How Does Caste Affect Entrepreneurship? Birth vs Worth

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Introduction

- **Large misallocation** in developing countries. Banerjee & Duflo (2005), De Mel et al (2008) & HK (2009)
  - large sd(MRPK) and sd(MRPL).
  - financial frictions, labor markets regulations, government policies.
- **This paper**: role of informal institutions in ↑ resource misallocation;
  - **The caste system in India** $\longrightarrow$ segregation by birth not by ability $\longrightarrow$ distort economic outcome.
    - caste system $\Longrightarrow$ ↑ capital and talent misallocation.
    - caste-dependent misallocation $\Longrightarrow$ ↓ TFP.

Main Results: Stylized Facts and Quantification

- Use MSME data with caste of enterprise owner (High (32%), Middle (39%) and Low castes (29%)).

- Do average revenue products vary across castes? **Yes!**

  1. LC & MC entrepreneurs ↑ **Average Revenue Product of Capital** (ARPK = Y/K ∝ MRPK under CD tech).
  2. Cross-caste difference in ARPK decreases over establishment size and age.
  3. ↑ **Financial development** (FD) ⟶ ARPK (↓), Capital-intensity (↑), Profitability (↓).

- Do LC & MC entrepreneurs face stricter borrowing constraints? **Yes!**

  1. Credit-to-output ratio (↓) ⟹ **Higher degree of financial frictions** (38% (↑) for LC rel. to HC).
  2. Lowers the enterprise ownership for LC individuals.

- What macro-implications of equalizing access-to-credit across castes?

  1. (↓) capital and (↓) talent misallocation ⟹ (**5.6% ↑ output per capita**).
  2. 55% gains comes from better allocation of talent (more entry of LC at the expense of HC firms).

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Conceptual Framework

Defining ARPK: Static Profit Maximization Problem

$$\max_{L_{isc},K_{isc}} \left\{ P_{isc} \underbrace{z_{isc}(K_{isc}^{\alpha_s} L_{isc}^{1-\alpha_s})^{1-\nu}}_{Q_{isc}} - w\, L_{isc} - (1+\tau_{sc})\, R\, K_{isc} \right\},\ \textit{where} \tag{1}$$

$$\text{MRPK}_{isc} := \alpha_s\,(1-\nu) \underbrace{\left(\frac{P_{isc}Y_{isc}}{K_{isc}}\right)}_{ARPK} = (1+\tau_{sc})\, R,$$

$$\text{MRPL}_{isc} := (1-\alpha_s)\,(1-\nu) \underbrace{\left(\frac{P_{isc}Y_{isc}}{wL_{isc}}\right)}_{ARPL} = 1,$$

$$\left(\frac{K}{L}\right)_{isc} := \left(\frac{\alpha_s}{1-\alpha_s}\right)\left(\frac{1}{1+\tau_{sc}}\right)\frac{w}{r}.$$

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$$\begin{aligned}
\text{MRPK}_{isc} &:= \alpha_s\,(1-\nu) \underbrace{\left(\frac{P_{isc} Y_{isc}}{K_{isc}}\right)}_{ARPK} = (1+\tau_{sc})\, R, \\
\text{MRPL}_{isc} &:= (1-\alpha_s)\,(1-\nu) \underbrace{\left(\frac{P_{isc} Y_{isc}}{w L_{isc}}\right)}_{ARPL} = 1, \\
\left(\frac{K}{L}\right)_{isc} &:= \left(\frac{\alpha_s}{1-\alpha_s}\right)\left(\frac{1}{1+\tau_{sc}}\right)\frac{w}{r}.
\end{aligned}$$

Data

Data & Descriptive Statistics

Table: Summary Statistics: Manufacturing Sector & Population Shares

	HC		MC		LC		Overall
	Total	%	Total	%	Total	%	Total
PANEL A.1: MSME 2006-2007 - Aggregate Statistics							
Observations (000s)	572	51%	438	39.1%	109	9.8%	1121
Enterprises (000s)	2915	39%	3504	46%	1144	15%	7563
	Mean	%	Mean	%	Mean	%	Mean
Employment	3.41	46.7%	2.53	41.5%	2.18	11.7%	2.82
Output	285495	61.3%	119040	30.7%	95227	8.0%	179594
Capital	679811	70.3%	195465	24.3%	133282	5.4%	372573
Credit	27689	75.1%	6158	20.1%	4462	4.7%	14200

PANEL D: IHDS

	HC	MC	LC
Population Share	31.2%	39.3%	29.5%
Share of Entrepreneurs	5.5%	4.6%	2.3%

