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THE IMPACT OF FINANCIAL DEVELOPMENT AND HUMAN CAPITAL ON ECONOMIC GROWTH: A CASE STUDY OF SAARC COUNTRIES

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Abstract

This study investigates the empirical nexus between financial development, human capital, and economic growth within the context of seven selected South Asian Association for Regional Cooperation (SAARC) nations. Utilizing annual panel data spanning 41 years (1980-2021), implied by the Pooled Mean Group Autoregressive Distributed Lag (PMG-ARDL) model to examine long-run and short-run dynamics. The primary focus is placed on the interactive impact (A) of financial development (proxied by Liquid Liabilities, LL) and human capital (proxied by Secondary School Enrolment) on Gross Domestic Product (GDP). Where control variables including Inflation (INF), Gross Capital Formation (GCF), and Trade Openness (TO) are incorporated to ensure model robustness. Diagnostic testing, including the Levin-Lin & Chu and Pesaran & Shin unit root tests, confirmed stationary at both level and first difference, while Johansen and Kao cointegration tests established a stable long-term relationship among the variables. The empirical finding reveals that while financial development and the interaction term (A) exert a positive and statistically significant influence on economic growth, human capital along shows a positive but statistically insignificant effect in the short run. Furthermore, robustness checks conducted via Dynamic Ordinary Least Squares (DOLS) and Fully Modified Ordinary Least Squares (FMOLS) validates these results, confirming that the synergy between financial depth and educational attainment provides a more potent stimulus for growth than either factor in isolation. Based on these findings, the study recommends that SAARC policymakers adopt an integrated policy framework.

INTRODUCTION

The two main forces behind contemporary economic progress in all the world's economies are financial development and the buildup of human capital. According to macroeconomic theory there are two distinct structures the real

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economy which is driven by human capital, and the formal financial inter mediation sector. While the latter promotes long-term innovation and productivity without experiencing diminishing returns, the former records activities through official accounting systems to reduce irregularity and enhance risk-sharing. Well-developed financial markets, such as those in emerging economies like Malaysia, which have a capitalization ratio of 161% of GDP, serve as accelerators for the mobilization of resources into highly productive sectors, according to recent worldwide statistics. Although there is a wealth of economic literature examining the separate effects of education and financial deepening on growth (Barro & Lee, 2014; Levine, 2013). The joint framework examining their explicit, interactive impact on overall welfare outcomes continues to be a crucial area in development. Since its founding on December 8, 1985, the member countries of the South Asian Association for Regional Cooperation (SAARC) have faced significant policy pressures due to sustained economic development, much like the current global situation. Due to unilateral liberalization, the introduction of the South Asian Preferential Trade Agreement (SAPTA) in 1995, and the subsequent South Asian Free Trade Area (SAFTA), the SAARC region has historically shown impressive periods of economic acceleration, most notably peaking with a regional GDP growth rate of 8.9% in 2006. Despite these macroeconomic achievements, the region still faces significant structural stress, public spending on research and development languishes at less than 1% of GDP, international trade stands at an astoundingly low 5% compared to 25% in ASEAN, and important metrics like primary school enrollment reveal gaps in the quality of human resources (Mukherjee & Satija, 2020). Rapid urbanization and industrialization have thereby increased market size, but complete human development is still hampered by low literacy rates, insufficient healthcare facilities, and ongoing financing restrictions for small and medium-sized businesses (SMEs).There is surprisingly little empirical agreement on how the precise relationship between financial development and human capital drives economic production within the unique socio-political environment of South Asia, despite the growing interest among regional policymakers. Financial depth (measured by liquidity ratios, private sector credit, or M2/GDP) and human assets (measured by education and enrollment rates) are often treated as separate, linear drivers of GDP in conventional research (Kagochi et al., 2013; Sarwar et al., 2021). To the best of our knowledge, no single econometric framework exists that can account for regional trade barriers, high unemployment, and geopolitical risks while modeling the non-linear, interacting synergy of these two aggregates inside SAARC panel data. To close this gap, this study is being conducted as a groundbreaking empirical effort to map the missing channels through which financial access conditions the growth promoting impacts of human capital. The main goal of this study is to examine how the SAARC countries' economic growth trajectory is significantly impacted by the systemic interplay between financial development and human capital. This study assesses whether the development of the financial system significantly modifies the impact of living standard, health, and education indicators on regional GDP. We test the alternative hypothesis of a significant, positive joint effect on South Asian economic growth against the null hypothesis that the interaction between financial deepening and human asset accumulation has no significant effect by creating a multiplicative interaction term (Financial Development × Human Capital). This method fills in the gaps in the literature about how financial access affects the macroeconomic returns on investments in human capital. This method provides evidence-based insights to help regional central banks and educational ministries maximize sustainable, inclusive development by filling in the gaps in the literature about how financial access affects the macroeconomic returns on investments in human capital. This study expands the regional growth literature by using a multi-step empirical and methodological approach to comprehensively address these analytical

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shortcomings. To capture the joint thresholds required for inclusive economic growth, we first build a strong interaction variable. Second, the study employs a rigorous econometric sequence using Panel Autoregressive Distributed Lag ARDL (PMG) bounds testing for long-run co-integration and Fully Modified Ordinary Least Squares (FMOLS) and Dynamic Ordinary Least Squares (DOLS) for optimal sensitivity analysis to protect against problems of structural breaks and cross-sectional dependence inherent to SAARC panels. The empirical findings produced by this analytical framework verify that the relationship between the growth of the financial sector and the accumulation of human assets has a statistically significant, favorable long-term effect on the GDP trajectory of SAARC countries. The long-run and short-run coefficients demonstrate that when the domestic banking sector reduces real interest rates and increases credit availability to private businesses, the growth-promoting potential of elementary education is significantly increased.

