

EDUCATIONAL ATTAINMENT AND ECONOMIC DEVELOPMENT IN INDIA



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ABSTRACT

Article History

Received: 30 June 2017

Revised: 2 August 2017

Accepted: 10 August 2017

Published: 22 August 2017

Keywords

Educational attainment

Economic development

Higher education and skills

Economic performance of the

States of India

Developmental expenditures

India

Educational inequality

Levels of education and wages

Educational attainment and type of employment.

The paper examines the relationship between different levels of educational attainment and economic performance at the micro level of an individual and at the macro level, across the States of India, for the period 2001 to 2011. Using secondary sources of data, the paper observes significant increase in educational attainment in India in the period 2001-2011 across the three levels of education – primary, secondary, and higher and skill-providing education. It is interesting to observe a quantum increase in persons acquiring higher and skill based education. But the gap has widened between the relatively well-to-do and the poorer sections of the population in the acquisition of higher and skill based education. This has implications for the type of employment generated and the wages earned. At the macro level, regression analysis highlighted the importance of higher education and skills in improving the economic performance of the States of India. However, the availability of educated and trained manpower needs to be complemented with other developmental infrastructure inputs in the form of availability of electricity and health to improve the economic performance of the States of India.

JEL Classification

O1, O2.

Contribution/ Originality: The study is one of the very few studies which have investigated the relationship between attainments in different levels of education with the level of economic development in India. The paper's main contribution is the finding that higher and skill education is the key to better economic performance.

1. INTRODUCTION

Investment in education which is akin to human capital is an important means by which economic, social and cultural potential of the people can be realized. Several studies suggest human capital accumulation as an important factor to a country's economic growth (Barro, 1991; Birdsall, 1993; World Bank, 1993;1998/99; Barro and Lee, 1994). However, Bils and Klenow (2000) find the channel from schooling to growth weak as there may be several omitted factors relating to schooling and subsequent growth rates.

Pritchett (2000) does not find association between the increases in human capital attributable to rising educational attainment of the labor force and the rate of growth of output per worker. This has been

attributed to perverse institutional/governance environment, falling marginal returns to education and low quality of education that 'years of schooling' have not created human capital. [Bosworth et al. \(2007\)](#) observe that growth contribution from increases in education has been modest in India for the period 1960-2004 with average years of schooling and literacy data among its population low and the effort to universalize education recent (p.42).

In the context of the above brief literature review, the objective of the research paper is to examine the relationship between educational attainment and economic performance at the micro level of the individual and at the macro level of the States of India for the period 2001 to 2011. The analysis is based on official secondary sources of data. The relationship between educational attainment and the economic performance of the States of India has been analyzed with the help of regressions.

2. EDUCATIONAL ATTAINMENT IN INDIA

Educational attainment may be discussed with reference to different levels of education attained namely completion of primary level of schooling, completion of secondary level of education and thereby complete schooling, and higher levels of education which builds skill sets in individuals. As an economy grows and undergoes structural transformation, the demands on its labor force keep changing. The skills and the dexterity required of the labor force increase. Primary education expands in the initial levels of economic development and subsequently the expansion of secondary and higher education is needed for rapid economic growth at higher levels of development ([World Bank, 1993;1998/99; Chun-Hung, 2007](#)). The different levels of educational attainment have implications for distribution of income ([Chenery et al., 1974; Schultz, 1999; Chun-Hung, 2007](#)).

With universalization of education in India, the average years of education has increased. Literacy rates have increased and the number of years completed in school has increased. Data provided by the Census of India shows literacy rates to have improved for the country as a whole from 18 per cent in 1951 to 74 percent in 2011 ([Reserve Bank of India, 2015-16](#)). The average level of education has increased as observed in the number of years of schooling completed. This has been examined in terms of levels of education i.e. those who have completed primary education, those completing secondary education (completing school education) and those undertaking education which builds skills to increase employment potential. For the purpose of this research paper, persons with technical and non-technical diploma or certificate courses, graduate and post graduate degrees have been considered as those with skills. In the period 2001 to 2011, i.e. two consecutive Census rounds, the number of persons with only primary education has increased from 14265 per lakh population to 15209 per lakh population. The number of persons completing secondary education i.e. completing the cycle of schooling has increased from 7702 per lakh population to 8749 per lakh population. The availability of persons with higher education and skills has increased from 4065 per lakh population to 6576 per lakh population in the same time period.

