

Economic Growth and Public Expenditure on Human Capital Formation in India: An Econometric Investigation

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Abstract: Sustainable, and inclusive economic growth could be achieved with the major contribution of skills, knowledge, and innovation, commonly known as human capital formation through the provision of a good education and training system, training development, better health sector infrastructure, a large diffusion of knowledge in the manufacturing and service sector, and a great effort to create a research-intensive agricultural economy. Indian economy lacks a number of these growth pre-take-off conditions. Employing neoclassical augmented Solow growth theory as the theoretical framework and using panel methodology, the study investigated the role of human capital resources as a factor in stimulating output growth in India. The findings showed that human capital formation was positive and significant to Indian economic growth. The results reveal that spending on human capital formation and public investment should be a priority for a government interested in improving economic outcomes. Consumer spending may not translate into economic growth since it will affect mainly the demand side of the economy. The results further suggest that boosting budget allocation in human capital formation and infrastructure development can enhance its complementary role with private investment and stimulate economic growth. The government should increase its investment in areas that are beneficial to the private sector and move away from those that compete with it or crowd it out. This study argues that policies and strategies that advocate for accelerated public investment in human capital development will promote productivity growth and further stimulate resilient economic growth in the Indian economy.

Keywords: Human capital; economic growth; education; health.

JEL Classification: C33; F63; H51; H52;I15;I25.

1. Introduction

Human capital, which includes the knowledge, skills, and abilities of the workforce, is a key determinant of a country's economic productivity and competitiveness. Investing in education, healthcare, and skill development can help develop human capital, which can lead to long-term economic growth. Public expenditure on human capital formation can have a

significant impact on economic growth. When the government increases its spending on education, healthcare, and skill development, it can lead to several positive outcomes. For example, investments in education can improve the quality of the workforce, which can lead to increased productivity and innovation. Similarly, investments in healthcare can improve the health of the population, which can reduce absenteeism and increase workforce participation. Moreover, investments in skill development can help reduce skill gaps and increase employability. This, in turn, can lead to a reduction in unemployment rates, an increase in income, and an increase in tax revenues for the government. Additionally, investments in human capital can lead to the development of new industries and the growth of existing ones, which can have a positive impact on economic growth. However, public expenditure on human capital formation should be balanced and sustainable. While investing in human capital can have long-term benefits, it can also be a costly affair in the short term. The government should consider the budget constraints while designing and implementing such programs. It is also essential to ensure that public expenditure is used effectively and efficiently to maximize the benefits. In conclusion, public expenditure on human capital formation can have a positive impact on economic growth by improving the productivity, employability, and overall well-being of the population. The government should continue to invest in education, healthcare, and skill development while ensuring that expenditure is sustainable and effectively utilized.

2. Human Capital Formation in India

Human capital formation refers to the process of developing and improving the skills, knowledge, and abilities of individuals, which in turn can contribute to economic growth and development. In India, from 1990 to 2021, there have been several initiatives and policies aimed at promoting human capital formation. One of the most significant changes during this period was the liberalization of the Indian economy in the early 1990s. This opened up opportunities for private investment and led to increased economic growth, which in turn had positive impacts on human capital formation. As the economy grew, more resources were available for investment in education and training, and there was a greater demand for skilled workers. The Indian government has also made several efforts to promote education and skill development during this period. The Sarva Shiksha Abhiyan (SSA) program, launched in 2001, aimed to provide universal elementary education for all children between the ages of 6-14. The Right to Education Act (RTE), passed in 2009, made it mandatory for

all children between 6-14 to receive free and compulsory education. Additionally, the government has launched several skill development initiatives such as the Skill India Mission, which aims to provide training and certification to 400 million people by 2022. The Pradhan Mantri Kaushal Vikas Yojana (PMKVY) scheme, launched in 2015, provides training and certification to youth in various sectors to increase their employability. However, despite these efforts, challenges persist in the area of human capital formation in India. One of the key challenges is the quality of education and training, as many institutions are still not equipped to provide high-quality education and training. There is also a need to bridge the gap between education and industry requirements and provide more opportunities for practical training and on-the-job learning. In summary, India has made significant progress in promoting human capital formation from 1990 to 2021 through policies and initiatives aimed at improving education and skill development. However, there is still a need for further investment and improvement to ensure that the workforce is adequately prepared to meet the demands of a rapidly evolving global economy. India has made considerable progress in human capital formation through various investments in the education and health sectors, especially from 1990 to 2021. The government has increased its expenditure on human capital formation over the years, although the percentage of GDP allocated to education and health sectors remains lower than in many other countries.