Research Objectives

1. To find out the impacts of interaction between Financial Development and Human Capital on the Economic Growth of SAARC Countries.
2. To investigate, How the advancement of Human Capital and Financial system plays a role in the Economic Growth of SAARC Countries.

Research Questions

1. How does the interaction of financial development and human capital effect economic growth?
2. Does the advancement of the financial system and human capital have a significant impact on the Economic Growth of SAARC countries?

Research Hypothesis

- **H_o:** There is no significant impact, of interaction of financial development and Human Capital economic growth of SAARC countries.
- **H_A:** There is a significant impact, of interaction of financial development and Human Capital economic growth of SAARC countries.

LITERATURE REVIEW

Theoretical Studies

Asghar et al. (2024), trade liberalization showed a negative but insignificant correlation with inclusive growth, whereas financial development and institutional quality have a positive correlation.

Human et al. (2023) studied that the level of regulation, financial development and human capital are not mutually related, and their relationship is not with the macroeconomic consequences of evaluation, the study examines financial frictions, educational attainment, and total factor production (TFP) in various nations using an occupational-choice model adjusted using U.S. data. The results show that while firms with limited human capital increase skilled pay, lowering their capital intensity and relieving financial restrictions, firms with limited financial resources hire fewer skilled individuals. The combined effect of human capital and financial development on total output is far greater than the sum of their separate effects. To achieve optimal economic growth, the study suggests simultaneously improving financial development and education, especially in nations with greater levels of educational attainment.

Sebastiana (2022) there is a close relationship between financial development, human capital, and economic growth. Well-structured financial institutions are essential for promoting improvements in education and general economic performance. Enhancing worker capacities, lowering learning barriers, and improving access to education finance are all made possible by stronger financial infrastructure. Mansha et al. (2022) indicate that the SAARC and ASEAN economies benefit substantially from the accumulation of human and physical capital through gross fixed capital formation, health expenditures, and education. Our results suggest that to take full advantage of the opportunities for economic growth in the

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SAARC countries, concerted policy interventions to enhance institutional quality, educational systems, and financial infrastructure are needed.

Thathsarani et al**.** (2021), the current research of the comprehensive review of the economic success of the institutional standard, human capital and financial development are not highlighted in SAARC nations. South Asian countries between short-term economic growth and financial inclusion, and human capital development, and what the effect is. Two-way research, financial progress, human capital development and economic development have confirmed long-term relationships.

SAARC and ASEAN do not benefit from overall fixed capital formation, health care and education through human and physical capital investment (Mansha et al., 2022).These results show that it is not necessary to improve the economic development of the country, the education and health of the people, and the financial budget.

Empirical Studies

Saroj et al. (2024) focuses on India and examined the role of financial development and economic development in relation to human capital, this study used the ARDL model and World Bank data, which concluded that the gross domestic product of human capital in terms of financial development had a positive effect to the extent that it increased significantly, the results show that people's education and experience, financial benefits did not improve, and economic performance did not improve.

Kumar and Batra (2023) According to the study how human development, financial development, and economic progress are interrelated in India, with a focus on human development as a major factor. It examines both short- and long-term interactions between these variables using the Autoregressive Distributed Lag (ARDL) bound test. The findings point to possible disadvantages of an over-reliance on financial expansion by showing that, although human development greatly propels economic growth and the development of the financial sector, financial development has a negative impact on economic growth. To boost human capital, the report suggests giving priority to policies that improve educational and health services. It also suggests incorporating human development into economic frameworks and implementing an integrated strategy to guarantee long-term prosperity.

Qamruzzaman et al. (2021) Between 1981 and 2016, it showed the relationship between economic growth, human capital development and financial innovation in many countries in South Asia. results confirm the long-term relationship between three variables using the Granger correlation test in the framework of the error correction model (ECM) to identify links and the automatic regression method with distributed intervals (ARDL) to evaluate the long-term and short-term relationships. economic development is positively affected by financial innovation and human capital, and the return hypothesis is supported by the return effect, to preserve regional economic development, the report recommends policies that encourage financial innovation through consistent financial policies and more public investment in human capital, financial innovation, long-term relationships between human capital development and economic development have been found in research in many South Asian countries, returning the hypothesis to be supported by two-way analysis.

Sarwar et al. (2021) In this study, the relationship between human capital and financial development and how they affect economic development in 83 emerging economies between 2002 and 2017 has been evaluated. This method considers the time and specific effects of each country that uses the two-stage system of the Generalized Moment Method (GMM) in a deep growth model. the results show that both human capital and financial development significantly increase economic growth, and this effect increases with their interaction. To safeguard long-term economic growth, the report recommends that policymakers in emerging economies prioritize strengthening financial institutions and funding education and skills development.

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Ibrahim (2018) this study examined how financial growth and human capital quality work together to promote economic growth in 29 sub-Saharan African countries between 1980 and 2014. According to the Pope-Wooldridge method and the GMM system, both elements have a consistent effect on development and financial development shows the best performance when combined with high human capital (as shown by the student-teacher ratio), the report highlights that sustainable growth, financial development and higher-quality education are essential, to optimize the financial sector development's economic benefits in SSA, it suggests measures that improve educational quality and accessibility.

Evans et al. (2002) adopting a trans log function of output to account for interactions between factor inputs, the study assesses the contributions of financial development and human capital to economic growth in 82 nations between 1972 and 1992. The results show that while human capital and financial development both have a major impact on growth, financial development is at least as significant. Although financial markets are essential for growth, human capital seems to have a mixed effect. For more successful policy execution, the study suggested concentrating on the quality of financial development and human capital rather than its quantity, stressing accurate measurement and context-dependent analysis.