From an economic development policy perspective, there is need to examine the distribution of educational attainment across income groups. Since education is considered to be human capital and the level of education attained determines the wages earned, it is imperative to examine how educational attainment is distributed across income groups. The examination of the three levels of education attained across different income groups has been done with data provided by the NSSO (National Sample Survey Organization) reports. (Table 1). NSSO releases data on educational attainment across consumer expenditure groups which may be used as a proxy for income levels of the population. In the distribution of population by Monthly Per Capita Consumer Expenditure (MPCE), the first decile called 0-10% is the level of MPCE below which 10 percent of the population lie. The second decile, called 0-20 percent is the level below which 20 percent of the population lie. And so on. The levels of education are in an ascending order beginning with not literate, literate without formal schooling, below primary, primary (Classes I-V), middle school (Classes VI-VIII), secondary level of education (Classes IX – X), higher secondary (Classes XI-XII), post higher secondary, certificate or diploma courses which may be technical or non-technical in nature, and graduates and post graduates.

Table-1. Percentage of persons completing different levels of education by consumer expenditure groups, 2007 and 2014

| | Level of education | Monthly per capita consumer expenditure (MPCE) by percentile class | | | | |
|---|--|--|----------|-------|-------|--------|
| | | 2007 | | | | |
| | | Lowest 20 | 20 to 40 | 40-60 | 60-80 | 80-100 |
| 1 | Not literate | 48.85 | 42.9 | 38.1 | 31.3 | 16.55 |
| 2 | Primary | 15.2 | 16.85 | 17.6 | 17.4 | 13.85 |
| 3 | Secondary | 3.2 | 5.1 | 6.95 | 9.95 | 15.15 |
| 4 | Diploma/Certificate, Graduate, post graduate and above | 0.6 | 0.9 | 1.85 | 3.9 | 16.5 |
| | | 2014 | | | | |
| 1 | Not literate | 39.35 | 32.85 | 27.7 | 23.7 | 15.95 |
| 2 | Primary | 15.1 | 15.15 | 15.05 | 13.3 | 10.45 |
| 3 | Secondary | 6.4 | 9.15 | 11.5 | 13.45 | 13.85 |
| 4 | Diploma/Certificate, Graduate, post graduate and above | 2.1 | 3.70 | 7.0 | 11.70 | 24.15 |

Note: Figures may not add to 100 as several levels of education have been omitted. The complete description is available in Annexure Table 1.

Source: NSSO, Education in India: Participation and Expenditure 2007-08, Report 532, 64th round (July 2007-June 2008), National Statistical Organization, Ministry of Statistics and Program Implementation, Government of India, May 2010.

NSSO, Education in India, Report 575, 71st round (January-June, 2014), National Statistical Organization, Ministry of Statistics and Program Implementation, Government of India, May 2016

Over the time period 2007-14 (data provided by the two rounds 64th and 71st), average levels of education have increased. Illiteracy has fallen in the time period 2007-14. The fall is higher in the lower consumption expenditure groups. However, illiteracy still remains high ranging between 16 to 40 percent in 2014 across different consumer expenditure groups. Completion of primary education has either remained the same or fallen across the different consumption expenditure groups. Completion of secondary education has increased across all expenditure groups except the last (the highest) where it has in fact fallen as the number of persons undertaking education which provides technical or non-technical diploma or certificate, graduate and post graduate degrees has increased. This implies that the average level of education has moved from primary to secondary completion. (Table 1).

Diploma, certificate, graduate and post graduate degrees which provide technical or non-technical knowledge may be considered to be employment oriented education and persons acquiring these levels of educational attainment can be seen to be rising across all income groups. There appears a direct correlation between acquisition of this type of education and income (as indicated by consumer expenditure). As one moves up the scale of income, the number of persons acquiring this education has also increased. This means the acquisition of these educational skills is more as one moves up the income ladder. This would imply that while average levels of education are on the rise in India, educational attainment inequality has also risen which has implications for income inequality. (Table 1).

Education earns a good return in India comparable to that of other strongly growing countries (Bosworth *et al.*, 2007). The different levels of education are a source of different levels of earnings. The returns to education differ across the various levels of education. Average wage/salary earnings per day received by regular wage/ salaried employee across the various NSSO rounds indicate that higher levels of education are associated with higher earnings. (Table 2). Between the years 2005-2006 and 2011-2012, while the illiterates had an increase in their average earnings from Rupees 77/- to Rupees 164/- per day, an increase of Rupees 87/-, for graduates and above, this increase over the same period has been Rupees 391/- per day. The study, therefore, indicates that the earning potential for those who have acquired higher levels education has increased far more significantly than those who are semi-literate or illiterate.

