

Mobility, Job Accessibility and Welfare From Jobs in Indian Cities

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Objectives

- Importance of cities
- How accessible are jobs in India's cities?
- What are the determinants of reservation wages in the Indian urban context?
- Are jobs welfare enhancing in India's cities?

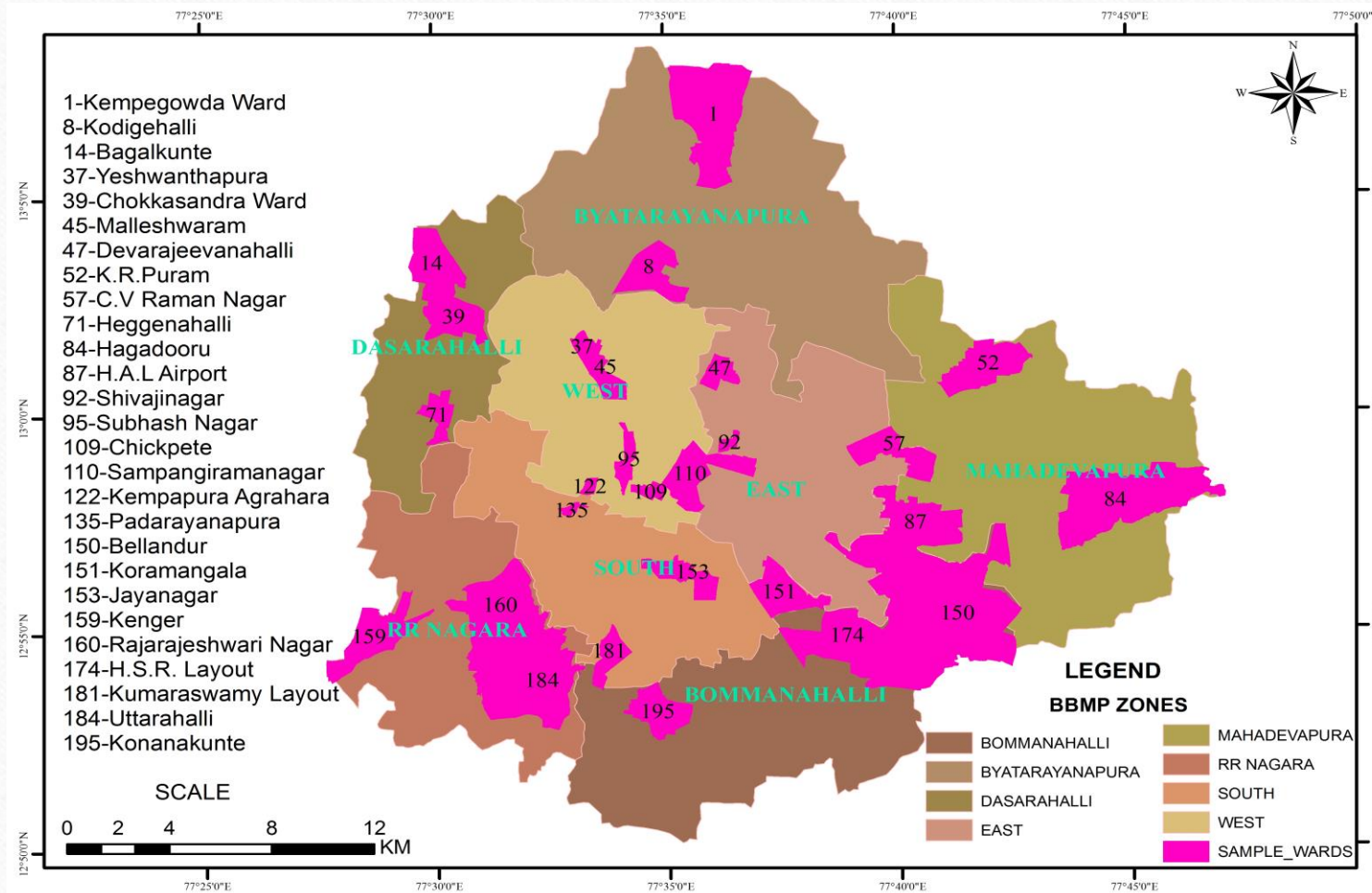
Theory

- What is a city's effective labor market?
 - Distinction between nominal and effective size of city labor markets
- Welfare defined by net benefits from jobs
 - Wages and reservation wages
 - Hypothesis regarding reservation wages

Methodology

- Lack of secondary data sets on journey to work and commute time
- Large primary surveys of 2,700 households in Bengaluru
- 27 representative wards of the city, with 100 households each (Map)
 - Delphi method
- Linear systematic sampling
 - N (Frame)/ n (Intended sample size)= K (integer) rule for sampling of households

