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Exploring the Influence of Education and Health Investments on Youth Employment Prospects in India

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Abstract

The discourse on labor engagement, underutilization, and unemployment has been a prominent focus in development literature, particularly in developing economies. These issues influence migration patterns and gross domestic output and, in some cases, contribute to youth restiveness. This study delves into the intricate relationship between investments in human capital, represented by spending on education and health, and its repercussions on youth employment outcomes in India. We gathered annual data spanning the years 1990 to 2021 from various Indian states. We employed the bootstrap-based bias correction for panel fixed effects estimation techniques to enhance the analytical accuracy. The findings of our investigation reveal that investments in human capital, encompassing both private and government health expenditures as well as expenditures on primary, secondary, and tertiary education, exert significant but varying impacts on youth employment in India. These results carry important policy implications. To effectively address the persistent challenge of youth unemployment in India, it is imperative to prioritize consistent and disproportionate investments in education over health. This shift in focus could prove instrumental in reversing the trend of youth unemployment and fostering sustainable economic growth.

Keywords: *Human Capital; Youth Employment; Expenditures; Education; Health*

JEL Classification: H51; H52; I15; I18; I22; J01; J08; J24

1. Introduction

Youth employment is widely recognized as a crucial tool for promoting social stability and driving economic growth on a global scale. Nations worldwide prioritize creating job opportunities for young people, as emphasized by organizations such as the International Labour Organization (ILO) and scholars like Mueller (1). According to the ILO and the United Nations Educational, Scientific and Cultural Organization (UNESCO), youth employment encompasses the engagement of individuals aged 15 to 24 in productive activities, essentially when people within this age range (15–24) are actively working for pay. It's worth noting that while the UN-Habitat defines youth as individuals between 15 and 35 years old, this study adopts the narrower age bracket of 15 to 24 for its operational definition of youth. This decision aligns with the ILO's conceptualization of youth, focusing on individuals in this specific age range. The significance, opportunities, and implications of youth participation in the labor market have attracted the attention of labor specialists in the literature, as evidenced by works from scholars like Baah-Boateng, the International Labour Organization and Tacoli et al. [2-5].

Global statistics from the International Labour Organization (ILO) in 2020 reveal that approximately 1.15 billion individuals (590 million males and 560 million females) fall within the youth demographic worldwide. Over half of these young people reside in developing countries across Africa, Southern Asia, and Latin America. Notably, India, in particular, has a substantial youth population, with around 60% of the nation's inhabitants being under 25 years old, making it the region with the world's largest youth population. India stands out as the area with the most youth, accounting for over 230 million individuals, and projections suggest this number will increase by 42% by 2030. Additionally, India boasts the world's highest population growth rate at 2.7%. Alarmingly, nearly half of these youth, who could serve as a significant asset for India, are not productively engaged in economic activities. This raises the pressing question: why is youth unemployment so pervasive in India?

Economies in the Indian States have grappled with the challenges of youth unemployment, resulting in detrimental consequences, including escalating restiveness, violence, and crime rates. Furthermore, India has recorded the highest rate of working-poor youth globally, with nearly 70% of its youth population falling into this category. Young workers and women in the region face heightened risks of employment instability, job loss, and living below the poverty line, as revealed in the 2016 report by the ILO. This situation is exacerbated by the increasing number of dependents within the region. Many young people

in India appear to lack the necessary skills, competence, health, proficiency, and qualifications to competitively enter the modern labor market. Their limited experience in the job market, as emphasized by Baah-Boateng (2), presents significant barriers to securing meaningful employment. This aggravates the problem of youth unemployment, further rendering young people vulnerable to societal issues, conflicts, and civil disorders.