Table-2. Average earnings for different levels of education, 2005-12

| | Level of education | Average earning in Rupees for various years | | | |
|---|--------------------------------|---|---------|---------|---------|
| | | 2005-06 | 2007-08 | 2009-10 | 2011-12 |
| 1 | Not literate | 77.27 | 88.88 | 123.36 | 164.05 |
| 2 | Literate and up to middle | 101.70 | 127.41 | 162.82 | 205.42 |
| 3 | Secondary and higher secondary | 162.37 | 200.19 | 273.38 | 331.37 |
| 4 | Diploma/certificate | 261.03 | 291.34 | 417.50 | 478.21 |
| 5 | Graduate and above | 306.20 | 428.69 | 547.77 | 697.22 |
| | All | 168.73 | 226.64 | 317.93 | 395.82 |

Source: Various rounds of NSSO including 62nd, 64th, 66th and 68th

Educational attainment in the form of completing different levels of education is important for the type of employment secured. (Table 3). NSSO data reveals self-employment is more common amongst illiterates and less educated. Salaried jobs are common amongst skilled persons. What is interesting is the unemployment rate amongst the skilled persons. (Table 3). This highlights the quality dimension of Indian education. Persons with qualifications are often not employable because of poor quality of training. The low quality of education imparted in schools has been highlighted by *Pratham*, a non-governmental organization, which publishes a report based on a household survey of rural India. In 2014 it had reported, of all the children enrolled in Standard V, about half cannot read a Standard II text book. In Standard VIII, 75 percent of the students could read a Standard II book. The gap in reading levels between children enrolled in government schools and private schools appears to be growing. Only 25.3 percent of Class III children could do a two-digit subtraction, 26.1 percent of Class 5 children and 44.1 percent of Class 8 students could do division.

Table-3. Levels of education and type of employment / unemployment

| Type of employment | Level of education | | | |
|--------------------|--------------------|---------|-----------|---------|
| | Not literate | Primary | Secondary | Skilled |
| Self employment | 30.8 | 24 | 13.3 | 7.2 |
| Salaried | 9.1 | 15 | 15.1 | 34.3 |
| Casual labor | 43.3 | 30 | 7.3 | 1 |
| Unemployed | 6.3 | 12 | 14.2 | 37.6 |

Source: Government of India, NSS Report 554: Employment and Unemployment situation in India 2011-12, 68th Round, Ministry of Statistics and Program Implementation, 2014

3. EDUCATIONAL ATTAINMENT ACROSS THE STATES OF INDIA, 2001 TO 2011

There are regional variations in the levels of education completed. Several studies highlight the need to invest in primary education as a means to remove regional disparities across the States of the country (Kurian, 2000; Dholakia, 2003; Ghosh, 2006). It may be argued primary education is needed in the early stages of development. As the economy grows in complexity, universalization of education would mean completion of secondary levels of education as the minimum threshold level of learning. And subsequently, the need for skilled persons is crucial for rapid development. The analysis across the States of India for educational attainment has considered levels of educational attainment as: those with only primary level of schooling, those who have completed secondary level of schooling and thereby completed the cycle of schooling, and persons with skills exhibiting the potential for employment. These may be considered as ready for the market. For purpose of this paper, literates who possess technical and non-technical diploma/certificate, graduate and above degree holders and the unclassified have been clubbed together as persons with employment oriented skill sets or education. In India, there exist many institutes which do not formally award a certificate but are involved in building skills sets which prepare people for some kind of employment. There are also self-learnt people. Hence, unclassified literates have been taken as part of the people possessing employment oriented skill building education.

The States differ in the pattern of achievement of the different levels of education. Refer to Annexure Table 2. They may be categorized as follows:

- States with an increase in all the 3 levels of educational attainment:
Arunachal Pradesh, Bihar, Chhattisgarh, Gujarat, Jammu and Kashmir, Jharkhand, Madhya Pradesh, Odisha, Rajasthan, Sikkim, Uttar Pradesh, Uttarakhand.
- States which exhibit decline in primary education completion, and increase in secondary education completion and significant increase in population acquiring skilled based education:
Andhra Pradesh, Goa, Haryana, Himachal Pradesh, Maharashtra, Manipur, Mizoram, Delhi, Punjab, Tamil Nadu, Tripura.
- States exhibiting decline in primary and secondary completion and substantial increase in skill based educated persons:
Chandigarh, Karnataka, Kerala
- States with a decline in persons with secondary education, but with an increase in primary and skilled based education :

Assam, Meghalaya, Nagaland, West Bengal. These States do not seem to follow the expected pattern of development.

The differences in educational attainment have consequences for the level of economic development in the State as indicated by the State Domestic Product (SDP) which is available in the Handbook of Statistics on Indian States 2015-16, Reserve Bank of India. To understand the relationship between educational attainment and the economic performance of the States of India, a regression analysis of the population completing different levels of education on Per Capita Net State Domestic Product (PCNSDP) in the two time periods, 2001 and 2011, was done. The results show educational attainment could explain 77 percent of the variation in per capita incomes across the States of India in 2001 and this has come down to 64 percent in 2011. This means that there exist other factors in determining per capita incomes across the States in 2011. Amongst the 3 different levels of education, it is skilled education which is statistically significant in 2001 and 2011 as observed in its t-statistics value. (Results in Table 4).

