

Caste Networks in the Modern Indian Economy

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Introduction

- Why does caste continue to play such an important role in Indian life?
 - Ancient inequalities and prejudices are slow to change
 - Caste reservation has perpetuated a system that would otherwise have withered away
 - Caste networks provide different forms of economic support to their members

Networks in the Modern Economy

- Networks can substitute for inefficient market institutions
 - referrals, mutual insurance
- Use social connections to solve information and commitment problems
 - In India, the natural social unit around which networks would be organized is the endogamous subcaste or *jati*

Caste Networks in India

- Rural caste networks historically provided insurance for their members
- With the arrival of the British and the growth of cities, they supported rural-urban migration and the establishment of urban labor networks
- Caste networks continue to provide insurance and jobs, and to support occupational mobility
- They have now expanded their domain from private economic activity to the public sphere (*panchayats*)

Outline of the Talk

- Evidence that caste networks continue to matter in rural and urban India
- Caste networks support economic and political activity
 - Occupational mobility (Munshi, *Review of Economic Studies*, 2011)
 - Commitment and competence in local governments (Munshi and Rosenzweig, work in progress)
- Caste networks generate inefficiencies
 - Misallocation of factors of production (Banerjee and Munshi, *Review of Economic Studies*, 2004)
 - Restrictions on mobility (Munshi and Rosenzweig, *American Economic Review*, 2006)

Rural Caste-based Insurance Networks

Data source:	REDS	
	1982	1999
Survey year:	(1)	(2)
Households participating (%)	25.44	19.62
Income sent (%)	5.28	8.74
Income received (%)	19.06	40.26
Number of observations	4,981	7,405

Loans by Purpose and Source

Purpose:	investment	operating expenses	contingencies	consumption expenses
	(1)	(2)	(3)	(4)
<u>Source:</u>				
Bank	64.11	80.80	27.58	25.12
Caste	16.97	6.07	42.65	23.12
Friends	2.11	11.29	2.31	4.33
Employer	5.08	0.49	21.15	15.22
Moneylender	11.64	1.27	5.05	31.85
Other	0.02	0.07	1.27	0.37

Loans by Type and Source

Data source:	1982 REDS			2005 IHDS
Loan type:	without interest	without collateral	collateral or interest	without interest
	(1)	(2)	(3)	(4)
<u>Source:</u>				
Bank	0.57	23.43	0.38	0.00
Caste	28.99	60.27	20.38	44.62
Friends	9.35	91.72	3.89	21.5
Employer	0.44	65.69	0.44	10.75
Moneylender	0.00	98.71	0.00	0.27

Caste-based Labor Market Networks

Fathers of students in Mumbai	Percentage that received referrals
<u>Occupation:</u>	
Unskilled manual	65.95
Skilled manual	60.13
Organized blue-collar	76.43
<i>All working class</i>	68.44
Clerical	47.41
Business	49.29
Professional	32.77
<i>All white-collar</i>	43.76
Number of observations	4,515

Caste-based Business Networks

Source of referrals (%):	Referrals for Kathiawaris (1)	Referrals for Marwaris (2)	Referrals for Palanpuris (3)
Kathiawari exporters	74.06	2.83	20.28
Marwari exporters	12.62	42.72	37.86
Palanpuri exporters	9.19	9.05	78.64

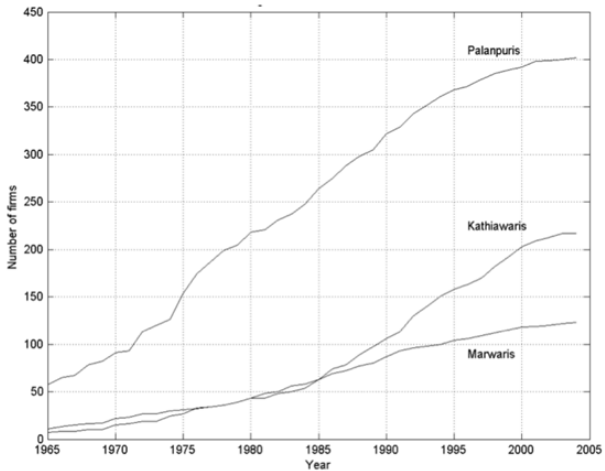
Caste Networks and Occupational Mobility

