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Whither Human Capital? The Woeful Tale of Transition to Tertiary Education in India

By: Sumon Bhaumik and Manisha Chakrabarty

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Whither human capital? The woeful tale of transition to tertiary education in India^{*}

Manisha Chakrabarty^{}**

Indian Institute of Management – Calcutta, India

Sumon Kumar Bhaumik

Aston Business School, Aston University, United Kingdom

IZA – Institute for the Study of Labour, Bonn Germany

Abstract:

In this paper we examine the issue of high dropout rates in India which has adverse implications for human capital formation, and hence for the country's long term growth potential. Using the 2004-05 National Sample Survey employment-unemployment survey data, we estimate transition probabilities of moving from a number of different educational levels to higher educational levels using a sequential logit model. Our results suggest that the overall probability of reaching tertiary education is very low. Further, even by the woeful overall standards, women are significantly worse-off, particularly in rural areas.

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Keywords: Education; Transitional probability; India

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^{**} *Corresponding author.* Address: Indian Institute of Management Calcutta, Joka, D.H Road, Kolkata-700104,, India Phone: +91-33-24678300-06(EXTN:513); Fax: +91-33-24678307.; Email: .mchakrabarty@iimcal.ac.in..

1. Introduction

The importance of human capital, the stylised measure for which is the level of educational attainment, is well understood. At the macro level, it is a key determinant of economic growth (Barro, 2001). At the micro level, it is both a key determinant of productivity (Black and Lynch, 1996), and earnings (Card, 1999). Education (especially for women) can also have significant welfare impact by way of, for example, increased survival rates for children (Cleland and van Ginneken, 1988). Of these, the impact of human capital and, correspondingly, educational attainment, on earnings is of particular interest to development and labour economists.

It is well documented that in developing countries the low average measure of years of schooling reflects high dropout rates, with a significant proportion of each age cohort not making the transition from one educational level to the next (Hillman and Jenkner, 2004). Economists have therefore attempted to identify factors that influence the probability of transition from each education level to higher levels of education (Pal, 2004). The literature suggests that these transition probabilities and educational attainment in general are affected by a wide range of factors such as family background, gender, and ethnicity and religion (Sander, 1992; Tansel, 1997, 2002),

In this paper, we use a sequential logit model to estimate transition probabilities for males and females in India, separately for rural and urban areas. The role of differences in human capital or educational attainment in explaining earnings differences between genders and Indian socio-economic groups that are separated by religion or social constructs such as caste (Bhaumik and Chakrabarty, 2008, 2009), and that between Indian wage earners and their counterparts in other emerging markets (Bargain et al. 2009) are well documented. However, the phenomenon of inter-group differences in educational attainment and, specifically, the issue of transition from one educational level to the next, remain relatively unexplored (Bhalotra and Zamora, 2009).

