EDUCATION AND DEVELOPMENT: A COMPARATIVE COST-BENEFIT ANALYSIS OF BIHAR AND KERALA

Irene Johnson[1] & Pushkarni Panchamukhi[2*]

Case Study Writer, Freelance[1], RV University[2]

*Corresponding Author: -
pushkarnip@rvu.edu.in

ABSTRACT:

India's multitudes of diversities are not limited to its culture, but also reflected in the varying positions of each state in human and economic development. Two states on the opposite extremes since the inception of India are Kerala and Bihar, causing variances in the average indices of the nation. Though there are differences in their GDP and per capita incomes, the stark contrast in their literacy rates, levels of educational attainment and gender roles have stood them apart. Based on the endogenous growth model, the contrasting relationships between education and development in these two states were analysed under the framework of cost-benefit analysis. The acclaimed 'Kerala Model' was demystified and critically analysed to test its applicability on improving the position of Bihar from the lowest rungs in the human development index. A real-time example of the importance of planned investment in human capital and its subsequent externalities to the society was examined through the different COVID-19 responses of the states.

KEYWORDS: *Cost-Benefit Analysis of Bihar and Kerala; Education and Human Development; Human Capital Theory; Endogenous Growth Model; Education Externalities; COVID-19 Response*

1.1. INTRODUCTION

Countries like Finland and Sweden, where the due emphasis is given to the role of education, are effective examples that provide adequate data that human capital development can lead to direct impact in overall well-being and economic development. Schultz (1961) has quoted examples of Germany and Japan in the post-war era, where they managed to out-perform most of the other countries that supposedly won the war with a much lesser degree of damages, owing to their high quality of human capital. Since then, these nations are used as examples for comparison on successful public educational planning and investment.

In a country with varying levels of development and standard of living, India has states with high and low performance indicators constantly affecting its average, thus inter-state comparison can shed light on the slow development of Indian economy and its human development index. The state of Kerala has held the position with the highest literacy rates since the inception of India in 1947 while Bihar has been in the lower rungs in terms of literacy as well as human development indicators. Due to its consistency in human development but lack of proportional increase in GDP, Kerala was acclaimed as a third world miracle and studied internationally as 'Kerala Model of Development'. The high contrast between these two states can be studied using a descriptive Cost-Benefit Analysis (hereafter CBA) framework that will help in identifying problem areas and restructuring national investment. The versatility of CBA will further help to accommodate the theoretical framework of an endogenous growth model to analyse the market and non-market externalities of investment in education.

The objectives of this study are to analyse and compare the effect of education on the market and non-market indicators of development in the states of Bihar and Kerala over the span of 20 years (1997-2017). The study will enquire into the disparities in their respective human resource progress through a CBA of the social costs incurred by the state and benefits accrued in the form of public good externalities. From the results, whether inferences from the Kerala model can be applied to the state of Bihar will be tested. To support the argument on the relationship between the state of education and development, three different relations will be analysed through multiple regressions, on living standards through per capita GSDP, population growth through fertility rates and health through life expectancy. To further the argument on the importance of human development, the COVID-19 response of the two states will be analysed.

1.2. Endogenous Growth Model

In 1961, Theodore W Schultz propounded the human capital theory indicating the direct relationship between economic growth in an economy and human capital investment in the form of educational attainment or training programs. This paved way for the further development of research on the economics of education. The model put forth by Lucas (1988) was one of the first neo-classical models that gave due importance to human capital, which he propounded was affected by household decisions for every level of education. This was followed by Romer's (1990) model that focused on human capital in R&D of an economy. In general, endogenous models focus on the growth or stock of technology (Romer, 1990) of an economy and their relationship to the educational attainment of the workforce. While this relationship is significant in the OECD/high-income countries, the other 130 developing and under-developed countries would not have the foundational infrastructure required to innovate or they may lack the funds to conduct experiments as often as the developed countries. Additionally, in low-income countries where a large proportion of the population is illiterate and basic infrastructure such as libraries or internet is unavailable or limited, research and innovation is a utopia (McMahon, 2004). This has prompted several economists to alter existing models to tilt the viewpoint from technological innovation to more implicit variables such as health, democracy or population growth trends.

Mingat and Tan (1966) have pointed out that the social profitability accrued by the state from the educational investment is positive. However, when computing costs, the private costs directly bore by the individuals are considered and the public subsidies spent by the state is taken into account as the social or indirect cost of education. Often in education growth models, public profitability is ignored as the benefits accrued by the state are seen as indirect public good externalities as the direct and immediate benefactor of education spending is the individual.