Main

Stylized Facts

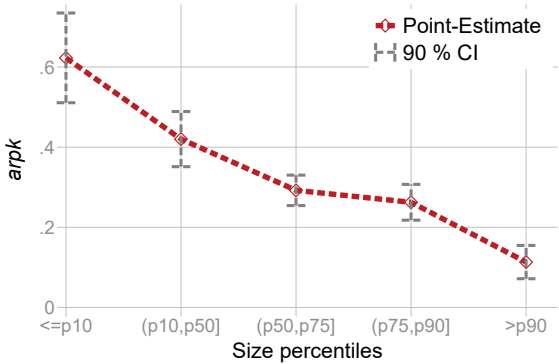
Fact 1: ARPK is higher for Low-castes

$$y_i = \beta_0 + \beta_1 1_{L-CASTE} + \beta_2 1_{M-CASTE} + \Gamma_i + \epsilon_i \quad (2)$$

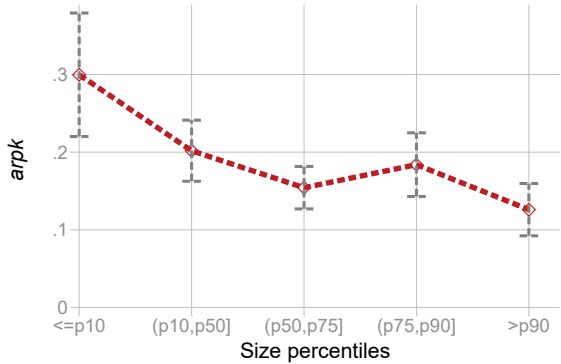
	(1)	(2)	(3)	(4)
	All-Sector		Manufacturing	
	arpk	*arpl*	*arpk*	*arpl*
M-caste	0.14***	-0.02*	0.13***	-0.05***
	(0.02)	(0.01)	(0.02)	(0.01)
L-caste	0.30***	0.02	0.25***	-0.02
	(0.03)	(0.03)	(0.02)	(0.02)
Constant	-0.66***	0.56***	-0.69***	0.60***
	(0.01)	(0.01)	(0.01)	(0.01)
Observations	1,438,573	1,387,768	1,180,610	1,141,632
R-squared	0.50	0.33	0.50	0.32
District FE	✓	✓	✓	✓
NIC4 FE	✓	✓	✓	✓

Controls S. weights Markups Technology

Fact 2: ARPK differences decline over Size



(a) ARPK for Low Caste over Size



(b) ARPK for Middle Caste over Size

Fact 3: ARPK differences decline with Regional Financial Development

	ARPK	ARPK	K/L	K/L	Profit Rate	Profit Rate
M-caste	0.15***	1.26***	-0.26***	-1.23***	0.03***	0.75***
	(0.02)	(0.18)	(0.02)	(0.16)	(0.01)	(0.13)
L-caste	0.30***	1.31***	-0.53***	-1.40***	0.08***	0.70***
	(0.03)	(0.20)	(0.04)	(0.17)	(0.02)	(0.15)
FD		0.79***		-0.25*		0.72***
		(0.18)		(0.15)		(0.13)
M-caste × FD		-1.35***		1.02***		-0.85***
		(0.20)		(0.19)		(0.15)
L-caste × FD		-1.18***		0.88***		-0.71***
		(0.21)		(0.20)		(0.15)
Observations	1,395,053	1,395,059	1,395,053	1,395,059	1,395,053	1,395,059
R-squared	0.50	0.14	0.54	0.23	0.48	0.10
District FE	✓	-	✓	-	✓	-
NIC4 FE	✓	✓	✓	✓	✓	✓

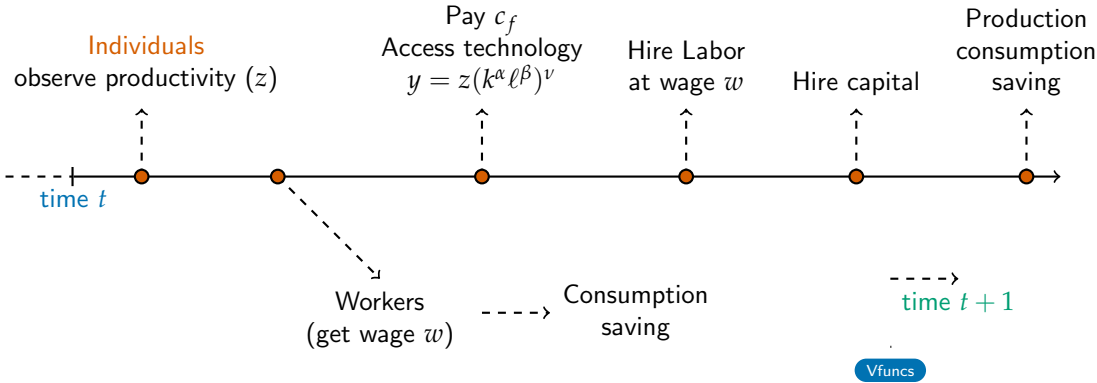
ARPK Capita-labor ratio Profits Pop-LC1 Pop-LC2

