

**ESSAYS ON FACETS OF THE EDUCATION SECTOR
IN DEVELOPING COUNTRIES**

Synopsis of the Thesis

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By

Sayoree Goptu

Department of Economics

Jadavpur University

Kolkata- 700032, India

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Introduction

The present thesis delves into different issues related to the education sector in developing countries. The extensive impact of education across diverse spheres of society is manifested in terms of increased labour productivity, reduced inequality, lower poverty rates, better health outcomes, greater social mobility, etc. Despite being well versed in the benefits associated with education, most developing countries are often found grappling with multifaceted issues such as school dropouts, overeducation, where individuals work in jobs with lower educational requirements, mushrooming of private tuitions stemming, etc. The thesis focuses on each of these issues separately. First, it explores how a reallocation of the government education budget might solve the dual problems of school dropout and overeducation. Second, it investigates the role of private tuition costs in determining the choice of schooling among Indian households at secondary and higher secondary levels. Third, it provides a detailed analysis of overeducation in different elementary occupations in India, where education requirements are typically low.

School dropout is one of the most important issues plaguing education sectors in developing countries as they hinder the process of human capital accumulation. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2019), there existed 258.4 million out-of-school children in the world in 2018, with a majority belonging to upper-secondary grades. In India, after the enactment of the Right to Education (RTE) Act by the government, which aimed at providing free elementary education for children in the 6-14 age group, though the gross enrolment ratio at the primary level in India is as high as 103.4, 1.5 percent, 3 percent and 12.6 percent of the students have dropped out at primary, upper primary and secondary level in the year 2021-22 (UDISE Plus, 2022).

At the other extreme, there exists an overeducation problem due to an excess supply of educated individuals given the availability of job opportunities. The All India Survey on

Higher Education (AISHE, 2018; 2021) shows that, despite an increasing trend in the gross enrolment ratio in higher education over the last couple of years (23 percent in 2013-14 to 27.3 percent in 2020-21), grim job prospects have forced individuals to work in occupations requiring lesser skills or education than what they acquire¹. According to McGuinness (2006), there is a potential welfare loss associated with overeducation since it involves wasteful expenditure on individuals without optimal utilization of the generated skills. In this context, the skewed spending towards higher education in developing countries or the ‘tertiary tilt’² discussed by Gruber and Cosack (2014) might be adding fuel to the overeducation scenario in a country.

However disparate the two phenomena – school dropout and overeducation might appear, they coexist in developing economies and require simultaneous attention for policy formulations. The government being one of the principal financiers of education in developing countries (UNESCO, 2016), plays a role in resolving these discrepancies that might arise out of households’ education decisions. The allocation (actual estimates) for higher education in the total education budget by the Ministry of Education, Government of India, has increased from 32.43 percent in 2011-12 to 41.73 percent in 2021-22 (PRS, 2022; 2023). Despite the long-term implications of higher education on growth and development, larger spending on higher education might raise overeducation. Also, it must not occur at the expense of school education quality. This holds especially in developing countries where education attainment and quality are very low (Su, 2004). In India, according to ASER (2019) report for 2018, only 44.2 percent and 22.7 percent of children in the fifth grade of government schools can read a

¹ From PLFS (2019, 2021) data we find an increase in the proportion of higher-educated workers (regular/salaried) working in elementary occupations from 3.7 percent in 2017-18 to 4.4 percent in 2019-20.