Though neglected, calculation of community-wide benefits is essential for growing economies as they help to get a holistic understanding of the importance of educational investment in development. In their work (Mingat & Tan, 1966), they have re-asserted that low-income countries benefitted more from investment in primary education while middle-income countries benefitted from secondary education and high-income countries were susceptible to the most returns when investment in higher education was increased. However, they also remarked that countries that strayed away from this pattern i.e., a low-income country that invested on higher education while access to primary education had not yet reached its maximum potential will receive poor social returns. In addition to a cost-benefit analysis of state investments, calculation of community-wide externalities also helps to predict the inter-generational impact of education on the development of these economies.

1.3. Cost-Benefit Analysis

The Cost-Benefit model was conceptualised in the 1960s by the US Army Corps and perfected by Kaldor and Hicks as an economic model. As Prest and Turvey (1965) define, a CBA is a practical way of calculating the desirability of a project, where it assesses the long or wide view or future or side effects from the factors involved. CBA has been a staple economic model used for analysis and has crossed the boundaries to evolve as a multi-disciplinary model.

In the 1960s, with the emergence of economic theories on education as a direct investment in human capital development (Schultz, 1961; Becker, 1964), education began to be viewed as a conscious and deliberate investment to economic growth. As the evidence mounted up, governments and organisations instigated dialogues for educational projects, reflected in a major initiative of the World Bank to provide funds for educational projects in developing countries (Psacharopoulos & Woodhall, 1985). From micro to macro, the CBA was applied to education by World Bank to help policymakers and governments to analyse their investments on different levels of education to the individual as well as the economy as a whole. Their extensive research and detailed database have been integral to the analysis conducted in this study. The World Bank's study on returns from primary education has influenced educational investment decisions around the world, to the extent that some African nations have neglected developing their higher education sectors (Tilak, 2018).

2.1 Kerala And Bihar: A Cost-Benefit Comparison

The states of Kerala and Bihar are distinct from each other in several ways. From being in the top rungs and lower rungs on the human development indicators, they also differ in terms of the demographics and migration behaviour. While Kerala is known for immigration to the West and the Middle East, Bihar is known for large scale inter-state migration. The first census showed that Kerala had a favourable literacy rate of 47% while the national average was 18%. In retrospect, Bihar's literacy rate at the time was only 13%. Kerala's past played an enormous role in ensuring a higher level of growth, Bihar did not have access to similar conditions to grow. But the continued rise of Kerala to become a 'third world miracle' is mainly owed to the progressive actions taken by the left-wing governments along with the Gulf Boom that has helped Kerala to sustain its status in the human development index. While this inter-state comparison can provide the difference between the existence of education externalities, the wide variation between the data of the two states can also be suggestive of the political stability and involvement of civic institutions in public investment that is conducive to growth and development (McMahon, 2004).

2.2. Social Costs

Social costs refer to the costs incurred by the state or government in investment in education. The costs of education incurred by the state are computed from the education expenditure of the states for the time period – 1997-2017[i]. Between the time frame 1997-2017, overall education expenditure of Kerala has grown about 30%. In Bihar, the education expenditure during the same period has grown by 23%. From 2003-04, there has been a dramatic increase in the education expenditure by Bihar and it overtakes Kerala's overall expenditure on education in the same year. Since then till the latest budget announcement of 2019, Bihar has proposed to allocate about 6.8% of its GDP to education, which is the highest among all the other states in India.

2.3. Benefits

The benefits of education to the state can be divided into two broader categories of economic and social development, reflected in the overall quality of life of the population. The economic development is reflected in the market indicators i.e., per capita income of the citizens while the human development is measured through an array of non-market indicators such as poverty rates, fertility or life expectancy.

Per Capita GSDP: Schultz was the first economist to highlight the effect of education on economic growth rates. Most of World Bank studies, as well as the endogenous growth models (Hicks, 1980; Mingat &Tan, 1996; McMahon, 2009), utilises the variable of GDP per capita growth rate as the ideal parameter to measure the economic growth of a region. For Kerala, in the two decades, its GSDP per capita has grown about 63.7%. In Bihar's case, the GSDP per capita has only grown by 36.3% (Figure 1). While the effect of growth rate in Kerala is partially due to its unique historical and physical advantage, the consistent emphasis given to the need for the state to invest in education has helped in creating a solid foundation as well as inculcating a culture of inter-generational transmission of education, nourishing an enriching human capital. However, it is important to note that the GSDP growth rate of Bihar was 11.3 per cent in 2017-18, which was highest in the country while Kerala was in the bottom tier with only 5.8% (CRISIL, 2018). This could be indicative of the trickle-down effect from the improved investment in education expenditure.