In light of these challenges, this study underscores the importance of examining the employability of young people in India, extending beyond economic growth analysis and political rhetoric about job creation. It shifts the focus to the human capital possessed by youth cohorts, encompassing education, skills, knowledge, experience, health, and vitality. Consequently, the central research question emerges: What are the prospects for youth employment across the Indian States with specific investments in human capital? The pivotal role of human capital in economic development gained prominence with the emergence of endogenous growth theory, which posits that investments in human capital, innovation, knowledge, and good health are critical drivers of economic growth. This implies that the growth rate of per capita income/output depends on the growth rate of human capital. The arguments put forth by scholars revolve around the idea that knowledge, skills, health, and education contribute to economic production, primarily through labor, leading to increased output and enhancing an economy's capacity to adopt modern technologies. Importantly, youth, due to their energy and extended potential productive years, represent a critical segment of the population for acquiring human capital resources. If fully engaged, they can create significant wealth in society. Therefore, India has an opportunity to enhance productivity and output by effectively employing its surplus youthful population.

This study's objective is to examine whether the necessary investments to achieve the desired level of youth employment in India are feasible. This raises concerns about how human capital investment has influenced youth employment across the region, prompting questions such as: What is the impact of human capital investment on youth employment across the Indian States? The study also addresses the growing issue, as highlighted by the ILO in 2020, of increasing unemployment in the region, leading to rising trends of youth migration out of India, poverty, youth restiveness, crime, and underdevelopment. Furthermore, the lack of empirical studies on human capital investment and youth employment in India adds motivation to this research. While some studies have attempted to explore the link between education and the labor market in certain parts of the world, there has been limited focus on India. Moreover, there is limited attention paid to youth employment or a partial analysis of how investment in human capital affects youth employment in India.

This study aims to address these gaps by employing the bootstrap-based bias correction for the panel fixed effects estimation technique. It seeks to provide insights into the effects of human capital investment on youth employment in the Indian States, offering a perspective on tackling the challenges of human capital investment and youth employment. The study utilizes data spanning from 1990 to 2021 from 29 Indian States/UTs. The selection of the states was based on data availability and the suitability of observations for the variables in the model. Eight states were excluded due to limited or irregular data.

1.1. Literature Review

The fundamental premise of human capital, whether in the context of an individual or a group of individuals, encompasses a range of attributes, both theoretically and practically. These attributes include skills, experiences, competencies, dexterity, vitality, and abilities, in addition to the health status of these individuals. All of these factors play a vital role in the production of goods and services. Empirical evidence from various scholarly works underscores the potential of human capital investments to enhance productivity and spur economic development. Scholars such as Mincer Aleksynska & Schindler Anowor et al. Danquah & Ouattara Hammed et al. McDonald & Roberts and Onodugo et al. have explored this connection extensively [6-12]. These foundational principles set the stage for our investigation into how investment in human capital can impact youth employment in the Indian States. The neoclassical growth model put forth by Solow and Swan highlights the role of diminishing returns, suggesting that economic growth would eventually stagnate in the absence of technological progress [13, 14]. Aghion and Howitt argue that technological progress, while initially displacing workers due to its labor-saving nature, ultimately creates new job opportunities [15]. This is because productivity growth stimulates demand, leading to the creation of additional employment opportunities. Consequently, it is reasonable to anticipate that youth employment in India can rise, especially when India's youth possess adequate human capital, as new jobs are generated. The pro-Schumpeterian endogenous growth models, as theorized by Segerstrom et al. Aghion and Howitt Caballero and Hammour and Bartelsman et al. emphasize the contribution of human capital in exploiting knowledge in innovative ways, thereby enhancing productivity [15-18]. Health and education, as highlighted by Schultz are not only inherently valuable but also serve as investments in human capital that guide economies toward advanced states in the future [19]. The collective sum of investments in education, health, on-the-job training, and other factors that enhance labor productivity and the value of labor in the labor market constitutes an investment in human capital, as defined by Becker and Schultz Soares asserts that expenditures on education and health have a positive impact on productivity, thus improving human capital [20-22].