Table 1: Summary of the study's relevant Literature

Authors	Country	Data and Methodology	Findings
Opoku et al., (2024)	Africa	GMM Model used, 2005 to 2018, from 40 countries.	Financial access and economic prosperity influence Economic Growth both positively and negatively.
Saroj et al., (2024)	India	Model ARDL, and data from WDI	Human capital shows enhancing effect of financial sector progress on economic outcomes.
Minhaj et al., (2023)	Pakistan	Panel data from 1990 to 2019, Bayesian and Classical methodologies	Finding has shown that Human capital is crucial and have positive impact on driving economic growth.
Dar & Nain, (2023)	SAARC	Panel data used Between 1990 And 2020, PFMLS, PMG,	Study proven that financial development, is negatively affected by inflation but Economic Growth has positive impact.
Islam (2020)	Few South Asian countries	Data from 2000 to 2016, panel unit Root Test, Pedroni Cointegration Test, ARDL, and Dumitrescu Hurlin panel Causality Test.	These results verify short- and long-term impact between variables with Strong correlation.

Research Gap

Although extant literature has significantly advanced our knowledge of the distinct effects of financial development and human capital accumulation on economic growth, a significant gap remains regarding their combined impact in the context of the SAARC countries. Although earlier research has examined separately effects of human capital and financial development on economic growth, there is still a lack of knowledge regarding how these two factors interact within SAARC nations. Several research studies have looked at how institutional frameworks and outside influences shape the

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relationship between financial development, economic growth, and human capital, a thorough examination that considers the contextual factors and difficulties that the SAARC countries face is lacking.

Keeping in the light of existing literature, there are limited evidence on the joint impact of financial development and human capital on economic growth within the SAARC context. By incorporating interaction terms and using advanced econometrics techniques and models, this study aims to bridge this existing gap in the literature.

Data, Model Specification and Estimation Strategy

Data and Sample

Annual panel data covering the period 1980 to 2021 were utilized to address the study's objectives. The data source is the World Bank (WB), World Development Indicator (WDI). Economic Growth is the dependent variable, while financial ddevelopmentt and human capital are main independent variables. Where liquid liability and Secondary School eenrolment serve as proxies for financial development (FD) and human capital (HC) respectively. The data of 7 selected SAARC countries namely, Pakistan, India, Bhutan, Bangladesh, Sri Lanka, Nepal and Maldives.

Econometrics Techniques

An economic analyst's capacity to examine complicated economic data and patterns depends heavily on the array of econometric techniques, in this study the following statistical tests are used to enhance the understanding of variables' impacts and make sure of the accuracy of the analysis, to ascertain whether the variables are stationary, the panel unit root test is employed, Second, the long-term link between the variables is verified using the Johansen Fisher panel cointegration test and Kao tests, Fourth, both short and long-term effects have been checked by the Panel Mean Group (PMG ARDL) estimator which is used to calculate the coefficients, Finally, FMOL (Fully Modified Ordinary Least Squares) and DOLS (Dynamic Ordinary Least Square) techniques are employed for robustness checks, and lastly, tests for multicollinearity, and cross-sectional dependence, alongside descriptive statistics, were also conducted.

Cross Section Dependence Test

Before estimating a panel model, this is one of the primary diagnostic tests that must be carried out, Four distinct cross-section dependence tests were employed in this study. The Breusch-Pagan LM test, as modified by Hahn and Shi, (2021), Pesaran Scaled LM, Bias-Corrected Scaled LM, and Pesaran CD test, Pesaran, (2014); Pesaran, (2015).In macro panels where the time dimension (T) exceeds cross-sectional dimension (N), the Pesaran scaled test is more suitable than the other suggested test (Pesaran et al., 1999).

Panel Unit Root Test

Unit root tests are used to determine variables stationarity, establishing the stationarity of the variables is crucial before implementing any long-term model, the right model can be selected based on the variables' panel unit root tests. The Pesaran and Shin (PS) and Levin Lin & Chu (LLC) tests were included in the investigation as stationary tests, one advantage of the PS test is its allowance for heterogeneity in both intercepts and slope coefficients across panel units Bildirici and Kayikçi, (2013).

Cointegration Test

After establishing the integration properties via panel unit root test to find out whether a long-term link exists, the Heterogeneous panel johansen cointegration tests indicate the rejection of the null hypothesis Johamen and Jtiselius (1990) and Kao cointegration test, Kao's (1999). Furthermore, at the 1% level of significance, the Kao cointegration test result confirms that there is a long-run equilibrium relationship among the variables. In addition we chose to use the Johansen cointegration test, an error correction panel cointegration testing method, to examine the data further after seeing signs of co-integration in Kao test results (Zhang and Zhang, 2024).Both the Johansen and Kao cointegration tests were employed to check for

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long-run relationships under different assumptions regarding system dynamics and panel homogeneity

PMG ARDL Model

In terms of analyzing panel data, the Pooled Mean Group (PMG) estimator is suitable for capturing both short-run dynamics and long-run relationships between financial development and human capital, and economic growth over time in different SAARC countries, the PMG ARDL estimation techniques proposed by Pesaran et al. (1999) accommodates heterogeneous short-run dynamics while constraining long-run coefficients to be equal across panel units for the estimation of an intermediate practical strategy, Different dynamic approaches and auto regressive parameters produced the results de Silva et al., (2019). This structure aligns with ARDL panel requirements, the fact is that the ARDL panel has short-term and long-term benefits. The flexibility of the region is necessary because it is a region that considers different economic arrangements and economic development, human capital and financial development. PMG used long-term interest estimation and error correction term (ECT) interest group to obtain the maximum Likelihood (ML) estimation, long-rub interest and short-run survey averages were taken. different SAARC countries and the parameters, methods, PMG estimates from the free distribution of these regressors and unit root processes are based on each other, so many features of the data are covered, summarized and the PMG estimates, in addition to the opposing panels that can be analyzed, provide new perspectives on the relationship between SAARC and human development, financial development and economic development, and mutual relationships and more complexities. Consequently, it is highly preferred by researchers dealing with economic and financial data from a plethora of countries and time periods, the PMG estimators are especially appropriate for this investigation because of their capacity to handle the large datasets that are a feature of this research, this study hopes to shed light on how the interaction between financial development and human capital affects economic growth throughout the SAARC countries during this study by utilizing these innovative approaches (Bangake and Eggoh, 2012).