Quantitative Analysis

Theoretical Framework: Timing

- 1 Good, Perfect Competition, GE in wages and interest rate (Buera, Kaboski & Shin 2011).
  - corporate sector: a representative firms, $Y = K^{\theta_c} N^{1-\theta_c}$
    - unconstrained borrowing at $r_t + \delta$
  - noncorporate sector: populated by entrepreneurs
    - Pay caste-specific κ_c access $f(z,k,l) = z\,(k^{\alpha} l^{\beta})^{1-\nu}$
    - size-based financial constraints
    - $(1 + r_t + \delta + d)k_t \leqslant \phi_r\, \lambda_s\, a_t; \quad a_t \geqslant 0$

Theoretical Framework: Timing



Calibration

Calibrated Parameters and Matched Moments

Fixed	Value	Description
δ	0.06	Annual depreciation rate
α	0.33	Physical capital share: noncorporate sector
α_c	0.33	Physical capital share: corporate sector
γ	1.50	Coefficient of risk aversion
κ_c	0.68	Share of capital in corporate sector
d	0.03	Net interest rate margin
P_{lc}	0.29	Population share: LC
P_{mc}	0.39	Population share: MC
P_{hc}	0.36	Population share: HC

Fitted	Value	Description	Moments	Model	Data
λ_{hc}	4.20	Financial frictions HC	Overall Credit/output	0.45	0.44
λ_{mc}	2.05	Financial frictions MC	Rel. Credit/output: MC	0.54	0.53
λ_{lc}	1.86	Financial frictions LC	Rel. Credit/output: LC	0.46	0.48
ν	0.25	Span of control	Income distribution	See Figure 2a	
η	4.85	Scale Parameter productivity	Employment distribution	See Figure 2b	
			Annual Real Interest Rate	5.84%	5.7%
ρ	0.92	Discount rate	Capital-output ratio	2.10	2.04
ψ	0.89	Persistence in productivity	Annual Enterprise Exit rate	10.1%	8.8%
κ_{hc}	0.40	Fixed cost of operating-HC	Share of enterprise owned-HC	37.9%	36.5%
κ_{mc}	0.30	Fixed cost of operating-MC	Share of enterprise owned-MC	46.1%	47.5%
κ_{lc}	0.67	Fixed cost of operating-LC	Share of enterprise owned-LC	16.0%	16.0%
$\overline{K}$	87.1	Capital threshold MSME sector	Share of MSME sector	0.72	0.70

Main

Calibrated Parameters and Matched Moments

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Model Assessment on Nontargeted Moments

	Model	Data		Model	Data
Panel A.1: ARPK, Capital Intensity and Profitability					
log(ARPK)-MC	$+17.7\%$	$+13\%(22\%)$	$sd(log(ARPK))$-HC	0.44	1.36
log(ARPK)-LC	$+31.6\%$	$+25\%(30\%)$	$sd(log(ARPK))$-MC	0.54	1.22
log(K/L)-MC	-17.7%	$-26\%(27\%)$	$sd(log(ARPK))$-LC	0.64	1.22
log(K/L)-LC	-31.6%	$-49\%(45\%)$			
Profitability-MC	$+10.4\%$	$+2\%(10\%)$			
Profitability-LC	$+6.0\%$	$+5\%(14\%)$			
Panel A.2: ARPK over Firm Size for LC Enterprises					
Small Enterprises: Lowest Decile	$+55\%$	$+52\%$			
Large Enterprises: Top Decile	$+15\%$	$+12\%$			

Regional Financial Development and ARPK Differences

	Model					Data		
Financial Development	Lowest	Benchmark			Highest	Low	Medium	High
Regions	(i)	(ii)	(iii)	(iv)	(v)	(a)	(b)	(c)
Intermdiation cost	$d = 0$	$d = 0.03$	$d = 0$	$d = 0$	$d = 0$			
Regional credit shifter	$\phi_r = 0.6$	$\phi_r = 1$	$\phi_r = 1$	$\phi_r = 2$	$\phi_r = 3$			
Credit-output ratio	0.33	0.45	0.60	0.82	0.90	0.28	0.62	1.21
log(ARPK)-MC	+34.2%	+17.1%	+19.4%	+14.4%	+9.1%	+19.1%(30.8%)	+9.7%(10.1%)	+8.5%(9.7%)
log(ARPK)-LC	+45.0%	+30.1%	+33.1%	+21.4%	+13.6%	+30.3%(45.8%)	+22.8%(14.5%)	+11.5%(9.3%)

Equalizing Access To Credit Across Castes

A comparison of Benchmark (BM) and Counterfactual Economy (CF)

	BM	CF	Change			
Panel A. Overall Economy						
Output per capita	1.43	1.51	+5.6%			
Capital Intensity	3.14	3.29	+4.7%			
Interest Rate	5.86%	6.35%	0.5 p.p.			
Panel B. Noncorporate Sector						
Output per worker	1.76	1.86	+5.7%			
$\sigma(arpk)$	0.54	0.41	-24.1%			
Capital Intensity	2.41	2.63	+9.1%			
Credit/Output	0.46	0.60	+30.4%			
Panel C. Caste-Level						
	Middle-Caste			Low-Caste		
	BM	CF	Change	BM	CF	Change
Capital Intensity	2.34	2.64	12.8%	2.28	2.64	15.8%
Output per worker	1.76	1.86	+5.7%	1.76	1.86	+5.7%
Enterprise Ownership	46%	46%	+0 p.p.	16%	22%	+6.0 p.p.
Credit/Output	0.35	0.60	71%	0.29	0.58	100%
$\sigma(arpk)$	0.54	0.41	-24.0%	0.64	0.45	-29.7%

