbanked locations (Burgess and Pande, 2005).
 - BLP set population targets for branch expansion from 1979-1990 (Kochar, 2005).
- Upsurge in service sector growth was not anticipated in 1991. Unlikely that branches are located in exactly those districts with growth prospects in services.
- 500+ districts within 28 states - can control for state FE.
- Some corroborative evidence.

Correlation between past and future district level growth



- Wage growth - Yes
- Employment growth - No, but negatively correlated with future.

Employment - Unemployment Survey (1999, 2004)

Variable	Mean	Min	Max	Standard Dev	Observations
Log annual wages	9.86	5.05	16.6	1.069	194349
Engaged in household production	0.26	0	1	0.439	1260113
Household enterprise employer	0.15	0	1	0.358	1260113
Household enterprise employee	0.11	0	1	0.314	1260113
Formal sector employee	0.08	0	1	0.277	1260113
Formal sector part-time employee	0.10	0	1	0.296	1260113
Unemployed	0.02	0	1	0.153	1260113
Student	0.25	0	1	0.4303779	1260113
Age (in decades)	2.75	0	11.5	1.855	1383432
Male	1.48	1	2	0.5	1383941
Illiterate	0.31	0	1	0.463	1606913
Literate: primary or less	0.28	0	1	0.447	1606913
Educated: middle school +	0.41	0	1	0.492	1606913
Total government branches by district 1991	34.19	0	268	34.66	1196954
Total government bank credit by district 1991	178.20	0	6048.2	660.4	1196954
Total branches by district 1991	169.80	3	1177	159.5	1196954
Total bank credit by district 1991	567.20	0.06	26169	2285.5	1196954

Service Sector Firms Survey (1999, 2005)

Variable	Mean	Min	Max	Standard Dev	Obs
Annual GVA	74424.3	-30128382	59008385024	24117383.6	446,426
Total workers	1.836	1	75052	27.16	446,877
Annual wages per worker	8094.6	7.355	9244473	22420.8	142,926
ln GVA per worker	9.677	1.378	18.47	0.977	442,659
Have an outstanding loan	0.116	0	1	0.32	446,883
Value of outstanding loans	701019	0	2.5037E+11	210364749.4	55,684
Loan amount relative to state mean	0.237	0	4923.8	7.986	55,684
Loan amount in hundred thousand USD	0.14	0	50074.1	42.07	55,684
Total branches by district 1991	140.1	9	1177	90.65	364
Total bank credit by district 1991	254.1	1.94	26168.5	841.7	364
Total government branches by district 1	26.42	3	175	21.8	364
Total government bank credit by district	83.62	1.11	5218	238.8	364
District population 1999	2051672.3	186729	11978450	1184698.4	444

Results 1: Likelihood of being a household enterprise employer

Variables	Sector			Employer education			Firm size	
	All sectors	Manufacturing	Services	Illiterate individual	Less than primary schooling	Middle school and above	Employs <= 6 workers	Employs > 6 workers
Log (Government Bank Branches in 1991 + 1)	-0.0065* [0.004]	-0.0288 [0.022]	-0.0024 [0.010]	-0.0013 [0.006]	-0.0107** [0.004]	-0.0115*** [0.004]	-0.0011 [0.012]	-0.0097** [0.004]
Age (in decades)	0.0537*** [0.001]	0.0792*** [0.006]	0.0553*** [0.003]	0.0353*** [0.001]	0.0616*** [0.002]	0.0631*** [0.002]	0.1123*** [0.004]	0.0391*** [0.001]
Male	0.1896*** [0.004]	0.1382*** [0.020]	0.1932*** [0.009]	0.2413*** [0.006]	0.1326*** [0.004]	0.1711*** [0.004]	0.1517*** [0.018]	0.1459*** [0.004]
District population (millions)	-0.0032* [0.002]	-0.0215** [0.009]	-0.0029 [0.004]	0.0009 [0.003]	-0.004 [0.002]	-0.0061*** [0.002]	0.0011 [0.005]	-0.0072*** [0.002]
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	946,381	20,716	148,639	307,253	288,322	350,806	75,582	870,799
Mean LHS	0.178	0.277	0.362	0.186	0.172	0.176	0.463	0.153
Mean Log gov't bank branches +1 in 1991	3.2	3.452	3.342	3.162	3.144	3.278	3.411	3.181
% effect at mean of branches on mean of LHS	-0.02	-0.10	-0.01	0.00	-0.03	-0.04	0.00	-0.03
% effect at sd of branches on sd of LHS	-0.01	-0.03	0.00	0.00	-0.01	-0.01	0.00	-0.01

- State, year, education dummies
- Driven by more educated individuals, larger firms.