- Networks allow communities to boot-strap their way out of occupational traps by substituting for inherited human capital
 - New networks strengthen most rapidly in communities with weakest outside options
 - Inter-generational occupational mobility correspondingly greater in those communities

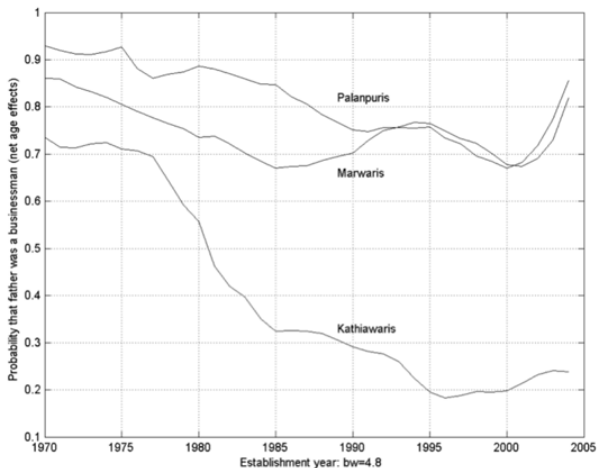
Institutional Setting

- Indian diamond industry
 - Buy roughs, cut and polish, sell polished
 - Networks most useful for buying roughs on credit in Antwerp
- The communities
 - Two traditional business communities – *Marwaris* and *Palonpuris* – dominated trade from 1960's
 - Lower caste *Kathiawaris* cut and polished the diamonds
 - Supply shock in 1979 allowed *Kathiawaris* to enter business

Number of Firms



Family Background of Entering Entrepreneurs (Business)



Firm Performance

Dependent variable: Sample:	exports			
	all firms		father	non-business
	(1)	(2)	(3)	(4)
Year-Kathiawari	1.874 (1.511)	7.419 (2.223)	10.076 (4.758)	16.752 (5.242)
Year-Marwari	-7.514 (1.452)	-6.626 (2.153)	-8.018 (2.130)	-9.374 (2.432)
Year	12.940 (2.169)	14.272 (1.906)	7.941 (1.658)	9.784 (2.137)
Firm fixed effects	No	Yes	No	Yes
Number of observations	6,114	6,114	2,034	2,034

Caste Networks, Commitment, and Competence in Local Governments

- Leadership commitment problem in representative democracies
 - Tension between horizontal and vertical dimensions of leadership quality
- Solutions to the commitment problem
 - Political competition
 - Promise of re-election
 - Political parties
 - Networks and social sanctions

Testing for Commitment

- Without commitment, the individual with median preferences will be elected
- Now suppose that a group (caste) can discipline the representative it puts forward
 - This representative will be the most competent member of the group and he will choose policies that are aligned with the preferences of a central (median) individual in that group

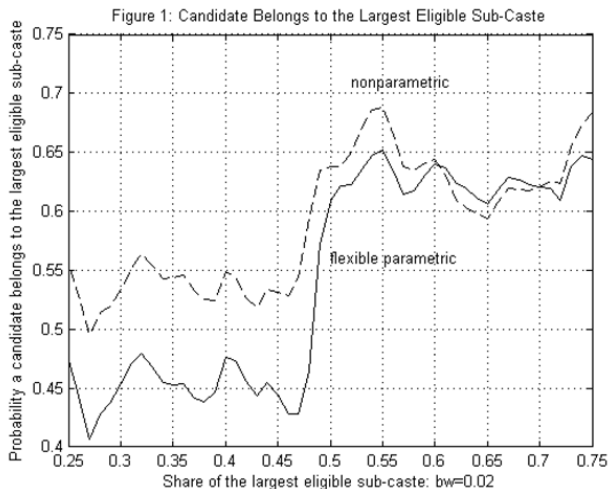
Testing for Commitment

- The group representative will be elected if he is sufficiently competent and the preference mismatch is not too large
 - This result can be restated in terms of the population-share of the group
 - Under reasonable conditions, the group representative will be elected and competence will increase discontinuously when the population-share crosses a threshold