Income and Wealth Inequality

Table: Income and Wealth Inequality across Castes

	Income		Wealth		Counterfactual Gains	
	Model	Data	Model	Data	Income	Wealth
HC	1.00	1.00	1.00	1.00	1.6%	-5.9%
MC	0.97	0.76	0.92	0.53	6.6%	6.5%
LC	0.91	0.51	0.74	0.28	8.8%	16.4%

What Do We learn

- Caste-specific distortions $\Longrightarrow$ important for $\downarrow$ manufacturing TFP $+$ $\uparrow$ misallocation.
- Future Research:
  - What about long-run growth?
  - Direct evidence & sources of discrimination in credit markets?
  - What about labor, intermediate inputs and product markets?
- Immense opportunities with better data $+$ Macro Machinery.

Appendix

Fact 1: ARPK is higher for Low-castes

Table: ARPK across castes

VARIABLES	(1) *arpk*	(2) *arpk*	(3) *arpk*
M-Caste	0.14***	0.13***	0.09***
	(0.02)	(0.02)	(0.02)
L-Caste	0.30***	0.26***	0.24***
	(0.03)	(0.03)	(0.04)
Wage			0.00
			(0.02)
log(Years of Schooling)			-0.07***
			(0.02)
log(Land Holdings)			0.01
			(0.01)
Sd(Output-Growth)			-0.24***
			(0.08)
Constant	-0.66***	-0.66***	-0.54**
	(0.01)	(0.01)	(0.24)
Observations	1,438,571	1,438,536	1,170,012
R-squared	0.50	0.51	0.52
District FE	✓	✓	✓
NIC4 FE	✓		
NIC5 FE		✓	✓

Main

Fact 1: ARPK is higher for Low-castes

Table: ARPK across castes

	(1)	(2)	(3)	(4)
	All-Sector		Manufacturing	
	$arpk$	$arpl$	$arpk$	$arpl$
M-Caste	0.17***	0.09***	0.22***	0.09***
	(0.03)	(0.02)	(0.04)	(0.03)
L-caste	0.25***	0.16***	0.30***	0.14***
	(0.06)	(0.04)	(0.05)	(0.05)
Constant	-0.09***	0.65***	-0.18***	0.58***
	(0.02)	(0.02)	(0.02)	(0.02)
Observations	1,438,546	1,387,741	1,180,585	1,141,607
R-squared	0.38	0.42	0.38	0.35
District FE	✓	✓	✓	✓
NIC4 FE	✓	✓	✓	✓

Main

Fact 1: ARPK is higher for Low-castes

Table: ARPK across castes

	All sectors		Manufacturing	
	(1)	(2)	(3)	(4)
Dep. Var.	$arpk$	$arpk$	$arpk$	$arpk$
MC	0.07**	0.07*	0.12**	0.11**
	(0.04)	(0.04)	(0.05)	(0.05)
LC	0.15**	0.13*	0.20***	0.19***
	(0.07)	(0.07)	(0.06)	(0.06)
μ		0.08***		0.04
		(0.03)		(0.03)
Constant	0.45***	0.42***	0.47***	0.45***
	(0.03)	(0.03)	(0.03)	(0.03)
Observations	1,438,552	1,438,542	1,145,267	1,145,267
R-squared	0.15	0.16	0.17	0.17
District FE	✓	✓	✓	✓
NIC4 FE	✓	✓	✓	✓

Main

Fact 1: ARPK is higher for Low-castes

Table: ARPK across castes

	All sectors			Manufacturing		
Dep. Var.	$arpk$	$arpk$	$arpk$	$arpk$	$arpk$	$arpk$
MC	0.10***	0.10***	0.07**	0.12***	0.12***	0.09**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
LC	0.17***	0.17***	0.21***	0.19***	0.20***	0.21***
	(0.05)	(0.05)	(0.05)	(0.04)	(0.04)	(0.04)
μ		0.00	0.00		-0.03	-0.03
		(0.02)	(0.02)		(0.03)	(0.03)
θ^k_{sc}			-2.33***			-3.32***
			(0.54)			(0.69)
Constant	0.44***	0.44***	0.72***	0.47***	0.48***	0.84***
	(0.02)	(0.02)	(0.07)	(0.02)	(0.02)	(0.08)
Observations	1,438,546	1,438,536	1,438,536	1,145,261	1,145,261	1,145,261
R-squared	0.37	0.37	0.37	0.36	0.36	0.36
District FE	✓	✓	✓	✓	✓	✓
NIC4 FE	✓	✓	✓	✓	✓	✓

