

# Returns to Education in India

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**Summary.** — In India both men and women with more education live in households with greater consumption per capita. Yet aggregating across age cohorts and states, an extra year of education brings male cohorts only 4% more consumption and provides no additional consumption for female cohorts. This result is robust to: (1) accounting for survey measurement error, (2) different measures of household consumption and composition, (3) allowing returns to differ by state and school quality, and (4) age misreporting. The only area with substantial returns is entering into regular wage work which still employs only a small fraction of the population.  
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*Key words* — Asia, India, returns to education, school quality, aggregate *versus* individual returns, age misreporting

## 1. INTRODUCTION

Education is often given the throne in the pantheon of development (Case, 2006) because of the extensive evidence for high returns at the individual level (Psacharopoulos & Patrinos, 2004). The empirical case for strong returns beyond the individual, when general equilibrium effects and externalities may be important, is not so clear. Despite huge increases in education in developing countries after 1960 the accompanying increases in production have been disappointing, prompting Pritchett (2001) to ask “where has all the education gone?” Since it is the returns to additional education for society, not the individual, that matter for policy, good estimates of the social returns are crucial.

One reason for the lack of relationship as suggested by Temple (2001) and Cohen and Soto (2007) is that the quality of the data comparing across countries is poor. Lutz, Cuaresma, and Sanderson (2008) do find that growth increases for some age and education groups using improved measures of education. Another reason highlighted by Pritchett (2001) may be that education exhibits strong externalities. For example, if education acts largely as a signal of quality then there may be high returns for individuals, but low returns to increases in education on average. Alternatively peer effects or innovation spillovers may result in positive education externalities, leaving the individual returns too low.<sup>1</sup>

To overcome some of these difficulties this paper focuses on India. Focusing on a single large country removes many of the problem of comparability and data quality which plague cross-country comparisons. Further, since this paper builds estimates of aggregates directly from micro data across 25 years of National Sample Surveys (NSSs) it is possible to compare the individual and aggregate returns, as well as examining the returns for women and the self-employed who are often ignored.

The basic approach of this paper and the conclusions it reaches can be summarized in two figures. Figure 1 shows the educational attainment of successive birth cohorts. There has been a tremendous increase in educational attainment in India accompanied by domestic and international efforts to build schools and train teachers.<sup>2</sup> From a low base of less than a year on average for women, and about 2 years for men for those born around 1920, the number of years of education has increased steadily to around 6 years for women and nearly eight for men in the last cohort to have finished its education.

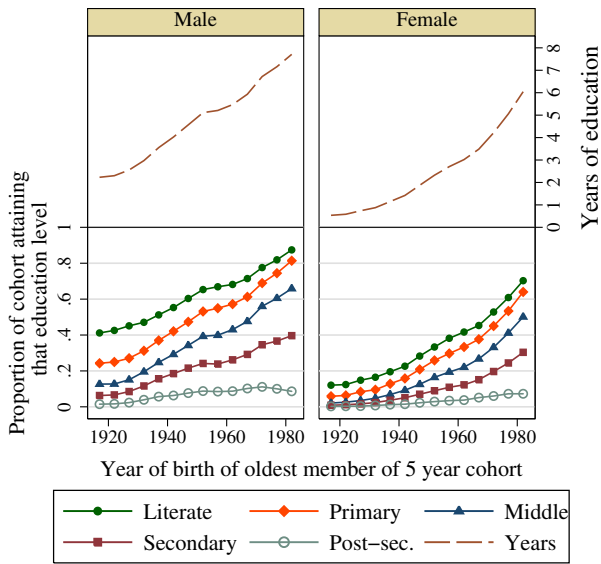
Have these gains in education brought similar gains in material well-being?

Figure 2 shows the per capita household consumption of birth cohorts from select years between 1983 to 2005. Although younger cohorts are on average better educated, and sometimes substantially better educated, they do not appear to live in households with systematically higher consumption. That suggests quite low returns to education for consumption at the cohort level. The bulk of the paper will be devoted to setting up the estimation to make the comparison between Figures 1 and 2 systematic. Adding in all available household surveys, comparing across states, allowing consumption to vary systematically with age and year across cohorts, accounting for measurement error, and using several different approaches to account for family composition, all confirm the basic observation: Between cohorts, the returns to education for males are between 3% and 4% and appear to have decreased after 1991 following a major liberalization of the economy. Women in better educated cohorts do not appear to live in households with higher per capita household consumption.

On an individual level, there do appear to have been substantial returns to education, so these results are not driven just by using consumption or some other peculiarity of the data. Across the population and within each age cohort, there is a strong positive relationship between education and consumption or wages: individuals with more education live in households with greater per capita household consumption, with an extra year associated with an increase in consumption of between 5% and 8% for both men and women. The estimated slopes appear to be larger for women. Such estimates have well-known biases and cannot capture general equilibrium effects so they are unlikely to tell us much about whether education improves consumption. Under reasonable assumptions, I show aggregating avoids these standard problems, although aggregating at the cohort level cannot capture growth effects from education that affect all cohorts.