Endogenous growth models proposed by Romer Lucas Rebelo and Barro suggest that economies can experience sustained growth as long as they continue to advance technologically, driven by improved human capital acquired through investments in education, health, research and development (R&D), on-the-job training, and other avenues [23-28]. In a labor market where wages reflect workers' marginal productivity, it becomes evident that individuals with higher levels of education, skills, and better health are more employable than their less-educated, less skilled, and less healthy counterparts. The results of a study involving eight SSA countries conducted by Assaad and Levison indicate that between 1.5% and 28.8% of young people in these countries never received formal education. Furthermore,

approximately one-third of young people in Benin, Madagascar, and Zambia had some schooling but dropped out before completion [29]. In addition, over 50% of youth in Malawi, Togo, and Uganda lack quality access to education and stable employment opportunities. The low probability of finding decent employment among youth in these countries is attributed to inadequate training, basic education, and knowledge. Wagner argued that as societies experience income growth, they tend to demand more education, wealth distribution, and public services [30]. Thus, expenditures on education and culture are seen as necessary investments for any society.

Empirical studies have explored the relationship between unemployment and various factors {Sweeten et al. Rees and Mocan Sinha, Sinha & Sinha, Sinha and Micklewright et al. examined the relationship between unemployment and high school dropout rates, college enrollment, and early school leaving [31-37]. These studies found different effects, emphasizing the complex nature of this relationship. Additionally, Okun empirically established Okun's law, which relates gross national product to the unemployment rate, highlighting the bi-directional relationship between unemployment and output [38]. Lee used a modified Solow growth accounting model to demonstrate the significant contribution of human capital accumulation to economic growth in Korea. This underscores the pivotal role of human capital in total factor productivity and economic growth [39]. Keji employed vector autoregressive and Johansen techniques to explore the relationship between human capital and economic growth, concluding that human capital has a long-run and significant impact on economic growth [40]. Alawamleh et al. conducted a study in Jordan, establishing that innovation is a product of human capital investment and that human capital investment is highly relevant to economic development [41].

In light of the existing literature, it is clear that human capital investment plays a crucial role in enriching the basic indicators of economic development. However, previous studies have not delved into the extent to which human capital investment has influenced employment, particularly youth employment. Furthermore, there is limited research examining disaggregated data on education (primary, secondary, and tertiary) and health (private and public) expenditures in relation to their effects on youth employment. This study, therefore, makes a significant contribution to the existing literature by addressing these gaps and aiming to ascertain the extent to which human capital investment has influenced youth employment across the Indian States.

1.2. Investment in Education & Health for human capital formation in India:

Over the period from 1990 to 2021, India has witnessed substantial strides in the process of enhancing individuals' skills, knowledge, and abilities that play a pivotal role in driving economic growth and development, marked by initiatives and policies aimed at nurturing its human capital. A transformative moment in India's journey was the liberalization of its economy in the early 1990s. This landmark shift opened doors to private investment, fueling economic growth, which, in turn, had a positive impact on human capital development. As the economy expanded, more resources became available for investments in education and training, aligning India with the demands of a rapidly evolving global economy. The government of India has made commendable efforts to promote education and skill development during this period. Initiatives like the Sarva Shiksha Abhiyan (SSA) and the Right to Education Act (RTE) have strived to provide universal elementary education and make schooling compulsory for all children between 6-14. Additionally, schemes like Skill India Mission and Pradhan Mantri Kaushal Vikas Yojana (PMKVY) aim to enhance employability by offering training and certification to millions of individuals. Despite these commendable efforts, formidable challenges persist in India's human capital formation landscape. One of the most pressing issues is the quality of education and training, with many institutions still lacking the resources and infrastructure necessary for providing high-quality education. Bridging the gap between educational curricula and industry requirements remains another critical challenge. Practical training and on-the-job learning opportunities need expansion to better prepare the workforce for the evolving demands of the global economy.

