

# **Is India's manufacturing sector moving out of cities?**

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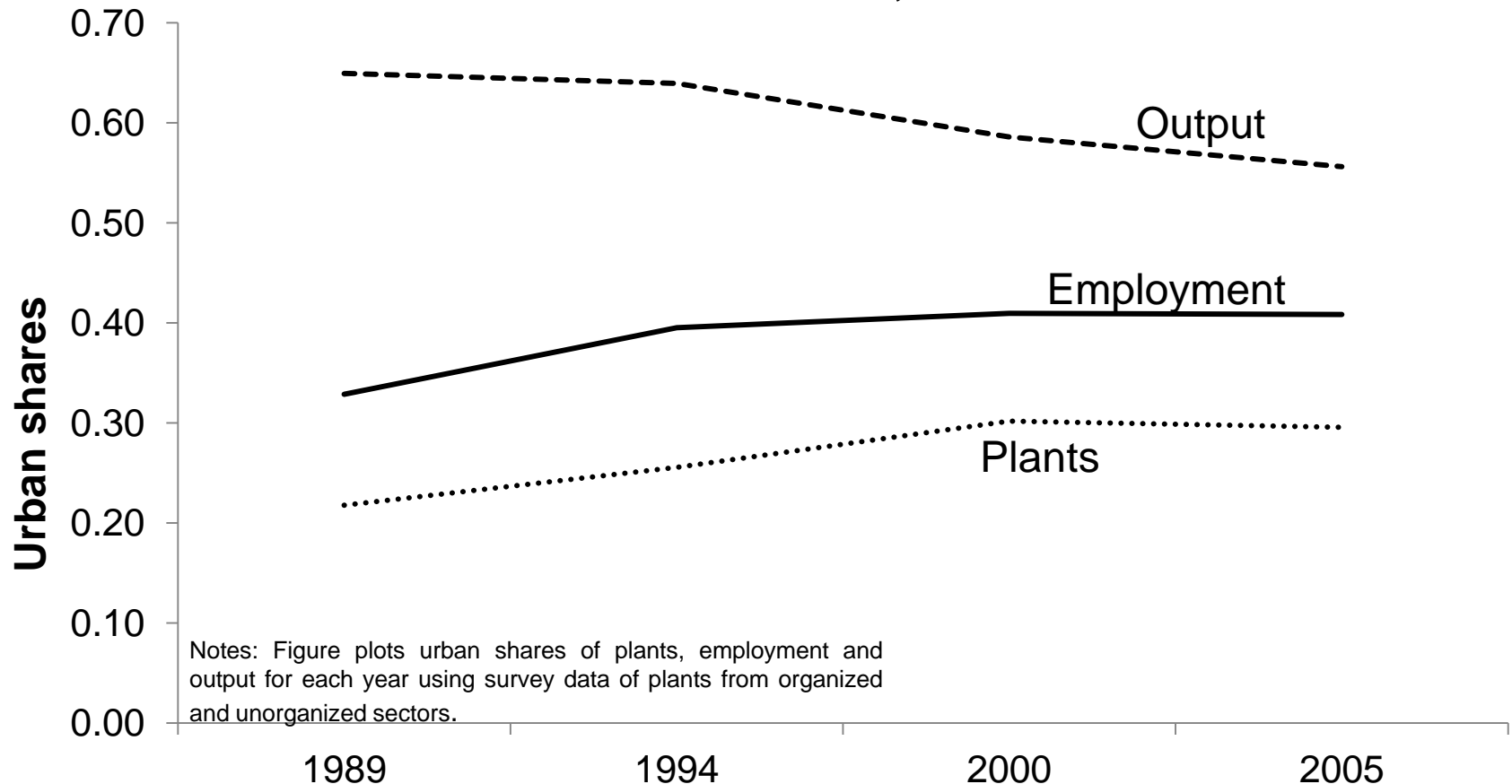
# An Outline

- Nearly two billion people are expected to move from rural areas into cities within developing countries. *Given the great challenges ahead, we look backward at India's urbanization experience.*
- Is urbanization of formal and informal manufacturing sectors behaving differently in India?
- What are the traits of districts that have successfully urbanized?
- Has the spatial allocation of plants across urban and rural areas improved? Is urbanization associated with more efficient allocation of industry?
- What can policy makers do to make urbanization more inclusive?

*This presentation is based on my NBER Working paper, co-authored with William Kerr and Stephen D O'Connell. Views expressed are those of the authors.*

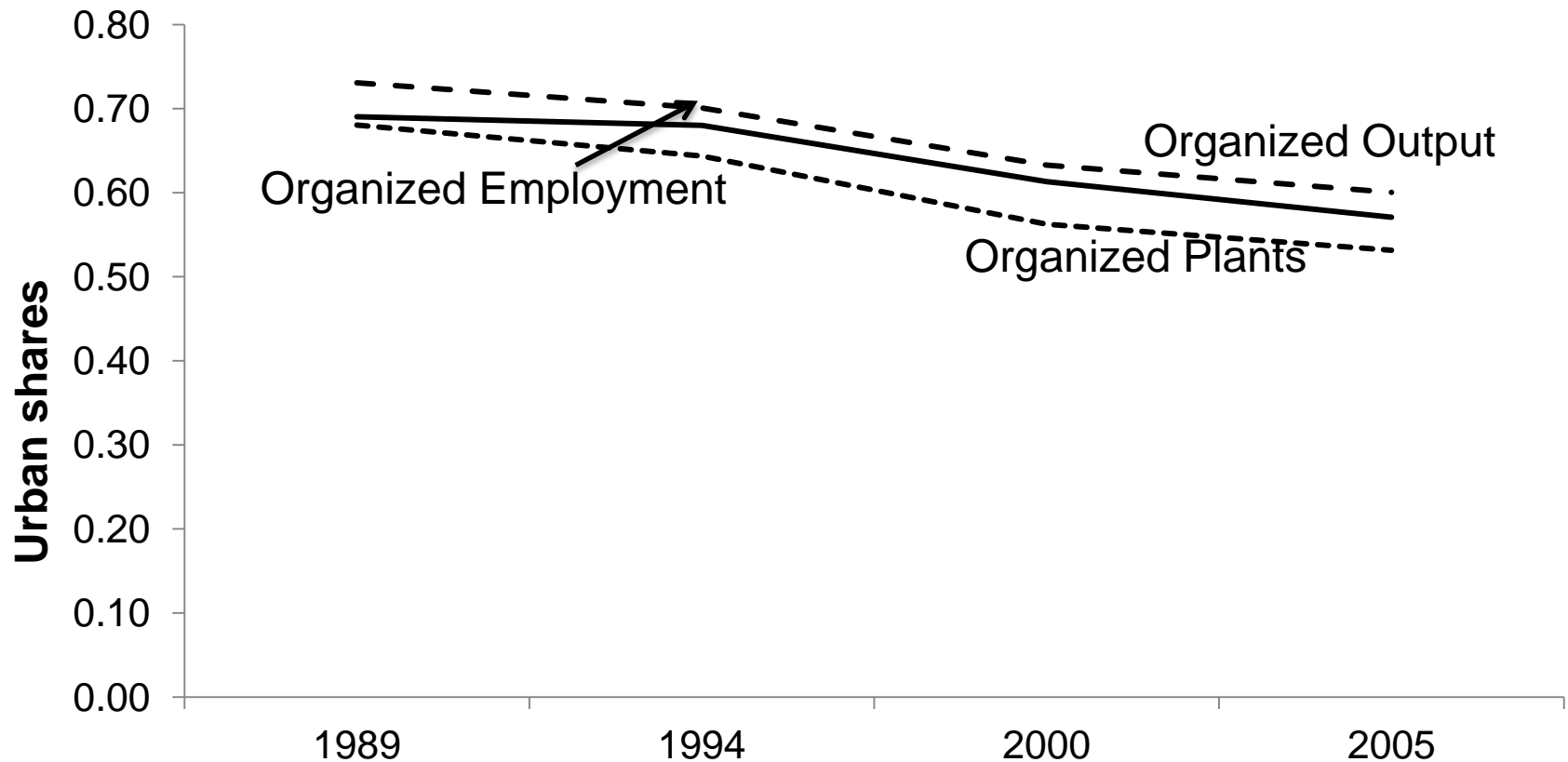
India's manufacturing sector has become more urbanized. Share of urban workers increased from 33% of employees in 1989 to 41% in 2005. Urbanization growth was dramatic from 1989 to 1994, but it has slowed down .