Map of Sampled Wards, Bengaluru



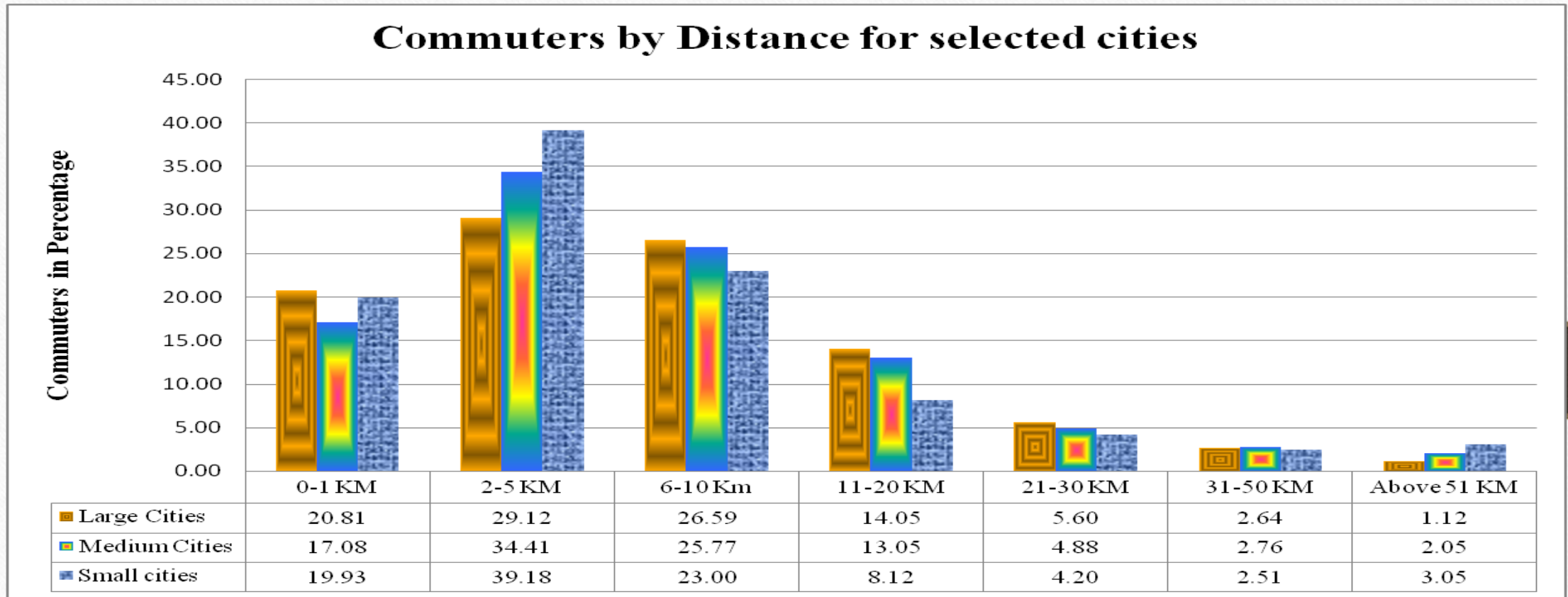
Mobility: Commute Time, Distance, Costs and Effective Labor Market

Commuting Time and Distance, Bengaluru

	N	Minimum	Maximum	Mean	Std. Deviation
Time taken to Travel by the most direct route (one way in minutes)	2505	0	200	27.54	23.63
Distance Travelled (One Way in kms)	2505	0	70	5.48	6.36
KMS travelled per minute	2505	0	0.35	0.20	0.27

Source: Primary surveys of 2,700 households in Bengaluru and author analyses

Commuting Distance by City Size, Selected Indian Cities



Large Cities: Hyderabad, Bengaluru, Delhi, Mumbai, Chennai and Kolkata (5M +)

Medium Cities: Pune, Nagpur, Jaipur, Vishakapatnam and Coimbatore (2M +)

Small Cities: Mysore, Ranchi, Gwalior, Trichy and Kota (1M +)

Commute Time in Indian Cities: What Do Other Studies Show?