Table-4. Regression results: Levels of education and PCNSDP, 2001 and 2011

| Dependent Variable | Independent Variable, levels of education | R Square | β coefficient | T statistics for $\beta=0$ | P value | f significance |
|--------------------|---|----------|---------------------|----------------------------|----------|----------------|
| PCNSDP 2001 | Primary, 2001 | 0.77 | 0.39 | 1.08 | 0.28 | 0.000 |
| | Secondary, 2001 | | 0.71 | 1.58 | 0.12 | |
| | Skilled, 2001 | | 2.36 | 5.71 | 5.12E-06 | |
| PCNSDP 2011 | Primary 2011 | 0.64 | 3.01 | 1.40 | 0.17 | 0.000 |
| | Secondary, 2011 | | 1.38 | 0.68 | 0.49 | |
| | Skilled, 2011 | | 7.50 | 4.63 | 8.76E-05 | |

An average of 2000-2001 and 2001-2002 was taken as PCNSDP for 2001 and an average of PCNSDP in 2010-2011 and 2011-2012 was taken for 2011. Educational attainment has been taken as completion of primary education per lakh population, completion of secondary education per lakh population and undertaking education which prepares a person for the market as skilled persons per lakh population. Data was obtained from the Census of India website.

Since the availability of persons with higher education and skills is an input indicator, we considered other input variables to understand the determination of the State Domestic Product (SDP). The availability of infrastructure facilities contributes to the ease of doing business and attracts investment. The availability of electricity is considered as one of the fundamental requirements for business. There are delays in obtaining electrical connections and there exist large transmission and distribution losses. Average power tariffs for industrial use in India are relatively high. Political reforms are needed to address fundamental problems of theft and cross subsidy. Despite the passage of the Electricity Act 2003 there is limited entry of private players in the field of distribution. Availability of electricity (power) per capita measured as Kilowatt per hour per capita for 2010-11 has

been used as an independent variable. Data is available in the Handbook of Statistics on Indian States 2015-16 published by the RBI.

There are concerns on logistics in India. In particular, road networks are relatively poor, limiting internal transport especially in poorer areas. Better transport is needed for improving the ease of doing business and attract investments. Hence, roads per capita was introduced as an independent variable along with availability of persons with skills and power per capita. Total road length per lakh population, 2011 has been used as an indicator. The data is available on the website of the Ministry of Road Transport and Highways.

Complementing education is health, as a healthy labor force will reduce absenteeism and increase productivity. There is need for large improvements in the existing health care system which is characterized by non-functional primary health care centers, deficient secondary care and an overburdened tertiary care. Public expenditure on healthcare has remained low in India, at about 1.2 percent of GDP in 2009 (Planning Commission, 2011). This has resulted in thriving private health care facilities which is largely unregulated and is a debt trap for the poor. The burden of private out of pocket expenses on health is high. In 2009, private expenditure in India accounted for 67 percent of the total expenditure on health (Planning Commission, 2011). Two key features of the private out of pocket spending are: outpatient treatment and not hospital care accounts for 74 percent of private out of pocket expenditures. Second, medicines account for 72 percent of the total private out of pocket expenditure. Per capita public health expenditure – revenue and capital – was considered as an independent variable. This data is available with the Economic and Political Weekly Research Foundation.

The correlations between independent variables namely the availability of persons with higher education and skills, availability of power per capita and health expenditures per lakh population and the dependent variable (PCNSDP) was high which meant that they are related. The correlation between availability of roads and PCNSDP was low at 0.001. In the step wise regression, this independent variable road length per lakh population got dropped.

Table-5. Regression results: Determinants of PCNSDP

| Dependent Variable | Independent Variable | R Square | β coefficient | T statistics for $\beta=0$ | Significance of T statistic | f significance |
|--------------------|--|----------|---------------------|----------------------------|-----------------------------|----------------|
| PCNSDP 2011 | Availability of power per capita | 0.90 | 29.105 | 4.5 | 0.000 | 0.000 |
| | Health expenditures per capita | | 30.406 | 6.2 | 0.000 | |
| | Availability of Skilled person per lakh population | | 3.741 | 4.1 | 0.000 | |

Regression results (Table 5) show that 90 percent of variation in PCNSDP can be explained by three independent variables – availability of persons with higher education and skills, availability of power per capita and public health expenditures per capita. The Durbin Watson statistic is 2.05 which shows that the error terms are not correlated. The step- wise regression method used indicated the resultant model is significant as indicated by the ANOVA results. Multicollinearity statistic VIF was within the acceptable range. The P-P plot of the regression standardized residual shows normal distribution of error terms.

The regression equation is as follows:

$$\text{PCNSDP} = -2310.815 + 29.105 \text{ Power} + 30.406 \text{ Health} + 3.741 \text{ Skilled persons}$$

$$(-4.23) \quad (4.5) \quad (6.1) \quad (4.1)$$

Figures in the bracket are the t values which are significant at 0.000 level.

This means that if power availability per capita increases by 1 percent, then PCNSDP will increase by Rupees 29. An increase in public health expenditures per capita by 1 percent will contribute to PCNSDP by Rupees 30. The contribution to PCNSDP of persons with higher education and skills was Rupees 4 for every one percent increase in the availability of trained manpower per lakh population.