## India's urban shares, 1989-2005



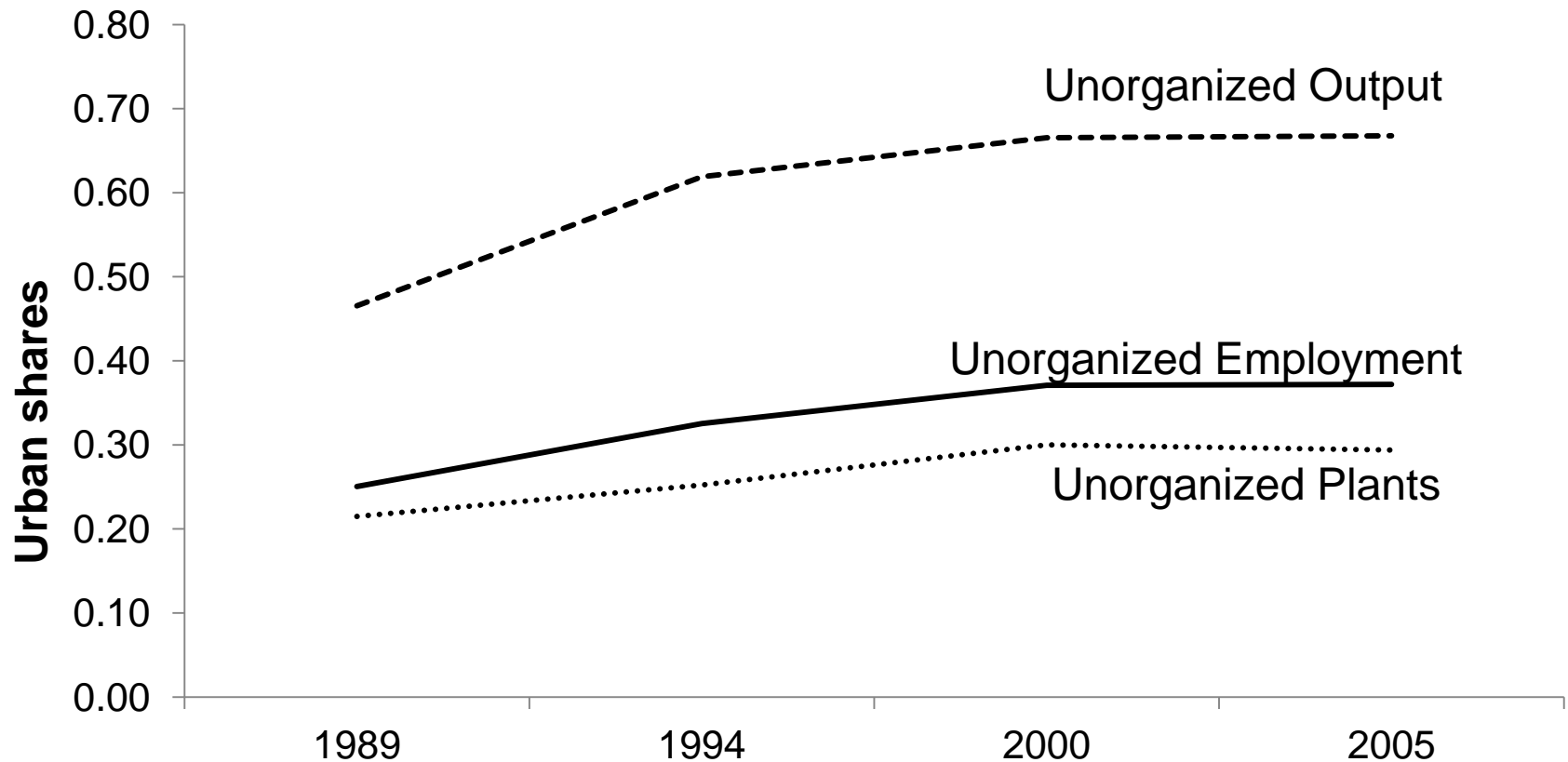
**Organized manufacturing is moving from urban to rural locations, with the urban employment share declining from 69% in 1989 to 57% in 2005.  
Organized sector accounts for 80% of output in India's manufacturing sector**