² The ‘tertiary tilt’ is evidenced with data from World Development Indicators provided by the World Bank. In South Asian countries, in 2015, government expenditure per student as percentage of GDP per capita at primary, secondary and tertiary level was 9.2, 10.5 and 29.4 respectively, against the corresponding figures of 20.0, 22.7, 27.7 in the OECD countries.

standard 2-level text and do divisions respectively. Poor learning outcomes driven by inferior school quality are the primary reasons for children dropping out of school (Hanushek et al., 2006). However, just as important as the infrastructural investment is for improving school quality (Glewwe et al, 2014), it depends to a large extent on the quality of teachers in schools who are products of the higher education system. Thus, siphoning away funds from higher education may lead to a perverse impact on school quality through the quality of teachers. The simultaneous effect of a reallocation policy on school dropouts and overeducation shows that indeed these two problems are interlinked. In the first chapter of the thesis, we discuss the government's role in catering to both the school dropout and overeducation issues through a reallocation of the education budget, given the complementarities between household and institutional investment on one hand and school and higher education quality on the other.

The significance of teachers in the education system is closely tied to the quality of education and student outcomes. In this context, one can discuss the parallel education system popularly referred to as *private tuition* or *shadow education*, which has grown rapidly, catering to the existing deficiencies in formal education (Bray, 1999; Dang and Rogers, 2008; Ghosh and Bray, 2020). According to the NSS 75th Round on Education 2017-18 (NSS, 2019), among secondary and higher secondary students going to private unaided schools, 40 percent reported the reason to be the poor quality of nearby government schools, 17 per cent reported the reason to be the availability of special facilities³ and around 17.5 per cent reported their preference for English medium of instruction. On the other hand, since private schools are expensive, affordability is an important factor driving the demand for government schools. It follows from here that the presence of a private tuition market can close the teaching quality

³ See NSS 75th Round on Education 2017-18 Report No. 585 (NSS, 2020). It shows that these special facilities include air-conditioned classrooms, state-of-the-art teaching aids, day boarding facility, transport facility, hostel facility, laboratory/library, school timing, extra-curricular activities, separate toilet facilities for boys and girls, co-educational structure.

gap between the two and enable households to select the more feasible option. In the second chapter of the thesis, we explore the impact of private tuition costs on the choice of schooling, contingent on the relative differences in teaching quality between private and government schools and other school-specific attributes. The empirical results are also explained with the help of a theoretical model which provides insight into the quality differences between private and government schools.

Given the linkage between the education sector and labor markets, it is also important to study the implications that education decisions might have on labor market outcomes. Overeducation in the US labor market was first brought to notice by Freeman (1976) whereby, the excess supply of higher educated graduates resulted in a substantial lowering of wages, giving rise to a section of overeducated workers. The discussion was carried forward by Duncan and Hoffman (1981), Verdugo and Verdugo (1989), and Rumberger (1981), who empirically estimated the extent of overeducation and their impact on wages using predetermined measures of education to calculate overeducation. In this thesis, we investigate the existence of overeducated tertiary graduates in elementary occupations in the Indian labor market using the returns to education approach, which caters to both the demand and supply conditions of the labor markets. According to the official occupation classifications provided by the National Classification of Occupations (NCO 2004), education requirements are low for such occupations. However, given the heterogeneity in the nature of work, which is not accounted for in these classifications, we verify whether all higher-educated workers in disaggregated categories of elementary occupations are overeducated or not⁴. The chapter also calculates the overall overeducation in an occupation, that might consist of lower education

⁴ Given the substantial investment costs associated with higher education, the presence of tertiary educated in low skilled elementary occupations is indeed a matter of concern (McGuinness et al, 2017; Battu and Bender, 2020).

levels getting insignificant returns over illiterate workers and compares with the conventional modal method of estimating overeducation.

Literature Review

In the literature on the economics of education, in the context of education production function Majumdar (1983) pointed out the complementarity between household and institutional investment, path dependence in educational investment, and interdependence between school and higher education quality. In Majumdar's (1983) approach, education achievement depends not only on the child's ability but also on the household investment and institutional investment for providing infrastructural facilities such as the construction of school and college buildings alongside the recruitment of teachers. Quality of schooling is a crucial factor determining the quality of higher education and is reflected in the education production functions used in the papers like Arcalean and Schiopu (2009) and Su (2004). There is a huge impact that teachers have on the quality of schooling of a child (Azam and Kingdon, 2014; Chetty et al., 2014; Kingdon, 2006). However, the school education quality functions presented in the literature rarely incorporate the quality of teachers who are products of the higher education system (Gilpin and Kaganovich, 2009).