4. EDUCATIONAL ATTAINMENT IN THE CONTEXT OF ECONOMIC DEVELOPMENT

Regression results (Table 6) show educational attainment explained 48 percent of the variation in poverty levels in 1999-2000. The data was available for 27 States (30 day recall). The results were significant for secondary level education. Over the decade under consideration, the significance of educational attainment appears to have gone down. Using poverty data for 2011-12 which was based on Mixed Recall Period, only 35 percent of variation in poverty levels in 2011-12 for 30 States could be explained by different levels of education. The significance of the results decreased. Secondary education continued to be significant in explaining poverty levels in 2011-12. (Table 6).

Table-6. Regression results: Levels of education and poverty, 2001 and 2011

| Dependent Variable | Independent Variable, levels of education | R Square | β coefficient | T statistics for $\beta=0$ | P value | f significance |
|--------------------|---|----------|---------------------|----------------------------|---------|----------------|
| Poverty 1999-2000 | Primary, 2001 | 0.48 | -3.7E-05 | -0.05 | 0.95 | 0.001 |
| | Secondary, 2001 | | -0.002 | -2.88 | 0.008 | |
| | Skilled, 2001 | | -0.0005 | -0.61 | 0.55 | |
| Poverty 2011-12 | Primary 2011 | 0.35 | -0.001 | -1.74 | 0.09 | 0.008 |
| | Secondary, 2011 | | -0.001 | -2.28 | 0.03 | |
| | Skilled, 2011 | | -0.0004 | -0.71 | 0.47 | |

Taking the health indicator, infant mortality rates (IMR) did not yield significant results. Possibly, levels of education do not impact social indicators like IMR. Levels of education could not explain availability of employment. The indicator for employment was labor force participation rates (LFPR) which is number of persons in labor force per 1000 persons in age group 15 years and above according to usual status in principal activity in the year 2011-12 (Government of India, 2014). It is possible to explain this observation as not all types of employment in India require higher levels of educational attainment.

The concentration on economic or output oriented variables led to an examination of the sectoral composition of the State Domestic Product which indicates the diversification of the economy. While manufacturing output per capita in 2001 and 2011 did not yield significant results, the availability of skilled workers could significantly explain services output per capita in 2001 and 2011. About 88 percent of the variation in Gross State Domestic Product at factor cost originating in the services sector could be explained by availability of educated manpower. Amongst the different levels of education, the availability of manpower with skills and higher education was most significant in explaining the diversification of the economy towards the services sector. (Table 7).

Table-7. Regression results: Levels of education and diversification of the economy, 2001 and 2011

| Dependent Variable | Independent Variable | R Square | β coefficient | T statistics for $\beta=0$ | Significance of t statistic | f significance |
|---|----------------------|----------|---------------------|----------------------------|-----------------------------|----------------|
| GSDP per capita in services sector, 2001-02 | Skilled, 2001 | 0.88 | 2.9 | 10.54 | 0.000 | 0.000 |
| GSDP per capita in services sector, 2011-12 | Skilled, 2011 | 0.87 | 10.4 | 10.84 | 0.000 | 0.000 |

Regression results show that 88 percent of variation in Gross State Domestic Product arising from the services sector (GSDP in services) can be explained by the availability of persons with higher education and skills. The

Durbin Watson statistic is 2.145 and 1.716 respectively for the two models which shows that the error terms are not correlated. The resultant model is significant as indicated by the ANOVA results. Multi-collinearity statistic VIF was within the acceptable range. The P-P plot of the regression standardized residual shows normal distribution of error terms.

5. FINDINGS AND CONCLUSIONS

The study revealed, average educational attainment in India has increased significantly over the last two decades. In terms of per lakh population, primary education has increased during the decade 2001-2011 by about 6.6 percent while secondary education has increased by 13.6 percent in the same period. However, there has been a quantum increase by about 61.8 percent with regard to persons acquiring higher education and education which provided them with skills and thereby increased their employability. The preference towards higher education and skill providing education is reflective of an aspirational change in the younger generation of Indians.

Analysis of educational attainment in the various consumer expenditure groups shows that in the lower income groups, 'not literate' percentage has gone down significantly, but, in the highest consumer expenditure group, there has been no significant reduction in the number of 'non-literate'. At the same time, in respect of higher and skill education, the lower income groups show only marginal increase, but the increase is higher in the higher consumer expenditure groups. This finding indicates the trend to seek higher education and education which builds skill sets leading to better employment prospects across all categories of consumer expenditure groups. However, this trend is more pronounced in higher consumer expenditure groups. This indicates that the gap has widened between the relatively well-to-do and the poorer sections of the population in the acquisition of education which is required by the market.

