



Mass education or a minority well educated elite in the process of growth: The case of India[☆]

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ABSTRACT

This paper analyzes whether mass education is more growth enhancing in developing countries than having a minority well educated elite. Using Indian Census data as a benchmark and enrollment rates at different levels of education, we compute annual attainment levels for a panel of 16 Indian states from 1961 to 2001. Results indicate that if the reduction in illiteracy stops at the primary level of education, it is not worthwhile for growth. Instead, the findings reveal a strong and significant effect on growth of a greater share of population completing tertiary education. The economic impact is also found to be large: a one percent change in tertiary education has the same effect on growth as a 13% decrease in illiteracy rates. A sensitivity analysis shows the results are unlikely to be driven by omitted variables, structural breaks, reverse causation or atypical observations.

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1. Introduction

According to the United Nations, in 2007 about 72 million children in the world did not have access to education.¹ This striking number highlights that in poorer countries a large mass of population work as unskilled labor in low productivity activities. In such economies, governments face a dilemma of whether to focus on policies that extend education to those who are illiterates or on policies that increase the share of well educated workers, who could specialize in high-skill

sectors that could in turn fuel economic growth. The dilemma comes from the fact that the number of well educated workers will be small, at least in the short run, given the vast masses of illiterates. In order to better understand whether mass education is more growth enhancing in developing countries than having a minority well educated elite, this paper focuses on a specific developing economy and estimates the effect on growth of different measures of human capital that capture the distribution of education, as well as the influence of each level of schooling.

The conventional wisdom about the relevance of each level of schooling is that mass education is the key. A possible explanation for this belief is that the marginal return to schooling is found to be decreasing with the level of schooling (e.g. Psacharopoulos and Patrinos, 2004). Nevertheless, these studies do not take into account the fact that in many countries, the majority of university graduates are employed in the public sector, where wages do not reflect their market value. Moreover, recent evidence suggests that the pattern of returns is changing and the rate of return to primary education may now be lower than in the case of post-primary levels of schooling. Colclough et al. (2010) survey the new evidence with data from the 1990s and early 2000s for individual countries and show that in most studies the rate of return to an extra year of education is found to be increasing as the level of education rises. Likewise, recent estimates with cross-country data have also challenged the traditional view by showing an estimated rate of return to an additional year of schooling being higher at the secondary and tertiary levels than at the

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¹ The second United Nations Millennium Development Goal is to achieve universal primary education by 2015.

primary level (e.g. Barro and Lee, 2010). Notwithstanding, private and social returns to education may differ as well. As noted by Pissarides (2000), educated laborers can be engaged in activities with high private returns but located in sectors that are not growth-enhancing.

The goal of this paper is to analyze the importance of the composition of human capital in less developed countries, which are characterized by a large share of population with no education. As a result, a trade-off between literacy and high-skill education may arise. Among the developing countries, India stands out as its governments have, at different points in time, prioritized extending primary schooling among the illiterates as well as increasing the share of population with tertiary education. High quality engineering and technology-oriented institutions of higher education have been the aim of all Indian governments since its independence in 1947. The high mass of illiterates along with a not negligible number of highly educated elite makes India an important case study for how the shape of the distribution of education may affect the economic performance of an economy.

The case of India is also convenient since it is one of the few developing countries with good statistics on relevant variables. Data on real GDP and other determinants of growth for the main Indian states are available on a yearly basis for the period 1961–2001 (e.g. Besley and Burgess, 2000, 2004; Ghatge and Wright, 2012). The advantage of using the cross-sectional and temporal dimension of the data is that they can be used to estimate a panel data model that controls for state-specific effects and therefore minimize any omitted variable bias in the analysis. Moreover, data quality varies enormously across countries and is typically worse in low income countries. The use of sub-national level data also has the advantage that the different levels of education are more comparable across states within a country than across developing economies.²

While data on income measures and other relevant variables are available for the states of India on a yearly basis, there are no similar panel data for educational measures. We fill this gap by computing yearly data on educational attainment across the states of India. More specifically, we use the Indian Census as a benchmark, which contains decadal information on the educational levels across the states and estimate annual observations using data on enrollment rates for different education levels and a variant of the perpetual inventory method that takes into account possible over-reporting of enrollments. We compute the share of population 15 years and above with no schooling, some primary, completed primary, completed middle, completed secondary and completed tertiary for 16 Indian states from 1961 to 2001. We also use these data to compute distributional measures, such as the Gini coefficient and the distribution of education by percentiles.