Main

Sectoral Shares of Output across Castes

Sector	NIC	LC Share	MC Share	HC Share	Sector Share
Manufacture of food products and beverages	15	0.016	0.054	0.106	0.090
Manufacture of wearing apparel	18	0.013	0.049	0.052	0.035
Manufacture of tobacco products	17	0.009	0.040	0.079	0.081
Manufacture of furniture; manufacturing n.e.c.	36	0.008	0.035	0.036	0.036
Manufacture of fabricated metal products	28	0.006	0.027	0.057	0.038
Manufacture of wood and of products of wood	20	0.006	0.014	0.017	0.015
Manufacture of other non-metallic mineral products	26	0.003	0.017	0.043	0.051
Manufacture of machinery and equipment n.e.c.	29	0.003	0.014	0.044	0.057
Tanning and dressing of leather	19	0.002	0.003	0.008	0.008
Manufacture of rubber and plastics products	25	0.002	0.006	0.024	0.024
Manufacture of chemicals and chemical products	24	0.002	0.009	0.037	0.133
Manufacture of basic metals	27	0.002	0.006	0.028	0.113
Publishing, printing and reproduction of recorded media	22	0.002	0.008	0.014	0.017
Manufacture of tobacco products	16	0.001	0.004	0.007	0.020
Manufacture of electrical machinery and apparatus n.e.c.	31	0.001	0.007	0.017	0.035
Manufacture of radio, television and communication equipment	32	0.001	0.002	0.004	0.015
Manufacture of other transport equipment	35	0.001	0.003	0.011	0.025
Manufacture of medical, precision and optical instruments	33	0.001	0.003	0.007	0.008
Manufacture of paper and paper products	21	0.000	0.003	0.012	0.014
Manufacture of motor vehicles, trailers and semi-trailers	34	0.000	0.002	0.005	0.064
Manufacture of coke, refined petroleum products and nuclear fuel	23	0.000	0.001	0.002	0.115
Manufacture of office, accounting and computing machinery	30	0.000	0.000	0.002	0.007
Recycling	37	0.000	0.000	0.000	0.000
Total		0.080	0.307	0.613	1.000

Main

Fact 3a: Regional Financial Development and ARPK

VARIABLES	(1) log(ARPK)	(2) log(ARPK)	(3) log(ARPK)	(4) log(ARPK)	(5) log(ARPK)	(6) log(ARPK)
M-Caste	0.13***	1.33***	1.71***	1.71***	0.65***	2.11***
	(0.02)	(0.21)	(0.30)	(0.33)	(0.25)	(0.28)
L-Caste	0.25***	0.95***	1.81***	1.06***	1.05***	1.77***
	(0.03)	(0.22)	(0.30)	(0.32)	(0.24)	(0.29)
Commercial banks per capita (10^{-3})		-3.28**				
		(1.33)				
M-Caste × Commercial banks per capita (10^{-3})		-8.33***				
		(1.75)				
L-Caste × Commercial banks per capita (10^{-3})		-2.07				
		(1.97)				
Rural banks per capita (10^{-3})			121.49***			
			(14.27)			
M-Caste × Rural banks per capita (10^{-3})			-81.15***			
			(16.14)			
L-Caste × Rural banks per capita (10^{-3})			-86.87***			
			(15.76)			
All Banks per capita (10^{-3})				2.14		
				(1.94)		
M-Caste × All banks per capita (10^{-3})				-11.36***		
				(2.53)		
L-Caste × All banks per capita (10^{-3})				-2.80		
				(2.41)		
% of HH with Bank account					-1.00***	
					(0.37)	
M-Caste × % of HH with Bank account					-0.21	
					(0.64)	
L-Caste × % of HH with Bank account					-1.01*	
					(0.58)	
% of HH with loan						8.58***
						(1.57)
M-Caste × % of HH with loan						-12.20***
						(1.69)
L-Caste × % of HH with loan						-8.48***
						(1.70)
Observations	1,119,508	1,119,514	1,114,209	1,114,209	1,119,514	1,119,514
R-squared	0.51	0.13	0.22	0.13	0.12	0.16
District FE	Yes	No	No	No	No	No
NIC4 FE	Yes	Yes	Yes	Yes	Yes	Yes