In terms of education, the government has taken several initiatives to increase access and improve the quality of education. For example, the Sarva Shiksha Abhiyan (SSA) program launched in 2001 aimed to provide universal elementary education for all children between the ages of 6-14, and the Right to Education Act (RTE), passed in 2009, made it mandatory for all children between 6-14 to receive free and compulsory education. The government has also launched various schemes to provide financial assistance and scholarships to students from marginalized communities to improve access to education.

In the health sector, the government has taken several measures to improve healthcare services, especially for the poor and marginalized sections of society. The National Rural Health Mission, launched in 2005, aimed to provide accessible and affordable healthcare services in rural areas. The government has also launched various schemes to provide financial assistance and insurance coverage for medical treatment to the poor and vulnerable sections of society.

Overall, the government expenditure on education and health sectors has increased over the years, but the percentage of GDP allocated to these sectors is still lower than the recommended levels by international

organizations such as the World Bank. Developing countries should regard education expenditure as a vital investment for steady growth and sustainable development. The level of spending by economically advanced countries like Japan, the USA, and the USSR as a proportion of their GNP on education and the likely trend in the future was also considered in recommending 6 percent of GDP for education expenditure. Out of many recommendations given by the Kothari commission, 6 percent of the GDP as education expenditure was accepted by the authorities. But there was always a gap between recommendations and implementations, especially in the case of public expenditure on education, which might have serious implications for the human resource development of the country. As per the Economic Survey 2021, the expenditure on the education and health sector during 2020-21 was around 4.8% of GDP, which is lower than the recommended 6% of GDP. This insufficient funding is one of the serious concerns, which may also be the reason for its low ranking in India in terms of HDI. The Economic Survey suggested "more investment in human capital," which refers to investment in education together with health. The concept of *human capital* identifies that not all labor is equivalent and that the quality of labor can be improved by investing in them. It is also evident that all those countries which have managed persistent growth in income have also had large increases in the education and training of their labor force. The enduring growth in per capita incomes of many countries during the nineteenth and twentieth centuries is relatively due to the spreading out of scientific and technical knowledge that nurtures the productivity of labor and other efforts in production. The growing reliance of industry on sophisticated capacity greatly augmented the importance of education to increase the availability of human capital. Studies have suggested the close dependence on collaboration between new acquaintances and human capital. That is why large increases in education and training have supplemented major progress in technological knowledge in all countries that have achieved significant economic growth. The outstanding economic records of Japan, Taiwan, and other Asian economies in recent decades vividly demonstrate the importance of human capital to growth. China is also progressing rapidly by mainly depending on its abundant, hardworking, and ambitious human resource. The level of education expenditure in OECD countries is at an average of 5.3 percent of the GDP of those countries; indeed 11 OECD countries exceed 6 percent. Note that these are highly developed countries, where income levels are high; the governments consider such expenditure as an investment in their people. In India's current state of development, a minimum of 6 percent of GDP, if not at a much higher level, should be an essential expenditure in the

education sector. In conclusion, while India has made significant progress in human capital formation from 1990 to 2021, there is still a need for greater investment in the education and health sectors to ensure equitable access and improve the quality of education and healthcare services.

3. Economic Theory of Human Capital Formation

Economists have in recent years focused studies on finding the factors pushing economic growth. Education level and health conditions of the public are the major components of the Human Development Index and have emerged as the major contributors to economic growth. Economic theory does not automatically generate strong conclusions about the role of human capital formation in explaining output growth and factor productivity. Indeed, most economic literature would agree that there are circumstances in which better-developed human capital infrastructure would translate to sustainable development and resilience growth {Mitchel (2005)} [1]. While others argue human capital accumulation has a minimal role in explaining output growth in developing economies. Human capital formation is the stock of competencies, knowledge, and social and personality attributes, including creativity, embodied in the ability of labor to perform and produce output. Many development theories explicitly connect investment in human capital formation to education and health, and the role of human capital in economic development, productivity growth, and innovation has frequently been cited as a justification for government subsidies for the education and health sector.

