Homeownership, Renting And Market Failures: Evidence from Indian Slums

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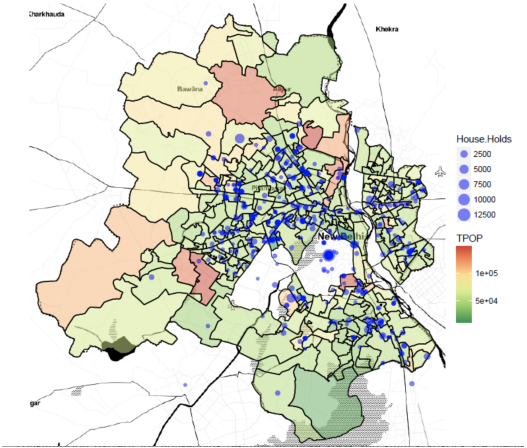
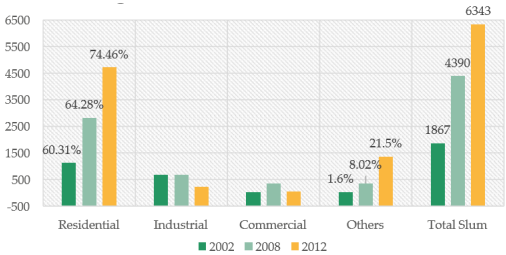
Introduction

Motivation

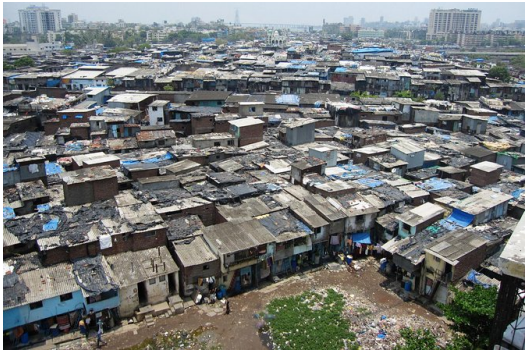
- 35% (Approx.) of India is urbanized (World Bank, 2021)
- 21.9% of Indian population lives under the poverty line (Planning Commission, 2013) or (17.9%, PLFS 2020-21?).
- Urbanisation provides economic opportunities.
- BUT often urban migration creates slums (Kling et. al., 2001 and Barnhardt et. al., (2015))

Motivation: Locational Choices of slums





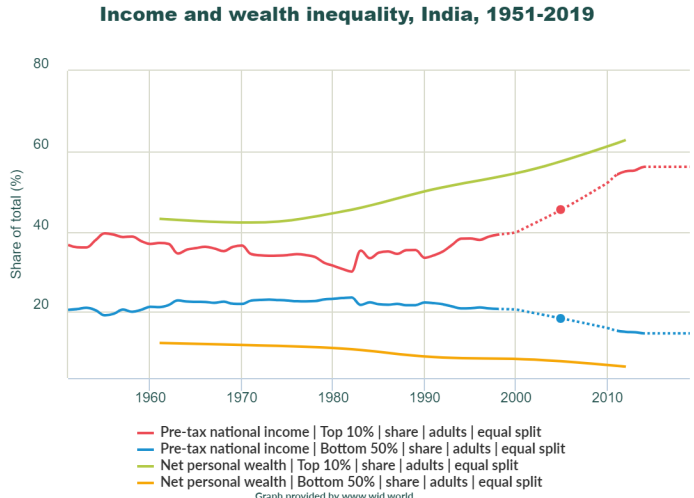
Motivation: Economic opportunity or adversity?



Dilapidated housing, lack of effective service provisioning, lack of tenure, market failures and coordination and governance gap

Motivation: The Socio-Economic-Human Development Puzzle

Gini Index (2018): Income Inequality - 0.63, Wealth Inequality - 0.75



Research Question

- Does a strong urban governance reform at all administrative and political tiers have multi-dimensional welfare effect for slum dwellers?

- I exploit a national slum housing policy intervention JNNURM-IHSDP (2005-2012), to empirically estimate the effect on
  - housing rental expenditure
  - homeownership
  - women empowerment
  - quality of housing

Literature

Poverty trap and investment inertia:

- Azariadis and Drazen (1990), Murphy et. al., (1989)
- Banejee et. al.,(2002), Durrand-Lasserve et. al.,(2007)

Market failure and governance gap:

- Davis (2006), Barnhardt et al., (2015), Nolan et. al., (2018)

Socio-economic inequality:

- Durlauf (2003), Oreopoulos (2003), Feng et. al., (2015)

Contribution to Literature

- First paper to empirically investigate this policy.
- Unique dataset combining multiple datasets at district level.
  - Multiple years survey data for 18,646 slum households.
  - Digitized detailed report of town level housing projects.
- Address multiple gaps in the literature related to governance gap, political and administrative conflict, public-private partnership.