Main

Fact 3b: Regional Financial Development and Capital-labor ratio

VARIABLES	(1) log(K/L)	(2) log(K/L)	(3) log(K/L)	(4) log(K/L)	(5) log(K/L)	(6) log(K/L)
M-Caste	-0.26***	-1.51***	-1.64***	-1.81***	-0.74***	-2.23***
	(0.02)	(0.20)	(0.24)	(0.30)	(0.23)	(0.24)
L-Caste	-0.49***	-1.13***	-1.92***	-1.15***	-1.36***	-1.76***
	(0.03)	(0.21)	(0.25)	(0.29)	(0.23)	(0.24)
Commercial banks per capita (10^{-3})		5.37***				
		(1.35)				
M-Caste × Commercial banks per capita (10^{-3})		8.93***				
		(1.85)				
L-Caste × Commercial banks per capita (10^{-3})		1.46				
		(2.07)				
Rural banks per capita (10^{-3})			-112.77***			
			(11.45)			
M-Caste × Rural banks per capita (10^{-3})			65.72***			
			(13.66)			
L-Caste × Rural banks per capita (10^{-3})			77.62***			
			(13.31)			
All banks per capita (10^{-3})				0.39		
				(1.89)		
M-Caste × All banks per capita (10^{-3})				11.09***		
				(2.55)		
L-Caste × All banks per capita (10^{-3})				1.35		
				(2.37)		
% of HH with Bank account					1.75***	
					(0.31)	
M-Caste × % of HH with Bank account					0.20	
					(0.65)	
L-Caste × % of HH with Bank account					1.36**	
					(0.59)	
% of HH with loan						-7.39***
						(1.27)
M-Caste × % of HH with loan						11.86***
						(1.49)
L-Caste × % of HH with loan						6.43***
						(1.46)
Observations	1,119,508	1,119,514	1,114,209	1,114,209	1,119,514	1,119,514
R-squared	0.55	0.24	0.31	0.23	0.24	0.26
District FE	Yes	No	No	No	No	No
NIC4 FE	Yes	Yes	Yes	Yes	Yes	Yes

Main

Fact 3c: Regional Financial Development and Profit Rate

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Profit Rate	Profit Rate	Profit Rate	Profit Rate	Profit Rate	Profit Rate
M-Caste	0.02**	0.62***	1.00***	0.88***	0.35**	1.16***
	(0.01)	(0.15)	(0.22)	(0.23)	(0.16)	(0.20)
L-Caste	0.05***	0.44***	1.08***	0.63***	0.49***	1.00***
	(0.02)	(0.15)	(0.22)	(0.21)	(0.15)	(0.20)
Commercial banks per capita (10^{-3})		-0.66				
		(0.90)				
M-Caste × Commercial banks per capita (10^{-3})		-3.51***				
		(1.20)				
L-Caste × Commercial banks per capita (10^{-3})		-0.95				
		(1.24)				
Rural banks per capita (10^{-3})			74.66***			
			(10.50)			
M-Caste × Rural banks per capita (10^{-3})			-50.72***			
			(11.65)			
L-Caste × Rural banks per capita (10^{-3})			-59.25***			
			(11.54)			
All banks per capita (10^{-3})				3.20**		
				(1.32)		
M-Caste × All banks per capita (10^{-3})				-5.84***		
				(1.71)		
L-Caste × All banks per capita (10^{-3})				-2.80*		
				(1.52)		
% of HH with Bank account					-0.34	
					(0.25)	
M-Caste × % of HH with Bank account					-0.12	
					(0.38)	
L-Caste × % of HH with Bank account					-0.49	
					(0.35)	
% of HH with loan						6.55***
						(1.11)
M-Caste × % of HH with loan						-7.25***
						(1.16)
L-Caste × % of HH with loan						-5.57***
						(1.13)
Observations	1,119,508	1,119,514	1,114,209	1,114,209	1,119,514	1,119,514
R-squared	0.46	0.08	0.15	0.08	0.08	0.12
District FE	Yes	No	No	No	No	No
NIC4 FE	Yes	Yes	Yes	Yes	Yes	Yes

Main

Population Share across castes

	Population Share			
Region	LC	MC	HC	Overall
Uttar Pradesh	0.237	0.535	0.228	0.156
Maharashtra	0.257	0.336	0.407	0.090
West Bengal	0.404	0.094	0.501	0.075
Bihar	0.228	0.592	0.180	0.073
Andhra Pradesh	0.286	0.544	0.170	0.071
Tamil Nadu	0.310	0.623	0.068	0.057
Rajasthan	0.300	0.493	0.206	0.057
Madhya Pradesh	0.340	0.447	0.213	0.053
Karnataka	0.278	0.504	0.218	0.052
Gujarat	0.230	0.457	0.312	0.049
Jharkhand	0.448	0.351	0.202	0.039
Orissa	0.385	0.437	0.178	0.035
Chhatishgarh	0.410	0.487	0.104	0.029
Kerala	0.105	0.568	0.327	0.028
Assam	0.369	0.106	0.525	0.025
Punjab	0.391	0.225	0.383	0.022
Haryana	0.278	0.357	0.365	0.019
Delhi	0.321	0.300	0.379	0.017
Uttaranchal	0.409	0.249	0.342	0.016
Jammu & Kashmir	0.115	0.157	0.728	0.012
Himachal Pradesh	0.326	0.089	0.585	0.006
Tripura	0.460	0.211	0.329	0.003
Goa	0.138	0.310	0.552	0.003
Meghalaya	0.845	0	0.155	0.002
Manipur	0	0.063	0.937	0.002
Nagaland	0.883	0	0.117	0.002
Pondicherry	0.041	0.923	0.035	0.002
Chandigarh	0.134	0.254	0.612	0.001
Arunachal Pradesh	0.911	0.028	0.061	0.001
Dadra+Nagar Haveli	0.388	0.245	0.367	0.001
Sikkim	0.225	0.414	0.361	0.001
Daman & Diu	0.434	0.470	0.096	0.000