## Urban shares in organized sector



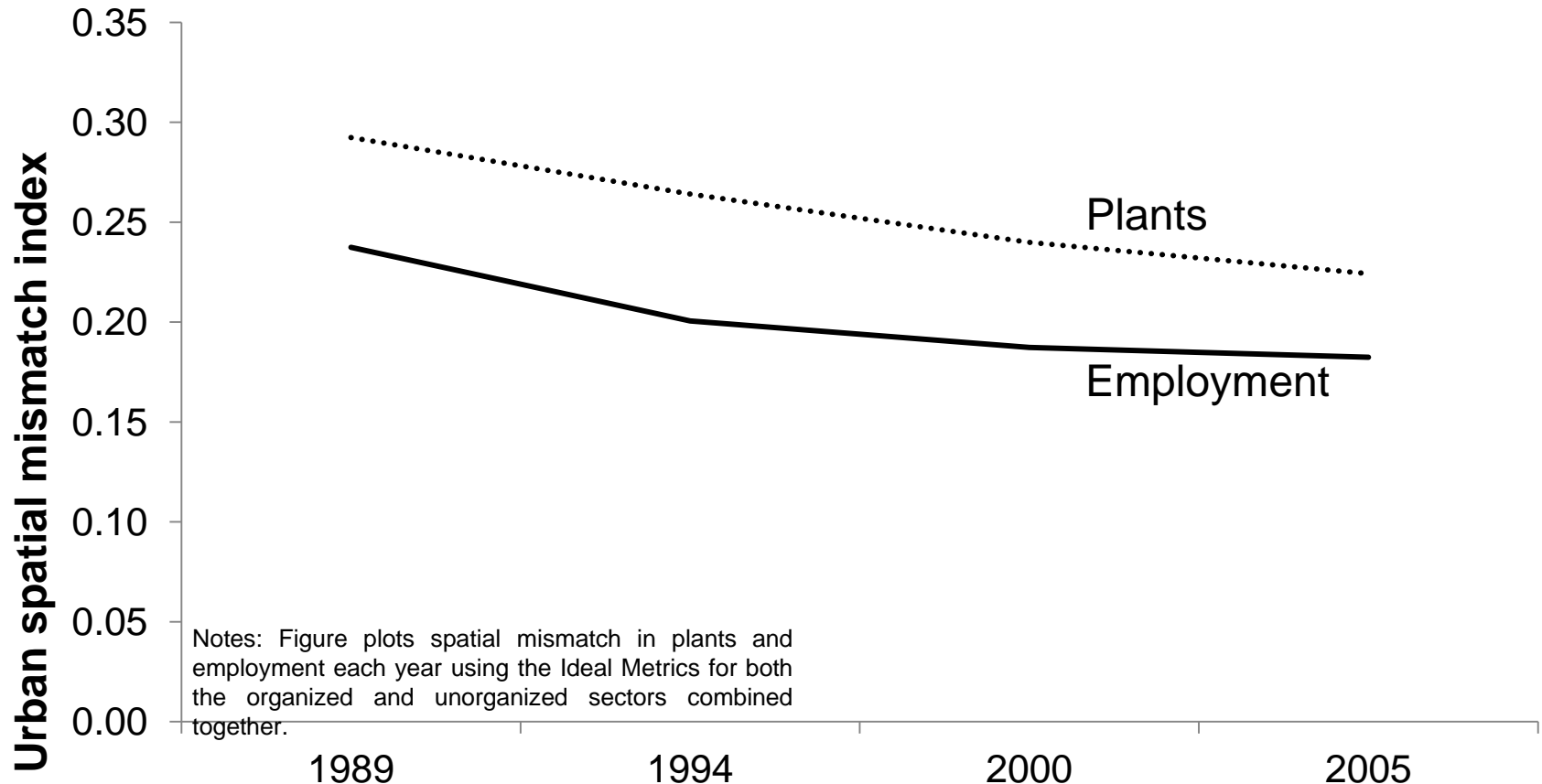
On the other hand, the unorganized sector is moving from rural to urban areas, with its urban share of employment increasing from 25% to 37%. Unorganized sector accounts for 80% of employment in India's manufacturing sector

## Urban shares in unorganized sector



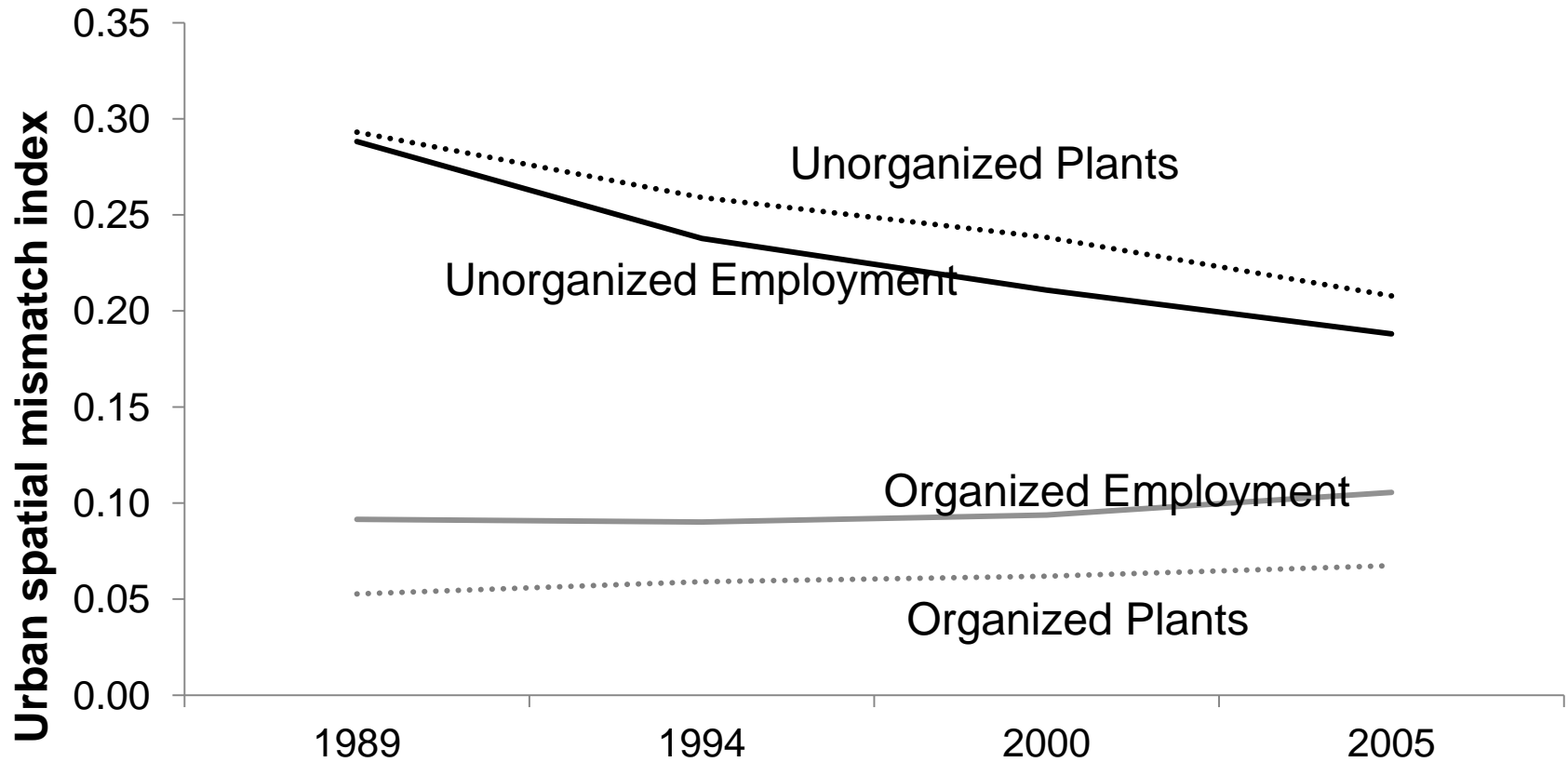
**Encouragingly, there has been an aggregate decline in spatial mismatch. Urbanization shifts associated with better education and infrastructure have also improved the spatial allocation of industry**

