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Schooling Investments over Three Decades in Rural Tamil Nadu, India: Changing Effects of Income, Gender, and Adult Family Members' Education

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Summary. — This article explores the changing determinants of schooling investments from 1971 to 2003 in Tamil Nadu, India, using pooled and panel data of farming households. We find that the high correlation between children's attainment of basic schooling and the household's assets for farming disappeared during the mid-1980s. However, even after the mid-1980s, the attainment of advanced education is still affected by rainfall and thus by farm income, indicating the lack of insurance markets and the segregation of poor households under agriculturally unfavorable conditions from advanced education. Meanwhile, the segregation based on gender and adult members' education has been disappearing.

Key words — schooling, green revolution, weather shock, Asia, India

1. INTRODUCTION

It is widely recognized that schooling investments by poor households are not prevalent in developing countries regardless of their high returns (Barro & Lee, 2000; Strauss & Thomas, 1995). Therefore, several attempts have been made to identify the constraints to schooling investments that poor households face. Among them, significant numbers of empirical studies have been drawn from India, which explain what constraints make so many Indian children drop out of school, using data from the 1980s or the 1990s (Bhalotra & Zamora, 2006; Dostie & Jayaraman, 2006; Drèze & Kingdon, 2001; Duraisamy, James, Lane, & Tan, 1998; Jacoby & Skoufias, 1997; World Bank, 2004). Meanwhile, recent data show that India has made considerable strides in schooling; the gross enrollment rate increased from 78% in 1970 to 116% in 2004 for primary school and from 24% to 54% during the same period for secondary school (World Bank, 2001, 2007). How did this progress become possible? How have the effects of the constraints that were recognized in the past literature changed over time? Answering this question is important for faster progress in schooling, especially for the poor states left behind this trend.

Among others, an important constraint recognized by the existing literature is credit and insurance (Strauss & Thomas, 1995). It argues that even if schooling investments guarantee high future returns, poor households have to give them up as they do not have sufficient funds on hand and, furthermore, cannot borrow money to finance such investments. This indicates further that poor households' schooling investments are vulnerable to negative income shocks (Jacoby & Skoufias, 1997; Sawada & Lokshin, 2009). Jacoby and Skoufias (1997) find that school attendance in Indian villages is negatively affected by idiosyncratic shocks particularly when the shocks are unanticipated. Moreover, similar to Townsend (1994), they find that covariate shocks hit households harder than idiosyncratic shocks do in an irregular income village. Therefore, the impact of the shocks on schooling investments is more discernible when income is affected by unanticipated shocks such as drought and flood. Although credit markets can provide ex-post insurance, they may not sufficiently insure against large unexpected shocks. Existing empirical literature suggests that schooling investments are constrained by incomplete credit markets, especially by the lack of insurance markets.

Another constraint identified by empirical literature is being a female. Expected returns to schooling among females are low probably because of discrimination against women in labor markets or because of the termination of the flow of returns at the time when women leave from households in their marriage (Garg & Morduch, 1998; Greenhalagh, 1985; Parish & Willis, 1993).[1] Another reason could be the high opportunity cost of girls who are expected to do some domestic work as their obligations. In this case, credit constraints affect girls harder than boys. It is also well documented that

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a low level of parental education is associated with low schooling investments for their children (Strauss & Thomas, 1995). The order of birth also matters when resource crowding exists within the household (Parish & Willis, 1993; Sawada & Lokshin, 2009; Strauss & Thomas, 1995). Many empirical studies have statistically and descriptively shown how strongly these determinants/constraints have shaped poor households' schooling investment behavior (Strauss & Thomas, 1995).

Although existing empirical studies have successfully identified the determinants of schooling investments, their limitation is that, given the unavailability of long-term micro-level data, they have shed only partial light on a particular period of time and thus have not provided a clear picture of how dynamically the determinants have changed their influences along the changes in investment environment. This means that existing literature cannot provide a comprehensive answer to the question about the long term changes which we have raised in the first paragraph. This paper attempts to fill this research gap by providing empirical evidence of the determinants of schooling investments and then investigating their changing impacts over the last three decades in Tamil Nadu, India. Tamil Nadu has achieved greater improvements in school enrollment rates than many other Indian states. [2] Because it has been a successful state, this paper tries to draw lessons from Tamil Nadu's experiences.