Results 2: Likelihood of being a household firm employee

Variables	Sector			Employee education			Firm size	
	All sectors	Manufacturing	Services	Illiterate individual	Less than primary schooling	Middle school and above	Employs <= 6 workers	Employs > 6 workers
Log (<i>Government Bank Branches in 1991 +1</i>)	-0.0179*** (0.006)	-0.0194** (0.010)	-0.0171*** (0.004)	-0.0115 (0.008)	-0.0157*** (0.005)	-0.0253*** (0.005)	-0.0237*** (0.007)	-0.0171*** (0.006)
Indiv, district characteristics, State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	946,381	20,716	148,639	307,253	288,322	350,806	75,582	870,799
Mean LHS	0.124	0.161	0.117	0.154	0.113	0.106	0.148	0.121
Mean Log gov't bank branches +1 in 1991	3.792	4.338	4.117	3.671	3.676	3.992	4.224	3.754
% effect at mean of branches on mean of LHS	-0.06	-0.07	-0.06	-0.04	-0.05	-0.08	-0.08	-0.05
% effect at sd of branches on sd of LHS	-0.02	-0.02	-0.02	-0.01	-0.01	-0.02	-0.02	-0.02

- Effect larger for more educated employees.

Results 3: Likelihood of being a Formal sector worker

Variables	Sector			Employee education			Firm size	
	All sectors	Manufacturing	Services	Illiterate individual	Less than primary schooling	Middle school and above	Employs <= 6 workers	Employs > 6 workers
Log (Government Bank Branches in 1991 +1)	0.0083** (0.003)	0.0794* (0.041)	0.0087 (0.015)	0.0091** (0.004)	0.0088* (0.005)	0.0203*** (0.008)	-0.0055 (0.013)	0.0073*** (0.003)
Indiv, district characteristics, State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	946,381	20,716	148,639	307,253	288,322	350,806	75,582	870,799
Mean LHS	0.0962	0.36	0.43	0.0458	0.0672	0.164	0.207	0.0866
Mean Log gov't bank branches +1 in 1991	3.2	3.452	3.342	3.162	3.143	3.279	3.411	3.181
% effect at mean of branches on mean of LHS	0.03	0.27	0.03	0.03	0.03	0.07	-0.02	0.02
% effect at sd of branches on sd of LHS	0.01	0.07	0.01	0.01	0.01	0.02	-0.01	0.01

- Effect driven by larger firms, more educated workers.

Results 4: Wages

Variables	Illiterate	Employee education		HH enterprise		Formal sector	
		than primary schooling	Middle school and above	Employer	Employee	Full-time	Part- time
Log (Government Bank Branches in 1991 +1)	0.0857*** (0.030)	0.1182*** (0.034)	0.1608*** (0.032)	0.06 (0.052)	0.1218** (0.061)	0.1560*** (0.036)	0.0730*** (0.028)
Indiv, district charac, State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	56,692	42,562	68,648	1,285	838	85,070	80,709
Mean LHS	9.292	9.632	10.28	8.51	8.265	10.3	9.276
Mean Log gov't bank branches +1 in 1991	3.318	3.307	3.42	3.16	3.223	3.395	3.322
% effect at mean of branches on mean of LHS	0.0306	0.0406	0.0535	0.0223	0.0475	0.0514	0.0261
% effect at sd of branches on sd of LHS	0.0827	0.118	0.147	0.0734	0.155	0.145	0.0842

- Higher for more educated individuals, full-time formal sector workers.