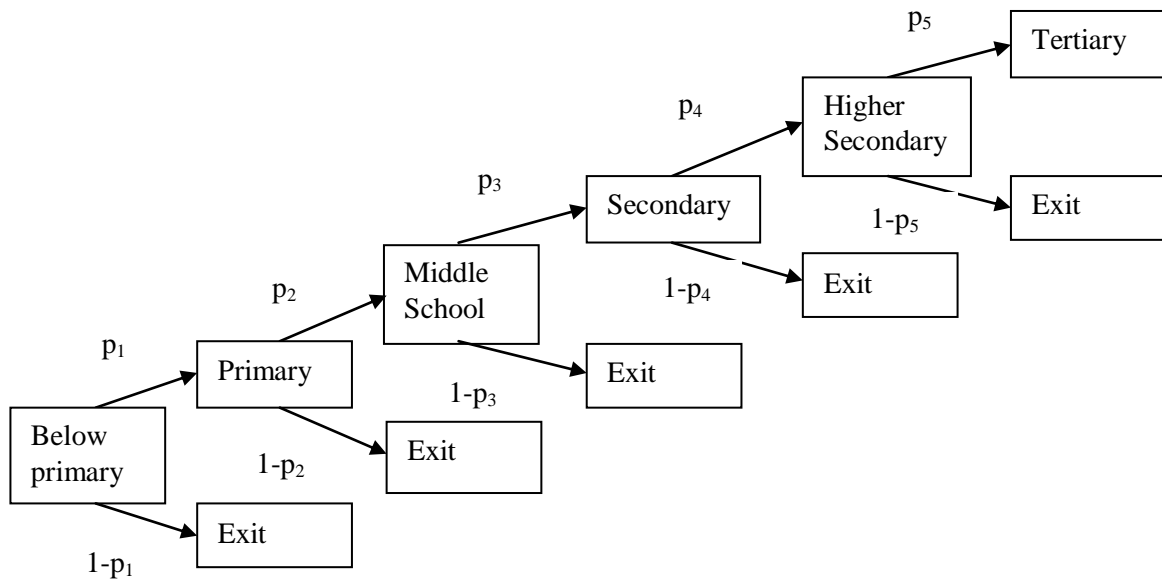
Our results suggest that for both the rural and urban areas, the transition probabilities for men are higher than those of female for all educational levels. The difference between transition probabilities is particularly higher in rural areas. There is a significant rural-urban divide as well. Transition probabilities of urban females, while significantly lower than those of their urban male

counterparts is comparable to (and generally marginally better than) those of their rural male counterparts.

2. Modelling educational transition

Following Buis (2009) and Pal (2004), we model educational attainment in India using a sequential logit model. In this framework, after completing any level of education k , an individual i has the option to continue to the next level of education with probability p_{ki} or exit with probability $(1 - p_{ki})$.

This can be summarised using the following diagram:



The use of the sequential logit model yields estimates of these transitional probabilities p_{ki} that are given by

$$\hat{p}_{ki} = \frac{\exp\left(\alpha_k + \sum_m \beta_{km} x_m + \sum_n \lambda_{kn} z_n\right)}{1 + \exp\left(\alpha_k + \sum_m \beta_{km} x_m + \sum_n \lambda_{kn} z_n\right)}, \text{ if } p_{k-1,i} = 1$$

We model the transition probability as a function of m individual and household characteristics (x) and n other variables that capture the economic environment in the state in general. Starting from an

educational level l , an individual's probability of reaching a higher education level L is, therefore,

given by $\prod_{k=l}^L p_k$.

We estimate this sequential logit model using data from the 61st round of the National Sample Survey (NSS) data from India, for 2005. Our sample for the urban sector includes 31,709 males and 31,127 females in the 25-55 age range. The sample for the rural sector includes 58,027 males and 58,834 females. In effect, we consider only post-independence individuals who have already decided to make (or not make) the transition to the highest recorded educational level. The data allows us to distinguish between the following education levels: less than primary education, primary education, middle school education, secondary education, higher secondary education, and tertiary education. The distribution of educational attainment is reported in Table 1.

Table 1: Distribution of educational attainment (Percentage)

	Male		Female	
	Rural	Urban	Rural	Urban
Less than primary education	40.78	24.33	67.61	41.83
Primary education	15.24	13.45	11.81	13.08
Middle school education	18.09	18.48	10.85	15.64
Secondary education	11.32	14.94	5.36	11.52
Higher secondary education	6.70	9.72	2.37	6.63
Tertiary Education	7.87	19.08	2.00	11.30
Sample size	58,027	31, 709	58,834	31,127

In light of the existing literature, we model the transition probabilities as function of the following household characteristics:

- *Economic status*: We use per capita total consumption as our proxy for the economic status of households. We also include the household occupation status which determines their major earning source. Occupations, of course, differ between rural and urban areas.
- *Age cohort*: We take into account the possibility that transition probabilities may have been affected by unobserved factors such as attitude to education and expectation about economic opportunities that change over time. Hence, we divide our sample into four age cohorts – 25-30, 31-40, 41-50 and 51-55 – and treat the oldest cohort as the reference category.