To understand where the low returns for consumption are coming from, I also examine returns across cohorts in the wage market. Only 14% of all women and 41% men work

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Graphs by Sex

Figure 1. Education by cohort birth year. Notes: Age cohorts are 5 years wide and are labeled by the oldest member. The years of education is calculated from the level of education, see Appendix C. The cohort education is the mean for each cohort calculated from all surveys in which the cohort would have finished most of its education (the oldest member of the cohort was 21 or older), without accounting for survey size. The oldest and youngest cohorts are thus less well estimated, and the youngest cohort may not have completed all of its post-secondary education. Secondary includes both secondary and higher secondary. Source: National Sample Surveys, various years.

for wages in India and so one of the major reasons to focus on consumption is that everyone consumes and so has potential returns to education.<sup>3</sup> Conditional on earning a wage, better educated cohorts of men earn about 10% more, are about 3% more likely to work for a wage, and are 2.5% more likely to earn a salary rather than be in casual work. Breaking up the market the returns to education at the cohort level for both salary and casual wage work are only 5–6%. A large portion of the returns to education comes from moving into salary work where wages increase much more steeply with age. Since less than 20% of working age men work for a salary, one reason for the low consumption returns is that the one area where there appears to be large returns to education employs a small fraction of the work force. Women appear to have negative cohort returns in the wage market. Although the negative estimate should be treated with caution since it is most likely driven by selection into working for a wage, it is consistent with zero returns for consumption for women.

It is important to note that wage returns and consumption returns are not directly comparable but their relationship provides insight into why the returns are low. Both wages and consumption are imperfect measures of welfare gains from education. Consumption can only be effectively measured at the household level because household formation implies some sort of sharing—that is almost by definition since a household is almost certainly sharing at least housing. Wages, on the other hand, are attributable to the individual although not everyone has wages and so well defined wage returns to education. If there are no other effects of education beyond increases in individual income then consumption returns will typically be smaller than income returns since gains from income must be shared in the consumption of other members of the

household. How much smaller depends on the importance of an individual’s income in overall household income: if a single person is the sole earner in a household, then the education and consumption returns for that person are identical. If many people earn incomes then consumption returns will tend to be smaller than the wage returns (see Appendix A).

So why are the returns to education for women in consumption so low? The cohort wage returns show that they have almost zero (possibly even negative) returns to education in the labor market. Female workforce participation is also very low and so their contribution to household income is small. Combined that means that the vast increase in female education has not translated into women living in households with higher consumption since Indian society and labor markets do not effectively use their skills. The advantage of consumption returns is that they allow for the possibility of other household spillovers from female education beyond direct income generation; these spillovers do not seem to be important either.

Aggregating over cohorts further allows me to correct for measurement errors both from sampling using the approach of Fuller (1987, Section 3.1.2) and because of age misreporting. Age misreporting is extensive in India: around one quarter of Indians have their ages incorrectly reported in the National Sample Surveys, and the least educated are the most likely to misreport their ages. At first glance that appears to create a large measurement error problem. Yet I show that unlike the standard measurement error which will tend to create attenuation to zero, even education-specific age misreporting does not lead to bias when estimating using appropriately defined cohorts.

Low consumption returns for men and women does not mean that there are low returns to education in all dimensions. Not all externalities are within cohorts and externalities that extend beyond cohorts are not captured by comparing cohorts. A more educated population may cause higher growth for everyone, for example. Whether such broader externalities exist, the results in this paper still suggest either strong negative externalities at the cohort level, particularly for women, or substantial biases in returns estimated at the individual level. Education contributes to a more desirable civic society and is valuable in its own right (Sen, 1999). There is ample evidence that it improves health (Cutler & Lleras-Muney, 2006). Moreover, education is likely to be particularly important for women leading to a more equitable distribution across society and within the family even without direct consumption or income effects (World Bank, 2012).

With a population of more than a billion people and large increases in education, the overall returns to education in India are important by themselves, but India’s diverse states provide an additional way to examine what drives the returns to education. For example, Foster and Rosenzweig (1996) find that returns increased in areas where the Green Revolution allowed the use of new technologies. Yet I show that the returns at the cohort level do not seem to vary substantially at the state level. One reason the returns may be so low is that the quality of education may be poor (see, for example, PROBE Team (1999)). I use a test administered to school age children as part of the nationally representative India Human Development Survey (IHDS) in 2005 (Desai & Vanneman, 2008) to get a sense of the quality of the education systems across states. There is a weak positive relationship between the returns across states and the added value that an additional year of education in that state brings. Going from the worst state to the best in the benefit of an extra year of education on reading raises the returns by less than 2%, and moving from the best to worst in mathematics by less than 1%. The variation in quality

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