The average earning potential for those who have acquired higher education and skill sets has increased far more significantly than those who are semi-literate or illiterate. At the same time, it is interesting to note that amongst the 'not literate' and those who studied only up to primary, the percentage of self-employed is significantly high and the unemployment rate is significantly low when compared to those who have acquired skill education. One may conclude that while the illiterates or semi-literates are usually self-employed and, therefore, have low levels of unemployment, people with higher education and skills aspire for employment for which either they are not found suitable or that sufficient opportunities do not exist for them. The above analysis further indicates that the educational disparity has increased across income groups, thereby empowering higher income groups to earn much more than the lower income groups, most of whom are semi-literate, illiterate or with lower levels of educational attainment.

The study also looked at the educational disparity in the context of income disparity which exists amongst the States of India and thereby to find out whether there was any relationship between educational attainment of the States and their Gross Domestic Product. The study indicates that there is a significant correlation between higher and skill education and Per Capita State Domestic Product, but the contribution of higher and skill education goes down in the decade from 2001 to 2011, even though it remains quite significant. This result is possibly expected. As the economy of a State grows and develops, education alone cannot provide them the inputs for economic growth. Education is necessary but not a sufficient condition for economic development. The regression analysis which has been presented, indicates that along with availability of skilled and higher educated persons, the availability of power and health expenditure per capita together explain up to 90 percent in the variation of the Per Capita State Domestic Product of the various States of India. These factors, availability of electricity and health facilities, may be looked upon as labor productivity enhancing services.

Regression results show that amongst the various levels of education, secondary education is important in reducing poverty. However, the statistical relationships between education and socio-economic outcomes like reducing poverty, reducing infant mortality rate and increasing employment are not strong. Regression analysis

highlights the importance of the availability of skilled manpower for the diversification of the economy towards the services sector.

Given the importance of skill based education and higher education for economic development, there is need to identify the skill sets which need to be developed. This may be done by identifying the sectors which are likely to grow in the medium run and will attract investment. *Future of India-The Winning Leap*, a report by PwC (PricewaterhouseCoopers) has identified ten sectors where investment is needed for rapid economic growth. *Skill Development in India 2015* by Konrad Adenauer Stiftung and FICCI has identified the incremental human resource requirement across sectors by 2022. Using these reports which have identified the growth sectors, the paper has identified some of the skill sets needed by India. This information is available in Annexure 3.

The analysis in this paper highlights the importance of higher education and education which builds skills in bringing about economic upgradation at the individual level as well as at the macro level – that of the State. The paper underscores the importance of quality and the employability aspects of skill education. It also highlights that the availability of a trained labor force with higher levels of education and skills has to go hand in hand with other infrastructural inputs like availability of electricity and health facilities to enhance the economic performance of the States. Without these complementary developmental expenditures, educational attainment may have a limited impact on the economic performance of the States of India.

Towards this end, a Human Resource Development Measure has been suggested (Annexure Table 4).

NOTES:

The analysis of regression results is based on [Srivastava and Rego \(2010\)](#).

In the Tables, the term skilled persons include those with higher education.

Funding: This study received no specific financial support.

Competing Interests: The author declares that there are no conflicts of interests regarding the publication of this paper.

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Annexure

Table-1. Percentage of Persons Completing Different Levels of Education by Consumer Expenditure Groups, 2007 and 2014

| | Level of education | Monthly per capita consumer expenditure (MPCE) by percentile class, 2007 | | | | |
|----|-----------------------------------|--|----------|--------|-------|--------|
| | | Lowest 20 | 20 to 40 | 40-60 | 60-80 | 80-100 |
| 1 | Not literate | 48.85 | 42.9 | 38.1 | 31.3 | 16.55 |
| 2 | Literate without formal schooling | 0.8 | 0.85 | 0.8 | 0.8 | 0.7 |
| 3 | Below Primary | 22 | 20.5 | 19 | 16.45 | 11.45 |
| 4 | Primary | 15.2 | 16.85 | 17.6 | 17.4 | 13.85 |
| 5 | Middle | 8 | 10.75 | 12.7 | 15.25 | 15.1 |
| 6 | Secondary | 3.2 | 5.1 | 6.95 | 9.95 | 15.15 |
| 7 | Higher Secondary | 1.3 | 2.1 | 3.05 | 5.05 | 10.55 |
| 8 | Diploma/Certificate | 0.1 | 0.15 | 0.25 | 0.55 | 1.9 |
| 9 | Graduate | 0.4 | 0.65 | 1.35 | 2.65 | 11.1 |
| 10 | Post Graduate and Above | 0.1 | 0.1 | 0.25 | 0.7 | 3.5 |
| | | 99.95 | 99.95 | 100.05 | 100.1 | 99.85 |
| | | Monthly per capita consumer expenditure (MPCE) by percentile class, 2014 | | | | |
| 1 | Not literate | 39.35 | 32.85 | 27.7 | 23.7 | 15.95 |
| 2 | Literate without formal schooling | 1.1 | 1 | 0.85 | 0.6 | 0.55 |
| 3 | Below Primary | 20.3 | 18.15 | 15.85 | 13.85 | 10.35 |
| 4 | Primary | 15.1 | 15.15 | 15.05 | 13.3 | 10.45 |
| 5 | Middle | 12.2 | 14.75 | 14.6 | 14.15 | 12.3 |
| 6 | Secondary | 6.4 | 9.15 | 11.5 | 13.45 | 13.85 |
| 7 | Higher Secondary | 3.4 | 5.15 | 7.4 | 9.35 | 12.3 |
| 8 | Diploma/Certificate | 0.3 | 0.6 | 1.15 | 1.85 | 3.15 |
| 9 | Graduate | 1.5 | 2.55 | 4.7 | 7.55 | 15.1 |
| 10 | Post Graduate and Above | 0.3 | 0.55 | 1.15 | 2.3 | 5.9 |
| | | 99.95 | 99.9 | 99.95 | 100.1 | 99.9 |