Empirical Research Model

In this study we used the method of analysing economic growth factors, using the Cobb-Douglas production function model to figure out the influence of various factors on economic growth (Demetriades and Law, 2006).

$$y_{it} = T_{it}\alpha\text{-}(S_{it}M_{it})^{1-\alpha} \qquad \textbf{Equation (3.1)}$$

where, y_{it} presents the real output, the country is the I and T is time, T_{it} represents the stock of physical capital where the country is I and time T, M_{it} is showing stock of raw materials in the country I at the time T; for now, s_{it} is the labor-augmenting factor reproducing the technology on advancement level in country I at time T. From equation (3.1), raw labour and labour-intensive level of technology should change as follows:

$$M_{it} = M_{io}e^{m_i t} \qquad \textbf{Equation (3.2)}$$

$$S_{it} = e^{h_i t} + f_{it}{}^{\theta_i} \qquad \textbf{Equation (3.3)}$$

Also, m_i is the exogenous growth rate of the labour force in country i, h_i represents exogenous progressive technology level rate in country i, f_{it} is a way of financial development, human capital, and other factors that may replicate disconnection between technology and its productivity in country i at time t, and θ_i is a route of measurements related to these variables. Hence

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$$y_{it} = y_{it}/M_{it} \quad = T_{it}\alpha\text{-}(S_{it}M_{it})^{1-\alpha}/M_{it} \qquad \textbf{Equation (3.4)}$$

Taking log of equation (3.4), we obtain:

$$lny_{it} = lnS_{it} + \alpha lnM_{it} \qquad \textbf{Equation (3.5)}$$

Applying equation (3.3) as:

$$lny_{it} = lnS_0 + (1-\alpha)h_i t + (1-\alpha)\theta_i f_{it} + \alpha lnM_{it} \qquad \textbf{Equation (3.6)}$$

To estimate (3.5),

In this study hypothesize a well-designed form of vector F and add a suitable error term, applying the linear as follows:

$$lny_{it} = lnS_0 + (1-\alpha)h_i t + (1-\alpha)\theta_{1i} lnf_{1it} + (1-\alpha) + \theta_{2i} lnf_{2it} + \alpha lnM_{it} + \varepsilon_{it} \qquad \textbf{Equation (3.7)}$$

Model (3.7) outspreads the basic model (3.6) by integrating financial development and human capital factors. Where F1 specifies financial development, F2 is a variable that summarizes the human capital indicators and εit is an error.

Model:

$$y_{it} = \beta_0 + \beta_1 fd_{it} + \beta_2 HC_{it} + \beta_3 (fd_{it} \times hc_{it}) + \beta_4 inf_{it} + \beta_5 GCF_{it} + \beta_6 TO_{it} + \varepsilon_{it} \qquad \textbf{Equation (3.8)}$$

This study created a fundamental empirical research model, Equation (3.8) which has been drawn from Sarwar et al. (2021) and Nguyen (2022) to examine the relationship between financial development, human capital, and economic growth in SAARC countries. Where equation (3.8) shows an interaction term constructed as a product of financial development and Human capital (i.e. FD x HC).

The empirical measurement is directed to amplify the factors of economic growth, financial development, and human capital, by testing interaction impact on output. Thus, the empirical model employed in the analysis can be expressed as follows:

This model's econometric equations are as:

$$y_{it} = \beta_0 + \beta_1 inf_{it} + \beta_2 GCF_{it} + \beta_3 TO_{it} + \beta_4 A_{it} + \varepsilon_{it} \qquad \textbf{Equation (3.9)}$$

By adding an interaction term (A) between Liquid Liabilities (LL) and Secondary School Enrollment (SSE), Model (3.9) expands on the prior formulation. This makes it possible to examine if the degree of financial development affects how human capital affects the dependent variable where A is representing $\mathbf{LL_{it} \times SSE_{it}}$. Stated differently, it investigates the combined impact of education and financial depth on economic results. The model additionally incorporates Trade Openness (TO), Gross Capital Formation (GCF) and Inflation (INF) as control variables in addition to this interaction. Other factors not included in the model are considered by the error term εit.

$$y_{it} = \beta_0 + \beta_1 inf_{it} + \beta_2 GCF_{it} + \beta_3 TO_{it} + \beta_4 LL_{it} + \varepsilon_{it} \qquad \textbf{Equation (3.10)}$$

Model (3.10) is a panel data regression model that examines how important structural and economic factors affect the dependent variable, $\mathbf{y_{it}}$. The explanatory variables include Trade Openness (TO), Gross Capital Formation (GCF) and Inflation (INF), which represents macroeconomic stability, Liquid Liabilities (LL), which serve as a stand-in for financial development. Each of these factors' effects on the dependent variable is represented by a different coefficient, β. Random shocks and

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unobserved factors influencing the model are captured by the error term $\boldsymbol{\varepsilon_{it}}$.

$$\boldsymbol{y_{it} = \beta_0 + \beta_1 inf_{it} + \beta_2 GCF_{it} + \beta_3 TO_{it} + \beta_4 SSE_{it} + \varepsilon_{it}} \qquad \boldsymbol{Equation\ (3.11)}$$

The model **(3.11)** looks at how trade openness, Gross Capital Formation, inflation and human capital, affect the dependent variable. Every explanatory variable has a direct impact on $\mathbf{y_{it}}$., according to the linear connection assumption. All other unobserved factors are captured by the error term. The model aids in comprehending how these factors influence economic results over time in various nations.

