Labour Market Access: How Networks and Education Shape Opportunities

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Introduction

- **Informal Employment**:Accounts for about 85–90% ofIndia's workforce (Srivastava, 2019; Abraham, 2019).
- Jobs lack protection, have unsafe conditions, and offer irregular, low wages (ILO, 2010; Chen, 2012).
- **Formal Jobs as Opportunity**: Provide security, fair wages, and better working conditions, but access remains unequal.
- **Labour Market Segmentation**: Unequal access to formal jobs based on caste, religion, gender, and socio-economic status (Deshpande, 2011; Jodhka & Newman, 2007).

- **Higher education** improves the chances of securing formal jobs, regardless of socio-economic background (Shonchoy & Junankar, 2014; Natarajan et al., 2020; Sheikh & Gaurav, 2020).
- Average education levels and intergenerational educational mobility has improved, but intergenerational occupational mobility has not kept pace (Iversen et al., 2017).
- It is observed that network contribute to this intergenerational occupational persistence. (Lahiri & Nandi ,2020)

- However, another line of discussion suggests that community-based (intracommunity) networks can help individuals from disadvantaged backgrounds escape low-skill occupational traps (Munshi & Rosenweig, 2006; Munshi, 2011).
- Studies suggest that different types of networks- **bonding (intracommunity)** or **bridging (intercommunity)**, can affect outcomes differently (Arun, et al., 2015; Jha & Edward, 2023).
- Further, networks could also intensify the affect that education has on access to formal employment.
- Hence, pertinent to explore the roles of networks and education further.

Research Objectives

- **Objective 1**:To investigate the overall effect of networks, with a specific focus on bonding (intracommunity) and bridging (intercommunity) networks, on an individual's access to formal employment in India.
- **Objective 2**: To assess the complementarity between an individual's education and their networks in enabling their access to formal employment.

Methodology

- **Approach**: Heckman Selection Model (Hussain & Mukhopadhyay, 2023).
- **Key Variables**:
  - Estimate of total networks in a household.
  - Networks (bonding and bridging), education levels, and their interaction.
  - Quadratic term for network to account for diminishing effects of networks (Arun et al., 2015).

Why Heckman Correction?

- Ordinary Least Squares (OLS) would introduce selection bias, as it includes only employed individuals.
- Heckman corrects this by:
  - Step 1 (Selection Equation): Estimates the probability of being employed based on relevant covariates.
  - Step 2 (Outcome Equation): Estimates access to formal employment, incorporating the Inverse Mills Ratio to adjust for bias.

Application to Research Objectives

- **Objective 1:**
  - Estimate the overall effect of networks on access to formal employment.
  - Identify which types of networks (e.g., bonding, bridging) are most effective.
- **Objective 2:**
  - An interaction term between education and networks.
  - A quadratic term for networks to capture non-linear effects (Arun et al., 2016).

Data Source

- **Dataset**: India Human Development Surveys (IHDS) with longitudinal data from over 40,000 households.
- Includes education, employment, and social network variables, enabling a detailed analysis of job access inequality (IHDS Official Report).
- Future rounds of IHDS will provide more insights for extended research.

STATA Workflow: Key Analytical Steps

- **Data Integration**
  Combined individual- and household-level files using the `merge` command to build a unified dataset.
- **Employment Categorization**
  Classified individuals into formal and informal employment groups using `gen` and `replace`.
- **Variable Construction**
  - Generated bonding, bridging, and total network indicators
  - Developed interaction and quadratic terms using `gen`
- **Model Estimation**
  Applied the `heckman` command (two-step method) to correct for selection bias and analyze access to formal employment.
- **Post-Estimation Analysis**
  Used `margins`, `predict`, and `esttab` to interpret and present regression results.

Regression results using Heckman Model: Access to Formal Employment

Variables	Total Networks	Bridging & Bonding Networks
Age	0.00065***	0.000839***
	(0.00000)	(0.00016)
Education (Years)	0.0110***	0.0117***
	(0.00001)	(0.00022)
Log Household Income	0.0445***	0.0498***
	(0.00001)	(0.00119)
Total Networks	0.00319***	–
	(0.00000)	
Bonding Networks	–	0.00497***
		(0.00048)
Bridging Networks	–	0.00202***
		(0.00041)
Set of X variables	Included	Included

Notes: Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Regression Results: Education and Networks Complementarity (1/2)

Variables	Model
Age	0.0004468***
	(0.0000041)
Primary Education	0.00844***
	(0.000383)
Secondary Education	0.03245***
	(0.000306)
Bachelor's Degree	0.2051***
	(0.000441)
Above Bachelor's Degree	0.2733***
	(0.000568)
Total Networks	0.002864***
	(0.0000492)
Square of Networks	-0.0001365***
	(0.0000017)

Regression Results: Education and Networks Complementarity (2/2)

Variables	**Model**
Interaction: Primary Education × Networks	0.000947***
	(0.0000556)
Interaction: Secondary Education × Networks	0.004363***
	(0.0000432)
Interaction: Bachelor's Degree × Networks	0.00458***
	(0.0000516)
Interaction: Above Bachelor's Degree × Networks	0.00577***
	(0.0000602)
Log Household Income	0.0418***
	(0.0000817)
Set of X Variables	Included

Results

- Each additional year of completed education is strongly associated with a higher probability of securing formal jobs.
- Networks have a significant effect on formal employment, with a coefficient of 0.00319. That is, for every additional network, the probability of accessing formal job increases by 0.319%.
- Bonding networks (0.497 %) increase the access to formal employment more than bridging networks (0.202%).
- **Square of Networks** (-0.0001365^{***}) indicates diminishing marginal returns as network size grows.

Results

- The effect of networks on formal employment strengthens with education: **Primary Education** increases formal employment by **0.095%** per unit of networks, compared to **Secondary Education 0.44%**), **Bachelor's Degree 0.46%**), and **Above Bachelor's Degree 0.58%**).
- These results highlight the **complementarity between education and networks**, where higher education amplifies the benefits of networks in securing formal employment.