- *Educational environment*: The NSS data does not permit us to compute educational levels for parents. Hence, we use the second best measure of average educational attainment at the district level. We generate averages for age groups that correspond to roughly the parental generations of the aforementioned age cohorts, namely, 50-55, 56-65, 66-75 and over 75.¹ We then interact these mean education levels with the cohort dummy for the generation that is roughly their children's age. For example, we interact the mean education level of the 50-55 year olds with the cohort dummy for the 25-30 year olds.
- *Caste and religion*: We treat Muslims as the reference category. While the Indian Constitution has provided for educational quotas for individuals from scheduled castes and tribes (SCST) since independence, quotas for other backward castes (OBC), came into effect much later, during the nineties. Hence educational quotas for OBCs would have affected only relatively young individuals. Hence, we include controls for SCST and other Hindus, and interact control for Hindu and Muslim OBCs only with the youngest cohort.
- *Location*: We use state-level dummy variables to control for unobserved location effects.²

3. Results and discussion

For the sake of brevity, we do not report the estimates of the sequential logit model. The results are available from the authors upon request. In Table 2, we report the transition probabilities instead. It is evident that for both the rural and urban areas, the transition probabilities for men are higher than those of female for all educational levels. The difference between transition probabilities is particularly higher in rural areas. There is a significant rural-urban divide as well. Transition probabilities of urban females, while significantly lower than those of their urban male counterparts is comparable to (and generally marginally better than) those of their rural male counterparts.

¹ Anecdotal and other evidence suggest that there were significant inter-generational changes in educational attainment after independence, especially in rural areas. We therefore feel that the use of this second best measure of educational environment does not affect our estimations significantly.

² Our measure of educational environment and control for location assumes that there is little intra-country migration, and this is consistent with the 2001 census data (http://censusindia.gov.in/Census_And_You/migrations.aspx). The census data suggest that while 30 percent of the population had migrated from their place of birth, 84 percent of these migrants had moved within the same state, and 70 percent of these intra-state migrants had moved within the same district.

Table 2: Transition probabilities

	Male		Female	
	Rural	Urban	Rural	Urban
Below Primary to primary education or higher	0.59	0.76	0.32	0.58
Primary to middle education or higher	0.70	0.80	0.53	0.71
Middle school to secondary education or higher	0.53	0.65	0.38	0.56
Secondary to higher secondary education or higher	0.49	0.58	0.34	0.50
Higher secondary to tertiary education	0.47	0.57	0.37	0.51
Sample size	58,027	31,709	58,834	31,127

These transition probabilities suggest that, in India, an urban male has a 13.06 percent probability of making the transition to tertiary education, while the corresponding probability for a rural male is 5.04 percent.³ The situation is far worse for women, whose corresponding transition probabilities are 5.88 percent and less than 1 percent, respectively. The regression results, not reported here due to conciseness, suggest that the impact of caste and religion on the transition probabilities of the two genders are roughly similar.

In other words, not only are the vast majority of Indians unlikely to benefit significantly from the rapid growth in sectors such as ICT and BPO that require tertiary education, even by the woeful overall standards, women are significantly worse off, especially in the rural areas.

4. Conclusion

Using the 2004-05 National Sample Survey employment-unemployment survey data, we estimate transition probabilities of moving from a number of different educational levels to higher educational levels using sequential logit model. Our results suggest that the overall probability of reaching tertiary education is very low. Further, even by the woeful overall standards, women are significantly worse-off, particularly in rural areas. This has serious implications for the education, morbidity and overall welfare of a vast section of the future generations. A discussion of Indian education and social policies lies beyond the scope of this paper. But such a discussion should be the priority of Indian policymakers.

³ Note that the product of 0.59, 0.70, 0.53, 0.49 and 0.47 is 0.0504. The other probabilities are similarly obtained.

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