Figure 1: Per Capita GSDP of Bihar and Kerala (1997-2018)
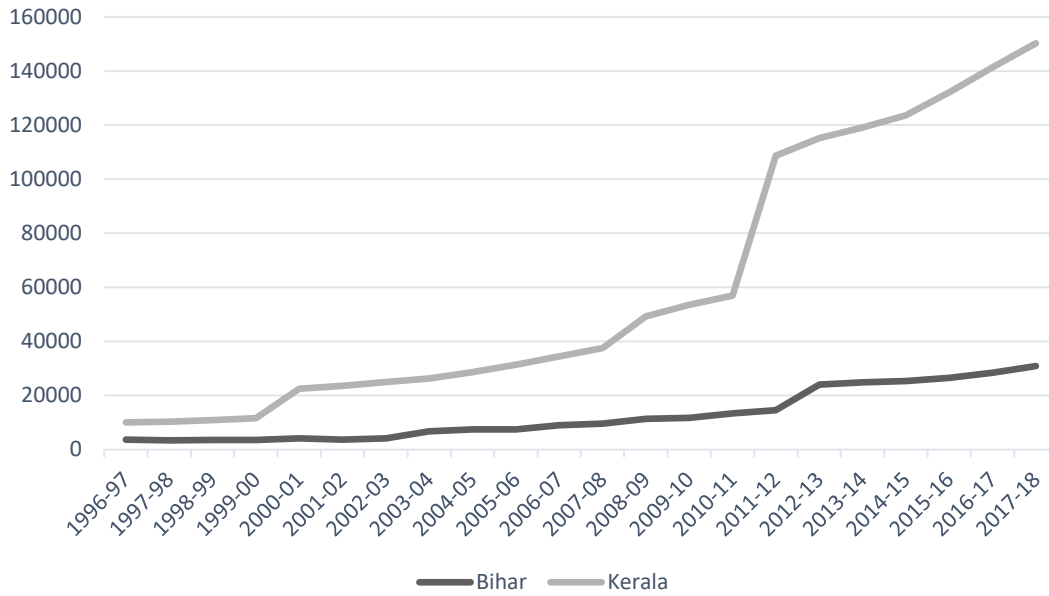
Source: Kerala Economic Review & Bihar Economic Survey, various reports

Population and health effects: The population growth rate of a region is a direct indicator of the level of development the state currently is in. A state with low population growth rates is indicative of a progressive populace while a state with a larger growth rate is considered backward. The distinguishing factor between these two is the levels of their income as well as their gross enrolment ratios. Empirical evidence has shown that primary education is bound to increase population growth rate as girls are taught about hygiene and health, but as girls are encouraged to pursue secondary education, fertility rates tend to decrease and population rests on the curve for a while (McMachon, 1999) . The population growth rate starts to decrease and eventually attain negative rates as the higher education enrolments of girls in a country increase. This parallel relationship shows that with more educational qualifications, their priorities change from family to career, hence strong measures of family planning will be introduced. Extrapolating this inference into Bihar and Kerala, it is evident that Bihar is a state with low female enrolment as their fertility rates are thrice of Kerala and population growth rates are five times that of Kerala (Figure 2). It is also important to note that the general fertility rate of illiterate women in Kerala is 0.7 while that of Bihar is 114.9 (Office of the Registrar General & Census Commissioner, 2017).

**Figure 2: Fertility Rates of Kerala and Bihar (1997-2017)**
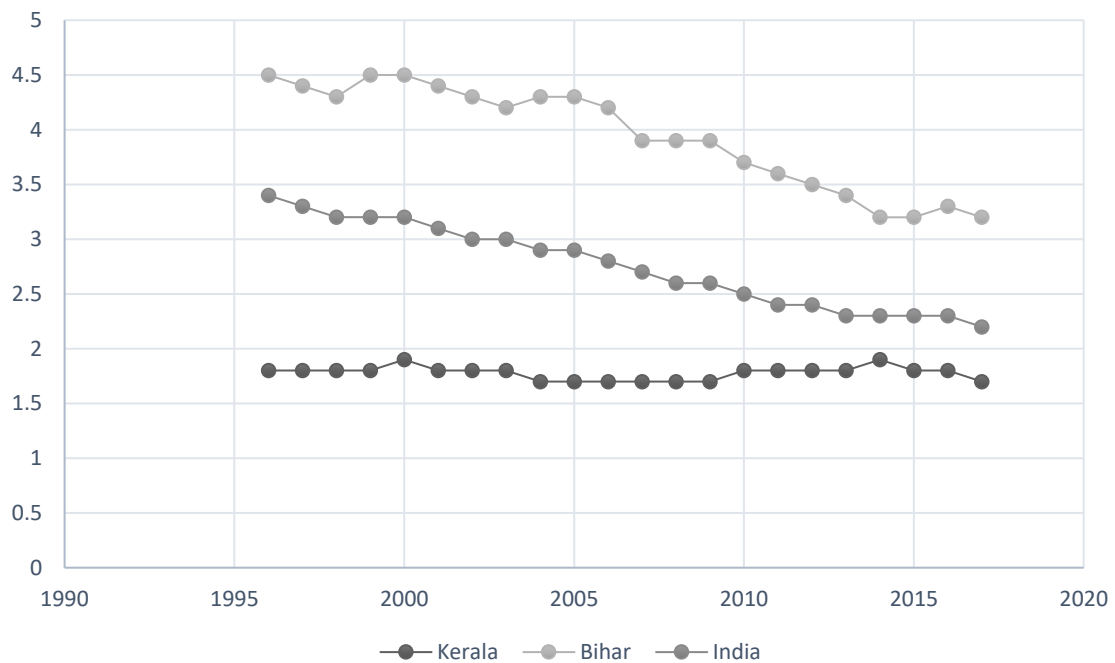
TFR indicates the average number of children expected to be born per woman during her entire span of the reproductive period.Source: Sample Registration System Statistical Report, 2017