The fiscal policy role of government in human capital development is an issue of debate since the neoclassical economist period. Economists are of two different views about the role of government spending in human capital development to stimulate economic activities. The New Keynesians present the multiplier effect in response and argue that the increase in government spending on human capital will increase demand and infrastructure development and thus increase economic prospects through productivity and technology growth {Kakar (2011)} [2]. Other importance of government expenditure includes the provision of those facilities that are not fully covered by the market economy such as health and education. However, neo-classical economists argue that increased public spending on human capital will reduce the role of the private sector by crowding-out effect and thus slowing productivity {Otieno & Thoni (2022)}[3], implying that human capital promotes positive benefits associated with economic growth, but the financial source for public expenditure which is taxation, reduces the benefits of the taxpayers and as such reduces the benefits associated with economic growth {Barro (1990)} [4]. The

performance of human capital is measured with the help of macroeconomic indicators such as the total number of years of schooling in the labor force, the number of educational facilities, the ratio of government expenditure on training to GDP, and per capita expenditure on education and health {Wossmann (2003)} [5]. Following empirical studies by Barro and Lee(1993) [6] and Wossmann (2003)[5], this study adopted government expenditure measures to show how spending on human capital (health and education sector) raises the productivity of labor and stimulates development. Education and health services are the important factors that determine the quality of labor in developing countries {Hansson & Henrekson (1994)} [7]. This includes higher salaries and wages for workers, greater workforce effectiveness, and higher gross domestic product. Government expenditure on health could lead to economic growth in the sense that human capital is essential to production function by improving the quality of labor. A healthy population means higher productivity, thus higher income per head. But due to the lack of sufficient revenue to fund ballooning expenditure, rise in financial crisis, and crowding out effect, there is a need to investigate the role of human capital spending on the economic prospects of India.

4. Literature Review

Lucas (1988)[8] regarded skilled and capable individuals as an important element not only in productive activities but also for sustainable economic and social progress. According to the policymakers, the skilled population shows substantial potential to initiate the process of economic growth. A study by Becker, Murphy and Tamura (1990) [9] reasoned that for the uninterrupted development in per capita income, spending on education enhancement proved to be an imperative constituent in almost a hundred countries. Blundell, Dearden, Meghir, and Sianesi (1999)[10] used progress regressions and proved the prominence of a skilled and educated labor force for the economy's efficiency and growth. In the study, education was found to be an important descriptive factor in general and higher education was the most pertinent factor specifically in the case of developed countries. There can be a causal relationship between economic growth and human resource development as evident from the results of the study conducted by Ranis, Stewart, and Ramirez (2000)[11] where economic growth has been significantly influenced by human resource development and substantially robust economic growth paves the way for human resource development. Thus, the importance of education for economic progress through human growth started receiving acceptance and motivated many emerging economies to spend for the improvement and enhancement of the education

sector. There is also theoretical literature available to support such a policy (Pissarides, 2000)[12]. Douglass (2010)[13] claimed that the scholastic achievement of the people of the country enhances efficiency and global competitiveness. Dukkipati (2010)[14] quoted that for India to maintain its economic growth in a global marketplace fuelled by the knowledge economy, it needs to nearly double the enrolment in higher education institutions by the end of 2012. But lack of required education facilities may transform the demographic dividend into a demographic catastrophe. He projected that expenditure on education; especially higher education expenditure is not at par with the economic progress. Bhatia and Dash (2013)[15] observed that most of the developed countries which have already accomplished the objective of education all spend considerably a higher proportion of GDP on education while underdeveloped and developing nations are required to expand and improve the resource allocation for the education sector. Musai, Mehrara, and Fakhr (2011)[16] conducted a study on the association between education and economic progress of 79 countries. According to their study, an increase in expenditure on education and so on the labor force intensifies economic growth. If education is related to economic growth significantly, then ideally, spending on education should be significantly related to economic growth. However, this is not a sufficient condition for growth. There are certain other factors also such as the country's institutional structure which determine whether investments in the education sector will affect growth significantly or not (Ghosh Dastidar, Mohan, & Chatterji, 2013)[17].