Source: NSSO, Education in India: Participation and Expenditure 2007-08, Report 532, 64th round (July 2007-June 2008), National Statistical Organization, Ministry of Statistics and Program Implementation, Government of India, May 2010
 NSSO, Education in India, Report 575, 71st round (January-June, 2014), National Statistical Organization, Ministry of Statistics and Program Implementation, Government of India, May 2016

Annexure Table-2. Levels of education per lakh population, 2001 and 2011

| | State | Primary 2001 | Secondary 2001 | Skilled 2001 | Primary 2011 | Secondary 2011 | Skilled 2011 |
|----|-------------------|-----------------|-------------------|-----------------|-----------------|-------------------|-----------------|
| 1 | Andhra Pradesh | 16225.13 | 7553.908 | 4282.359 | 15901.13 | 10150.63 | 7953.326 |
| 2 | Arunachal Pradesh | 11260.71 | 5640.237 | 2620.75 | 13685.43 | 7899.246 | 4383.235 |
| 3 | Assam | 11965.02 | 8822.706 | 2643.024 | 14046.82 | 4632.233 | 3479.253 |
| 4 | Bihar | 10042 | 5724.874 | 2652.591 | 12636.92 | 6979.987 | 3406.822 |
| 5 | Chandigarh | 12807.52 | 13835.46 | 16543.55 | 12340.04 | 13473.49 | 20028.23 |
| 6 | Chhattisgarh | 14095.94 | 4721.202 | 2964.648 | 16410.69 | 6374.924 | 4381.908 |
| 7 | Goa | 14370.68 | 11484.65 | 8373.576 | 12443.57 | 12709.79 | 13127.05 |
| 8 | Gujarat | 15939.79 | 8358.368 | 4562.148 | 17467 | 10145.65 | 6645.644 |
| 9 | Haryana | 15259.92 | 10591.42 | 4351.908 | 14878.91 | 12724.85 | 8420.027 |
| 10 | Himachal Pradesh | 18262.41 | 13371.38 | 4309.926 | 16941.91 | 16432.08 | 7548.551 |
| 11 | Jammu & Kashmir | 10170.91 | 9011.012 | 3360.756 | 10253.39 | 11258.58 | 5924.233 |
| 12 | Jharkhand | 11456.71 | 6486.406 | 3109.049 | 14576.77 | 7499.136 | 4304.53 |
| 13 | Karnataka | 16025.29 | 9783.026 | 5133.317 | 15538.19 | 8318.819 | 8457.487 |
| 14 | Kerala | 19016.9 | 14230.54 | 6539.627 | 15164.04 | 11532.01 | 10650.17 |
| 15 | Madhya Pradesh | 13962.48 | 4691.128 | 3337.312 | 16355.17 | 6115.188 | 4801.194 |
| 16 | Maharashtra | 16802.53 | 10825.61 | 5539.015 | 14797.15 | 12066.67 | 8917.783 |
| 17 | Manipur | 11971.31 | 10068.31 | 6880.138 | 11448.76 | 11563.02 | 8324.865 |
| 18 | Meghalaya | 11196.5 | 5564.075 | 2301.902 | 13917.91 | 5394.978 | 3370.837 |
| 19 | Mizoram | 19612.23 | 6445.053 | 3102.277 | 18907.11 | 8034.316 | 4801.924 |
| 20 | Nagaland | 15603.74 | 9266.214 | 3013.212 | 16697.38 | 8568.351 | 5009.75 |
| 21 | NCT of Delhi | 14205.01 | 12212.51 | 13106.79 | 13288.67 | 13023.12 | 17150.39 |
| 22 | Odisha | 15756.03 | 7108.594 | 3644.549 | 18379.65 | 7665.074 | 4925.929 |
| 23 | Punjab | 15538.63 | 13348.76 | 4596.466 | 15456.68 | 15089.65 | 7431.449 |
| 24 | Rajasthan | 12472.62 | 5138.829 | 2674.196 | 15353.27 | 6725.441 | 4982.748 |
| 25 | Sikkim | 15618.9 | 6630.662 | 2815.748 | 18933.07 | 8724.207 | 6008.743 |
| 26 | Tamil Nadu | 18671.47 | 9623.996 | 4282.359 | 17083.39 | 11356.29 | 10190.17 |
| 27 | Tripura | 20061.09 | 4989.086 | 3225.272 | 19016.65 | 5466.346 | 4176.224 |
| 28 | Uttar Pradesh | 11248.37 | 5488.445 | 3076.105 | 13912.45 | 7575.766 | 5367.921 |
| 29 | Uttarakhand | 15024.72 | 7581.783 | 5695.69 | 15373.08 | 10107.68 | 9602.349 |
| 30 | West Bengal | 14281.05 | 6061.257 | 4126.762 | 16383.9 | 5949.918 | 5710.378 |
| | India | 14265.85 | 7702.598 | 4065.75 | 15209.98 | 8749.169 | 6576.473 |