## **India's spatial mismatch, 1989-2005**

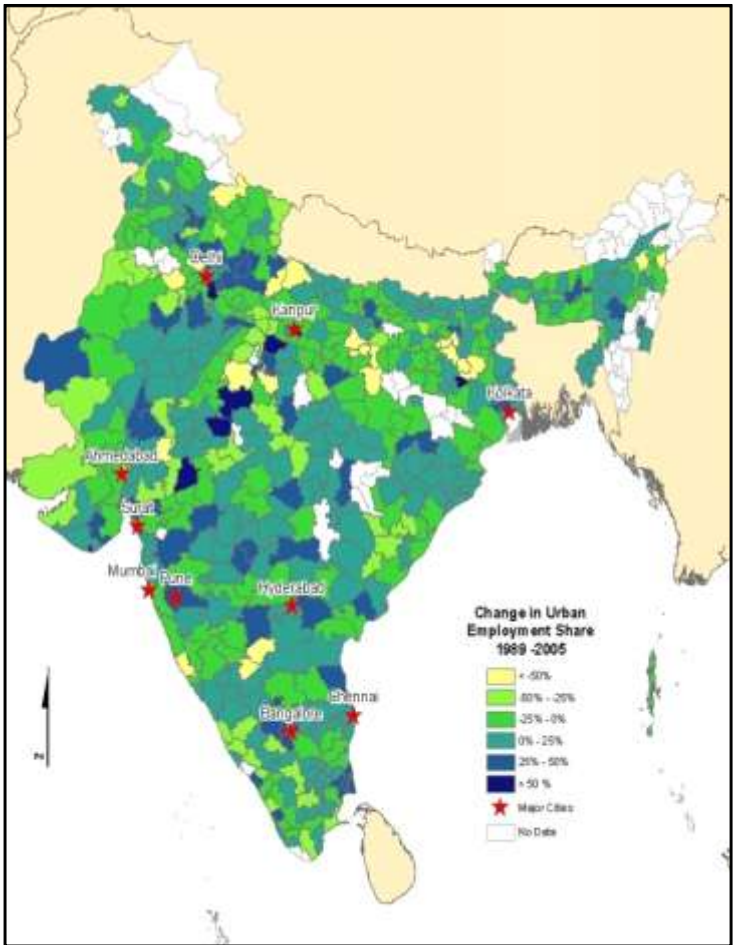
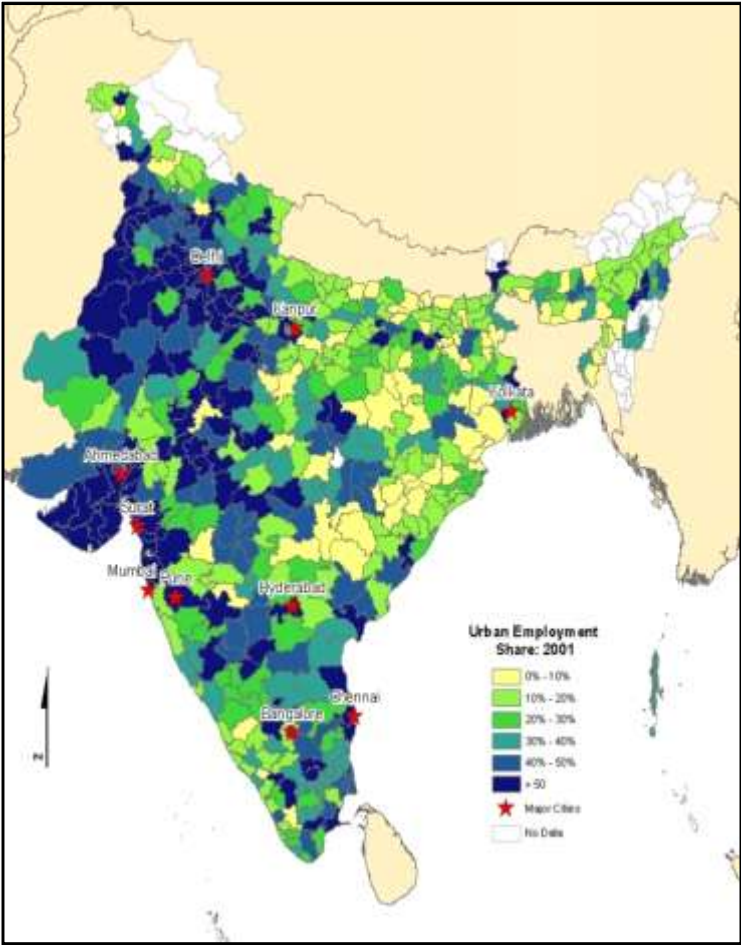


**Improvements in spatial location mismatch is primarily driven by improved allocation of the unorganized sector**

### **Spatial mismatch by sectors**



**Fig. 3a: India's manufacturing urbanization by district**





# Data and Definitions

- Organized and unorganized sectors. Definition has not changed
- ASI data for organized sector data and NSS for unorganized sector.
- Definition of urban has been mostly stable since the 1961 Census. Some reclassification but minor.
- India uses a more demanding definition of urban than USA.

**Urbanization of manufacturing is concentrated in a few States.  
Only 8 of the 17 States and 7 of the 22 industries exhibit an  
increase in urbanization**

- Most urbanized states in terms of manufacturing employment are Delhi and Chandigarh at over 90% in 2000.
- Gujarat, Haryana, Maharashtra and Punjab are above 60%. These states account for 35% of urban employment and 47% of urban output for India in 2000.
- Larger states of Bihar, Orissa, Uttar Pradesh and West Bengal have below average urbanization rates of less than 20% for manufacturing employment.