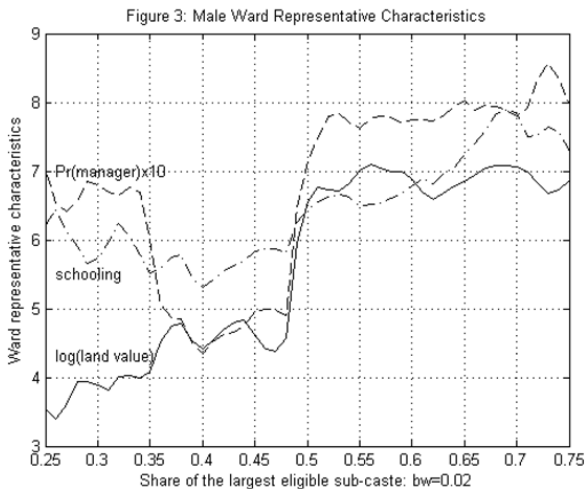
Leadership Competence and Caste Affiliation

- Use caste reservation in *panchayat* elections to generate exogenous variation in group-share within each ward
- $y_{jt} = \phi(S_{jt}) + f_j + \xi_{jt}$
 - y_{jt} is leader's caste affiliation or characteristics in ward j in term t , S_{jt} is group-share, and f_j are ward fixed effects.
 - Estimate the equation using nationally representative data over three terms
 - All regressions include reservation dummies

Probability that Leader Belongs to Largest Eligible Caste



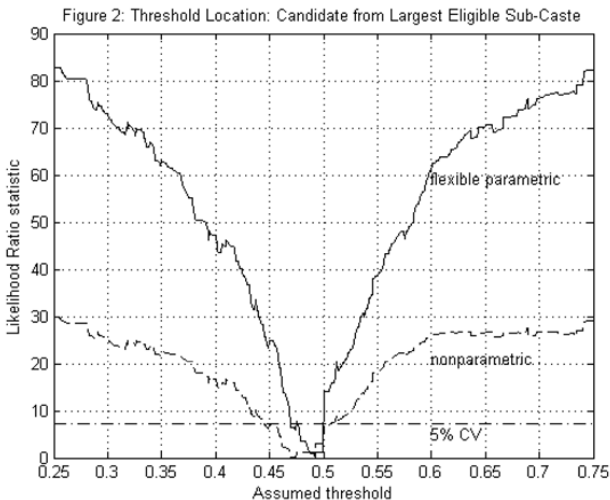
Ward Representative Characteristics



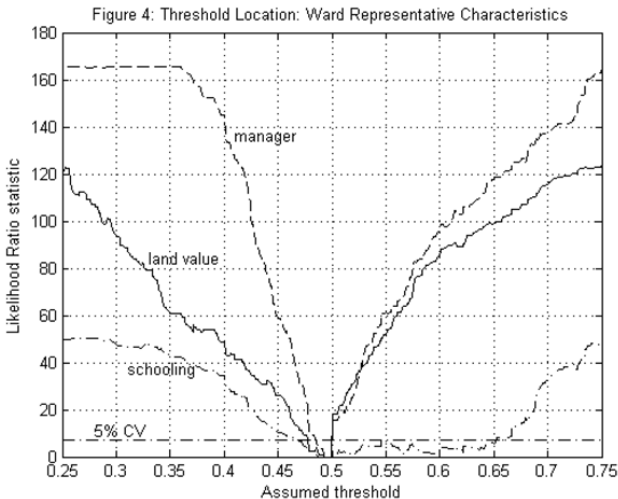
Locating the Threshold

- Following the change-point literature, we estimate the following equation with different assumed threshold, S :
- $y_{jt} = \alpha + \beta D_{jt} + \varepsilon_{jt}$
 - $D_{jt} = 1$ if $S_{jt} \geq S$, 0 otherwise
 - Best estimate of true threshold is the assumed threshold at which R^2 is maximized
 - Likelihood ratio test places bounds on the location of the threshold

