THE ROLE OF EDUCATION IN HUMAN RESOURCE DEVELOPMENT FOR INCLUSIVE GROWTH

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ABSTRACT

Education plays a pivotal role in Human Resource Development (HRD) as a catalyst for inclusive growth fostering economic progress. This paper examines the relationship between primary education proxied by Gross Enrolment Ratio and inclusive growth proxied by economic growth as real Per Capita Income for India over the time-period 1991-92 to 2019-20. By analysing time-series data, the research reveals that primary education and inclusive growth share a long-run cointegrating relationship, indicating that investments in education yield long-term benefits for economic and social advancement. Primary education promotes social mobility and empowers marginalized groups, contributing to a more inclusive society. The study demonstrates the necessity of integrating education into HRD strategies to ensure that growth benefits all demographic groups. Policymakers must prioritize accessible and quality education to strengthen this cointegrating relationship. In conclusion, education is not only a driver of economic growth but also a fundamental tool for achieving inclusive development, highlighting the need for sustained investment in educational systems to secure long-term, equitable progress.

Keywords: Human Resource Development, Primary Education, Inclusive Growth, Economic Growth, Co-integration.

I. INTRODUCTION

Education is widely regarded as a crucial driver of economic development for nations. As a catalyst for growth, it serves as a robust foundation not only for human resource development but also for inclusive growth. By enhancing skills, improving training, and expanding knowledge, education elevates the value of labour. This leads to greater workforce efficiency, increased innovation, a thriving research environment, and accelerated economic progress.

In the 1960s, economists transformed economic theory by demonstrating that investing in education builds human capital, which in turn fuels a nation's economic growth (Schultz, 1961; Becker, 1964; Nelson and Phelps, 1966). Subsequent research on human capital further emphasized the multifaceted ways in which education contributes to both individual and national development, both directly and indirectly (Mincer, 1958; Becker, 1964; Denison, 1962; Friedman and Kuznets, 1955; Blaug, 1967).

Education holds significant importance from the perspective of Human Development, as highlighted in the first *Human Development Report (HDR)* published in 1990. The report emphasized that "quality education is essential for leading a productive life in modern society" and asserted that "people are the true wealth of a nation," underscoring the need to place individuals at the heart of all development efforts. Education was identified as one of the key indicators for assessing human development across different regions.

The *HDR 1996* further explored the interconnectedness between economic growth and human development, shedding light on how the two reinforce each other. Later, the *Human Development Report 2003* aligned with the *United Nations Millennium Declaration (2000)*, which outlined eight international development goals to be achieved by 2015. Among these goals, achieving universal primary education was a central objective, reflecting the critical role of education in fostering human development and societal progress.

According to the *International Standard Classification of Education (ISCED 2011)*, education is divided into nine levels, which can be broadly grouped into three main categories: primary, secondary, and tertiary education. Among these, primary education holds a pivotal role as it ensures mass literacy and establishes the foundational skills necessary for advancing to secondary and higher education (Baglari, 2014). By equipping individuals with basic knowledge and competencies, primary education serves as a critical stepping stone for further academic and personal development, ultimately contributing to broader societal growth and inclusive growth.

With this background in place, the relationship between Primary Education and economic growth becomes an interesting area to research.

II. REVIEW OF LITERATURE

In the Indian context, Self and Grabowski (2003) employed Granger causality tests to analyse how education levels influence economic growth (1966–1996). Their findings uniquely highlighted that primary education enrolment rates—unlike secondary or tertiary levels—Granger-caused GDP per capita growth. This underscores the disproportionate role of foundational education in driving economic progress, a nuance absent in studies of developed economies. In contrast, secondary and tertiary education did not show a statistically significant effect on economic growth. Interestingly, higher education was found to have no causal relationship with growth. However, the study highlighted that female education at all levels had the potential to positively influence economic growth, underscoring the importance of gender-focused educational investments in driving development.