Given the importance of education investments, it is essential to study household investment decisions in their child's education. There exists a vast literature that looks into the sequential decision-making of households in education investments for their child (Galor and Zeira, 1993; Ranjan, 2001; Abbott et al., 2013). Given the complementarity in investments, the literature equally highlights the importance of government redistribution of education funding on outcomes. While papers like Su (2004) and Arcalean and Schiopu (2009) advocate a higher share of education expenditure towards basic education, Hidalgo-Hidalgo and Iturbe-Ormaetxe (2005) questions such a policy's effectiveness in catering to equity and

efficiency concerns in a developing country with very low higher education enrolment. However, none of these papers studying the government's role in education outcomes incorporate the interdependence between school and higher education outcome as discussed by Gilpin and Kaganovich (2009).

Schooling systems in developing countries are known for its high rate of school dropout. Siddhu (2011), Gibbs and Heaton (2013) explain different factors affecting dropouts during the transition from primary to secondary, which accounts for a major share of school dropout in developing countries. Acknowledging the positive effect of secondary education on economic growth, Mussida et al. (2018) find that increasing secondary school dropouts reduces the possibility of employment in non-elementary occupations.

Just like school dropouts, overeducation, where the excess supply of higher educated forces individuals to work in occupations with lesser education requirements, is also a widespread problem. According to McGuinness et al. (2017), overeducation is one of the most frequently used measures of skill mismatch in the literature. Overeducation problem is not specific to developed countries only (Cultrera et al, 2022, Croce and Ghignoni, 2012, Leuven and Oosterbeek, 2011), but observed in developing countries as well (Battu and Bender, 2020; Quinn and Rubb, 2006). While Castelló-Climent and Mukhopadhyay (2011) advocate higher expenditure on higher education in developing countries to facilitate growth, the existence of overeducation among tertiary graduates, due to a lack of appropriate job opportunities cannot be brushed aside (Jaume, 2021). The first chapter in the thesis fills the gap in the literature by looking at budget reallocation policies to resolve specific problems such as school dropouts and overeducation, both of which requires redressal in developing nations.

The choice of schooling is quite an important issue in the literature on education economics. As Lahoti and Mukhopadhyay (2019) point out, some of the main factors affecting

parental decisions for their child's schooling involve school infrastructure, affordability, medium of instruction, teaching quality, availability of special facilities at school, etc. The general skepticism of households about government schools in developing countries has often been highlighted in the literature (Glick and Sahn (2006), Nishimura and Yamano, (2013)). Chaudhary et al. (2006), Kremer et al. (2005) emphasize the acute teacher absenteeism present in government schools. However, the affordability of government schools, still makes them a preferable option for a large section of households (Harma, 2011; Woodhead et al., 2013).

The literature also discusses the surge in private tuition across developed and developing countries (Bray, 1999; 2013). One of the main sources of demand for private tuition arises from deficiencies in teaching quality (Bray and Lykins, 2012; Sen, 2010; Sujatha, 2014). Though there exist studies on the impact of private tuition on achievement (Dang, 2007; Dongre and Tewary, 2015; Aslam and Atherton, 2012), the effect on school choice is not analyzed. The third chapter of the thesis fills in the gap by connecting the two kinds of literature, one on school choice, and the other on private tuition. It looks into the effect of private tuition expenditure on the school choice behaviour of households. It also provides a comparison between private and government school teaching quality which is not well discussed in the literature.