City	Work Location	Avg time taken (mins)	Avg distance travelled (km)	KM Travelled per min
NCR	DLF Cyber City	93.91	38.97	0.41
Chennai	Chengalpattu	63.05	34.70	0.55
Hyderabad	Hitech City	51.98	20.10	0.39
Mumbai	Malad	50.77	19.06	0.38
Pune	Kharadi	48.98	19.87	0.41
Bengaluru	Whitefield	46.8	16.8	0.36

Sources: MoveInSync report 2016 and Nayka & Sridhar, 2019

Commuting Distance, Time and Costs by Occupation, Bengaluru

Occupation	Weighted Average one way travel time (in minutes)	Weighted average distance (one way, in KMs)	KMs travelled/Minute
Teaching and or Research	33.35	7.27	0.22
Doctor	25.84	5	0.19
Engineer	38.95	8.75	0.22
Own Business	19.33	3.57	0.18
ICT	51.77	12.78	0.25
Average	27.54	5.48	0.21
Max	51.77	12.78	0.25
Min	19.33	3.57	0.18

Source: Primary surveys of 2,700 households in Bengaluru and author analyses

What is Bengaluru's Effective Labor Market?

Wards	Central or Peripheral	Workers (2011 DCHB)	Weighted Average commute time (in mins)	Jobs w/in 1 min	Time taken (in minutes) to travel 1 Km of road length
Kempegowda Ward	P	14794	25	583	0.31
Kodigehalli	P	20690	32	642	0.38
Bagalkunte	P	28278	33	862	0.26
Yashwanthpura	P	16911	18	965	0.70
Chokkasandra	P	33082	29	1135	0.37
Malleshwaram	C	13572	28	486	0.82
Devarajeevanahalli	C	16403	34	479	1.22
K.R.Puram	P	14711	24	620	0.29
C.V Raman Nagar	C	27027	32	842	0.46
Heggenahalli	P	34123	28	1212	0.49
Hagaduru	P	22359	30	755	0.19
H.A.L Airport	P	16457	24	680	0.61
Shivaji Nagar	C	12723	21	601	0.95
Subhash Nagar	C	16569	25	652	0.94
Chikpete	C	12158	23	536	0.61
Samapangirama Nagar	C	11017	23	483	0.38
Kempapura Agrahara	C	18454	24	778	1.43
Padarayanapura	C	13034	16	838	1.17
Bellandur	P	42330	30	1390	0.12
Koramangala	C	18350	32	577	0.43
Jayanagar	C	15662	24	652	0.50
Kengeri	P	16631	28	599	0.28
Rajarajeshwari Nagar	P	24660	32	781	0.15
H.S.R. Layout	P	30718	28	1078	0.20
Kumaraswamy Layout	C	19931	35	563	0.61
Uttarahalli	P	25161	34	732	0.16
Konanakunte	P	25446	30	849	0.34
Average		20,787	27	755	0.53
Max		42330	35	1390	1.43
Min		11017	16	479	0.12

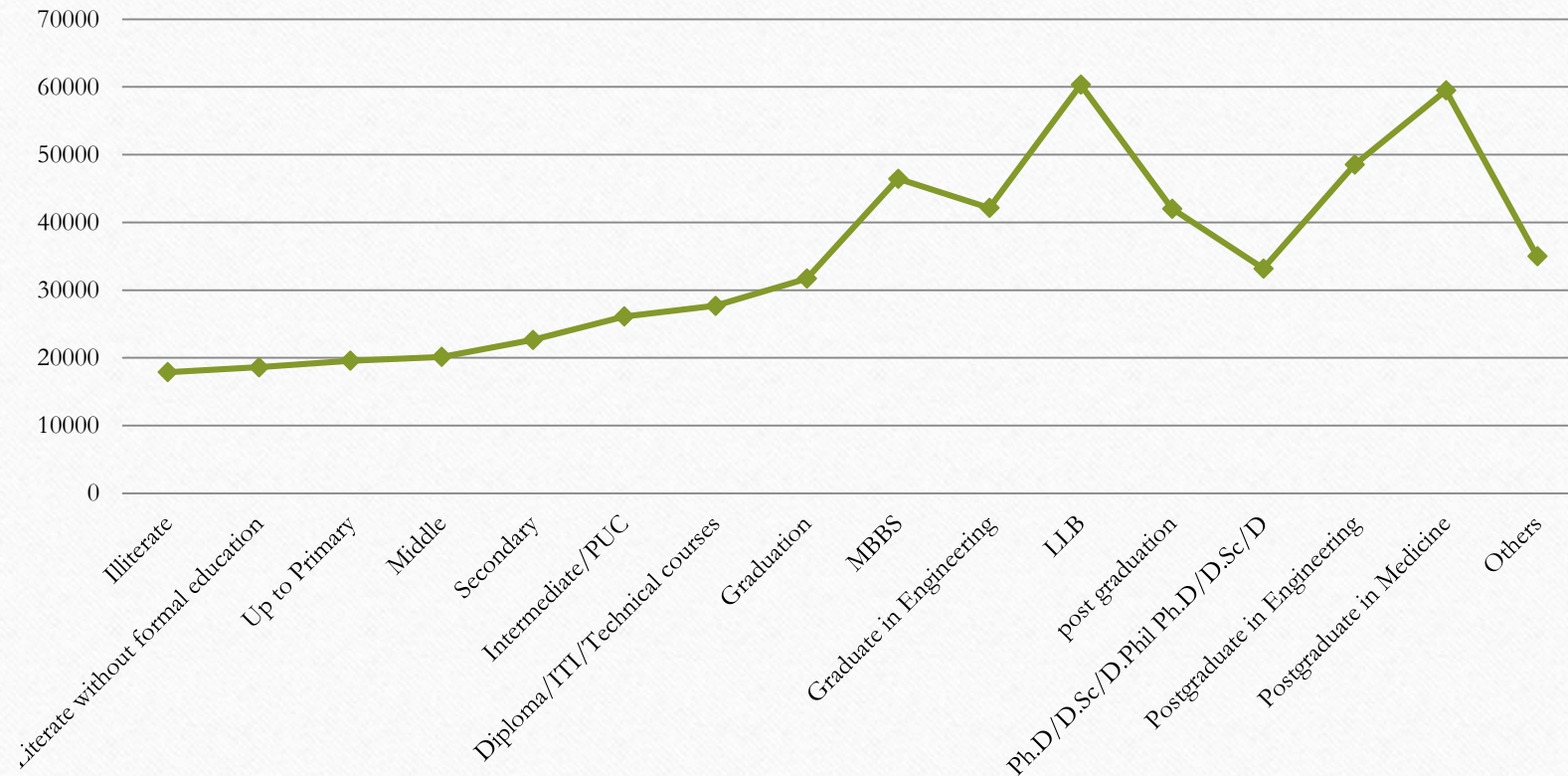
Accessibility of Jobs, Selected Cities Across the World, Comparison with Bengaluru