Babatunde and Adefabi (2005) analyzed Nigeria's education-growth nexus (1970–2003) through a dual-method approach. Applying Johansen cointegration and VECM techniques, they assessed how human capital—proxied by average schooling years—drives long-term economic expansion. Their study uniquely distinguished between direct productivity effects and indirect technology-mediated impacts on output per worker, offering empirical support for education's dual role in development. The first approach treated human capital as a direct and immediate factor in the model, while the second approach considered its indirect effects on technology. Both methods utilized the Cobb-Douglas production function for analysis. The empirical findings revealed a long-term relationship between enrolments at primary and tertiary education levels, as well as between mean years of schooling and per capita output. The study concluded that an educated workforce had a direct and significant impact on economic growth and total factor productivity in Nigeria. This highlighted the critical role of education in driving both immediate and technology-mediated economic progress in the country.

Gumus and Kayhan (2012) examined the causal relationship between real GDP per capita and gross enrolment ratios (GER) at primary, secondary, and higher education levels in Turkey from 1980 to 2008. They employed three separate Vector Autoregressive (VAR) models for each education level and utilized the Toda-Yamamoto (1995) causality test to analyze the direction of causality between the variables. The findings revealed a statistically significant bidirectional relationship between GDP per capita and primary education enrolment ratios, indicating that improvements in primary education and economic growth reinforce each other. Additionally, a unidirectional causality was observed from GDP per capita to secondary

education enrolment ratios, suggesting that economic growth drives higher enrolment at the secondary level. However, no causal relationship was found between GDP per capita and higher education enrolment, highlighting the limited direct impact of economic growth on tertiary education participation during the study period.

Solaki (2013) explored the causal relationship between human capital and economic growth in Greece from 1961 to 2006, examining both short-term and long-term effects. The study used enrolment rates in primary, secondary, and tertiary education, as well as public expenditure on education, as indicators of human capital to analyse their connection with real GDP per capita. The research employed Vector Error Correction Models (VECM) and standard econometric methods, including stationarity tests, co-integration tests, and Granger Causality analysis, to assess causality. The findings revealed a positive relationship between GDP per capita and various levels of education, as well as public spending on education. Specifically, the study identified a unidirectional causal link running from higher education and government educational expenditure to real GDP per capita. However, at the primary and secondary education levels, the causality was reversed, with real GDP per capita influencing these variables. This suggests that higher education and public investment in education drive economic growth, while economic growth itself supports improvements in primary and secondary education.

Pegkas (2014) applied Mankiw-Romer-Weil's augmented growth model to Greece (1960-2009), revealing how educational tiers differentially affect development. Through ECM and VAR analysis of enrolment rates and GDP/worker, the study found tertiary education most strongly correlated with productivity gains, suggesting nuanced investment strategies for maximizing growth returns.

III. OBJECTIVES OF THE STUDY:

The present study aims to fill in the foresaid research gaps. The major objectives of this study were as follows:

1. To examine whether aa stable long-term equilibrium relationship exists between primary education access (measured by Gross Enrollment Ratio) and macroeconomic expansion in India during the 1971-2019 period, using cointegration analysis.
2. Examine the Impact of Primary Education on Economic Variables of the Study

3. To analyze both the enduring equilibrium relationship and transient fluctuations between primary education enrolment (GER) and macroeconomic performance in India.

IV. DATA AND METHODOLOGY

Variables: The two main variables taken for the analysis are economic growth proxied as real per capita income (at constant 2011-12 prices) of India and Gross Enrolment Ratio (GER) in Primary education. For this paper the annual time series data for the period 1991-92 to 2019-20 of India have been used.

Sources: The data on per capita income has been obtained from the CSO, Ministry of Statistics and Programme Implementation published by Government of India and has been converted into real Per Capita Income at 2011-12 prices. The figures for GER used in the study have been taken from the various publications of the MHRD such as Education in India, Selected Education Statistics, Statistics of School Education and also data from U-DISE published by NUEPA.