The measurement of overeducation entails a comparison of the level of education acquired by a worker versus their occupational requirements. Conventionally, three methods are used to calculate overeducation and undereducation empirically– the subjective method, which depends on the self-assessment of workers (Duncan and Hoffman (1981), Battu et al. (1999), Galasi (2008)), job evaluation method, which entails a comparison of occupation requirements done by professional job analysts (Rumberger, 1981, Hartog and Oosterbeek, 1988) and realized matches or empirical method, where the education level of workers are compared to the mean or modal level of education within an occupation (Verdugo and

Verdugo, 1989; Kiker et al, 1997). While the first method is subject to bias due to non-response or overreporting of educational requirements, the second method might be extremely costly, given the need to upgrade occupational requirements frequently, whereas the third method suffers from the inability to address the demand side of education, via the labor market. Mehta et al. (2011), calculate the rate of return to education levels using the Mincerian equation (Mincer, 1974) and identifies the education level that provides significant positive returns. Any worker with excess education getting insignificant returns is deemed as overeducated. This approach caters to both the demand and supply sides to estimate returns to education in each occupation. The literature on overeducation in India is relatively limited (Kukreja, 2018; Mukherjee and Paul, 2012; Sengupta, 2017). Besides, except Roy Chowdhury et al. (2021) and Mehta et al. (2011), none examines the presence of overeducation in elementary occupations. The fourth chapter of the thesis uses the returns to education method to estimate overeducation in disaggregated categories within elementary occupations in India, where educational requirements are low according to the official standards.

Outline of the chapters

The thesis consists of three core chapters.

Chapter 2 explains the role of a government budget reallocation policy on two pressing issues in developing countries, namely school dropouts, and overeducation. The theoretical model set up in the chapter consists of utility-maximizing households, who decide on their child's education across two periods – school and higher education. We consider identical households differing in the ability of their child. The model consists of education production functions which include three important features -first, the path dependence between school and higher education investment, second, the complementarity between household and institutional investments and third, the interdependence between school and higher education outcomes.

These three characteristics are instrumental in deriving the results of the model. The optimization exercise is solved by backward induction, with households first making choices about higher education and then deciding whether or not to complete schooling. At the equilibrium, the representative household chooses one of the three options for their child based on the endogenously determined ability thresholds – dropping out of school and joining the unskilled labor market, completing school and joining the semi-skilled labor market, and opting for higher education. However, we consider that higher education does not ensure skilled employment. In such a situation, higher educated individuals are absorbed in semi-skilled occupations as overeducated workers. Given the household choices of education derived in the model, we check for the implications of a government reallocation of the education budget in favor of school education. The results show that such a policy resolves both the school dropout and overeducation problems under certain conditions, else ends up aggravating these issues. The chapter also shows that such a reallocation is ineffective in eliminating school dropouts.

Chapter 3 highlights the role of the private tuition market, which operates parallel to the formal education system and supplements it. One of the primary sources of private tuition demand among households is driven by the poor quality of teaching in schools. The analysis in this chapter is an attempt to connect the private tuition market with the choice of schooling at secondary and higher secondary levels. Given that the private tuition markets can assuage the deficiencies in formal school teaching, it could be feasible for the parent to send the child to the more affordable schooling option after taking into account the cost of private tuition. The empirical model constructed in this paper addresses how the cost of private tuition interacts with school-specific characteristics such as availability of special facilities, discipline, infrastructure, etc., and determines school choices of households. Due to the unavailability of data on the cost of private tuition, we take the share of private tuition expenditure of a child in the monthly per capita consumption expenditure of the household as a suitable estimate. The

results show how private tuition crowds out private schooling as long as it is a reasonable option for households. The chapter also constructs a theoretical school choice model simultaneously with the empirical framework to infer about the relative differences in between government and private school teaching quality.