Bhatia and Dash (2013) [18] showed that the HDI of India and also the spending on education by the government used to be very low. They suggested that to improve human resource development, education being an essential component, the policymakers should plan for the facility of free education up to graduation level, which directly indicates a huge public expenditure on education. But, the youth of India can become assets only when government invests sufficiently in their capacity building otherwise they will become a liability to society. Shi Mei-ling (2014)[19] used the regression equation and estimated that the income elasticity of individual education outlay as 1.074 and that of health outlay as 1.539, both more than 1 verifies that educating people of the country can greatly promote economic growth. According to the study by Mehdi and Chaudhry (2015)[20], the size of India's workforce will go up by 249 million between 2015 and 2050 and China's will go down by 166 million during that period. Based on this prediction, India can also potentially overtake China in terms of economic growth by 2030, if policymakers get serious about augmenting its human capital. Mallick, Das, and Pradhan (2016)[21] attempted to

discover the relationship between expenditure on education and economic growth in 14 major Asian countries. The study employed a comprehensive data set of 14 major Asian countries (Bangladesh, China, Hong Kong, India, Japan, Malaysia, Nepal, Pakistan, The Philippines, Saudi Arabia, Singapore, Sri Lanka, Thailand, and Turkey) covering from 1973 to 2012. By using panel cointegration tests, the study observed that a long-run relationship exists between education expenditure and economic growth in all the selected countries. Li, Loyalka, Rozelle, and Wu (2017) [22] enunciated that in China, adequate education was given to almost all the children up to the primary and middle school level with basic maths and language skills along with the training given to them to be meticulous citizens. This was sufficient to build the huge capacity of low-wage, low-skill labor force required for the manufacturing sector, which has driven the growth of China from the 1980s to the early 2000s. But this labor force cannot be considered human capital due to a lack of high skill and innovative aptitude. The authors suggested placing more emphasis on investment in human capital which they consider a more significant driver of the future growth of China.

Although the human capital theory explained the role of education in increasing productivity, the signaling theory of education asserts that education is just a signal of the worker's ability. Both theories work simultaneously. In the case of India, Unni and Sarkar (2012) [23] found that the education levels in disadvantaged social groups are low due to the unavailability of schools in the local region and therefore a large section of the population remains informal labor due to non-accessibility of formal education that is expected to enhance the productivity of the labor on the one hand and provide with a documented proof that signals about the ability of the worker on the other hand. Thus, access to formal education for the masses should be a priority by policymakers to ensure economic growth through human resource development.

5. Purpose of the Study

The specific objective of this study is to investigate the effect of human capital formation on the economic growth of India. Growth models of human capital development are best represented by the works of Musgrave and Rostow, whose views are generalizations gleaned from the examination of a large number of different historical trends of advanced nations {Brown & Jackson(1996)} [24]. In the early stages of economic development, public investment as a proportion of the aggregate investment of the economy is found to be high since public capital formation is of particular importance at this stage. The public sector is therefore seen to provide social

infrastructure overheads such as roads, health, education, and other investments. This public investment, it is argued, is necessary to increase productivity and to gear up the economy for take-off into the middle stages of economic and social development. In the middle stage of growth, the government continues to supply investment goods but this time public investment is complementary to the growth in private investment (Gitonga & Owiti (2022)) [25]. During all the stages of development, market failures and information asymmetry exist which can frustrate the push toward maturity, hence the increase in government involvement to deal with these market failures. Rostow claims that once the economy reaches the maturity stages the mix of spending will shift from expenditures on infrastructure to increasing expenditures on human capital (education and health) and welfare services (Brown & Jackson (1996) [24]; Kibet, Naftaly Kiprop (2020) [26]). The primary conclusion of Solow's (Solow (1956)) [27] theory is that the accumulation of physical capital cannot account for the vast geographic differences in output per person. The model predicted technological progress and human capital development typically assumed to grow at a constant 'steady state' - is what determines output growth. The augmented Solow growth model was introduced by Mankiw *et al.* (1992) [28] and stresses the significance of including human capital in the Solow framework model. In addition, Ram (1986) [29] and Barro (1990) [4], added expenditure components (human, investment, consumption) to the Solow production equation that increases private capital marginal productivity and growth. Empirical studies [Romer (1996) [30]; Kwakka & Morrissey (1999) [31]; Akpan (2005) [32], Kibet, Naftaly Kiprop (2020) [26]] have been carried out on the relationship between spending (aggregate) and output growth but the majority of those studies do not examine specifically the effect of human capital spending on output growth and are prone to many econometrics disadvantages like multicollinearity and omitted variable bias, Gisore (2022) [33].