The data used in this study are farm household data collected from 1971 to 2003 by Tamil Nadu Agricultural University under the Cost of Cultivation of Principal Crops (hereafter, CCPC) scheme. The advantage of this data set is the availability of annual data collected in a consistent format for more than three decades. Moreover, the expansion of questionnaires in 1993 allows us to use detailed household panel data for the analyses of the last decade. The disadvantage is the restriction of the sample to farming households, excluding both urban and landless rural households. However, the data set includes marginal farmers, so our results will not be seriously biased toward rich rural households. Through our analyses with this data set, we believe that the paper makes two major contributions. First, our analyses with a single data set provide a more consistent and comprehensive picture of the changing impacts over time than a chronological synthesis of existing independent studies. Second, with the use of data from the expanded questionnaire, more detailed analysis is conducted for the last decades, in which we examine the influence not only of income, gender, and adult members' education but also of weather shocks, which are rarely incorporated in the empirical literature of schooling investments. [3]

The paper proceeds as follows. Section 2 describes the educational system and policies in Tamil Nadu. Section 3 presents the determinants of schooling investment and their changing impacts over time. After explaining the data set in Section 4, we review the progress of schooling over three decades in Section 5. Econometric results for the entire period and for the last decade are presented in Sections 6 and 7, respectively, and Section 8 concludes.

2. THE EDUCATIONAL SYSTEM AND POLICIES IN TAMIL NADU

To understand changes in the environment of schooling investments, we first explain the educational system in Tamil Nadu and then review educational policies. Formal education in Tamil Nadu consists of 8 years of compulsory education, which is divided into 5 years of primary school (age group 6–11) and 3 years of middle school (11–14), followed by 2 years of secondary school (14–16) and then 2 years of higher secondary education (16–18). [4] Pupils must pass a public exam to proceed to the higher secondary level. The higher secondary graduates have to take a public exam to pursue studies at colleges or universities for higher education (age group 18 and above). [5]

The Indian government has put the highest priority on universal primary and middle school enrollment since its independence. The Constitution stipulates that the state shall endeavor to provide, within a period of 10 years from the commencement of the Constitution, free and compulsory education for all children until they complete the age of 14 years. The National Policy on Education in 1966 emphasized the improvement of education quality and more equitable expansion of educational facilities. Tamil Nadu has been providing public school education for free up to secondary school since 1964 and up to higher secondary education since 1978. However, parents still had to shoulder miscellaneous costs for items such as school supplies and uniforms in this period. Note also that, although it is not so large for immature children, the opportunity cost of sending children to schools does exist in developing countries. Thus, in this period, the cost of education was considerable in Tamil Nadu even at the primary level.

The national government became more aggressive in pursuing universal education after drafting the National Policy on Education (NPE) in 1986. The Programme of Action was drafted in the same year and many national and state projects under the Programme enlarged opportunities for primary and middle school education (Duraisamy *et al*., 1998; Tyagi & Paramasivan, 2001). Prior to the Programme, the Tamil Nadu state government introduced the Nutrition Meal Scheme (a free mid-day meal program) in 1982. [6] In 1985, the state government started a free supply of textbooks and uniforms. [7] This means that in the 1980s the cost of sending children to primary or middle schools was reduced close to the level of the opportunity cost. [8] The opportunity cost among the children of the primary- or middle-school age group is not so large as they cannot earn as much as adults. Hence, sending children to either level of schools must have become an affordable investment opportunity in this period as long as schools exist in the accessible distance. On the other hand, education beyond middle school still requires miscellaneous costs. The opportunity cost of this age group is as high as adults' earning. Thus, even after the 1980s, the acquisition of this level of education must have been an expensive investment.

Other important policies are those that are targeted to socially vulnerable groups such as women and lower caste groups. The NPE in 1986 addressed the necessity of focus on these groups. The National Policy on Empowerment of Women in 2001 emphasized the state's commitment to equal access to education for women, particularly those belonging to lower castes. In 2002, a constitutional amendment further emphasized the guarantee of free and compulsory education for all children aged 6–14. This indicates that the government's will to eliminate discrimination against socially vulnerable groups is getting stronger. How much have these policies been effective in removing the constraints? In the following section, we will discuss households' schooling investment behavior under these changes.

3. HOUSEHOLDS' SCHOOLING INVESTMENT BEHAVIOR: THE DETERMINANTS OF INVESTMENT

Existing literature suggests key factors underlying households' schooling investment behavior. Among them, the most important household-level variable in this study is income or