Reduction of poverty and inequality: Tilak (2000) in his paper 'Higher Education and Development in Kerala', points out that the most literate state with the highest human development index was home to 25 per cent poor in the year 1993-94. In the next two decades, Kerala has been able to raise the quality of life of its people and decrease the percentage of poor in the state to the lowest in the country, 7.05% in 2011-12 (Figure 3). On the contradictory, the poverty rates of Bihar have always been higher than the national average, declining at a slow pace.

However, while the overall percentage of poor in the state has drastically reduced since 1994, the Gini co-efficient (Reserve Bank of India, 2020) in the state is very high compared to other states. Data shows that Kerala has the largest inequality ratio between the rich and poor in income distribution. While rural inequality in Kerala is 0.37, the coefficient is only 0.23 in Bihar indicating that the poor-rich divide is less significant in Bihar. However, these data could have two different implications. In the case of Kerala, while utter poverty is low, the rich in the state is higher. While in Bihar, the low inequality coefficient points that the proportion of people living in the same level i.e., in poverty (inferred from its high poverty rate) is responsible for the low inequality ratios.

As McMahon (2004) states it depends on who and which part of the society is benefitting from the state's investment in education. In Kerala, with the level of literacy, it has achieved, it has to now follow the example of other West Asian countries like Japan and South Korea, where economic growth was accompanied by falling inequality rates because of the wide range public funding on secondary education (McMahon, 2002; World Bank, 1993). In the case of Bihar, attaining higher enrolment rates that steadily complement the completion rates in primary and secondary levels especially skill/vocational education can help the state to break their vicious cycle of poverty.

Figure 3: Poverty Rates of Bihar and Kerala (1993-2012)
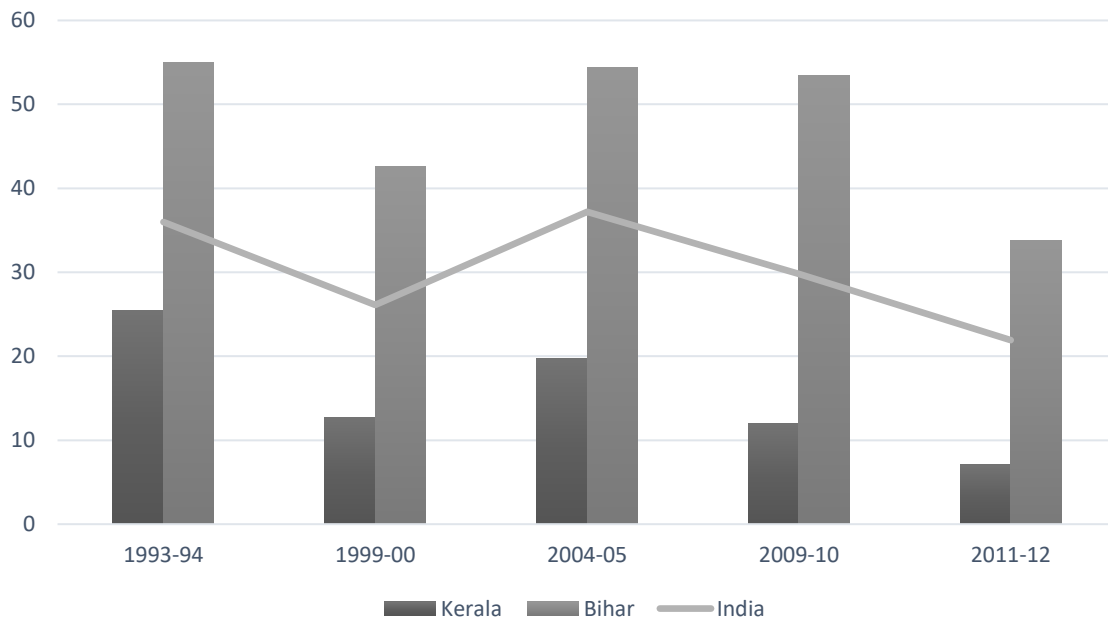
Poverty Rate measures the percentage of people living below the poverty line.
Source: The Handbook of Statistics on the Indian Economy, 2020