Note: Skilled workers include those with technical and non-technical diploma/certificate, graduates and above and the unclassified.

Annexure Table-3. Skill sets which need to be developed

| | Sector | Skills required |
|---|---------------------------|---|
| 1 | Agriculture | Use of new seed varieties and new products, Use of environment friendly sustainable farming technology Export legislation, Marketing and advertising skills, Processing technology, Maintenance and IT skills. |
| 2 | Manufacturing | |
| | Gems and Jewelry | Jewelry fabrication, Cutting and polishing, Quality control. |
| | Leather and footwear | Processing of raw leather to finished product, Design, Production, Marketing. |
| | Textiles and Garments | Garment construction, Pattern making, Texture science, Planning and control. |
| | Handlooms and Handicrafts | Clothing and fashion technology, Handloom and textile technology, Fabric firming. |
| | Pharmaceuticals | Retail pharmacy, Hospital pharmacists, Industrial pharmacy, Research. |
| | Automobile | Automobile engineering courses |
| 3 | Management | Marketing and Finance courses |
| 4 | Power | Power transmission and distribution equipment |
| 5 | Healthcare | Physicians, Medical laboratory professional, Nurses, Paramedics, Technologists in radiology and imaging |
| 6 | Education | Teachers at various levels of education |
| 7 | IT | Architecture, Programming/application development, Project management, Data administration, Business intelligence/analytics, Technical support, Cyber security, Cloud services, Web development, Mobile engineering. It hardware courses: building computers, hardware and software problems. |

Based on Skill Development in India by Konrad Adenauer Stiftung and FICCCI
(http://www.kas.de/wf/doc/kas_42848-1522-2-30.pdf?151016072126)

Future of India: The Winning Leap by PWC (Price Waterhouse Copper)
(<https://www.pwc.in/assets/pdfs/future-of-india/future-of-india-the-winning-leap.pdf>)

Annexure Table-4. Human Resource Development Measure for the Indian States

| | State | Human Resource Development Measure | |
|----|-------------------|------------------------------------|------|
| | | Value | Rank |
| 1 | Andhra Pradesh | 0.29 | 14 |
| 2 | Arunachal Pradesh | 0.27 | 15 |
| 3 | Assam | 0.05 | 28 |
| 4 | Bihar | 0.00 | 30 |
| 5 | Chandigarh | 0.67 | 3 |
| 6 | Chhattisgarh | 0.10 | 26 |
| 7 | Goa | 0.90 | 1 |
| 8 | Gujarat | 0.30 | 12 |
| 9 | Haryana | 0.38 | 8 |
| 10 | Himachal Pradesh | 0.41 | 5 |
| 11 | Jammu & Kashmir | 0.30 | 13 |
| 12 | Jharkhand | 0.05 | 29 |
| 13 | Karnataka | 0.27 | 16 |
| 14 | Kerala | 0.31 | 11 |
| 15 | Madhya Pradesh | 0.13 | 23 |
| 16 | Maharashtra | 0.32 | 10 |
| 17 | Manipur | 0.22 | 18 |
| 18 | Meghalaya | 0.18 | 20 |
| 19 | Mizoram | 0.27 | 17 |
| 20 | Nagaland | 0.19 | 19 |
| 21 | NCT of Delhi | 0.78 | 2 |
| 22 | Odisha | 0.13 | 24 |
| 23 | Punjab | 0.38 | 6 |
| 24 | Rajasthan | 0.17 | 21 |
| 25 | Sikkim | 0.41 | 4 |
| 26 | Tamil Nadu | 0.38 | 7 |
| 27 | Tripura | 0.10 | 27 |
| 28 | Uttar Pradesh | 0.10 | 25 |
| 29 | Uttarakhand | 0.37 | 9 |
| 30 | West Bengal | 0.14 | 22 |
| | India | 0.21 | |

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