The financial allocation to education and health sectors, although increased over the years, continues to fall short of international benchmarks, such as the World Bank's recommendation of 6% of GDP. The Economic Survey of 2021 reported that India's expenditure on education and health during 2020-21 amounted to around 4.8% of GDP, highlighting the persistent funding gap. Investing in human capital is paramount for a nation's steady growth and sustainable development. Economically advanced countries allocate a significant proportion of their GDP to education, recognizing it as an investment in their people. India, in its current development phase, should prioritize education expenditure, aiming for at least 6% of GDP. In conclusion, India has made substantial progress in fostering human capital from 1990 to 2021, with commendable initiatives in education and skill development. However, to bridge the gap and meet international standards, there is an urgent need for increased investment in the education and health sectors. Equitable access and improved quality of education and healthcare services will be pivotal in shaping India's future as a global economic powerhouse.

2. Methods & Data

To address the methodological shortcomings identified in previous studies, this research employs various panel data approaches to robustly estimate the nexus between human capital investment and youth employment in India. Several econometric techniques are used to ensure the reliability of the results. First, the Westerlund Error Correction Model (ECM) panel co-integration technique is applied. However, due to potential endogeneity issues and the presence of root mean square error in this technique, the study considered using the System Generalized Method of Moments (Sys-GMM), a common choice for dynamic panel data studies. Yet, Sys-GMM can suffer from weak instrument problems, particularly in the presence of large time series and substantial unobserved heterogeneity and cross-sectional dependence. Therefore, the study opted for the bootstrap-based bias correction for the panel fixed effects (FE) estimator, which helps enhance the analytical correction when the variance of individ-

ual effects increases. This approach also addresses the emphasis on cross-sectional effects, which are predominant in this study, compared to time series effects.

The theoretical foundation of this research is rooted in the New Endogenous Growth Theory, which builds upon the modifications made by Romer and Lucas to the traditional neoclassical growth theory [23, 25]. The endogenous growth theory recognizes the crucial role of endogeneity in human capital and research and development (R&D) activities in the growth process. The production function of a firm, based on Romer's model, is formulated as follows:

$$Y = A(R)\, F(R_i, K_i, L_i), \quad (1)$$

Where:

- A(R) represents the public stock of knowledge from research and development.
- R_i signifies the stock of results from expenditure on research and development.
- K_i represents the capital stock of firm i.
- Li indicates the labor stock of firm i.
- R_i is the technology prevalent in firm i at the time.

The research employs a dynamic panel model inspired by Mankiw et al. as used in studies by Islam and Armah and Nelson to estimate the effect of human capital investment on youth employment across the Indian States [42-44].

The model considers the ratio of youth employment (ages 15 to 24) to total employment (YE_{it}/EM_{it}) as a function of different levels of education expenditures (primary, PE, secondary, SE, and tertiary education, TE), private health expenditure (PHE), public health expenditure (GHE), population growth rate (PGR), and per capita growth rate (GDPpc). The model is designed to capture how youth employment responds to various components of human capital expenditures.

The general dynamic equation is structured as follows:

$$(YE_{it}/EM)_{it} = \alpha 0 + \delta(YE/EM)_{it-1} + \lambda_1 PE_{it} + \lambda_2 SE_{it} + \lambda_3 TE_{it} + \lambda_4 PHE_{it} + \lambda_5 GHE_{it} + \lambda_6 \ln GDPpc_{it} + \lambda_7 PGR_{it} + \rho_{it} + v_t, \quad (2)$$

Where:

- $(YE/EM)_{it}$ represents the ratio of youth employment to total employment in country i at time t.
- $(YE/EM)_{it-1}$ represents the initial level of youth employment to total employment in i at time t.
- PE^{it} denotes expenditure on primary education as a percentage of total education expenditure.
- SE_{it} represents expenditure on secondary education as a percentage of total education expenditure.
- TE_{it} signifies expenditure on tertiary education as a percentage of total education expenditure.
- PHE_{it} indicates private health expenditure as a percentage of total health expenditure.
- GHE_{it} represents public health expenditure as a percentage of total health expenditure.
- $GDPpc_{it}$ is the per capita growth rate, reflecting aggregate economic performance.
- PGR_{it} is the population growth rate, capturing demographic trends.
- ρ_{it} represents country and period-specific effects.
- α_0 is the intercept.
- v_{it} denotes idiosyncratic or stochastic error terms.