Strengthening civic institutions and the rule of law: An important aspect to be considered when analysing the social costs of a government on public investment is the democratization as well as the political stability of the state. "Democratization is used here as shorthand to reflect the building of civic institutions, development of the rule of law, protection of the role of opposition parties and candidates in the electoral process and lack of domination by the military" (McMahon, 2004). To ensure democratic values in the society, the populace must be educated, thereby having an idea on the human rights and power of judiciary and police in society. Additionally, as the level of education increases and standard of living of the populace increases, the middle class will rise keeping the government in question accountable.

The Corruption Survey ranked Bihar second with 75% of people reporting that they had to bribe public officials while Kerala was among the least corrupt with only 10% incidence (Transparency International India , 2019). The literacy and education levels in Kerala has helped the state to empower its citizens with an awareness of their rights and act as watchdogs of their civic institutions.

Lower crime rates: The morality index of a society is considered an important externality of education. Studies on the subject have shown that unsupervised teenagers or dropouts can result in higher crime rates (Witte, 1997). McMahon (1999:141) has mentioned that an increase in property crime rates is an indicator of economic growth. Education is

expected to provide better peer interaction and help disadvantaged students to overcome the vicious cycle of poverty and hence enjoy a better quality of life. In terms of Kerala and Bihar, the results are surprising, as Kerala has the highest crime rate in the country i.e., 1463.2 in the latest report (National Crime Records Bureau , 2018). This data can be decoded in relation to the role of civic institutions, that cases are filed at the right medium of authority indicating the high literacy rates (Gupta & Lalit, 2019). However, a study (Kumari, 2009) has stated that the high workload and higher status of women in terms of educational background could be the reason for the high crime rates against women. Trends also indicate that crime rates in Kerala increased after the large scale immigration of daily wage workers from Northern parts of India (Unnikrishnan, 2016). While some crime statistics in Kerala reflect a paradox, the rising numbers in property crime validate the theory of economic growth. At the same time, the crime rates in Bihar are on the state average, however, in 2019, Bihar had one of the highest murder rates accounting to 11% of overall murder rates. Gupta & Lalit (2019) claims that Bihar's low rates can be attributed to under-reporting. In this paradox of Kerala and Bihar, Prathivadi B (2009) stated that apart from the 'reporting effect' and differences in governance scores, the theory of violence of urbanisation could also account to the differences.

Indirect environmental effects: In the vast expanse of literature on social returns on education, the most neglected and overlooked category of externalities are the environmental effects. As the population grows and income of a country increases encouraging more production by the manufacturing sectors, the compulsion to reforestation in a society will be overridden by the need to collect timber for production, thus accelerating the rate of deforestation. But once education affects the gender roles and reduces fertility rates, the population growth rates will decrease, thereby positively affecting the reforestation process in the states. However, data to compare this aspect of externality is limited, especially state wise. However, a quick inference from the population growth rates would show that the strain on the topography of Kerala is expected to be much lesser than Bihar. The population density of Bihar was less than Kerala in 1951 but overtook Kerala since 2001 reaching 1106 while Kerala has managed to stabilise the figure from 2001 at 860 (Reserve Bank of India, 2020).

Geographic spillovers: Positive geographic spillovers were anticipated by Schultz (1961) in his famous work, where he stresses that internal migration of workers is also a form of investment, however long term. As young people have more vigour, it is more convenient for them to yield more returns than elder workers. Though Schultz does not create a connection between education and migration, McMahon's endogenous model attributes this as a public good externality, that can be positive or negative. It is positive when there is less migration occurring from rural to urban ghettos and negative when there is an unbalanced emigration of college graduates to other countries or states, causing brain drain for the nation.

In rural areas in India, migration behaviour is highly significant, as people move to urban ghettos and slums in the hope of getting better opportunities and returns. A similar situation is evident in the case of Bihar, where in the past years, a large-scale migrant behaviour to other Indian states, especially the South is very visible. A very small proportion of these migrants acquire better jobs and outrun their vicious cycles of poverty however the large pockets of the population living in sub-standard situations in slums across India is a reflection of the lack of education and opportunities available in rural India.