Threshold Location: Candidate from Largest Eligible Sub-Caste



Threshold Location: Ward Representative Characteristics



Representative Characteristics

	P(from the most numerous subcaste) (1)	ward representative characteristics		
		log(land value) (2)	manager (3)	education (4)
Mean-shift at threshold	0.44 (0.13)	2.82 (1.05)	0.21 (0.06)	1.29 (0.56)
Reservation dummies	Yes	Yes	Yes	Yes
Threshold location	0.49	0.50	0.50	0.50
Number of obs.	1,145	1,681	1,994	1,979

Public Good Provision

- Leader competence should translate into increased public good provision
 - But without sacrificing on commitment

- Estimate equation of the form:

$$G_{kjt} = (\alpha_k + \delta_k X_{jt})(1 + \theta M_{jt}) + h_j + \epsilon_{kjt}$$

- G_{kjt} is fraction of households that received good k , X_{jt} measures characteristics of pivotal individual, $M_{jt} = 1$ if $S_{jt} \geq \widehat{S}$, 0 otherwise
- α_k , δ_k are preference parameters and θ is the competence parameter

Public Good Provision

Dependent variable: Pivotal characteristic:	public good provision		
	log(land value)	manager	education
	(1)	(2)	(3)
θ	0.14 (0.03)	0.16 (0.03)	0.17 (0.03)
F-statistic ($\delta_k = 0$) (p-value)	17.00 (0.00)	10.68 (0.00)	2.32 (0.04)
Number of observations	14,250	14,215	14,255

Political Commitment Tests

Dependent variable: Pivotal individual:	public good provision		
	medians	rep. for share < 0.5	rep. for share > 0.5
	(1)	(2)	(3)
<u>log(land value)</u>			
θ	0.21 (0.04)	0.20 (0.05)	0.27 (0.05)
F-statistic ($\delta_k = 0$) (p-value)	12.68 0.00	7.19 0.00	1.79 0.11
<u>manager</u>			
θ	0.14 (0.03)	0.18 (0.03)	0.17 (0.03)
F-statistic ($\delta_k = 0$) (p-value)	8.34 0.00	3.55 0.00	2.15 0.06
<u>education</u>			
θ	0.16 (0.03)	0.16 (0.03)	0.17 (0.03)
F-statistic ($\delta_k = 0$) (p-value)	2.78 0.02	3.97 0.00	1.27 0.27

Caste Networks and the Misallocation of Resources

- Positive role for the caste at the local level may not scale up
- Even at the local level, there are distributional consequences that are not necessarily benign
 - Threshold at 0.5 indicates little support outside the caste
 - Banerjee and Munshi's (2004) study of Tirupur's garment-export industry

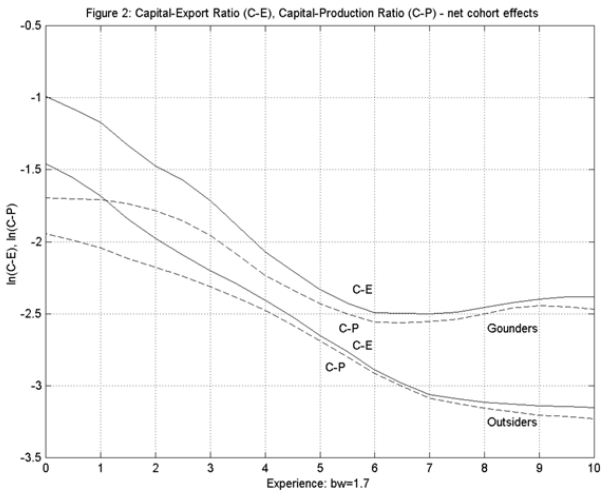
Institutional Setting

- Tirupur supplies 70 percent of India's knitted-garment exports
 - Industry dominated by a wealthy local caste, the Vellala Gounders
 - In 1996, when firms in Tirupur were surveyed, half were outsiders belonging to traditional business communities