These variables are included for the following reasons:

- Education and health are recognized by scholars as key components of human capital (Becker, Romer, Lucas, Rebelo, Barro, Aghion, and Howitt) and are expected to improve youth employability.
- Per capita growth rate serves as a measure of aggregate economic performance, and the study assumes that higher economic performance positively impacts youth employment.
- Population growth rate captures demographic trends and their implications for employment opportunities and challenges.

5.1. The study utilizes panel datasets from various sources, including the MoSPI, Government of India; the DES of the various States; UNESCO Institute of Statistics (2018 update), the ILOSTAT database of the International Labour Organization, World Bank Edstats/World Development Indicators 2018, and Penn World Data 9.0. These datasets provide information on GDP growth, human capital investment, demographic trends, and youth employment across the Indian States. India is currently divided into 29 states and seven union territories. However, the limitation of relevant comparable data restricts our sample to 26 states and union territories, which represent more than 90 percent of the country. Stata 14 software is employed for estimation and analysis.

3. Results & Discussion

3.1. Cross-sectional Dependence Analysis

In this section, we employ the Pesaran Cross-sectional Dependence (CD) test to assess cross-sectional dependence (Cd) in our analysis. It's important to note that our panel data has a larger number of cross-sectional units (N = 26) compared to time periods (T = 31). The Pesaran CD test follows a standard normal distribution under the null hypothesis, suggesting cross-sectional independence (CD ~ N (0,1)). The results of this test are presented in Table 1.

Variable	CD-test	P-value	Corr	Abs(corr)
YE / EM	−1.06	0.296	0.007	0.354
GDPpc	110.13	0.000	0.823	0.866
PGR	0.54	0.602	0.005	0.493
PHE	35.97	0.000	0.264	0.428
GHE	12.63	0.000	0.094	0.359
PE	15.78	0.000	0.115	0.422
SE	11.91	0.000	0.098	0.397
TE	12.13	0.000	0.097	0.443

Table 1. Pesaran cross-sectional dependence test result

Table 1 displays the outcomes of the Pesaran CD test for the study. It reveals that, except for the ratio of youth employment to total employment (YE / EM) and the population growth rate (PGR), all the macro panel variables exhibit cross-sectional independence. At a 5% level of significance, the CD-test and the associated p-values for these variables support the null hypothesis of cross-sectional independence in our macro panel data.

3.2. Panel Unit Root Analysis

Testing for unit roots and co-integration in macro panel data can be challenging due to issues like structural breaks and cross-sectional dependence. To address these challenges, we adopt the Pesaran Panel Unit Root test, which can handle both structural breaks and cross-sectional dependencies. This method, known as the Cross-sectional Augmented Dickey-Fuller (CADF) test, augments the standard ADF regression with the lagged cross-sectional mean and its first difference to capture cross-sectional dependence. The results of this test, both in levels and first differences, are presented in Table 2.

	Level				Difference			
Variable	**t-bar**	**Z[t-bar]**	**p-value**	**Int.**	**t-bar**	**Z[t-bar]**	**p-value**	**Int.**
YE_EM	−2.137	−1.179	0.881	I(1)	−2.700	−2.650	0.004	I(1)
GDPpc	−2.080	1.567	0.941	I(1)	−2.921	−4.156	0.000	I(1)
PGR	−2.231	0.534	0.703	I(1)	−2.640	−0.246	0.012	I(1)
PHX	−2.313	−0.019	0.492	I(1)	−2.995	−4.658	0.000	I(1)
GHX	−2.630	−2.177	0.015	I(0)	−2.900	−4.015	0.000	I(1)
PE	−2.540	−2.015	0.022	I(0)	−2.821	−3.477	0.000	I(1)
SE	−2.600	−1.973	0.024	I(0)	−3.252	−6.408	0.000	I(1)
TE	−2.708	−2.703	0.003	I(0)	−3.540	−6.812	0.000	I(1)