The biased and unbalanced flow of human resources from the Global South to the Global North in search of better job opportunities and social status have created a risk for the developing countries. Among all the states in India, Kerala has outperformed other states in terms of outflow of human resources. It started as the Gulf Boom in the 1990s, which created a new class of wealthy, encouraging large scale migration to the Middle East and English-speaking countries in search of better education and higher salaries. While this helped the state in raising the GDP without investing in any sectors, it has also led to a large scale brain drain as well as increased inequality among the rich and poor. Simultaneously, to replace the workers who emigrated, the state has compensated with welcoming about 3 million migrants, especially in manual labour sectors (Centre for Development Studies, 2018).

2.4. Kerala Model: An Enigma worth Emulating?
It can be concluded from the close analysis on education externalities that while Kerala is doing extremely well compared to other states in many aspects of human development such as health, gender roles and literacy, a close inspection questions the applicability and relevance of the model. The Kerala Model is known for its achievement as a third world country state to reach the highest pedestal on social development, but not substantially increase its income. However, the existing literature on the positive relationship between literacy and economic growth was not mimicked in the case of Kerala. The Kerala model has been quoted as an anomaly by Indian economists such as Amartya Sen, Jagdish Bhagwati and Aravind Panagariya (Oomen, 2018). The high crime rates, large scale brain drain and high inequality in income distribution questions the effect of education on the public. The high scores in health indicators and the continuing culture of inter-generational transmission of educational benefits have camouflaged the ugly statistics of Kerala. In terms of gender equality, even with the largest number of educated women in the country, it has not led to greater female employment or equal pay. Parayil (2000) argued that in the neo-liberalist view, Kerala is a failed application. Even with near equal access to education the earning power of half the population is not fully utilised. Thereby, it is a waste of public funds to be invested in female education, which could have been used in the labour market, where men are more in demand and paid

more. As Mukhopadhyay (2007) calls Kerala an 'enigma', while there are direct social benefits that have benefited the society from education for women, but many aspects of their lives are the same as everywhere else in India.

However, with the intrinsic differences between the two states, rather than applying the Kerala model, Bihar can infer some lessons from the performance of Kerala. Bihar has already captured attention with its economic growth and has taken some bold steps in the recent past to overcome its stigma as the least developed in development indicators. However, some areas such as governance and civic institutions in the state can play an important role as is evident from the Kerala Model. If the government injects resources into the problem areas as highlighted in this study along with ensuring quality and equal access education to all, Bihar can replace its current vicious cycle of poverty with an inter-generational cycle of educational achievement.

3.1. Regression Analysis

To assert the relationship between education and market and non-market externalities, multiple regression models on three important parameters was conducted to analyse their viability in the model. From the original Romer Model (1990), several attempts have been made to test the effect of education on non-market indicators (Hicks, 1980; McMahon, 2004; Mingat & Tan, 1996). The following relationships are analysed with Gross Enrolment Ratio (GER) depicting the level of education – living standards, population growth and gender roles and health. The data used in the model spans over 20 years from 1997 till 2017. Due to unavailability of data, some of the data on GER had to be imputed in SPSS for data analysis[ii].

To analyse living standards, per capita GSDP and GER of primary, secondary and higher levels of education were used as dependent and independent variables respectively. In the health parameter, life expectancy at birth was dependent on GER at each level of education as the independent variables. In the population parameter, fertility rates were the dependent variable while the female GER at each level of education was used as the independent variable to understand the gender roles in the two states.

Living Standards: As interpolated in the cost-benefit analysis, an indirect yet important measure of education investment on the economy is the per capita GSDP. In the endogenous growth models, it is propounded that as the educational attainment of the working force increases, it serves as an impetus for innovation and research, increasing new technologies in the economy, thereby increasing the per capita output. To analyse the relationship between education and output, a multiple linear regression was calculated to predict per capita GSDP based on levels of enrolment rates, the equation was as follows:

Per capita GSDP = f (primary education enrolments rates + secondary education enrolment rates + higher education enrolment rates)

In the case of Bihar, the results of regression indicated that the model explained 80% of the variance and that the model was a significant predictor of per capita GSDP (F $(3,16)$ = 21.399, p<.000). While higher education enrolment rates contributed significantly to the model, (B=1752.752, P=.007), primary education (B=72.924, P=.432) and secondary education (B=113.3, P=.244) did not significantly predict per capita GSDP. The results can be interpreted that there is a strong positive relationship between the increase in higher education qualifications of the workforce and economic output of the state. However, the relationship between secondary education and GSDP was not evident as expected from the literature.