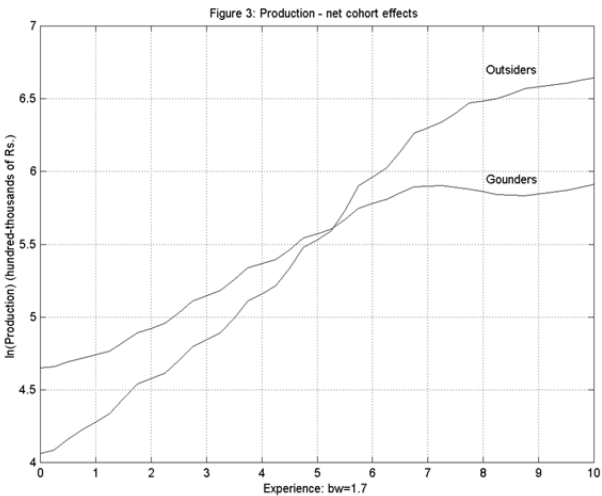
Identifying Misallocation

- Two stylized facts:
 - Gounders use roughly twice as much capital per unit of production as Outsiders
 - Production grows faster for the Outsiders than for the Gounders at all levels of experience

Capital per unit of Output



Production



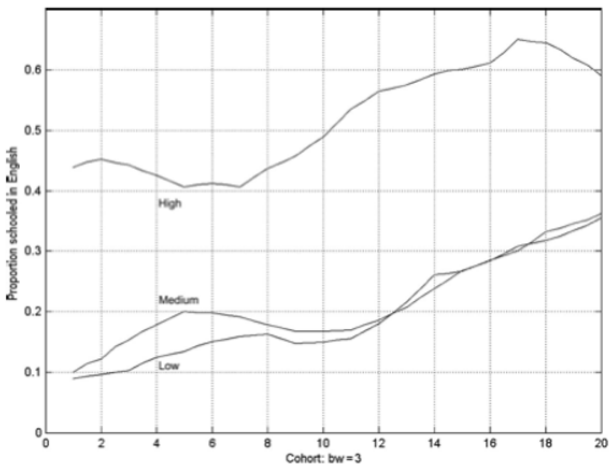
Interpretation of the Stylized Facts

- Let the production trajectory be determined by entrepreneurial ability and capital
 - Assume that these inputs are complements
 - If all entrepreneurs face the same interest rate, then higher ability entrepreneurs will grow faster and hold more capital
- The fact that the Outsiders grow faster despite having lower capital implies that they must have higher ability *and* face a higher interest rate
 - Rule out the possibility that capital and ability are substitutes by showing that firms with a steeper trajectory invest more *within* each community

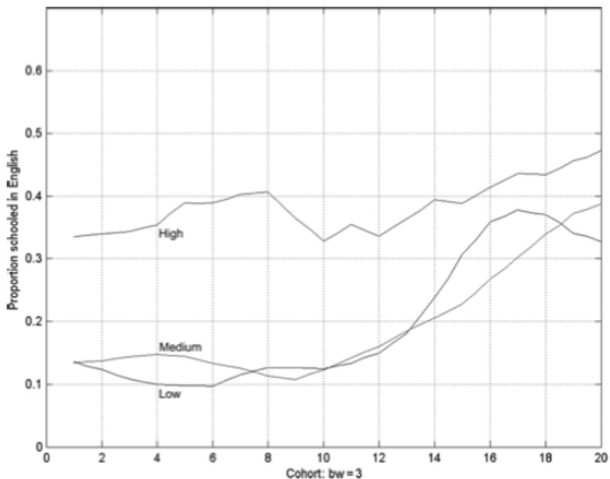
Caste Networks and Restrictions on Mobility