Preview of Main Results

The nation wide urban slum housing policy:

- Increases real rents significantly.
- Females more likely to be the household head.
- Slum households are more probable to be homeowners.
- Partial improvement in quality of dwelling.
- Legal slums are more likely to benefit from the policy.

Roadmap

Policy

JNNURM-IHSDP Policy

- Single largest 'governance reform-driven initiative' from 2005-2012.
- Efficient, equitable and responsive cities.
- Mandatory coordination by central and state governments, urban local bodies.
- Integrated slum development in 887 'less developed urban area'.
- Mandatory and optional reforms to access funds (80:20).

JNNURM-IHSDP: Reforms

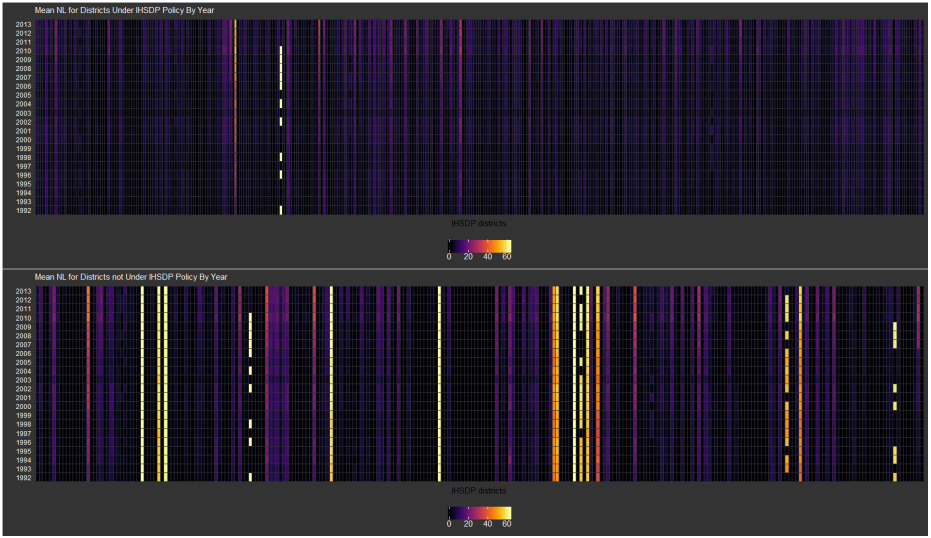
- Subsidized affordable housing.
  - Land entitlement to females.
  - Beneficiary contribution 12%.
  - Maximum cost of dwelling 80,000 INR (USD 1050).
  - Two room accomodation with kitchen and toilet.
  - Maximum dwelling area 25 sqm.
- Stricter rent control laws.

Data

Data

- **Pooled cross-sectional household survey for year 2002, 2008, 2012** (NSSO India)
  - Urban households located in slum areas at district level.
  - 5818 hhds (2002), 7510 hhds (2008), 5318 hhds (2012)
  - characteristics: social, household, demographic, living facilities.
  - *rents, gender of hhd head, homeownership, dwelling characteristics, slum type.*
- **JNNURM-IHSDP policy areas** - detailed monitoring report of housing projects at town level (Indian Ministry of Housing and Urban Affairs, 2019)
- **District economic activity**: mean nighttime light intensity from 1992-2013 for 631 districts (DMSP-OLS)
- **Inflation rate**: consumer price index 2002, 2008, 2012.

Nighttime Light Distribution of Policy Districts in India [1992-2013]



Methodology

Methodology

Quality of Dwelling Deprivation Score (QODDS)

- 15 dwelling characteristics, for e.g., drinking water, bathroom, electricity, drainage, kitchen, roof, etc.
- Assignment of weights from (0-2) in decreasing order of quality (Nolan et. al., 2018).
- Aggregate QODDS score ranges from [0-24.5]

Methodology: Assignment to Treatment

- A town/urban area with at least 50% take up rate of completed dwelling.
- Match the town with the district.