Table 2: Results for Pesaran's Cross- sectional Augmented Dicky Fuller test
Full sample estimate (*CV10 = −2.540, CV5 = −2.610, CV1 = −2.730*)

Table 2 reveals that in levels, four of the macro panel variables are not integrated (I (0)): Government Health Expenditure as a percentage of Total Health Expenditure (GHX), expenditure on primary education as a percentage of total education expenditure (PE), expenditure on secondary education as a percentage of total education expenditure (SE), and expenditure on tertiary education as a percentage of total education expenditure (TE). On the other hand, the remaining variables are integrated (I (1)) in levels.

In the first difference operator, the four variables that were integrated into levels become stationary (I (1)), making all the variables stationary in the first differences.

3.3. Panel Co-integration Analysis

For co-integration analysis, this study employs the Error Correction-based panel co-integration tests introduced by Westerlund and modified by Persyn and Westerlund [45, 46]. These tests provide four statistics: Ga, Gt, Pa, and Pt. Ga and Gt are panel statistics, while Pa and Pt are group statistics. These tests are flexible and allow for substantial heterogeneity, both in long-term co-integrating relationships and short-term dynamics, as well as dependence within and across cross-sectional units (countries). Additionally, these tests can produce robust critical values through bootstrapping when cross-sectional dependence is present, as is the case in our study. The results of the Westerlund ECM panel co-integration tests are presented in Table 3.

		YE / EM vs regressors		
Regressor	**Stat.**	**Value**	**Z-Value**	**P-value**
GDPpc	Gt	−9.275	−52.647	0.000
	Ga	–9.684	–2.134	0.973
	Pt	-19.569	-6.085	0.000
	Pa	–16.809	–6.189	0.000
PGR	Gt	−15.766	−99.852	0.000
	Ga	–12.501	–1.528	0.978
	Pt	-16.966	-1.967	0.061
	Pa	–9.387	–0.267	0.432
PHE	Gt	−4.958	−19.731	0.000
	Ga	–9.384	2.428	0.982
	Pt	-18.123	–4.580	0.000
	Pa	–9.171	-0.154	0.461
GHE	Gt	−5.799	−28.324	0.000
	Ga	–4.654	–7.278	1.000
	Pt	-16.620	-3.761	0.000
	Pa	–13.765	–4.971	0.000
PE	Gt	−5.756	−28.621	0.000
	Ga	–11.173	–1.840	0.960
	Pt	-19.888	-7.568	0.000
	Pa	–13.833	–5.472	0.000
SE	Gt	−5.618	−25.329	0.000
	Ga	–5.927	–5.967	1.000
	Pt	-19.752	-6.996	0.000
	Pa	–12.898	–3.187	0.001
TE	Gt	−4.979	−22.343	0.000
	Ga	–6.369	–5.466	1.000
	Pt	-14.395	-0.978	0.169
	Pa	–11.250	–2.346	0.013

Table 3: Westerlund ECM panel co-integration test results

Table 3 demonstrates that a co-integration relationship exists in the model for the ratio of youth employment to total employment (YE_EM). In the panel results, at least one of the four statistics (Ga, Gt, Pa, Pt) leads to the rejection of the null hypothesis of no evidence of co-integration for the aggregate panel series.

3.4. Random and Fixed Effects Analysis (Hausman Test)

To determine whether the Fixed-Effects (FE) model or the Random-Effects (RE) model is more suitable for our analysis, we conduct the Hausman specification test. The results of this test are presented in Table 4.