# Urbanization of manufacturing are concentrated in a few states

State	Total establishment counts			Urbanization rate establishments			Urbanization rate employment			Urbanization rate output		
	1994	2000	2005	1994	2000	2005	1994	2000	2005	1994	2000	2005
Andhra Pradesh	748,360	1,469,307	1,437,720	0.25	0.27	0.30	0.40	0.38	0.38	0.56	0.46	0.43
Bihar	1,053,839	1,250,688	1,307,078	0.11	0.13	0.12	0.18	0.17	0.16	0.56	0.52	0.56
Chandigarh	3,906	6,046	1,534	0.93	0.89	0.54	0.95	0.94	0.85	0.96	0.97	0.98
Delhi	131,842	230,598	99,712	0.81	0.95	0.96	0.87	0.97	0.97	0.98	0.97	0.94
Gujarat	551,254	545,122	647,845	0.63	0.55	0.54	0.70	0.62	0.61	0.68	0.58	0.56
Haryana	90,898	189,548	227,445	0.41	0.49	0.49	0.62	0.66	0.65	0.71	0.74	0.67
Himachal Pradesh	80,096	94,708	102,682	0.10	0.08	0.07	0.16	0.17	0.18	0.29	0.30	0.35
Karnataka	526,997	1,032,334	942,142	0.25	0.34	0.31	0.36	0.42	0.41	0.70	0.64	0.66
Kerala	237,391	481,157	572,320	0.18	0.18	0.23	0.27	0.23	0.27	0.41	0.39	0.41
Madhya Pradesh	463,195	957,108	1,019,022	0.25	0.28	0.32	0.41	0.36	0.38	0.68	0.55	0.60
Maharashtra	629,357	1,223,468	1,116,648	0.50	0.46	0.51	0.66	0.61	0.64	0.71	0.68	0.60
Orissa	1,078,820	955,560	831,287	0.04	0.06	0.10	0.07	0.09	0.13	0.37	0.43	0.38
Punjab	151,520	331,683	290,789	0.54	0.46	0.50	0.72	0.65	0.64	0.80	0.71	0.68
Rajasthan	343,140	599,027	608,407	0.32	0.37	0.36	0.44	0.46	0.51	0.64	0.58	0.65
Tamil Nadu	943,138	1,463,466	1,465,806	0.42	0.45	0.42	0.49	0.51	0.48	0.57	0.52	0.47
Uttar Pradesh	1,894,046	2,302,322	2,257,163	0.24	0.29	0.29	0.30	0.37	0.39	0.53	0.59	0.59
West Bengal	1,628,708	2,733,376	2,694,214	0.17	0.23	0.20	0.30	0.30	0.29	0.69	0.63	0.63
Totals and wtd averages	10,928,081	16,517,785	16,307,628	0.26	0.30	0.30	0.40	0.41	0.41	0.64	0.59	0.56
Unweighted averages	620,971	933,266	918,930	0.36	0.38	0.37	0.47	0.47	0.47	0.64	0.60	0.60

Notes: Indian descriptive statistics taken from Annual Survey of Industries and National Sample Statistics. Totals and weighted averages at the bottom of the table are for the full manufacturing sector, including states and industries not in the final sample. Urbanization rate in establishments is measured as the share of establishments in urban areas. Urbanization rates for employment and output are similarly defined.

# Some industries are more urbanized

- Office, accounting and computing machinery; Publishing, printing and media; Medical, precision and optical instruments; and Watches are most urbanized
- Least urbanized are wood and wood products; tobacco products; and food products.
- Major increases in urbanization of employment are in textile, leather tanning, luggage, handbags and footwear.

# Some industries are more urbanized, two digit NIC industry combining organized and unorganized sectors

Table 3a: Industry-level urbanization rates for India's manufacturing sector

	Total establishment counts			Urbanization rate establishments			Urbanization rate employment		
	1994	2000	2005	1994	2000	2005	1994	2000	2005
	15 Food products and beverages	2,391,234	2,962,970	2,572,043	0.19	0.22	0.20	0.24	0.27
16 Tobacco products	1,004,510	2,062,543	2,753,644	0.20	0.22	0.17	0.32	0.28	0.24
17 Textiles	1,971,821	2,239,348	2,312,117	0.24	0.31	0.32	0.37	0.42	0.45
18 Wearing apparel; dressing and dyeing of fur	90,952	2,785,199	3,158,538	0.67	0.40	0.40	0.85	0.52	0.52
19 Leather tanning; luggage, handbags, footwear	190,786	171,759	144,328	0.44	0.49	0.74	0.63	0.68	0.80
20 Wood and wood products; straw and plating	1,957,120	2,720,752	1,895,690	0.15	0.13	0.11	0.20	0.16	0.15
21 Paper and paper products	63,172	90,214	165,652	0.59	0.70	0.38	0.60	0.66	0.47
22 Publishing, printing and media reproduction	105,479	144,293	116,764	0.76	0.84	0.86	0.84	0.88	0.87
23 Coke, refined petroleum and nuclear fuel	5,075	7,429	6,435	0.48	0.27	0.20	0.48	0.43	0.34
24 Chemicals and chemical products	98,048	216,410	401,055	0.44	0.51	0.29	0.60	0.53	0.42
25 Rubber and plastic products	74,771	95,352	74,108	0.76	0.65	0.67	0.81	0.69	0.61
26 Other non-metallic mineral products	686,560	784,551	606,049	0.15	0.16	0.17	0.22	0.22	0.22
27 Basic metals	38,086	43,127	39,461	0.80	0.65	0.62	0.74	0.70	0.57
28 Fabricated metal products, except machinery	422,420	640,256	616,937	0.44	0.43	0.41	0.64	0.61	0.60
29 Machinery and equipment, n.e.c.	319,227	171,138	178,220	0.33	0.53	0.61	0.63	0.73	0.76
30 Office, accounting and computing machinery	498	303	931	0.95	0.94	0.91	0.77	0.88	0.86
31 Electrical machinery and apparatus, n.e.c.	29,495	67,896	112,788	0.67	0.66	0.54	0.83	0.79	0.66
32 Radio, television, and comm. equipment	7,355	7,589	5,863	0.75	0.84	0.71	0.76	0.79	0.70
33 Medical, precision and optical instruments,	11,715	9,190	10,283	0.96	0.82	0.85	0.82	0.80	0.77
34 Motor vehicles, trailers and semi-trailers	6,924	24,186	16,664	0.65	0.84	0.63	0.84	0.77	0.60
35 Other transport equipment	22,955	17,495	26,002	0.76	0.70	0.78	0.82	0.77	0.76
36 Furniture, manufacturing n.e.c.	1,429,878	1,255,784	1,094,058	0.38	0.54	0.54	0.47	0.60	0.62
Totals and wtd averages	10,928,081	16,517,785	16,307,628	0.26	0.30	0.30	0.40	0.41	0.41
Unweighted averages	496,731	750,808	741,256	0.52	0.53	0.50	0.60	0.59	0.55