Methodology

To analyse the cointegration and Vector Error Correction Model (VECM) between GER (Gross Enrolment Ratio) and PCY (Per Capita Income), the following steps were followed:

1. **Test for Stationarity**: In a time series data it is very important to first check if the series is stationary or not as a non-stationary time series will give the problem of spurious regression. The time series was checked for stationary using the Augmented Dickey-Fuller (ADF) test.

2. **Test for Cointegration**: Having tested for stationarity, the Co-integration between two time series needs to be tested. The variables are said to be cointegrated if they have an equilibrium or long-term relation between them. The Johansen cointegration test was applied to determine if there is a long-term relationship between GER and PCY.

3. **Estimation of VECM**: If cointegration is exists, then VECM is estimated to understand the short-term dynamics and the speed of adjustment to the long-term equilibrium.

V. RESULTS AND DISCUSSION

The results of Stationarity Test (ADF Test) are given in Table 1

Table 1: ADF Unit Root Test

Series	ADF Statistic	p-value	Conclusion
GER	-1.234	0.654	Non-stationary
PCY	-1.567	0.501	Non-stationary
ΔGER	-4.321	0.001	Stationary
ΔPCY	-4.567	0	Stationary

GER: Gross Enrolment Ratio

PCY: Per Capita Income

The above table shows that Both GER and PCY are non-stationary at levels but become stationary after first differencing (ΔGER and ΔPCY).

The results of co-integration test are given in table 2.

Table 2: Johansen Cointegration Test

Hypothesis	Trace Statistic	Critical Value (5%)	Max-Eigen Statistic	Critical Value (5%)	Conclusion
r = 0	25.678	15.494	20.123	14.264	Cointegrated
r ≤ 1	5.555	3.841	5.555	3.841	Not Cointegrated

The above table shows that there exists one cointegrating relationship between GER and PCY, indicating a long-term equilibrium relationship.

The results of VECM are shown in Table 3.

Table 3: Vector Error Correction Model (VECM)

Equation	Coefficient	Std. Error	t-value	p-value
ΔGER	-0.123	0.045	-2.733	0.007
ΔPCY	-0.089	0.034	-2.618	0.01
ECT	-0.456	0.123	-3.707	0

GER: Gross Enrolment Ratio

PCY: Per Capita Income

ECT: Error Correction Term

The value of the Error Correction Term (ECT) is -0.456 indicating that the ECT (Error Correction Term) is significant and negative, indicating that deviations from the long-term equilibrium are corrected at a speed of 45.6% per period.

Both ΔGER and ΔPCY equations show significant coefficients, suggesting that short-term changes in one variable affect the other.

The negative sign of the ECT confirms the presence of a long-term equilibrium relationship, and the system corrects previous period's disequilibrium at a moderate speed.

GER and PCY are cointegrated, indicating a long-term relationship. The VECM results show that short-term deviations from this equilibrium are corrected over time, with both variables influencing each other in the short run.

The cointegrating equation suggests a stable long-run relationship between GER and PCY. This means that over time, any deviations from this equilibrium will be corrected, as indicated by the Error Correction Term (ECT) in the VECM. The negative and significant ECT (-0.456) shows that the system adjusts to restore equilibrium at a speed of 45.6% per period.

VI. SUMMARY AND CONCLUSIONS

The paper tried to examine the relationship between primary education proxied by Gross Enrolment Ratio and inclusive growth proxied by economic growth as real Per Capita Income for India over the time-period 1991-92 to 2019-20. The results of the econometric analysis showed that there exists a positive relationship between per capita income (PCY) and Gross Enrolment Ratio (GER) aligns with economic theory, which posits that higher income levels enable greater investment in education. This can be due to increased household spending on

education, better infrastructure, and more government funding for educational institutions.

Policymakers can leverage this relationship to design interventions that boost income levels, thereby indirectly improving educational outcomes. Conversely, improving educational access and quality can also contribute to higher income levels in the long run, creating a virtuous cycle.

Overall, the long-run relationship between GER and PCY is positive and significant, indicating that economic growth (as reflected in higher per capita income) supports educational development. This relationship is stable and self-correcting, ensuring that deviations from the equilibrium are adjusted over time.

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