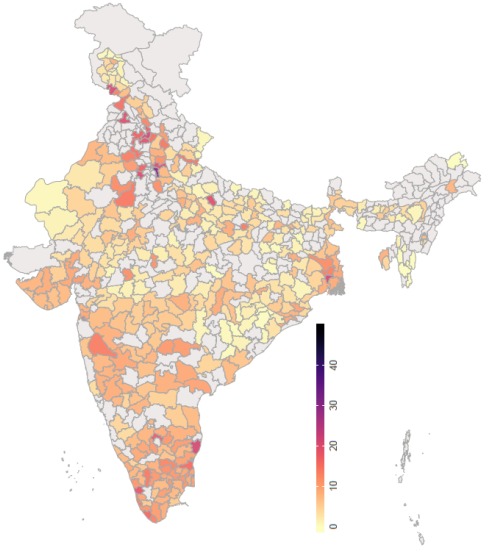
- Unit of treatment D_{ij}: slum household i in district j.

$$D_{ijk} = \begin{cases} 1 & \text{if } d_{ijk} = \text{IHSDP district} \\ 0 & \text{if } d_{ijk} = \text{No IHSDP district} \end{cases} \tag{1}$$

- Pre/post policy period T_i :

$$T_i = \begin{cases} 1 & \text{if } t_i = 2008, 2012 \\ 0 & \text{if } t_i = 2002 \end{cases} \tag{2}$$

Treated slums households in the sample



Descriptive Statistics

	group	vars	n	mean	sd	median	trimmed	min	max
household composition									
male	Control	8	11321	2.4	1.4	2.0	2.3	0.0	13.0
male	Treated	8	6856	2.5	1.4	2.0	2.3	0.0	16.0
female	Control	9	10716	2.3	1.4	2.0	2.2	0.0	17.0
female	Treated	9	6832	2.4	1.4	2.0	2.2	0.0	14.0
household expenditure									
(INR)									
Rent	Control	12	3509	601.7	689.2	400.0	476.2	0.0	10000.0
Rent	Treated	12	1565	638.9	620.1	500.0	536.5	0.0	6000.0
real rent(cpi)	Control	13	3509	290.0	390.2	137.9	210.9	0.0	4646.8
real rent(cpi)	Treated	13	1565	360.2	333.5	275.9	312.4	0.0	4137.9
construction									
floorarea (sqft)	Control	23	383	236.5	210.5	180.0	196.5	0.0	1500.0
floorarea (sqft)	Treated	23	71	268.1	213.3	220.0	235.7	0.0	900.0

Descriptive Statistics

	group	vars	n	mean	sd	median	trimmed	min	max
Δhousehold composition									
(last365days)									
stayduration_presentarea	Control	42	7869	20.5	16.6	16.0	18.5	0.0	99.0
stayduration_presentarea	Treated	42	3064	26.1	18.5	25.0	24.6	0.0	88.0
Overall Score									
QODDS1	Control		7284	8.10	3.80	8.00	7.90	0.00	22.00
QODDS2	Treated		11086	8.70	4.00	8.50	8.60	0.00	20.50
mean nighttime lights									
nl-t	Control	43	32938	19.2	21.0	7.9	16.1	0.0	63.0
nl-t	Treated	43	22172	7.0	4.7	6.2	6.4	0.3	49.0
nl-t-1	Control	44	32938	19.0	21.0	7.9	16.0	0.0	63.0
nl-t-1	Treated	44	22172	6.8	4.4	6.0	6.2	0.2	49.1

Identification & Results

Identification

Difference in Difference Model

$$y_{ijk} = \alpha + \beta T_i + \gamma D_{ijk} + \delta(T_i * D_{ijk}) + \chi z_i' + \eta r_j + a_{jk} + \mu_{ijk} \quad (3)$$

- $y_{ijk} \longrightarrow$ outcome variable
- $T_i \longrightarrow$ policy period [dummy]
- $D_{ijk} \longrightarrow$ treatment variable [dummy]
- $z_i' \longrightarrow$ household controls (e.g. slum type, social group etc.)
- $r_j \longrightarrow$ district controls (e.g. district GDP)
- state & year fixed effects $\surd$, clustered SE $\surd$

Policy Effect on Real Rents

	Dependent variable: Log Real Rents		
	(1)	(2)	(3)
Treated	-0.173***	-0.592***	-0.166***
	(0.058)	(0.061)	(0.062)
Time	1.278***	1.202***	1.291***
	(0.068)	(0.109)	(0.071)
Policy	0.182**	0.327***	0.196**
	(0.073)	(0.080)	(0.078)
Δ Mean Nightlights$_{t-1}$		0.0004	
		(0.0003)	
Slum type *(1=Legal)*			0.202***
			(0.041)
Constant	4.295***	4.391***	4.047***
	(0.072)	(0.075)	(0.094)
Observations	5,039	5,039	4,338
R^2	0.385	0.282	0.387