# Plants in urban areas employ more labor and less land and capital than plants in rural areas.

	Urbanization rate			Industry traits in 2000				Urban-rural ratio in 2000			
	1994	output 2000	2005	Labor intensity	Capital intensity	Materials intensity	Land intensity	Labor intensity	Capital intensity	Materials intensity	Land intensity
15 Food products and beverages	0.48	0.45	0.45	0.040	0.239	0.808	0.045	0.884	0.606	1.024	0.603
16 Tobacco products	0.72	0.62	0.60	0.084	0.112	0.515	0.027	1.903	1.227	0.826	1.198
17 Textiles	0.60	0.53	0.49	0.067	0.475	0.736	0.084	2.090	0.777	0.921	1.119
18 Wearing apparel; dressing and dyeing of fur	0.96	0.81	0.80	0.063	0.219	0.602	0.045	0.606	0.319	0.919	0.405
19 Leather tanning; luggage, handbags, footwear	0.70	0.72	0.78	0.047	0.179	0.773	0.044	1.487	1.460	0.987	1.343
20 Wood and wood products; straw and plating	0.55	0.45	0.39	0.063	0.369	0.759	0.051	0.987	0.460	0.969	0.539
21 Paper and paper products	0.52	0.48	0.42	0.058	0.659	0.730	0.087	1.335	0.657	0.969	0.701
22 Publishing, printing and media reproduction	0.93	0.86	0.84	0.078	0.441	0.591	0.068	2.168	0.289	1.069	0.178
23 Coke, refined petroleum and nuclear fuel	0.67	0.60	0.47	0.052	0.378	0.796	0.037	1.296	1.018	0.963	0.755
24 Chemicals and chemical products	0.66	0.57	0.53	0.052	0.528	0.670	0.064	1.392	0.849	1.003	0.866
25 Rubber and plastic products	0.71	0.53	0.48	0.048	0.469	0.712	0.064	1.716	0.816	1.034	1.005
26 Other non-metallic mineral products	0.40	0.36	0.35	0.066	0.931	0.619	0.119	1.468	0.690	1.055	0.691
27 Basic metals	0.65	0.60	0.51	0.046	0.410	0.809	0.058	1.529	0.810	1.006	0.850
28 Fabricated metal products, except machinery	0.85	0.69	0.69	0.076	0.300	0.717	0.041	1.741	0.681	0.925	0.704
29 Machinery and equipment, n.e.c.	0.83	0.72	0.72	0.096	0.314	0.654	0.065	1.447	0.642	1.003	0.602
30 Office, accounting and computing machinery	0.71	0.84	0.76	0.035	0.403	0.755	0.034	1.830	3.293	1.255	0.988
31 Electrical machinery and apparatus, n.e.c.	0.84	0.88	0.66	0.096	0.348	0.704	0.067	1.966	0.823	0.974	0.918
32 Radio, television, and comm. equipment	0.61	0.67	0.60	0.065	0.412	0.718	0.049	1.650	0.676	1.084	0.876
33 Medical, precision and optical instruments,	0.73	0.72	0.76	0.110	0.350	0.591	0.074	1.460	0.873	1.349	1.000
34 Motor vehicles, trailers and semi-trailers	0.83	0.65	0.53	0.075	0.594	0.680	0.079	1.532	0.905	0.945	0.553
35 Other transport equipment	0.65	0.62	0.55	0.072	0.291	0.759	0.065	1.952	0.816	0.962	0.944
36 Furniture, manufacturing n.e.c.	0.78	0.77	0.83	0.055	0.189	0.730	0.039	0.989	0.552	1.017	0.607
Totals and wtd averages	0.64	0.59	0.56								
Unweighted averages	0.70	0.64	0.60	0.07	0.39	0.70	0.06	1.52	0.87	1.01	0.79

# Decompositions of urban share changes, 1994-2005

- Within-district and between-districts components operate in the same direction.
- For organized sector, both components serve to reduce the urbanization rate
- For the unorganized sector, both components serve to increase the urbanization rate.
- For organized sector, within-district component is larger than the between-district component.
- Rapidly growing districts experienced relative declines in manufacturing urbanization levels. Urbanization growth was highest in those districts that were growing their manufacturing base less than the national average.
- Within district component capture the majority of urbanization changes.

# Decompositions of urban share changes, 1994-2005

	Total Activity			Organized Sector			Unorganized Sector		
	Plants	Employ.	Output	Plants	Employ.	Output	Plants	Employ.	Output
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A. Sector change in urbanization level using balanced panel									
Urban share start	0.247	0.376	0.615	0.688	0.667	0.620	0.239	0.302	0.565
Urban share ending	0.289	0.395	0.528	0.595	0.567	0.514	0.279	0.347	0.589
Urban share change	0.042	0.019	-0.087	-0.093	-0.100	-0.106	0.041	0.045	0.024
B. Decomposition: Bailey et al. (1992)									
Within-district component	0.045	0.022	-0.074	-0.095	-0.086	-0.091	0.047	0.057	0.010
Between-district component	0.030	0.029	-0.001	-0.014	-0.009	-0.001	0.024	0.014	-0.016
Covariance term	-0.033	-0.032	-0.011	0.015	-0.005	-0.014	-0.030	-0.025	0.030
Total	0.042	0.019	-0.087	-0.093	-0.100	-0.106	0.041	0.045	0.024
C. Decomposition: Griliches and Rejev (1995)									
Within-district component	0.029	0.006	-0.080	-0.087	-0.089	-0.098	0.032	0.044	0.025
Between-district component	0.013	0.013	-0.007	-0.006	-0.012	-0.008	0.009	0.001	-0.001
Total	0.042	0.019	-0.087	-0.093	-0.100	-0.106	0.041	0.045	0.024



# Urbanization of districts

- Highly urbanized areas like Delhi have limited potential to further urbanize. There is strong unconditional convergence, where higher initial urban shares for district-industries experiences lower urbanization.
- Districts with more educated workforce experienced increased urbanization.
- Districts with better infrastructure experienced increased urbanization.
- Higher costs, or sharper differences in urban-rural wage levels, decrease the pace of urbanization.
- These effects are most pronounced in the unorganized sector.
- District land area and urban population are not important.
- Higher build-up area is strongly associated with increased urbanization.
- Cost factors in real estate market may also be present in labor markets

# Urbanization changes in the manufacturing sector

DV: Change in urbanization share for total district-industry employment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Initial urban share	-0.693+++ (0.031)	-0.743+++ (0.029)	-0.689+++ (0.030)	-0.739+++ (0.029)	-0.694+++ (0.030)	-0.741+++ (0.029)	-0.711+++ (0.029)	-0.754+++ (0.029)	-0.692+++ (0.030)	-0.741+++ (0.029)
Education level	0.055+++ (0.010)	0.059+++ (0.011)	0.056+++ (0.009)	0.062+++ (0.011)	0.057+++ (0.010)	0.060+++ (0.012)	0.044+++ (0.012)	0.041+++ (0.013)	0.057+++ (0.010)	0.059+++ (0.012)
Infrastructure level index	0.030+++ (0.011)	0.042++ (0.019)	0.027++ (0.011)	0.039++ (0.019)	0.026++ (0.011)	0.036+ (0.019)	0.020+ (0.011)	0.019 (0.019)	0.022+ (0.012)	0.036+ (0.020)
Log average wage			-0.020 (0.015)	-0.031++ (0.014)	-0.019 (0.014)	-0.031++ (0.014)	-0.023 (0.014)	-0.035++ (0.014)	-0.026+ (0.016)	-0.040++ (0.016)
Urban/rural wage ratio			-0.021+ (0.011)	-0.015 (0.010)	-0.020+ (0.011)	-0.016 (0.010)	-0.021+ (0.011)	-0.015 (0.010)	-0.019+ (0.011)	-0.014 (0.010)
Log total district land area					0.007 (0.014)	-0.013 (0.016)	0.017 (0.014)	0.002 (0.017)	0.009 (0.014)	-0.012 (0.016)
Change in urban population					0.235 (0.219)	-0.019 (0.203)	0.194 (0.186)	0.067 (0.189)	0.238 (0.212)	-0.016 (0.199)
Urban build-up [50th,75th]							0.033 (0.024)	0.046++ (0.022)		
Urban build-up [75th,100th]							0.082+++ (0.027)	0.100+++ (0.028)		
Log land use intensity									0.017 (0.011)	0.019+ (0.011)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Number of observations	1700	1700	1700	1700	1700	1700	1700	1700	1700	1700
Adjusted R-squared	0.353	0.381	0.357	0.385	0.358	0.385	0.364	0.391	0.359	0.386

# What explains substantial flattening of urbanization?

- While the secular trend for India's manufacturing urbanization has slowed, the localized importance of education and infrastructure has not.
- Reforms in the early period contributed to a pent-up sorting to move to cheaper locations within districts.
- As this process worked out, general district wage rates became more important.
- Other district traits like distance to a large city, household banking, demographic trends, and import penetration are not that important to urbanization of manufacturing.