Main

Population Share across castes

Table: Regional Financial Development and Capital Allocation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Full Sample						Restrcited Sample					
	log(ARPK)	log(ARPK)	log(K/L)	log(K/L)	Profit Rate	Profit Rate	log(ARPK)	log(ARPK)	log(K/L)	log(K/L)	Profit Rate	Profit Rate
M-Caste	0.14***	1.35***	-0.30***	-1.41***	0.03***	0.77***	0.18***	2.14***	-0.35***	-2.16***	0.06***	1.26***
	(0.02)	(0.21)	(0.02)	(0.19)	(0.01)	(0.15)	(0.03)	(0.29)	(0.03)	(0.24)	(0.02)	(0.20)
L-Caste	0.25***	1.37***	-0.49***	-1.52***	0.05***	0.72***	0.28***	1.55***	-0.51***	-1.70***	0.07***	0.82***
	(0.03)	(0.22)	(0.03)	(0.19)	(0.02)	(0.16)	(0.03)	(0.28)	(0.04)	(0.24)	(0.02)	(0.19)
FD_s		0.83***		-0.31*		0.71***		1.16***		-0.59***		0.92***
		(0.20)		(0.17)		(0.14)		(0.22)		(0.18)		(0.15)
M-Caste $\times$ FD_s		-1.36***		1.05***		-0.80***		-1.69***		1.42***		-0.97***
		(0.23)		(0.21)		(0.15)		(0.24)		(0.22)		(0.16)
L-Caste $\times$ FD_s		-1.26***		1.05***		-0.76***		-1.35***		1.17***		-0.79***
		(0.24)		(0.23)		(0.16)		(0.30)		(0.27)		(0.20)
Population Share	-0.04	-0.37**	0.18**	0.64***	-0.05**	-0.33***	-0.13*	-1.91***	0.29***	1.95***	-0.12***	-1.36***
	(0.05)	(0.17)	(0.07)	(0.17)	(0.02)	(0.11)	(0.07)	(0.35)	(0.10)	(0.33)	(0.04)	(0.23)
Constant	-0.66***	-1.19***	11.32***	11.57***	-0.04***	-0.43***	-0.72***	-1.10***	11.36***	11.50***	-0.07***	-0.36***
	(0.02)	(0.19)	(0.03)	(0.16)	(0.01)	(0.13)	(0.02)	(0.19)	(0.03)	(0.16)	(0.01)	(0.13)
Observations	1,118,427	1,118,433	1,118,427	1,118,433	1,118,427	1,118,433	897,456	897,458	897,456	897,458	897,456	897,458
R-squared	0.51	0.13	0.55	0.23	0.46	0.09	0.55	0.19	0.59	0.29	0.50	0.14
District FE	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
NIC4 FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Main

Model

- Preferences,

$$\mathbb{E}\sum_{t=o}^{\infty}\rho^{t}\frac{C_{t}^{1-\gamma}-1}{1-\gamma}.$$

- Occupation choice of the household.

$$V(a,z,s)=\max\{V^{w}(a,z,s),V^{e}(a,z,s)\}. \tag{3}$$

The workers' value function is given by

$$\begin{aligned} V^{w}(a,z,s) &= \max_{c,a'\geqslant 0} u(c)+\rho\{\psi V(a',z,s)+(1-\psi)\int_{z'}V(a',z',s)d\Upsilon(z'|s)\} \\ &\text{s.t.} \quad c+a'\leqslant w+(1+r)a. \end{aligned} \tag{4}$$

The entrepreneurs' value function is given by

$$\begin{aligned} V^{e}(a,z,s) &= \max_{c,k,l,a'\geqslant 0} u(c)+\rho\{\psi V(a',z,s)+(1-\psi)\int_{z'}V(a',z',s)d\Upsilon(z'|s)\} \\ &\text{s.t.} \quad c+a'\leqslant z\,(k^{\alpha}l^{\beta})^{1-\nu}-wl-(r+\delta+d)k-\kappa_{s}+(1+r)a \\ &\qquad (1+r+\delta+d)k\leqslant\phi\,\lambda_{s}\,a. \end{aligned} \tag{5}$$

Main

Model

- Preferences,

$$\mathbb{E}\sum_{t=o}^{\infty}\rho^{t}\frac{C_{t}^{1-\gamma}-1}{1-\gamma}.$$

- Occupation choice of the household.