Minutes' Commute ⇒	10	20	30	40	50	60
	% of Jobs Accessible↓					
New York	2	9	21	38	61	89
Los Angeles	5	22	51	92	100	100
Chicago	3	13	31	58	93	100
Washington	5	20	49	90	100	100
Atlanta	3	13	32	59	95	100
Bengaluru	40	81	100 (25 mins)			

Sources: Bertaud (2014), Primary surveys of 2,700 households in Bengaluru and author analyses

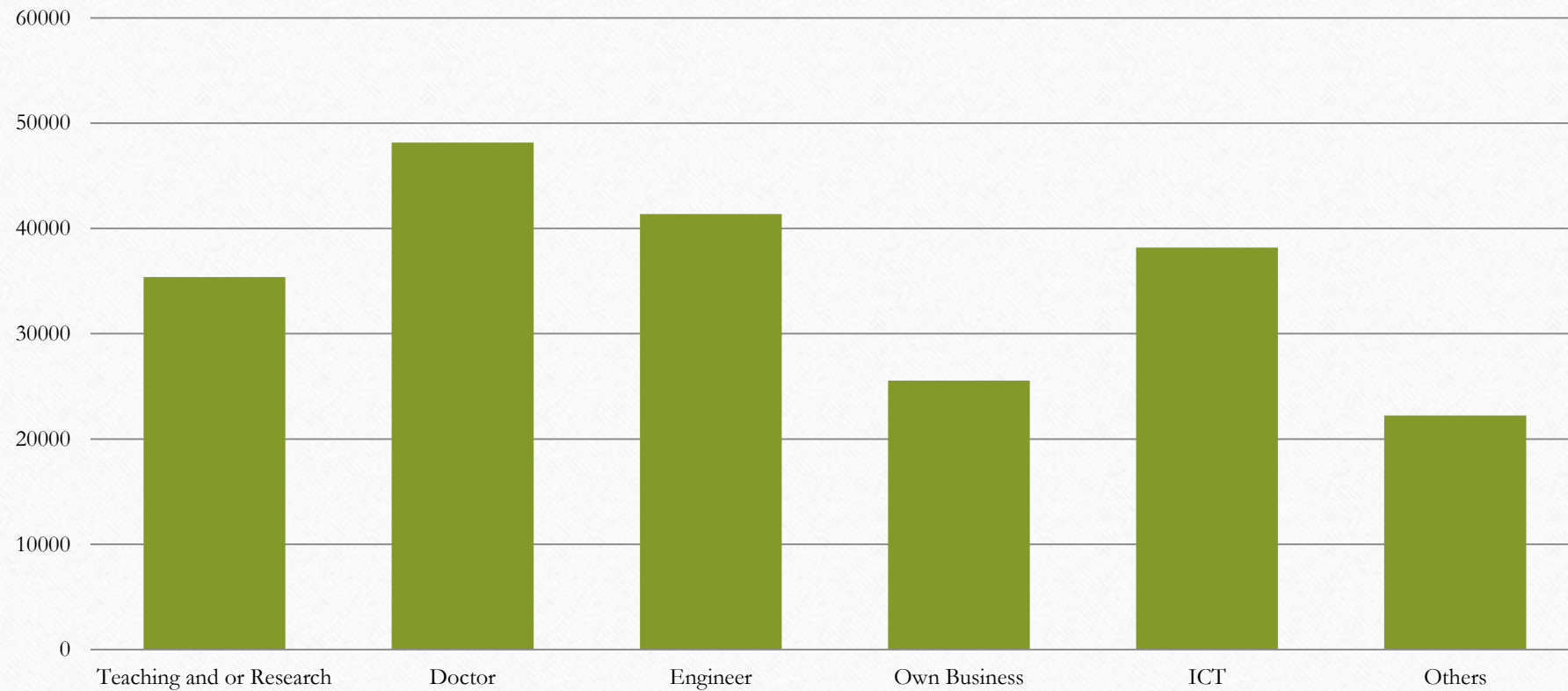
Welfare and Net Benefits from Jobs

Reservation Wages by Education



Source: Primary surveys of 2,700 households in Bengaluru and author analyses

Reservation Wages by Occupation



Source: Primary surveys of 2,700 households in Bengaluru and author analyses

Summary Statistics for Welfare from Jobs

	Ratio of actual to stated reservation wage
N	219
Minimum	0.00
Maximum	9.00
Mean	0.36

$$Welfare_i = \frac{NB_i}{R_i} = \frac{W_i - R_i}{R_i}$$

Source: Primary surveys of 2,700 households in Bengaluru and author analyses

Estimation of Reservation Wages

Parameter	Estimate (T statistic)
Constant	-2835.36 (-0.35)
Religion	-3082.76 (-1.15)
Sex (1 = Male, 0 = Female)	57.47 (0.02)
Age (in years)	277.40 (2.48)**
Marital Status	-1272.04 (-0.56)
Education	2221.22 (5.15)***
Main Activity	-186.62 (-0.30)
Current wage (in monthly INR)	0.28 (9.05)***
Duration of current employment (in years)	154.35 (1.09)
HH size	73.14 (0.09)
Slum or noN Slum (1=General; 2=Slum)	-1036.70 (-0.27)
F value	20.73
R-squared	0.50
Number of observations	219

**Statistically significant at the 5 percent level

*** Statistically significant at the 1 percent level

Source: Primary surveys of households in Bengaluru and author analyses

Summary Statistics for the Ratio of Actual to Reservation Wages, Using the Predicted Reservation Wage

	Ratio of actual wage to predicted reservation wage
N	219
Minimum	-3.98
Maximum	21.28
Mean	1.09