# What explains slowing trend in urbanization?

DV: Change in urbanization share for total district-industry employment

	Base estimation		1994-2000 period		2000-2005 period		1989-2005 period	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Initial urban share	-0.694+++ (0.030)	-0.741+++ (0.029)	-0.681+++ (0.028)	-0.728+++ (0.026)	-0.644+++ (0.028)	-0.695+++ (0.028)	-0.801+++ (0.034)	-0.869+++ (0.033)
Education level	0.057+++ (0.010)	0.060+++ (0.012)	0.042+++ (0.010)	0.034+++ (0.012)	0.061+++ (0.010)	0.067+++ (0.013)	0.070+++ (0.013)	0.073+++ (0.015)
Infrastructure level index	0.026++ (0.011)	0.036+ (0.019)	0.029+++ (0.009)	0.032 (0.020)	0.025++ (0.011)	0.030 (0.019)	0.033+++ (0.012)	0.024 (0.023)
Log average wage	-0.019 (0.014)	-0.031++ (0.014)	0.025+ (0.014)	0.011 (0.014)	-0.027+ (0.015)	-0.035++ (0.016)	-0.018 (0.019)	-0.039+ (0.020)
Urban/rural wage ratio	-0.020+ (0.011)	-0.016 (0.010)	-0.023+++ (0.009)	-0.019++ (0.008)	-0.008 (0.009)	-0.005 (0.009)	-0.021++ (0.010)	-0.015 (0.010)
Log total district land area	0.007 (0.014)	-0.013 (0.016)	0.007 (0.015)	-0.027 (0.019)	0.011 (0.013)	-0.007 (0.016)	0.002 (0.015)	-0.039++ (0.018)
Change in urban population	0.235 (0.219)	-0.019 (0.203)	-0.080 (0.200)	-0.283 (0.215)	0.367+ (0.200)	0.097 (0.183)	0.624++ (0.309)	0.317 (0.289)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	No	Yes	No	Yes	No	Yes	No	Yes
Observations	1700	1700	1700	1700	1700	1700	1276	1276
Adjusted R-squared	0.358	0.385	0.369	0.400	0.313	0.337	0.430	0.462

Notes: See Table 5.

# Interaction of District traits and industry traits

- Land and capital intensive industries may be urbanizing less in districts with more educated workforce, but the results are weak.
- Land and capital intensive industries urbanized less in districts with better infrastructure.
- Industries with high capital and land intensity are more likely to locate in rural areas in districts with strong education and infrastructure levels.
- Most of the district traits mostly act similarly across industries.

# District-Industry Interaction. How sensitive are industries to district traits?

DV: Change in urbanization share for district-industry

	Plants			Employment			Output		
	1994-2005	1994-2000	2000-2005	1994-2005	1994-2000	2000-2005	1994-2005	1994-2000	2000-2005
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A. Estimations using industry land intensity									
Initial urban share	-0.824+++ (0.033)	-0.840+++ (0.031)	-0.777+++ (0.032)	-0.811+++ (0.034)	-0.811+++ (0.030)	-0.739+++ (0.035)	-0.730+++ (0.031)	-0.814+++ (0.029)	-0.761+++ (0.031)
Education level x Industry land intensity	-0.021 (0.019)	-0.026+ (0.015)	-0.015 (0.019)	-0.026 (0.018)	-0.020 (0.014)	-0.018 (0.019)	-0.028 (0.023)	-0.007 (0.019)	-0.019 (0.023)
Infrastructure level index x Industry land intensity	-0.036++ (0.016)	-0.042+++ (0.016)	-0.030+ (0.016)	-0.022 (0.015)	-0.039+++ (0.014)	-0.016 (0.015)	-0.022 (0.018)	-0.035++ (0.017)	-0.012 (0.019)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.428	0.490	0.399	0.445	0.486	0.406	0.418	0.451	0.433
B. Estimations using industry capital intensity									
Initial urban share	-0.824+++ (0.034)	-0.839+++ (0.031)	-0.776+++ (0.032)	-0.810+++ (0.034)	-0.809+++ (0.030)	-0.739+++ (0.035)	-0.731+++ (0.031)	-0.817+++ (0.029)	-0.761+++ (0.031)
Education level x Industry capital intensity	-0.026 (0.016)	-0.025 (0.016)	-0.018 (0.016)	-0.022 (0.017)	-0.029+ (0.015)	-0.012 (0.017)	-0.016 (0.020)	0.000 (0.017)	-0.008 (0.020)
Infrastructure level index x Industry capital intensity	-0.025+ (0.015)	-0.026+ (0.015)	-0.025+ (0.015)	-0.015 (0.015)	-0.024+ (0.013)	-0.014 (0.015)	-0.007 (0.018)	-0.027 (0.019)	-0.004 (0.018)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.428	0.489	0.399	0.444	0.486	0.406	0.417	0.451	0.432

# Has urbanization improved allocation of industry across urban and rural areas?

- Districts with large initial spatial mismatch tend to decrease the mismatch over time.
- Spatial mismatch metric declines as urbanization increases.
- Districts with more educated workforce show stronger declines in spatial mismatch.
- Infrastructure is also associated with reduced mismatch but not strong. Cost factors not significant.
- Urbanization process in India linked to education and perhaps infrastructure is improving spatial industry allocation.