Chapter 4 deals with the measurement of overeducation in elementary occupations in the Indian labor market. As against the conventional methods, which calculates overeducation using some predefined measures, we adopt the returns to education approach which first identifies the education level in an occupation providing positive significant returns and then calculates the proportion of workers with excess education. Since we are especially concerned with overeducation among higher-educated, we identify the elementary occupations where tertiary graduate workers do not get any positive significant returns and then calculate their proportion in the occupation. The analysis in this chapter starts with the measurement of overeducation in elementary occupations considered as a broad category and then proceeds into narrowly defined disaggregated categories within elementary occupations. The three occupation groups that we focus on in the study are ‘Domestic and related helpers, cleaners and launderers’, workers in ‘Mining and construction’, and ‘Messengers, Porters, Door Keepers, and Related Workers’. The main objective of this chapter is to test the hypothesis of whether all higher-educated workers in elementary occupations are overeducated for getting insufficient returns. Owing to the heterogeneous nature of work, we focus on gender-specific occupation categories in narrowly defined occupation categories, to get precise estimates. The chapter also briefly discusses the extent of overall overeducation in these occupations, which also includes workers with lower education levels, and compares it with the estimates under the modal method of defining overeducation.

Results

Chapter 2 addresses the issues of school dropouts and overeducation in a unique theoretical model which accounts for complementarity between household and infrastructural investment in education production function on the one hand, and school and higher education, on the other. The results derived in the chapter show that a reallocation of the education budget in favor of school education can solve both problems in one go if two conditions are satisfied – the quality of school education is more responsive to school infrastructure compared to teaching quality and the semi-skilled wages are sufficiently responsive to school education quality. The chapter, on the one hand, questions the efficacy of the widely practiced budget reallocation policy in favor of school education and on the other, shows that the reallocation cannot eliminate school dropout.

Chapter 3 argues that private tuition to some extent crowds out private schooling. *Ceteris paribus* it compensates for the teaching quality deficiency in government schools. As long as the cost of private tuition is below a threshold, a household may prefer to send its child to a government school and private tuition. With costlier private tuition, government school is substituted by a private school. Using the National Sample Survey 75th Round, 2017-18 data on education in India, we estimate a negative significant impact of the share of private tuition expenditure in monthly per capita expenditure of a household on government school enrolment of its child, who is in the 13-18 age group. The result remains robust after controlling for district-level school-related variables. The chapter also uses a theoretical model for explaining its empirical finding. The theory argues that the empirical results derived in the paper provide hard-to-find evidence in support of the widely held view that on average the unaided private schools in India impart better teaching quality compared to the government schools. The results also help us to understand the likely impact of policies like the crackdown on private tuition as has happened in China recently on school choice and quality of education in a country.

Chapter 4 uses the returns to education approach for estimating overeducation. In two occupations - ‘Domestic and related helpers, cleaners and launderers’, and ‘Mining and construction’, workers with higher education do not get any positive significant return, and thus confirms the presence of overeducation. On the contrary, higher-educated workers in ‘Messengers, Porters, Door Keepers and Related Workers’, despite falling under the broad category of elementary occupations, get significant positive returns. Thus, even though the official education requirements for elementary occupations are low, we find a worker with a higher education might signal higher productivity to the employer and secure a higher return. In a way, it circumvents the existing biases associated with the predefined measures of overeducation. While calculating the overall rates of overeducation in an occupation, the chapter finds that among domestic workers and ‘mining and construction’ workers, workers with any education are overeducated. For ‘Messengers, Porters, Door Keepers and Related Workers’, all workers with education between ‘below primary’ and ‘higher secondary’ are overeducated. In comparison to the returns to education approach, the estimates match for the domestic workers, whereas, leads to an underestimation in the latter two occupations using the modal method of calculating overeducation.

Plan of the Thesis

The thesis is divided into three core chapters: Chapters 2, 3 and 4. Chapter 1 introduces the thesis and Chapter 5 concludes. Chapter 2 analyses the impact of a government reallocation of the education budget on school dropouts and overeducation. Chapter 3 investigates the role of private tuition cost on the choice of schooling at secondary and higher secondary level among students in India. Chapter 4 explores the extent of overeducation present in elementary occupations in India, which are typically characterised by very low education requirements going by the official standards.

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