Estimation Method

Table 2: Description of Variables, Measurements and Source

Variables	Measurements	Source
Economic Growth (EG)	GDP Growth rate (annual %) $\mathbf{Y_{GDP} = \frac{GDP_t - GDP_{t-1}}{GDP_{t-1}} \times 100}$	WDI
Financial development (FD)	LL	WDI
Liquid liabilities (% of GDP) (LL)	LL=Currency in Circulation+Demand Deposits +Time and Savings Deposits $\mathbf{LL = \frac{GDP}{LL} \times 100}$	WDI
Human Capital	SSE	WDI
Secondary school enrolment (SSE)	$\mathbf{SS = \frac{Total\ Number\ SSE}{Total\ Population\ of\ Relevant\ Age\ Group} \times 100}$	WDI
Inflation, consumer prices (annual %) (IN)	$\mathbf{IN = \frac{CPI_t - CPI_{t-1}}{CPI_{t-1}} \times 100}$	WDI
Gross Capital Formation (GCF)	GCF (% of GDP) = (GCF / GDP) × 100	WDI
Trade openness (% of GDP)	$\mathbf{TO = \frac{Imports + Export}{GDP}}$	WDI

In this study, the panel data have been used. For panel data analysis there is a method of POOLED MEAN GROUP, PMG is discussed below for the estimation of regression equation or model equation.

RESULTS AND DISCUSSIONS

Table 4.1 displays the descriptive analysis, there are distinct disagreements between the mean and median of variables like LL and A, indicating the presence of skewness, most likely because of outliers. Variables such as SSE, LL, and A, demonstrate high standard deviations, indicating notable variation over time and across

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nations. Most of the variables, such as LGDP, LL, SSE, and A, are positively skewed, according to the skewness values, suggesting distributions with extreme positive values. Variables like LL and A show leptokurtic behavior in terms of kurtosis. Their values are much higher than the typical benchmark of the three, suggesting peak distributions in the extremes. On the other hand, the kurtosis values of variables such as LGDP and GCF are nearer normal. Given their excellent test statistics and zero p-values, the Jarque-Bera test results verify that every variable deviates from normalcy. Given that the Null Hypothesis of a normal distribution has been rejected, further econometric research may need to modify the data or employ robust estimating techniques.

Table 3: Descriptive statistics

	LGDP	LL	SSE	A	INF	GCF	TRADE
Mean	7.1641	45.5619	50.3647	2507.995	7.6301	29.7773	62.4213
Median	6.9985	43.0285	45.2452	1994.351	7.1650	27.8336	46.2517
Maximum	9.3292	122.7795	151.7600	10254.08	26.1454	69.4725	170.3288
Minimum	5.8117	11.3969	3.6256	118.2463	-1.6854	14.4393	12.21927
Std. Dev.	0.8750	18.5217	29.3831	1961.972	4.2360	10.9427	43.8607
Skewness	0.6998	0.9972	0.9323	1.1337	0.8084	0.9629	1.2347
Kurtosis	2.7224	4.5020	3.7858	4.1408	4.6528	4.0738	3.4178
Jarque-Bera	24.9406	76.3719	50.1580	78.9331	65.4945	59.5674	76.8492
Probability	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Sum	2106.262	13395.21	14807.23	737350.6	2243.257	8754.542	18351.88
Sum Sq. Dev.	224.3336	100514.9	252967.9	1.13E+09	5257.650	35084.98	563664.2
Observations	294	294	294	294	294	294	294

Source: Author's calculation from WDI

Note: LGDP stands for Log of GDP, LL describes Liquid liability, SSE is using for Secondary School Enrollment, A is representing the interaction term of LL*SSE Where the INF stands for inflation, GCF For Gross Capital Formation and Trade represents Trade Openness.

The occurrence of multicollinearity between the independent variables is investigated using the correlation matrix. When the correlation coefficient between two independent variables is more than 0.80 or less than -0.80, multicollinearity is typically seen as a problem. Table 4.2 shows that there are no significant multicollinearity problems because many correlation coefficients are within the permitted range. However, since LL and SSE are components of A, the correlation between LL and A (0.8165) and between SSE and A (0.8139) marginally beyond the threshold, indicating a possible multicollinearity issue between these variables.

Table 4: Correlation Matrix

	LGDP	LL	SSE	A	INF	GCF	TRADE
LGDP	1.0000	0.2785	0.5160	0.4268	-0.2538	0.5021	0.7789
LL	0.2785	1.0000	0.3932	0.8165	-0.2288	0.3926	0.0129
SSE	0.5160	0.3932	1.0000	0.8139	-0.0883	0.2456	0.1797
A	0.4268	0.8165	0.8139	1.0000	-0.1977	0.3883	0.0827
INF	-0.2538	-0.2288	-0.0883	-0.1977	1.0000	-0.1649	-0.0744
GCF	0.5021	0.3926	0.2456	0.3883	-0.1649	1.0000	0.5930
TRADE	0.7789	0.0129	0.1797	0.0827	-0.0744	0.5930	1.0000

Source: Author's calculation from WDI

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Note: LGDP stands for Log of GDP, LL describes Liquid liability, SSE is using for Secondary School Enrollment, A is representing the interaction term of LL*SSE Where the INF stands for inflation, GCF For Gross Capital Formation and Trade represents Trade Openness.