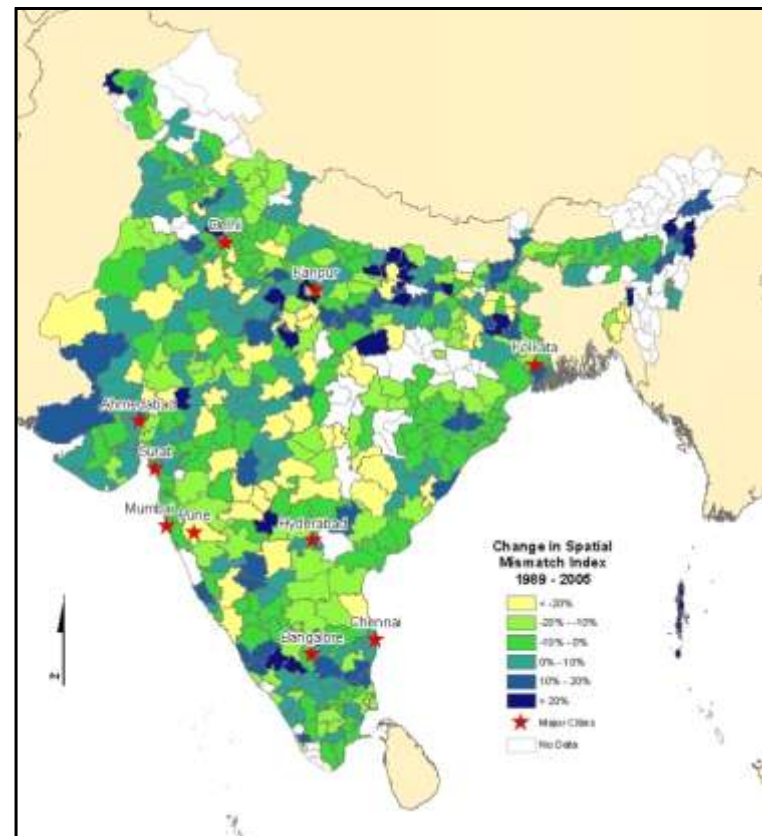
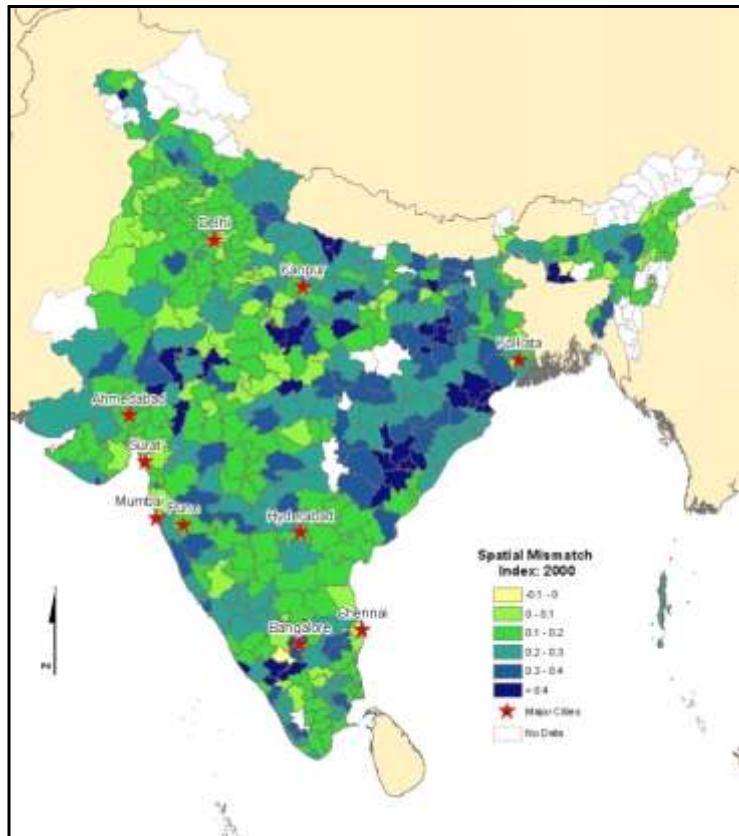
# Urbanization and Spatial Mismatch

DV: Change in urban spatial mismatch for district employment

	Total employment, 1994-2005		Organized sector, 1994-2005		Unorganized sector, 1994-2005		Total employment, 1994-2000		Total employment, 2000-2005	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Initial urban spatial mismatch	-0.688+++ (0.057)	-0.738+++ (0.060)	-0.343+++ (0.063)	-0.404+++ (0.070)	-0.789+++ (0.057)	-0.819+++ (0.060)	-0.708+++ (0.050)	-0.764+++ (0.056)	-0.617+++ (0.090)	-0.698+++ (0.094)
Change in urban share	-0.172+++ (0.036)	-0.169+++ (0.035)	-0.186+++ (0.033)	-0.180+++ (0.028)	-0.174+++ (0.035)	-0.170+++ (0.033)	-0.199+++ (0.032)	-0.188+++ (0.032)	-0.216+++ (0.027)	-0.198+++ (0.031)
Education level	-0.024+++ (0.006)	-0.028+++ (0.008)	-0.009+ (0.005)	-0.008 (0.006)	-0.028+++ (0.006)	-0.033+++ (0.007)	-0.026+++ (0.006)	-0.026+++ (0.007)	-0.020+++ (0.007)	-0.027+++ (0.008)
Infrastructure level index	-0.009 (0.007)	-0.008 (0.017)	0.006 (0.007)	-0.018 (0.018)	-0.006 (0.007)	0.012 (0.017)	-0.025+++ (0.006)	-0.020+ (0.012)	-0.007 (0.007)	-0.009 (0.017)
Log average wage	-0.001 (0.010)	0.008 (0.010)	-0.005 (0.011)	0.002 (0.010)	-0.007 (0.012)	0.002 (0.012)	-0.002 (0.010)	0.003 (0.011)	-0.002 (0.011)	0.007 (0.011)
Urban/rural wage ratio	-0.004 (0.008)	-0.007 (0.007)	0.001 (0.007)	-0.001 (0.007)	0.003 (0.007)	0.000 (0.006)	-0.001 (0.005)	-0.002 (0.005)	-0.001 (0.006)	-0.003 (0.006)
Log district land area	-0.014+ (0.009)	-0.015 (0.013)	0.006 (0.008)	0.008 (0.013)	-0.022++ (0.009)	-0.018 (0.012)	-0.010 (0.008)	0.007 (0.011)	-0.008 (0.008)	-0.014 (0.012)
Change in urban population	0.038 (0.182)	0.033 (0.223)	-0.079 (0.075)	-0.051 (0.089)	-0.184 (0.114)	-0.196 (0.152)	-0.077 (0.116)	-0.101 (0.149)	0.060 (0.146)	0.107 (0.167)
State fixed effects	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	250	250	201	201	247	247	250	250	250	250
Adjusted R-squared	0.608	0.629	0.304	0.367	0.651	0.683	0.597	0.626	0.500	0.520



# Fig. 3b: India's urbanization mismatch by district



# Conclusions and Policy suggestions

- Organized manufacturing is moving from urban to rural areas
- Unorganized manufacturing is urbanizing
- Urbanization is higher in districts with better education and infrastructure
- Urbanization has improved rural-urban allocation of industries
- Policy makers should encourage an inclusionary approach to the urban informal economy
- Research on spatial location and concentration of economic activity is still at an early stage.
- Movement of organized manufacturing from cities to rural areas is surprising at this stage of India's development.