	YE / EM Model			
	Coefficients		Difference	Sqrt(diag (V_b- V_B))
	FE (b)	RE (B)	(b)-(B)	S. E.
GDPpc	−0.0000787	−0.0000903	0.0000116	0.00000696
PGR	−0.3256297	−0.2977328	−0.0278969	0.0153209
PHE	0.0122001	0.0119955	0.0002046	0.002134
GHE	−0.0295825	−0.0317681	0.0021856	0.0010207
PE	−0.0098894	−0.0085236	−0.0013658	0.0008101
SE	−0.0285845	−0.0284267	−0.0001578	0.0009507

TE	−0.0205858	−0.0190746	−0.0015112	0.0009846
Statistic	ChiSq(7) = 38.61; Prob ChiSq. = 0.0000			

b = consistent under Ho and Ha; B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Source: Author's estimation.

Table 4: Results of the hausman test

Table 4 indicates that the null hypothesis of no systematic difference in coefficients between FE and RE models is rejected for the ratio of youth employment to total employment (YE_EM). This conclusion is based on the Chi-Square statistic for the model. As a result, we conclude that the FE estimator is both consistent and efficient and best suited for our model's analyses.

4. Model Results

Based on the results of the pre-estimation tests, particularly the Hausman test that favors the Fixed-Effects (FE) model, and the evidence of co-integration from the Westerlund ECM panel co-integration tests, we present the results of our model in Table 5. The table includes both Long-Run (LR) and Short-Run (SR) coefficients for the specified variables.

	(1)	**(2)**
VARIABLES	YE/E M (LR)	YE/EM (SR)
Ecm		−0.327***
		(0.0479)
D.lnGDPpc		0.0538***
		(0.00436)
D.PE		0.0194***
		(0.00192)
D.SE		0.0288
		(0.0352)
D.PHE		−0.00182
		(0.0167)
D.GHE		−0.0286**
		(0.0141)
D.SPR		0.215
		(0.136)
D.TE		0.000459**
		(0.000184)
lnGDPpc	0.0748***	
	(0.00991)	
PE	0.0155***	
	(0.00400)	
SE	0.0759	
	(0.0822)	
PHX	0.0238	
	(0.0478)	
GHX	0.0569***	
	(0.0040)	
SPR	0.544***	
	(0.0342)	
TE	0.00826***	
	(0.00171)	
Constant		16.44***
		(2.443)

Standard errors in parentheses

*** p <0.01, ** p <0.05, * p <0.1.

Table 5: Results of YE / EM model

(Table 5 is presented as it is, as it contains numerical results that are essential for the analysis.)

In this table, column 1 (Long Run, LR) and column 2 (Short Run, SR) display the estimated coefficients for the variables in the model.

5. Discussion

Table 5 provides insights into the relationship between youth employment, education investments, health expenditures, economic factors, and population growth rate across the Indian States in both the short-run and long-run. Let's delve into the key findings and their implications.

5.1 Education Investments:

• Youth employment, represented by the ratio of youth employment to total employment (YE_EM), exhibits positive linear relationships with education investments, including primary and tertiary education expenditures, in both the short run and long run.
• Specifically, a 10%-point increase in primary education expenditure is associated with an approximately 0.184% increase in youth employment in the short run and a 0.145% increase in the long run.
• Similarly, a 10%-point increase in tertiary education expenditure leads to a 0.0045% increase in youth employment in the short run and a 0.082% increase in the long run.
• However, expenditure on secondary education does not have a statistically significant impact on youth employment in either the short-run or long-run.
These findings align with the view that educational spending enhances employment opportunities, supporting the claims made by Fashoyin and Tiraboschi [47]. They also highlight the varying impacts of different levels of education expenditure on youth employment.

5.2. Health Expenditures:

• Youth employment demonstrates negative linear relationships with both private and government health expenditures in the Indian States in the short run.
• A 10%-point increase in private health expenditure as a percentage of total health expenditure is associated with a 0.18% reduction in youth employment, while a 10%-point increase in government health expenditure leads to approximately a 0.28% decrease in youth employment.
• This suggests a trade-off between investment in the health sector and youth employment in India. Contrary to earlier findings by Eme et al. increased health expenditure does not seem to improve youth employment.
• The response of youth employment to changes in human capital investment varies by investment type, with education investments positively affecting youth employment and health expenditures showing mixed results.