Before proceeding toward the Panel unit root test, the Cross-section dependence test must be applied. The cross-section dependence test obtained by using four different methods: the Breusch-Pagan LM, Pesaran Scaled LM, Bias-Corrected Scaled LM, and Pesaran CD test. Table 4.3 indicates that all test statistics for the variables LGDP, LL, SSE, A, INF, GCF and Trade are highly significant at 1 and 5% levels of significance, meaning that each of the four methods rejects the null hypothesis, indicating convincing evidence of cross-section dependence in the dataset. Standard econometric techniques that presume independence may produce inaccurate results when cross-section dependence is present. However, in the presence of cross-section dependence, techniques such as the Pooled Mean Group (PMG ARDL) estimator can manage this problem and yield more trustworthy results (Rahman and Alam, 2021).

Table 5: Cross Section Dependent Test

Variables	Breush Pegan LM	Pesaran Scaled LM	Bias Corrected Scaled LM	Pesaran CD
LGDP	819.8180***	123.2603***	123.1749***	28.6099***
LL	393.8956***	57.5390***	57.4536***	17.4850***
SSE	532.6337***	78.9467***	78.8614***	21.9662***
A	588.5419***	87.5736***	87.4882***	24.0076***
INF	171.5608***	23.2320***	23.1466***	11.5542***
GCF	225.6819***	31.5831***	31.4977***	2.37758***
TRADE	197.0544***	27.1657***	27.0804***	2.2275**

Source: Author's calculation from WDI

Note: *** and ** Represents at 1% and 5%, significance level respectively. LGDP stands for Log of GDP, LL describes Liquid liability, SSE is using for Secondary School Enrollment, A is representing the interaction term of LL*SSE Where the INF stands for inflation, GCF For Gross Capital Formation and Trade represents Trade Openness.

According to statistically significant test statistics across the Levin, Lin & Chu (LLC), and Pesaran and Shin W-stat methods, which are all significant at the 1% level (***), Table 4.4 shows that the inflation variable (INF) is stationary at the level. On the other hand, (LGDP) is non-significant according to the Pesaran-Shin test and only weakly stationary according to the LLC test with trend (significant at the 10% level, *). This implies that LGDP lacks consistent evidence across tests but may show weak stationarity at level.

Table 6: Panel Unit Root Test (at level)

Variables	Levin, Lin & Chu		Pesaran and shin W-STAT	
	Intercept	Intercept With Trend	Intercept	Intercept With Trend
INF	-4.2112***	-3.5938***	-4.9691***	-4.5300***
LGDP	~~~~~	-1.39984*	~~~~~	~~~~~

Source: Author's calculation from WDI

Note: *** and *, Represents at 1% and 10% significance level respectively. LGDP stands for Log of GDP, Where the INF stands for inflation.

Panel unit root tests at the first difference are reported in Table 4.5, where all variables (LGDP, LL, SSE, GCF, TRADE, and A) are

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rejecting null hypothesis of a unit root in all tests, including intercept only and interceptions along with trend specifications. Test statistics for the LLC and Pesaran-Shin approaches are significant at the 1% level, and LGDP becomes very stable at first difference. This result makes it abundantly evident that other variables, including LGDP, LL, SSE, TRADE, and A, only become stationary after initial differencing, whereas variables like INF are already stationary at level. The following use of cointegration techniques, such as the PMG-ARDL model, to investigate long-term equilibrium relationships is justified by the presence of I (1) series.

Table 7: Panel Unit Root Test (At First Difference)

Variables	Levin, Lin & Chu		Pesaran and shin W-STAT	
	Intercept	Intercept With Trend	Intercept	Intercept With Trend
LGDP	-3.2226***	--	-7.0931***	-8.1713***
LL	-4.8071***	-5.4193***	-6.6816***	-5.8480***
GCF	-3.4243***	-1.8610**	-8.3963***	-7.0396***
SSE	-4.8336***	-4.0770***	-7.6192***	-6.5157***
TRADE	-8.6284***	-7.7607***	-10.0291***	-8.9141***
A	-2.8172***	-3.1642***	-6.0370***	-6.0691***

Source: Author's calculation from WDI

Note: *** and ** Represents 1% and 5% significance level respectively. LGDP stands for Log of GDP, LL describes Liquid liability, SSE is using for Secondary School Enrollment, A is representing the interaction term of LL*SSE Where the INF stands for inflation, GCF For Gross Capital Formation and Trade represents Trade Openness.

There are long-term correlations between LGDP, INF, GCF, A, and TRADE, in model 1, according to the results of the Johansen cointegration test. The existence of at least two cointegrating vectors is confirmed by the trace and max-eigenvalue statistics, which are both statistically significant at the 1% level for the first two hypotheses (None and At most 1) shown in table 4.6 This implies that over time, the variables will move together.

Table 8: Johansen Fisher Panel Test of Cointegration for Model 1
LGDP INF GCF A TRADE

Hypothesized No CE (s)	First Stat. from trace test	Fisher Stat. from max-eigen test
None	61.24***	35.07***
At most 1	34.15***	27.21***
At most 2	17.83	14.22
At most 3	12.44	11.69
At most4	14.43	14.43

Source: Author's calculation from WDI

Note: *** Represents 1% significance level respectively. LGDP stands for Log of GDP, LL describes Liquid liability, SSE is using for Secondary School Enrollment, A is representing the interaction term of LL*SSE Where the INF stands for inflation, GCF For Gross Capital Formation and Trade represents Trade Openness.

There is compelling evidence of co-integration between LGDP, INF, GCF, TRADE, and LL, according to Model 2 results. In table 4.7 shows Both the (None and At most 1) hypotheses have

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extremely significant test statistics, suggesting the existence of up to two significant others.