From a methodological point of view, this paper shows that in developing countries, measures commonly used in the literature such as average years of education or the human capital Gini coefficient are not sufficient to assess the effect of the level of education on economic growth rates, since they are determined to a large extent by the huge mass of people with no education. For instance, in the case of India, the correlation between the average years of schooling and the share of illiterates is above 0.9. These measures, therefore, mainly pick up the influence of illiterates on the economic performance of economies. Alternate specifications that include the share of illiterates, average years of education among the literates and the Gini coefficient among literates also fail to extricate the effect. This is because these distributional statistics are driven by large proportions of people with low levels of education. Hence, average educational attainment is collinear to these popularly used distributional statistics.

² Gennaioli et al. (2011) use a new dataset that comprises 1569 sub-national regions from 110 countries to examine the determinants of regional income. Controlling for fixed effects, the findings reveal that while some institutions or cultures may matter at the national level, differences in education attainment account for a large share of the regional income differences within a country.

We show that when attainments at various education levels differ a lot in degrees of magnitude, using shares of attainment of each education level does a much better job in bringing out the effect of the distribution of education. Results indicate that the tertiary attainment level is the level of education that had the strongest contribution to the growth rates of the Indian states over the period 1961–2001. Moreover, the economic impact is also found to be large: a percentage change in tertiary education (a re-allocation from primary and secondary level) has the same effect on the growth rate as a 13% decrease in illiteracy.

We find that the results are robust across different specifications, hold with different frequencies used to compute the growth rates and survive splitting the data into sub-periods that reflect different stages of development of the Indian economy. Moreover, the findings also hold with the use of instrumental variables. In our econometric specification, endogeneity can arise because states with conditions favorable to economic growth also produce higher investment in education. In order to account for this possibility, we use fixed effects to control for geographical, institutional or cultural characteristics that remain quite stable over time and may influence both economic growth and human capital investment. In addition, we use an instrumental variable approach focused on the potential endogeneity of tertiary education, since more educated workers are more mobile and could locate in high income or faster growing states. We also apply the system GMM estimator as an additional robustness test. The advantage of this technique is that it uses instruments for all the explanatory variables and corrects for potential endogeneity stemming from any regressor.

Overall, the results indicate that if the reduction in illiteracy stops at the primary level of education, the impact on growth rates is very low. This is in contrast to micro-studies like Psacharopoulos and Patrinos (2004), who report that returns to education are usually higher for low levels of schooling and decline for higher levels of education. However, in line with our macro findings, Bosworth et al. (2007) also find that in India the returns of primary education are relatively lower than average returns. Likewise, estimating a Mincerian wage equation using data from 2004 to 2005, Kingdon (2009) shows that the returns to education in India are convex, that is, the marginal return to each extra year of schooling rises with the level of education. These findings are consistent with a low quality educational system at the primary level, which may lead to higher literacy, but does not contribute to skill accumulation. In fact, teacher absenteeism and negligence are common in many Indian schools (e.g. Kremer et al., 2005).

So far, the traditional literature that empirically investigates the influence of human capital on economic growth has not emphasized the role of the composition of human capital. Instead, the most common approach has been to use average years of schooling of the adult population as a proxy of the stock of human capital (Benhabib and Spiegel, 1994; Cohen and Soto, 2007; de la Fuente and Doménech, 2006), or the Gini coefficient to analyze the effect of the distribution of education (e.g. Castelló and Doménech, 2002).³ However, this

³ The effect of human capital on economic growth has been under debate in the empirical literature. Bils and Klenow (2000) calibrate a model and find that most of the relationship between schooling and growth, found in Barro (1991), can be explained by a channel that goes from expected growth to schooling instead of from schooling to growth. Another challenging finding was made by Pritchett (2001), who in a growth accounting regression shows that the impact of growth in educational capital on growth of per worker GDP is negative. In the development accounting literature, Caselli (2005) finds that differences in the stock of physical and human capital account for only 30% of the income variation across countries, whereas Jones (2011) generalizes the human capital aggregator and shows that human capital variations play an important role in explaining cross-country income differences. Contradictory results have also been found in individual countries. For example, using a measure of human capital that takes productivity differences into account, Whalley and Zhao (2010) find that human capital has played an important role in China's economic growth during the period 1978–2008, in contrast to previous evidence which showed that human capital had been relatively unimportant for China's growth success (e.g. Bosworth and Collins, 2008).

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