5.3. Economic Factors:

• Youth employment has a positive linear relationship with GDP per capita (GDPpc) and the population growth rate (PGR) in both the short-run and long-run.
• A 10%-point increase in GDP per capita leads to a 0.53% increase in youth employment in the short run and a 0.74% increase in the long run.
• Similarly, a 10%-point increase in the population growth rate results in approximately a 1.1% increase in youth employment in the short run and a substantial 5.34% increase in the long run.
These findings are consistent with existing literature, which suggests that increased youth employment contributes positively to the national economy by boosting capital formation and aggregate demand.

5.4. Speed of Adjustment:

• In the long-term, the speed of adjustment or the Error Correction Model (ECM) parameter indicates that approximately 31.7% of the disequilibrium in the youth employment equation will adjust back to equilibrium in the preceding year.
• This suggests a relatively slow adjustment by youth employment to shocks in human capital investment, demographic changes, and economic performance in the long term. It takes about four years for youth employment to return to equilibrium aftershocks induced by the explained variables in the model, especially human capital investment variables.
In summary, this study provides valuable insights into the factors influencing youth employment in the Indian States. It highlights the importance of education investments, the complex relationship between health expenditures and youth employment, and the positive impact of economic factors on youth employment. Additionally, the relatively slow adjustment of youth employment to external shocks underscores the need for long-term policies aimed at improving youth employment prospects in the region.

6. Conclusion and Recommendations

The issue of youth employment in emerging economies, particularly in India, has garnered significant attention from policymakers and scholars due to its far-reaching implications. With a youthful population in abundance, India has been the center of debates regarding the potential of human capital investments to drive development. While numerous studies have explored the relationship between human capital and employment/unemployment in various countries, there has been a scarcity of research focusing on disaggregated expenditures on education (primary, secondary, and tertiary) and health (private and public) and their impact on youth employment. This study aimed to address this gap.
The key findings of this study can be summarized as follows:
6.1 Impact of Human Capital Investment: Human capital investment, as measured by both private and government health expenditures, as well as expenditures on primary, secondary, and tertiary education, was found to have varying and significant effects on youth employment in India.
6.2. Positive Impact of Education Investment: Education expenditures, especially at the primary and tertiary levels, were found to have a positive impact on youth employment. This implies that nations seeking to enhance youth employment prospects should prioritize investments in these education segments.
6.3. Negative Impact of Health Expenditure: In contrast, health expenditures exhibited a negative impact on youth em-

ployment. This suggests that the youth population in India may be in a stage of physiological development where health burdens are relatively light, leading to reduced health spending. However, this does not imply a reduction in health spending but underscores the importance of early-stage health investments (prenatal, neonatal, and infancy levels) to ensure robust health during youth, potentially reducing health spending in this demographic group.

In light of these findings, the study concludes that human capital investment, particularly investment in education, significantly affects youth employment in India. To address the implications of these findings, the following recommendations are made:

6.4. Targeted Education Investment: Policymakers should prioritize investments in education, with a focus on primary and tertiary levels. These segments were found to have a more substantial impact on youth employment than secondary education. By enhancing educational opportunities, India can better equip their youth for gainful employment.

6.5. Balanced Health Investment: While health spending among youth may be lower due to their relatively good health status, it is essential not to neglect health investments at earlier stages of human development. Investing in prenatal, neonatal, and infancy health can lead to better health outcomes during youth, potentially reducing health expenditures in this demographic group.

6.6. Long-Term Policy Planning: Given the relatively slow adjustment of youth employment to external shocks, policymakers should implement long-term policies aimed at improving youth employment prospects. These policies should consider the complex interplay of education, health, and economic factors.

In conclusion, this study highlights the importance of strategic human capital investments in improving youth employment in India. By tailoring investments in education and health to the specific needs and developmental stages of youth, Indian states can make significant strides in addressing youth unemployment and fostering economic growth.

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