Table 9: Johansen Fisher Panel Test of Cointegration for Model 2
LGDP INF GCF TRADE LL

Hypothesized No CE (s)	First Stat. from trace test	Fisher Stat. from max-eigen test
None	76.98***	43.90***
At most 1	41.00***	29.84***
At most 2	20.76	12.82
At most 3	17.27	16.27
At most4	16.60	16.60

Source: Author's calculation from WDI

Note: *** Represents 1% significance level respectively. LGDP stands for Log of GDP, LL describes Liquid liability, SSE is using for Secondary School Enrollment, A is representing the interaction term of LL*SSE Where the INF stands for inflation, GCF For Gross Capital Formation and Trade represents Trade Openness.

Cointegration between the variables is confirmed by Model 3 shows table 4.8, the significant level at 1% findings confirmed by (None and At most 1) and 5% (At most 2) by the trace test. where at the 10% level, the fourth rank is slightly significant, indicating the possibility of another long-term partnership. All things considered, the existence of several cointegrating vectors suggests that LGDP, INF, GCF, TRADE, and SSE have solid long-term relationships.

Table 10: Johansen Fisher Panel Test of Cointegration for Model 3
LGDP INF GCF TRADE SSE

Hypothesized No CE (s)	First Stat. from trace test	Fisher Stat. from max-eigen test
None	83.55***	45.60***
At most 1	46.40***	30.99***
At most 2	25.30**	20.31
At most 3	15.11	12.03
At most4	21.41*	21.41*

Source: Author's calculation from WDI

Note: ***, ** and * Represents 1% ,5% and 10% significance level respectively. LGDP stands for Log of GDP, LL describes Liquid liability, SSE is using for Secondary School Enrollment, A is representing the interaction term of LL*SSE Where the INF stands for inflation, GCF For Gross Capital Formation and Trade represents Trade Openness.

Table 4.9 presents the existence of long-term linkages supported by the Kao test, which shows cointegration in Models 2 and 3 at the 10% significant level. Despite Model 1's poorer performance, the overall results support the Johansen test and demonstrate how cointegration is consistent across models.

Table 11: Kao Cointegration Test

	Model 1	Model 2	Model 3
T-statistic (ADF)	-0.7658	-1.3762*	-1.3278*

Source: Author's calculation from WDI

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Note: * Represents 10% significance level respectively.

Table 4.10 presents the PMG-ARDL short- and long-run estimates for GDP growth (LGDP). In the long run, gross fixed capital formation (GCF) significantly stimulates growth (0.110%), while inflation (INF) exerts a negative but insignificant impact (-0.0178), aligning with the findings of Dar and Nain (2023) regarding the moderating effects of inflation. Trade openness (TRADE) has a positive and significant effect (0.0267), contrasting with the observations of (Asghar et al. 2024). for whom the link between trade and inclusive growth is insignificant compared to the favorable effects of finance and human capital. Crucially, the long-run interaction term (A) [LL*SSE] is positive and significant, confirming that financial systems and human capital stimulate output in a complementary manner (Sarwar et al., 2021). Conversely, in the short run, inflation has a positive impact (0.0005), reflecting an initial economic adaptation to moderate inflation, while GCF remains positive and significant (0.0028), reinforcing Ibrahim, (2018b) results. However, the impact of trade openness in the short run is insignificant, and the interaction term (A) becomes significantly negative, indicating temporary growth constraints due to adjustment costs. Finally, a positive and highly significant constant points to an underlying growth trend, and the significant ECM coefficient of -0.0203 confirms an annual adjustment speed of 2% toward the long-run equilibrium.

Table 12: Results of Pooled Mean Group (PMG -ARDL) Estimation

	Model 1	
Variables	**Long Run**	**Short Run**
INF	-0.0178 (0.0214)	0.0005** (0.0002)
GCF	0.1102* (0.0624)	0.0028** (0.0012)
A	0.0001** (0.00007)	-0.00002* (0.00001)
TRADE	0.0267* (0.0154)	0.0008 (0.0010)
CONSTANT		0.0658*** (0.0143)
ECM		-0.0203** (0.0105)

Source: Author's calculation from WDI

Note: ***, ** and * Representing 1, 5and 10% significance level. Figures in () are standard errors. LGDP stands for Log of GDP, A is representing the interaction term of LL*SSE Where the INF stands for inflation, GCF For Gross Capital Formation and Trade represents Trade Openness Where ECM stands for Error Correction Mechanism.

Table 4.11 presents the short- and long-run PMG-ARDL estimates for Model 2. In the long run, inflation (INF) exerts a substantial negative influence on GDP growth, suggesting that persistent inflationary pressures hinder

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expansion this finding aligns with the conclusions of Dar and Nain (2023) regarding the negative impact of inflation on financial development, even while economic growth remains positive. Conversely, financial development, measured by liquid liabilities (LL), significantly supports long-run growth with a one-unit increase in LL raising GDP growth by (0.0549) demonstrating the crucial role of the financial sector (leading to the rejection of the null hypothesis). However, LL have a substantial negative impact in the short run, potentially due to temporary market fluctuations, as noted by Balach & Law, (2015);Eltayeb Elfaki & Musa Ahmed, (2024).Gross capital formation (GCF) makes a positive and considerable contribution in the short run (leading to the rejection of the null hypothesis), with a one-unit increase in GCF resulting in a (0.0049) rise in GDP growth, highlighting the importance of investment for immediate performance however, it has no perceptible effect on long-run growth. Trade openness (TRADE) shows no perceptible impact in either period, indicating a limited contribution this contrasts with the results of Ibrahim, (2018b), who found a significant positive impact of trade openness. Finally, the ECM coefficient of (-0.0139) confirms that any short-run disequilibrium adjusts toward the long-run equilibrium at an annual rate of 1%.