Results 5: Women and minorities

	Student	Wages	HH firm boss	HH firm worker	Formal employee
Scheduled Castes	-0.001 [0.005]	0.1348*** [0.032]	0.0144 [0.012]	-0.0172*** [0.006]	0.0111** [0.005]
Upper castes	0.0147*** [0.005]	0.1616*** [0.029]	-0.0158*** [0.005]	-0.0177*** [0.007]	0.0108** [0.006]
Women	0.0118*** [0.004]	0.0922* [0.048]	-0.0017 [0.005]	-0.0175* [0.009]	0.0074** [0.003]
Men	0.0084* [0.005]	0.2077*** [0.032]	-0.0125** [0.006]	-0.0195*** [0.004]	0.0325*** [0.010]

- Larger effects for men and forward castes.
- But significant effects still for women and backward castes.

Loans and Service Sector Firms

Variable	Firm size			Location	
	All Firms	Firms with < 5 workers	Firms with >= 5 workers	Rural	Urban
Log (<i>Government Bank Branches in 1991</i> + .	0.260* (0.139)	0.132 (0.117)	0.443*** (0.159)	0.094 (0.163)	0.324* (0.175)
Industry FE	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Number of observations	40,098	32,502	7,596	18,447	21,651
Mean LHS	9.83	9.32	12	9.5	10.1
Mean Log gov't bank branches +1 in 1991	0.074	0.06	0.13	0.045	0.098
% effect at mean of branches on mean of LHS	0.002	0.00086	0.0049	0.00045	0.0031
% effect at sd of branches on sd of LHS	0.028	0.014	0.065	0.0087	0.037

- Larger firms, urban firms, borrow more.

Other results for Service Sector Firms

- Access to credit associated with increase in
 - Employment
 - Gross value added per worker
 - Wages.
- Larger effects for firms in urban areas, and larger firms.

Concluding remarks

- Literature finds that wages and productivity lower in informal sector firms, entrepreneurs are less educated, and firms rarely expand, or transition into the formal sector.
- Suggests a mechanism by which financial development facilitates economic growth, by moving individuals from unproductive informal sector activities, to more productive formal sector jobs.
- If formal sector firms are also credit constrained - providing access to credit to these firms may induce labor reallocation from subsistence jobs to employment in the formal sector.
- Women and discriminated groups may also benefit from expansion in formal sector credit.

Results 6: Likelihood of being unemployed or a student

	Unemployed		Student	
Log (Government Bank Branches in 1991 +1)	0.0011		0.0070**	
	(0.001)		(0.003)	
Indiv, district charac, and state fe	Yes	Yes	Yes	Yes
Number of observations	946,381	946,381	946380	946380
Mean LHS	0.0279	0.0279	0.181	0.181
Mean Log gov't bank branches +1 in 1991	3.2	3.792	3.2	3.792
% effect at mean of RHS on mean of LHS	0.00346	0.00112	0.123	0.119
% effect at sd of RHS on sd of LHS	0.000998	0.000438	0.0167	0.0221

Employment and access to credit

Variable	Firm Size			Location	
	All Firms	Firms with < 5 workers	Firms with ≥ 5 workers	Rural	Urban
Log (Government Bank Branches in 1991 +1)	0.108** [0.051]	0.023* [0.012]	1.186*** [0.308]	-0.045 [0.058]	0.163*** [0.051]
<i>Labor_Post</i>	-0.139 [0.107]	-0.021 [0.026]	0.26 [0.684]	-0.219* [0.131]	-0.086 [0.126]
<i>District population</i>	0 [0.000]	-0.000* [0.000]	0 [0.000]	0 [0.000]	0 [0.000]
Constant	3.639*** [0.409]	2.489*** [0.154]	6.784*** [1.275]	4.209*** [0.388]	4.669*** [0.718]
Industry FE	yes	yes	yes	yes	yes
State FE	yes	yes	yes	yes	yes
Number of observations	296,684	268,558	28,126	114,261	182,423
Mean LHS	2.62	1.58	12.6	2.01	3.01
Mean Log gov't bank branches +1 in 1991	0.11	0.11	0.099	0.12	0.11
% effect at mean of branches on mean of LHS	0.0045	0.0016	0.0093	-0.0026	0.0057
% effect at sd of branches on sd of LHS	0.0028	0.0086	0.0092	-0.0025	0.0034

Do loan magnitudes make sense?

- In levels, 1 extra branch = \$100/firm
- Typically 1760 service firms per district, so \approx \$176,000 extra loans to service firms per district.
- From banking data, each extra branch is associated with \$1 million in extra loans per district.
- First-order plausible.