6. Data and Methodology

The study is limited to the period of 1990–2021 considering the availability of data used in the study. A time series dataset of public expenditure on education and health by the Government of India and the State Governments as a percent of GDP. The public expenditure on education and health includes expenditure on education and health by both central and state governments. Data from HDI published by UNDP is used as an indicator of human resource development. Since 1990, United Nations Development Program publishes HDRs as independent, analytical, and empirical discussions of key development issues, trends, and policies.

The study employed a quantitative research design to capture the trend and effect of human capital development on growth in India. This was carried out in the period 1990-2021 using secondary data and fixed panel data analysis. The choice of the study period was informed by the availability of secondary data. This was a sample of thirty-one (31) years. The reasoning behind this country sample was to reveal a pattern of human capital accumulation in the Indian economy.

7. The Econometric Model

A neo-classical model developed by Ram [29], Barro [4], and Kweka and Morrissey [31] was adopted for econometric analysis in this study. In the model, output (Y) representing economic growth was assumed to be a function of three factors, investment (K), human capital (H), and consumption (C). In the context of the developing economies of India Population growth (P) is a potential determinant of growth that is not accounted for by other independent variables and hence was included in the econometric growth model below.

$$Y = f \{H, K, C, P\} \quad (1)$$

$$\ln Y_{i,t} = \beta_0 + \beta_1 \ln H_{i,t} + \beta_2 \ln K_{i,t} + \beta_3 \ln C_{i,t} + \beta_4 \ln P_{i,t} + \epsilon_{i,t} \quad (2)$$

Where, $\ln Y_{i,t}$ = Economic growth, measured by real GDP growth rate;
 $\ln H_{i,t}$ = Human capital proxied by total health and education expenditure;
 $\ln K_{i,t}$ = Public investment proxied by capital expenditure;
 $\ln C_{i,t}$ = Public consumption proxied by recurrent expenditure;
 $\ln P_{i,t}$ = Population growth measured by the population size; and
 $\epsilon_{i,t}$ = the error term in time t.

8. Data Analysis

Descriptive and inferential analyses were used to analyze the panel data series, all to investigate the role of human capital expenditure on economic growth using panel methodology.

8.1. Hausman test

The Hausman [34] test was applied to underpin the application of the fixed effects model in this analysis. This statistical test was generally used for deciding between applying a fixed or random effects model [Hausman(1978)(34); Baum (2006)(35)]. Fixed-effects (FE) are used whenever one is only interested in estimating the effect of variables that

vary over time. An advantage of random effects is that one can include time-invariant variables [34].

8.2. Panel unit root test

Macroeconomic time series data are generally characterized by stochastic trends which can be removed by differencing Levin A, Lin CF, Chu J. (2002) [36]. This study adopted the Levin-Lin-Chu test to verify the presence of unit roots in the study data. The test was carried out to eliminate any possibility of spurious regressions and erroneous inferences. This involved determining the order of integration of the time series through the unit root test.

8.3. Co-integration test

The study attempted to determine whether a long-run relationship exists between the variables following Engel and Granger's approach. The Engle-Granger approach is used to investigate whether cointegration relations exist between study factors Granger CW. (1988) [37]. However, this approach can only be applied if there is only one cointegrating relation.

8.4. Post-estimation panel diagnostic tests

Post-estimation panel diagnostic tests were carried out during the study. Heteroskedasticity (modified Wald test), serial correlation (Wooldridge test), and cross-sectional dependence (Breusch-Pagan Lagrange Multiplier test) were tested for the regression models before estimation and corrected accordingly.

9. Results & Discussion

9.1. Panel Unit Root Test

Levin-Lin-Chu's [36] unit root test was conducted at the level and first difference, and the result is reported in Table 1. Table 1 findings reveal that all the variables are non-stationary at level except economic growth and public investment variables. However, they become stationary after the first difference implying that the variables are integrated into order one, I (1).