Source: Primary surveys of households in Bengaluru and author analyses

Summary of Findings and Implications

- All of Bengaluru's jobs are accessible within a 30-minute commute, in contrast to North American cities for which the data are available
- Bengaluru's commute distance covered smallest when compared with that for other Indian cities
- The commuting distance, and time are the highest for ICT workers, and lowest for the self-employed in Bengaluru, but the reverse when distance travelled per minute is considered
- The jobs of Bangaloreans are welfare-enhancing
 - More of better quality and more skilled jobs needed
- Given a majority of our sample is single income earner households, the commute time is short, making for a large effective labor market
 - Possible that due to congestion, commuters are locating close to their place of work, walking or using the metro/public transport such as buses
 - Need more information on journey to work in Indian cities

Data Caveats

- Data on jobs are from the Census 2011
 - If jobs are created or fired, our job accessibility is unable to capture
- Assumption that primary surveys are representative
 - Comparison with Census data indicates confidence
- Reservation wages are real
 - Comparison with actual wages and expenditure indicates similar neighborhood

References

- Bertaud A. (2014) *Cities as labor markets* [Online]. Marron Institute on Cities and Environment. New York University.
- MoveInSync report 2016
(<https://timesofindia.indiatimes.com/city/bengaluru/road-to-gurugrams-cyber-city-longest-in-india-beats-bengaluru/articleshow/57459392.cms>)
- Shivakumar Nayka and Sridhar, Kala Seetharam (2019). Urban commuters in India's states and cities: Modes and distance, *Urbanisation*, 3(2): 69-107.

Thank you for the attention