- $y_{ijk} \longrightarrow$ log real rents
- real rents:
- policy areas $\longrightarrow \Uparrow$ 19.6%
- legal slums $\longrightarrow \Uparrow$ 20.2%

Policy Effect on Tenure

	Dependent variable: Tenure	
	(1= Homeowner)	
	(1)	(2)
Treated	-0.078***	-0.078***
	(0.014)	(0.014)
Time	-0.178***	-0.178***
	(0.014)	(0.014)
Policy	0.167***	0.168***
	(0.016)	(0.016)
Slum type		0.038***
-0.118***		
(1=Legal)		(0.008)
Constant	0.672***	0.639***
	(0.017)	(0.018)
Observations	18,370	18,370

- $y_{ijk} \longrightarrow$ Tenurial Status [dummy]
- Probability to transition to homeownership:
- policy area $\longrightarrow \Uparrow$ 16.8 pp
- legal slum households $\longrightarrow \Uparrow$ 3.8 pp

Policy Effect on Gender of the Household Head & QODDS

- $y_{ijk} \longrightarrow$ Gender of household head [dummy]
- Females as household head $\longrightarrow \Uparrow$ 2.4 pp

- $y_{ijk} \longrightarrow$ Quality of Dwelling [score]
- quality of dwelling $\longrightarrow$ 8.5%
- bathroom, kitchen, flood status, approach road $\longrightarrow$ 1.2% - 9.3%
- legal slum households $\longrightarrow$ 23%

Robustness

Robustness

- State wise Policy Adoption $\surd$
  - 6 states $\longrightarrow$ stringent rent control reforms before JNNURM
  - Karnataka, Nagaland, Rajasthan, Manipur, Mizoram, Odisha
- real rents $\longrightarrow$ no effect

	Dependent variable: Log Real Rents		
	All States	*States before JNNURM*	*States in JNNURM*
	(1)	(2)	(3)
Treated	-0.506^{***}	0.212	-0.564^{***}
	(0.082)	(0.281)	(0.086)
Time	1.298^{***}	2.170^{***}	1.192^{***}
	(0.079)	(0.246)	(0.083)
Policy	0.355^{***}	-0.490	0.435^{***}
	(0.094)	(0.301)	(0.099)
Constant	4.247^{***}	3.717^{***}	4.294^{***}
	(0.073)	(0.235)	(0.077)
Observations	5,039	598	4,441
R^2	0.250	0.243	0.244

Conclusions

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The nation wide urban slum housing policy:

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- Slum households are more probable to be homeowners..
- Partial improvement in quality of dwelling..
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$\tau h \alpha \eta \kappa \ \gamma \theta \mu$!!