Table 1: Unit root test results

Variables in Logs	Levin-Lin-Chu at level		Order	LLC at first difference		Order
	Unadjusted t	Adjusted t		Unadjusted t	Adjusted t	
lny	-5.6309	-3.3789	I(0)			
lnh	-4.7545	-2.7132	I(0)			
lnk	-2.1781	-0.1564	I(1)	-7.7901	-5.1570	I(0)
lnc	-1.2185	0.8759	I(1)	-9.1697	-6.3458	I(0)
lnp	-3.5390	-1.1393	I(1)	-8.2229	-5.4380	I(0)

Table 2. Regression results

<i>Variable</i>	<i>Coefficient</i>	<i>Standard error</i>	<i>t-Statistics</i>	<i>p-value</i>
lny	4.274	1.538	2.923	0.005***
lnh	0.846	0.089	9.420	0.011**
lnk	0.594	0.185	2.826	0.046**
lnc	-2.398	0.818	-2.854	0.006***
lnp	-2.588	0.319	-8.060	0.015**
The goodness of Fit Test		R ² = 0.65	Adjusted R ² = 0.63	
F(7,85) = 5.852		P-value(F) = 0.0000	Durbin.W = 1.8629	
Hausman Test		χ^2 (5) = 13.040	Prob> χ^2 = 0.0237	
Wooldridge Test		F(1,2) = 10.135	Prob > F = 0.0879	
Modified Wald Test		χ^2 (3) = 1.490	Prob> χ^2 = 0.7177	

9.2. Panel Cointegration Analysis

Estimation of a cointegrating relationship requires that all-time series variables in the model be integrated in order of one [37]. But from the results in Table 1, the dependent variable (economic growth) is already stationary I (0) while the rest of the variables are of order (1), hence they are not of the same integration. This, therefore, implies there was no co-integration since the variables are of different integration.

9.3. Fixed Effect Regression Analysis

- i) The Panel data was estimated using the fixed effect model of the panel estimation technique, geared at controlling for time-invariant and unobservable country effects. The Hausman result supported the use of the fixed effect estimation method over the random method as supported by p-value (0.0237 < 0.050). The regression results on the effect of human capital accumulation on economic growth are presented in Table 2.
- ii) The regression results show that the coefficient of human capital is positive and statistically significant at 5 percent as expected. The findings show that human capital outlay (health and education) is critical in enhancing economic prospects. It implies that a 1 percent increase in human capital development will lead to about a 0.7 percent increase in output in India. The performance of human capital is measured with the help of macroeconomic indicators such as per capita expenditure on the education and health sector per empirical studies of Barro and Lee [6], and Wossmann [5]. This is because a healthy and educated population is productive, which is necessary for increasing both industrial and agricultural output. When human capital increases in areas such as science, health, agriculture, industry, education, and management, it leads to increases in innovation, social well-being,

equality, increased productivity, and improved rates of participation, all of which contribute to economic growth. This finding conforms to the findings by Barro and Lee [6] and Wossmann [5] but contrasts with Knight et al. [38] and Loto's [39] empirical studies.

- iii) The effect of public investment on economic growth is positive and significant at a five percent level of significance. This type of expenditure could be associated with the productive infrastructure outlay that Barro [4] and Gemmell [40] pointed out to be an additional input to the production function. This public investment, as argued in growth models, is necessary to increase productivity and to gear up the economy for take-off into the middle stages of human and physical capital development. Public investment in energy and basic infrastructure is an essential precondition for capital accumulation in the private and public sectors [4,41]. Gemmell [40] and Niloy et al. [42] agreed with the findings. In contrast, Josaphat and Oliver [43] found the relationship between investment and growth in Tanzania to be negative as a result of the crowding-out effect.
- iv) These results point out that public consumption has a negative and statistically significant effect on economic growth at a one percent level of significance. It can be said that increased public consumption is usually at the expense of infrastructure and human capital development or the private sector's investment which in most cases leads to instances of reduced economic growth. Classical and Neoclassical theories consider consumption expenditure ineffective on the grounds of the well-known crowding-out phenomenon, that is, when public goods are substituted for private goods, this leads to lower private spending on education, health, or physical infrastructure. As the governments borrow heavily to fund spending, pressure in the credit market results in higher interest rates which discourage private investment. These results are in line with the findings of Barro [4] and Lin [44]. On the contrary, Kweka and Morrissey [31] reported positive findings in Tanzania which they associated with the rise in private consumption.
- v) Analysis depicts that population growth has a negative and significant relationship with economic growth. Malthus' [45] model stated that population growth can reduce the output per capita and human capital development because the population increases at a geometrical rate while production rises at an arithmetic rate so the output growth rate cannot keep the same pace. This finding is similar to Barro and Sala-i-Martin's [46] study in developing countries.