In the case of Kerala, the results of the regression indicated that the model explained 79.1% of the variance and that the model was a significant predictor of per capita GSDP (F $(3,16)$ = 20.151, p<.000). While higher education enrolment rates contributed significantly to the model, (B=4030.479, P=.000), primary education (B=3419.861, P=.125) and secondary education (B=2274.444, P=.208) did not significantly predict per capita GSDP. Primary and secondary education has already impacted the GSDP over the long term that their significance is not that prominent to the model. However, in Kerala, the significance of higher education enrolment rates on increased economic output is very significant. This strong relationship portrayed in Bihar and Kerala highlight the importance of capacity building in the field of higher education in both states.

Population Growth: To analyse the role of education and the growth of population among the states, the fertility rates were entered as the dependent variable while the female enrolment rates in primary, secondary and higher education were taken as the independent variables. The following data also proceed to show the gender roles in each of the states, as the fertility values will correspond to the status of women and their voice in family planning. A multiple linear regression was calculated to predict fertility rates based on levels of female enrolment rates; the equation was as follows:

Fertility Rate = f (female primary education enrolments rates + female secondary education enrolment rates + female higher education enrolment rates)

In the case of Bihar, the results of the regression indicated that the model explained 87% of the variance and that the model was a significant predictor of fertility rate (F $(3,16)$ = 35.909, p<.000). Here as well, higher education enrolment rates contributed significantly to the model, (B= -0.061, P=.000), followed by secondary education (B= -0.005, P=.097) and primary education (B= -0.002, P=.604) did not significantly predict fertility rates. As McMahon (1999) explains this could

be because of the stronger effect of primary education on decreasing infant mortality rates and longevity of life. Both of these factors tend to act against the proposed need of decreasing population and hence primary education does not largely affect population growth. However, comparatively, secondary education shows a more significant change, meaning that as their eligibility for formal job sector increases, desired family size decreases, negatively affecting population growth rates. But the higher education female enrolments rates depict an inverse relationship between fertility rates and enrolment. This reasserts the fact that investing in providing higher education to girls is the most impactful method to decrease population growth rates.

However, the regression model in Kerala showed a different pattern. In the case of Kerala, the results of the regression indicated that the model explained less than 10% of the variance and the significance of the model (F $(3,16)$ = 0.339, p=.798). While higher education enrolment rates contributed significantly to the model, Secondary education (B= -1.801E-005, P=.995) contributed the least followed by primary education (B= -0.001, P=.775). Higher education enrolment (B=0.002, P=.372) showed significant results than primary and secondary enrolments. This could be explained by the fact that since Kerala has already attained very low fertility rates fluctuating between 1.7-1.9 since 1996, the decreasing or rather stagnancy of the values over the time period has led to a culture of good family planning in the state.

Health: To analyse the relationship between health and education, the life expectancy (Reserve Bank of India, 2020) over the span of 20 years is analysed in the states of Bihar and Kerala. Life Expectancy at Birth refers to the maximum number of years an individual can live depending on the health conditions at birth. This variable gives an overview of the parents' education, poverty and access to healthcare. A multiple linear regression was calculated to predict life expectancy based on levels of enrolment rates; the equation was as follows:
Life Expectancy = f (primary education enrolments rates + secondary education enrolment rates + higher education enrolment rates)

In the case of Bihar, the results of the regression indicated that the model explained 71.7% of the variance and that the model was a significant predictor of life expectancy (F $(3,16)$ = 13.545, p<.000). While higher education enrolment rates contributed significantly to the model, (B=0.818, P=.002), primary education (B=0.24, P=.515) and secondary education (B=-0.28, P=.464) did not significantly predict life expectancy.

In the case of Kerala, the results of the regression indicated that the model explained 50% of the variance and that the model was a significant predictor of per capita GSDP (F $(3,16)$ = 5.335, p<.010). While higher education enrolment rates contributed significantly to the model, (B=0.067, P=.056), primary education (B=0.137, P=.141) and secondary education (B=0.084, P=.265) did not significantly predict life expectancy. This indicates that higher education attainment has had a significant impact on the upliftment of living standards of the individual, which in turn has led to increased longevity of the individual.

From the three multiple regression models, it can be deduced that the significance of higher education was highest on living standards, population growth and health effects. The significance of the primary education was the next prominent relationship followed by secondary education with the least significance in all the models. While theory points out the significance of secondary education in a state like Bihar, the results have underrated its significance, possibly due to the lack of accurate data.

4.1. Covid-19 Response
A relevant application to understand the importance of a high human development index in the present times can be inferred from the COVID-19 response of Bihar and Kerala. A recent UNDP Report (2020) highlighted the importance of inventory and capacity building in the health sector to cope in times of crises. It drew its argument from the human development index, which points out the number of hospital beds, medical practitioners and staff of the country. Extrapolating the results of the study, with a high human development score, Kerala has a higher preparedness strategy as well as lesser vulnerability index (0.3) to pandemics. As expected, comparing Bihar with a country with an adjacent HDI score and a higher population was found to have very high overall vulnerability index (0.75) in socioeconomic, demographic, housing, hygiene, epidemiological and health system (Acharya & Porwal, 2020).