$$V(a,z,s)=\max\{V^{w}(a,z,s),V^{e}(a,z,s)\}. \tag{3}$$

The workers' value function is given by

$$\begin{aligned} V^{w}(a,z,s) &= \max_{c,a'\geqslant 0} u(c)+\rho\{\psi V(a',z,s)+(1-\psi)\int_{z'}V(a',z',s)d\Upsilon(z'|s)\} \\ &\text{s.t.} \quad c+a'\leqslant w+(1+r)a. \end{aligned} \tag{4}$$

The entrepreneurs' value function is given by

$$\begin{aligned} V^{e}(a,z,s) &= \max_{c,k,l,a'\geqslant 0} u(c)+\rho\{\psi V(a',z,s)+(1-\psi)\int_{z'}V(a',z',s)d\Upsilon(z'|s)\} \\ &\text{s.t.} \quad c+a'\leqslant z\,(k^{\alpha}l^{\beta})^{1-\nu}-wl-(r+\delta+d)k-\kappa_{s}+(1+r)a \\ &\qquad (1+r+\delta+d)k\leqslant \phi\,\lambda_{s}\,a. \end{aligned} \tag{5}$$

Main

Recursive Competitive Equilibrium

- *Equilibrium*: At time 0, given the distribution $\Lambda_0(a,z,c)$, the equilibrium of the economy is characterized by a sequence of allocations $\{o_t, \mathcal{C}_t, a_{t+1}, k_t, l_t\}_{t=0}^{\infty}$, factor prices $\{w_t, r_t\}_{t=0}^{\infty}$, and $\Lambda_t(a,z,c)_{t=1}^{\infty}$ such that
  1. $\{o_t, \mathcal{C}_t, a_{t+1}, k_t, l_t\}_{t=0}^{\infty}$ solves the individuals' policy functions for given factor prices $\{w_t, r_t\}_{t=0}^{\infty}$.
  2. The capital, labor, and goods markets clear in each period

$$\int_{o_t(a,z,s)=e} k_t \, d\Lambda_t(a,z,s) + K_c - \int a_t \, d\Lambda_t(a,z,s) = 0,$$

$$\int_{o_t(a,z,s)=e} l_t \, d\Lambda_t(a,z,s) + N_c - \int_{o_t(a,z,s)=w} d\Lambda_t(a,z,s) = 0,$$

$$\int_{o_t(a,z,s)=e} [z_t(k_t^{\alpha} l_t^{\beta})^{1-\nu} - \kappa_s] d\Lambda_t(a,z,s) + K_c^{\theta_c} N_c^{1-\theta_c} = \int c_t d\Lambda_t(a,z,s) + (\delta + d)K + \delta K_c;$$

  3. The joint distribution of productivity and assets for each caste $\Lambda_t(a,z,s)_{t=1}^{\infty}$ evolve according to the equilibrium mapping

$$\Lambda_{t+1}(a,z,s) = \psi \int_{\{z,a_{t+1}(a,z,s)<a\}} \Lambda_t(da,dz,s) + (1-\psi) \int_{\{z' \leqslant z, a'(a,z,s) \leqslant a\}} \Lambda_t(da,dz,s) d\mathrm{Y}_t(z'|s).$$

Main

Marginal Revenue Product of Capital

- The consumption Euler equation for constrained entrepreneurs is given by,

$$\mathcal{C}_t^{-\gamma} = \rho \int_{z'} \{\mathcal{C}_{t+1}^{-\gamma}(1 + r_{t+1} + \lambda_c \Theta_{t+1})\} d\Lambda(z'|z),$$

- where Θ_{t+1} is defined as,

$$\Theta_{t+1} = \max[f_k(\lambda_c a_{t+1}, z_{t+1}) - (r_{t+1} + \delta), 0].$$

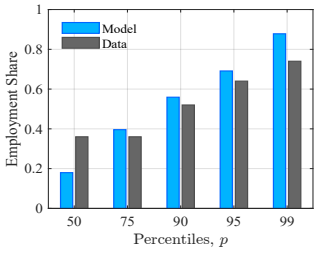
- where $f_k(\lambda_c a_{t+1}, z_{t+1})$ is $mrpk$ and $r_{t+1} + \delta$ is the marginal cost of capital.

- and $mrpk = \alpha(1 - \nu)arpk$

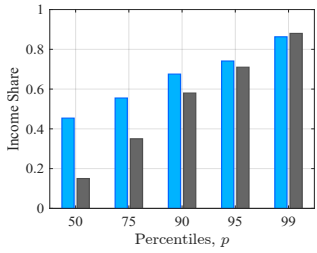
Employment & Household Income Distributions

Main

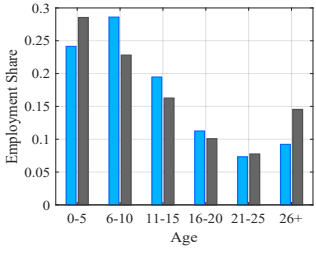
(a) Employment Share Distribution



(b) Household Income Distribution



(c) Cohort Employment Distribution



(d) The Survival of Cohorts