- Schooling in Mumbai is either in English or Marathi
 - Expensive English schooling increases the likelihood of obtaining a white-collar occupation, while Marathi schooling channels children into working class jobs
- Restructuring of the Indian economy increased the returns to English
 - Steep increase in the proportion of children sent to English-medium schools from the late 1980s
 - Gap in English schooling between upper and lower castes narrows dramatically for girls, but no convergence for the boys

English schooling - Boys



English schooling - Girls



Our Interpretation

- Labor market networks in Mumbai
 - Organized at the level of the subcaste or *jati*
 - Most active and most useful in working class occupations dominated by *lower caste men*
- Once networks were in place, socially optimal to restrict exit (occupational mobility) because individual members would not internalize the value of the referrals they provided

Our Interpretation

- These restrictions could have remained in place even as the returns to white-collar occupations grew in the 1990s, explaining the persistent gap between lower caste and high caste boys
 - The restrictions may no longer be efficient
 - Without restrictions to hold them back, lower caste girls swiftly caught up with high caste girls

Empirical Analysis

- Networks give rise to inter-generational occupational persistence (for the boys)
- $\mathbb{P}(E_{ij} = 1) = \alpha P_j + X_{ij}\beta + \omega_j$
- Pooling boys and girls
- $\mathbb{P}(E_{ij} = 1) = (\alpha - \tilde{\alpha})P_j B_{ij} + X_{ij}\tilde{\beta} + X_{ij}B_{ij}(\beta - \tilde{\beta}) + \gamma B_{ij} + f_j$

Caste-Based Networks and Schooling Choice

Dependent variable: Sample	English schooling					
	Boys only		Girls only		Boys and girls	
	(1)	(2)	(3)	(4)	(5)	(6)
Referrals	-1.060 (0.164)	-0.377 (0.148)	-0.646 (0.160)	0.124 (0.167)	-	-
Referral - boy	-	-	-	-	-0.398 (0.091)	-0.464 (0.105)
Additional household variables	No	Yes	No	Yes	No	Yes
Number of obs.	2,405	2,286	2,228	2,093	4,635	4,379

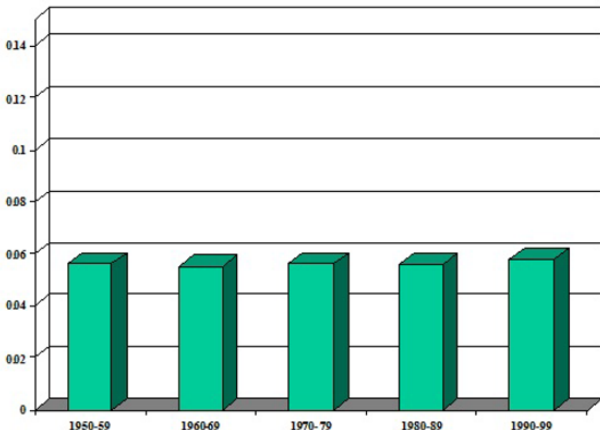
- Note: regressions include sex and cohort, parental education, and household income
- $(\alpha - \tilde{\alpha})$ coefficient does not weaken across cohorts
 - This is the wedge that keeps the lower and upper caste boys apart

Conclusion

- Caste networks continue to support economic and political activity in India
 - But there is no substitute for well functioning market institutions
 - Apart from economic inefficiencies, there are social and political reasons to dismantle the caste system
 - This will happen when caste networks lose their relevance

Out-Marriage in Rural India

Figure 6: Rates of Out-Marriage, by Decade, Rural India 1950-1999 (N=31,529)



Out-Marriage in Mumbai

Figure 7: Rates of Out-Marriage, by Quinquennia, Mumbai 1970-2002 (N=5,406)