The above hypothesis has been evident from the respective COVID-19 responses of the states. Kerala was applauded yet again as the 'Kerala Model' in reference to its resilient and steadfast response. While cases in the country were rising gradually, the state of Kerala with its prior experience of controlling the NIPAH virus in the near times had imposed restrictions earlier than the national lockdown. In addition to that, the adherence to World Health Organization guidelines, improving access to healthcare, enforcement of Kerala epidemic disease act, the establishment of community kitchens, financial aid to the vulnerable population and strong political commitment was made possible by the long term investment in human capital, especially in education and healthcare (Bajpai & Wadhwa, 2020; Thankappan, 2020). The high level of literacy and prominence of civic institutions has helped Kerala to effectively control the present crisis with much grace than the other states in the country. The geographical spillover externality has led Kerala to introduce action plans that required evacuations of citizens trapped in other countries. These incoming citizens from vulnerable countries have led to a spike in the number of cases, however, preventive measures such as 14-day quarantine as well as advanced health infrastructure have controlled Kerala's fatality rate as the lowest in the country (Sinha, 2020).

However, the same cannot be said for Bihar. The geographical spillovers have been a bane for Bihar (Sinha, 2020) as well. The human destruction and brutality that accompanied the migrant workers' departure from the host states have only further aggravated the situation in Bihar. The response of the state to migrant behaviour is also an indicator of the democratization and political leaders in power. The lack of government action was reflected in the low scores received in a satisfaction survey on the COVID-19 response (India Today, 2020). As the incidence of cases is rising in rural areas of Bihar, the unavailability of health infrastructure can drastically increase the mortality rates.

It is also important to note the current status of education dissemination in the states. While the premier institutes in Bihar such as IIT Patna has started classes online, other higher education institutions and schools have not been able to contact students as efficiently due to the rural-urban divides. In Bihar's poor villages, education has come to a standstill for most students. In Kerala, due to the less severe crisis situation and consistent investment on education has enabled the state to kick start classes via online platforms. In the regions with concentrated pockets of below poverty line students and tribal families, the government has started initiatives such as providing equipment such as phones or televisions to continue their studies. However, the income inequalities and lack of digital skills among teachers have heavily affected students, especially in the rural areas in both states. It can only be predicted that because of the greater investment in the education sector in Kerala, the schools will have access to some basic technologies which can reduce the gap in access compared to Bihar. Nevertheless, the Kerala Model has been highlighted as an example for other states' not only in steadfast response but also in sustainable development to prepare for any forthcoming calamities.

5.1. Conclusion

Large scale cost-benefit analyses conducted by World Bank across the world nations has shown that in most cases, low-income countries have benefitted the most from investment in the primary sector. The middle-income countries have accrued most social returns from investment in secondary education while the high-income countries gained most social returns from investment in higher education. Linking to Tilak's (2001) earlier comment, it is evident from the present analysis between Kerala and Bihar that both the states are focused on investing in primary education while neglecting the other levels. This trend is currently uniform across the entire country's education sector.

The cost-benefit analysis and the regression analysis between the two contrasting states have highlighted the problem areas of Bihar that can be corrected and highlighted the overlooked parts of Kerala's human development index. Given Kerala's performance in the development index, it is high time for the state to realign its focus and invest in secondary and higher education while maintaining the high literacy rates and low drop-out rates. As for Bihar, investment in primary as well as secondary is major concerns. The latest trends in budget allocation show optimistic sights for Bihar and if it can sustain this investment level, the long-term effects on its economy will be visible. The regression also highlighted the crucial role higher education has played in Bihar's development, denoting the need for higher qualified personnel.

The drastic importance of human development has been put forth to test in the wake of an unprecedented pandemic. The COVID-19 response of both states has been on the opposite ends as their human development indicators. However, the numbers have been rising simultaneously in both the states owing to their migration behaviour. There is no one solution and short term measures can only decelerate the incidence rates, highlighting the crucial requirement of disaster management i.e., sustainable development.

In a world where monetary returns decide the future of investment on education and thereby, the quality of education imparted to coming generations, the citizens and their representatives in power need to look into the deeper impact on non-market and community returns far along in the future rather than relying only on budgets and balance sheets.

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[i] All data on Kerala and Bihar's per capita GSDP that have been used in this article are at current prices as mentioned in the states' economic surveys.

[ii] The five imputations were then combined to a single file using the Output Management System (OMS). The data for the year 1998 was unavailable, and hence has not been included in the analysis.

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