- vi) The adjusted R^2 is 0.65 which implies that 65 percent of the variations of the dependent variable are explained by the explanatory variables in the model.
- vii) The F statistic test result reveals that the null hypothesis is rejected and a conclusion made that the estimators are non-zero and therefore are simultaneously significant at a 1 percent level of significance. Durbin-Watson's result is 1.86, implying serial correlation is not a problem.
- viii) The study used the Wooldridge test for autocorrelation in panel data. The null is no serial correlation (0.0869). The study accepts the null hypothesis and concludes that the data does not have first-order autocorrelation. From the above result (0.7177) heteroscedasticity is not a problem.
- ix) The results reveal that spending on human capital formation and public investment should be a priority for a government interested in improving economic outcomes. Conversely, consumer spending may not translate into economic growth since it will affect mainly the demand side of the economy. The results further suggest that boosting budget allocation in human capital formation and infrastructure development can enhance its complementary role with private investment and stimulate economic growth. The government should increase its investment in areas that are beneficial to the private sector and move away from those that compete with it or crowd it out. In the same vein, reducing consumption expenditure to prop up capital and human investment is a policy recommendation worth pursuing. To increase human capital, governments need to build infrastructure in the education and health sector such as schools, hospitals, and universities. The second solution is to increase the knowledge and skill of tutors by issuing scholarships and sending them to study sciences in advanced institutions of learning. This policy would enhance the transfer of knowledge, skills, and technologies from advanced institutions that are mostly based in developed countries to developing nations. From the findings of this study, there is a need for further disaggregation of the human capital data into education and health services for deeper policy prescriptions.

10. Discussion & Conclusion

Human capital is critically intertwined with economic growth, with education and health constituting its major components. Investment in education and health makes the labour force more productive, healthy,

competitive and efficient, all of which taken together contribute to higher economic growth. There is renewed focus on attaining social sustainability to achieve the objective of sustainable growth and demands a greater emphasis on investment in human capital with a view to improving life expectancy, ensuring availability of human capital with appropriate skill sets to support business activity while in that process also helping to develop innovative capacity and entrepreneurship in the Indian economy in the light of the World Development Report (WDR) 2013 that observed that providing key services like health and education can help create the right jobs while also contributing to improved standards of living and inclusive growth. The use of policies with a focus on strengthening the human resource base is considered extremely relevant for India which is expected to contribute a significant proportion of the global labour force in the coming years. In this Indian context, development initiatives undertaken by planners have been driven by these concerns and are reflected in increasing importance being assigned to the provisioning of social services by the central and state governments since the inception of the Plan era. While there has been a steady increase in the share of social sector expenditure in total plan expenditure, which is noteworthy, total public sector expenditure¹ on important social sector heads remains low when compared with international standards. The combined expenditure of the central and state governments in India on education is just about 2.8 per cent of GDP while that on the health sector is even lower at 1.0 per cent of GDP. In contrast, countries of the European Union spend 5.5 per cent of GDP (from their general government account) on education and 7.5 per cent of GDP on health. Canada's public spending on health alone is over 11 per cent of its GDP and that on education is nearly 5 per cent.

India would be the youngest nation by 2030 indicating that the population demand for education would be on the upsurge and that's why government responsibility for providing education facilities would also be on the rise. This demands higher budgetary allocation of at least 6 percent of GDP, which was kept on recommended by National education policies and various education commissions but never actually incurred more than 4 percent. This lack of financial support can affect negatively the human resource development of our nation which is labor-abundant. The lack of basic education infrastructure is one of the outcomes of such scanty resource allocation to the education sector that not only affects the access to education for all but also the quality of the human resource. Insufficient resource allocation from the central government for education and training is making education a private good in India rather being a public good. Even education is also considered a merit good by various experts and ought to be

subsidized or provided free at the point of use so that consumption does not depend primarily on the ability to pay. In India, many are still deprived of education and health services due to the inability to pay for it and that's why HDI is pretty low. Though, the education structure of India is regarded as one of the leading in the world but just not sufficient as per the growing demand. Policymakers, experts, academicians, and researchers are showing concerns about the quality enhancement of education and health services and considering the quality aspect as a crucial factor for the skill gap of human resources. The skill gap hampers employability and raises questions about the education sector, which has taken the responsibility of equipping the youth with the required skills to be a productive part of the economy. In the case of India, not only the quality but the quantity is also an important concern for policymakers.

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