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Appendix

Districts

Figure: Growth rate Nighttime Light Distribution of Districts in India

Rents Distribution

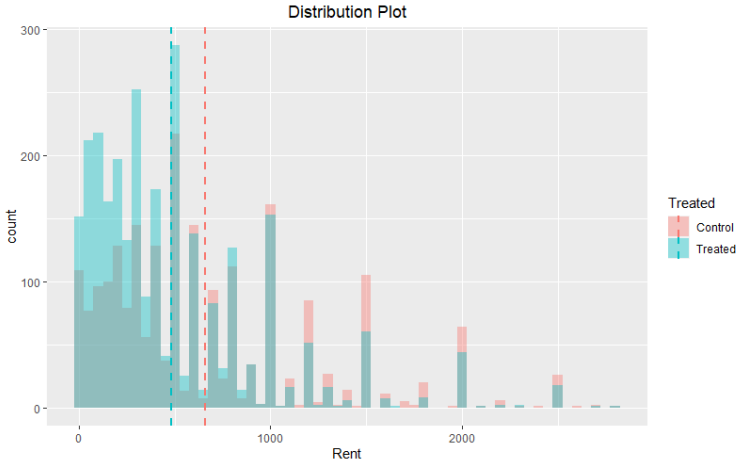

Figure: Rental Expenditure for Slum Households

Parallel Trends

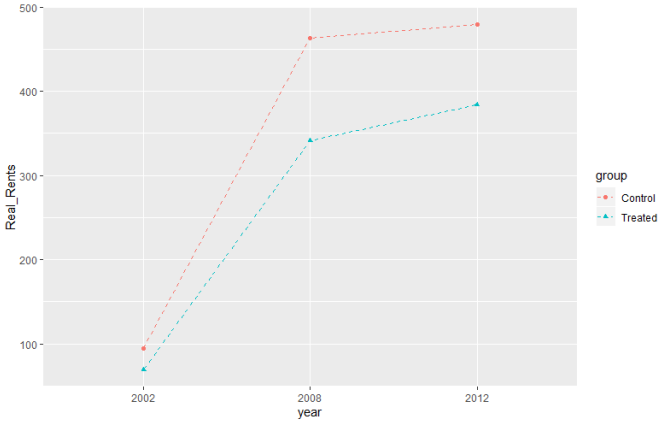

Figure: Average Real Rents: By Treatment Status

Policy Effect on Quality of Dwelling: Individual Characteristics

	Quality of Dwelling Deprivation Score[1]				
	Source of drinking water	*Bathroom*	*Toilette*	*Electric wire*	*Drainage*
	(1)	(2)	(3)	(4)	(5)
Treated	-0.090***	0.054***	-0.041***	-0.033***	-0.010
	(0.011)	(0.013)	(0.011)	(0.008)	(0.008)
Time	-0.020*	-0.107***	-0.076***	-0.128***	-0.162***
	(0.011)	(0.013)	(0.011)	(0.008)	(0.008)
Policy	0.088***	-0.050***	0.069***	0.080***	0.115***
	(0.012)	(0.015)	(0.013)	(0.009)	(0.009)
Slum type *(1=Legal)*	-0.044***	-0.116***	-0.030***	-0.053***	-0.125***
	(0.005)	(0.007)	(0.005)	(0.004)	(0.004)
Constant	0.318***	0.791***	0.161***	0.340***	0.557***
	(0.014)	(0.016)	(0.012)	(0.010)	(0.010)
Observations	18,368	18,369	12,832	16,663	18,369
R^2	0.145	0.112	0.139	0.201	0.172

Policy Effect on Quality of Dwelling: Individual Characteristics

	Quality of Dwelling Deprivation Score[1]				
	Garbage disposal	*Flooded*	*Approach road*	*Ventillation*	*Floor*
	(1)	(2)	(3)	(4)	(5)
Treated	-0.067***	0.007	0.042***	-0.0002	-0.043***
	(0.010)	(0.007)	(0.012)	(0.012)	(0.014)
Time	-0.011	0.040***	-0.041***	-0.058***	-0.115***
	(0.010)	(0.007)	(0.012)	(0.012)	(0.013)
Policy	0.115***	-0.093***	-0.039***	-0.012	0.116***
	(0.011)	(0.008)	(0.014)	(0.013)	(0.016)
Slum type	-0.112***	-0.030***	-0.092***	-0.065***	-0.081***
(1=Legal)	(0.005)	(0.004)	(0.006)	(0.006)	(0.007)
Constant	0.299***	0.096***	0.326***	0.722***	0.285***
	(0.012)	(0.009)	(0.014)	(0.015)	(0.015)
Observations	18,368	18,367	18,366	18,365	18,367
R^2	0.178	0.102	0.116	0.073	0.114

Policy Effect on Quality of Dwelling: Individual Characteristics

	Quality of Dwelling Deprivation Score[1]				
	Wall	*Roof*	*Structure condt.*	*Structue type*	*Kitchen*
	(1)	(2)	(3)	(4)	(5)
Treated	0.027**	0.006	-0.023*	-0.027	0.004
	(0.012)	(0.010)	(0.012)	(0.044)	(0.006)
Time	-0.079***	-0.098***	-0.056***	-0.041	-0.038***
	(0.011)	(0.010)	(0.012)	(0.050)	(0.006)
Policy	0.042***	0.026**	0.005	-0.016	-0.012*
	(0.013)	(0.011)	(0.014)	(0.063)	(0.007)
Slum type	-0.100***	-0.108***	-0.099***	-0.174***	-0.024***
(1=Legal)	(0.006)	(0.005)	(0.006)	(0.029)	(0.003)
Constant	0.242***	0.422***	0.474***	0.454***	0.560***
	(0.013)	(0.013)	(0.015)	(0.058)	(0.008)
Observations	18,369	18,368	18,366	925	18,364
R^2	0.112	0.110	0.106	0.172	0.079