Table 13: Results of Pooled Mean Group (PMG -ARDL) Estimation

	Model 2	
Variables	**Long Run**	**Short Run**
INF	-0.0532***	0.0003
	(0.0163)	(0.0004)
GCF	-0.0103	0.0049***
	(0.0174)	(0.0018)
TRADE	-0.0001	0.0019
	(0.0057)	(0.0013)
LL	0.0549***	-0.0031***
	(0.0107)	(0.0009)
CONSTANT		0.1207
		(0.0891)
ECM		-0.0139**
		(0.0042)

Source: Author's calculation from WDI

Note: *** Represents 1% significance level respectively. Figures in () are standard errors. Note: LGDP stands for Log of GDP, LL describes Liquid liability, Where the INF stands for inflation, GCF For Gross Capital Formation, Trade represents Trade Openness and ECM stands for Error Correction Mechanism.

The Model 3 PMG estimation findings show that both short-term and long-term dynamics affect GDP growth. Inflation (INF) has a positive but statistically insignificant long-term rejecting null hypothesis, But inflation has a short-term negative impact on GDP growth, inflationary swings could hinder growth soon by Dar and Nain (2023), the coefficients indicate that one unit increase in GCF will increase GDP growth by (0.2020) in the long run and (0.0031) in short run which are shown in table 4.12, GCF continues to have a positive and significant impact on GDP by growth Ibrahim, (2018b). Even though trade openness (TRADE) was positively correlated with GDP growth during both periods, this relationship is not statistically significant, does not rejecting the null hypothesis in previous study by Sarwar et al., (2021) trade is negatively and significant effecting. The ECM is (-0.0107) it shows that any short or disequilibrium in the short run will move towards long run equilibrium at the speed of 1% per Anum, secondary school enrollment

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(SSE), a proxy for human capital, has a negative and statistically insignificant short-term effect on GDP growth but a positive but insignificant long-term association with it Saroosh (2023) Gayyar (2005) Disman (2024) Akinlo and Oyeleke (2020),. prove that education is major growth drivers and indicate a strong relationship between economic performance and expenditures in human capital.

Table 14: Results of Pooled Mean Group (PMG -ARDL) Estimation

	Model 3	
Variables	**Long Run**	**Short Run**
	0.1029	-0.0005*
INF	(0.0856)	(0.0003)
	0.2020*	0.0031**
GCF	(0.1195)	(0.0012)
	0.0370	0.0012
TRADE	(0.0320)	(0.0011)
	0.0063	-0.0005
SSE	(0.0093)	(0.0006)
		0.0043
CONSTANT		(0.0186)
		-0.0107**
ECM		(0.004)

Source: Author's calculation from WDI

Note: ** and * Represents 5 and 10% significance level respectively. Figure in () are standard errors. LGDP stands for Log of GDP, SSE is using for Secondary School Enrollment, Where the INF stands for inflation, GCF For Gross Capital Formation, Trade represents Trade Openness and ECM stands for Error Correction Mechanism.

The FMOLS and DOLS findings for Model 1 confirm the accuracy of the previous PMG estimation, shown in Table 4.13. The results validate the stability of the long-term relationships between the variables and are in line with the PMG model. With coefficients of (0.0001), (FMOLS) and (0.0002), (DOLS), both rejecting the null hypothesis, significant at the 1% level, the interaction term (A), has a positive and highly significant impact on GDP growth across both estimators, highlighting the significance of human capital and financial development in promoting economic growth Human et al. (2023) examines how financial development and human capital intersect results the combined effect of human capital and financial development on total output is far greater than the sum of their separate effects. Ibrahim and Alagidede (2018) highlights that expansion of the financial sector greatly accelerates growth when combined with high-quality human capital. Both models show that inflation (INF) has a negative and statistically significant effect, with coefficients of (-0.0267) (FMOLS) and (-0.0252) (DOLS), such as decreased investment and elevated uncertainty rejecting null hypothesis. With coefficients of (0.0106) and (0.0127), respectively, gross capital formation (GCF) also rejecting null hypothesis and continue to have a positive and significant relationship with GDP growth, growth Ibrahim, (2018b).Trade openness (TRADE), on the other hand, has small negative coefficients and is statistically insignificant in both models, indicating that trade does not consistently affect GDP over the long run in the sample that was studied does not rejecting the null hypothesis in previous study by Sarwar et al., (2021) trade is negatively and significant effecting.

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Table 15: Panel FMOLS and Panel DOLS results for Model 1

Variables	Methods	
	PFMOLS	PDOLS
A	0.0001***	0.0002***
	(0.00001)	(0.00002)
INF	-0.0266***	-0.0252***
	(0.0062)	(0.0084)
GCF	0.0105**	0.0127**
	(0.0045)	(0.0059)
TRADE	-0.0001	-0.0030
	(0.0022)	(0.0025)

Source: Author's calculation from WDI

Note: *** and ** Represents 1 and 5% significance level respectively. Figure in () are standard errors. LGDP stands for Log of GDP, A is representing the interaction term of LL*SSE Where the INF stands for inflation, GCF For Gross Capital Formation and Trade represents Trade Openness.

The panel FMOLS and DOLS results for Model 2, which are shown in Table 4.14, validates the reliability of the PMG estimations. With coefficients of (-0.0346) in FMOLS and (-0.0401) in DOLS, inflation (INF) continuously exhibits a negative and statistically significant impact on both models, confirming the theoretical prediction that inflation impairs economic performance by lowering purchasing power by Dar and Nain (2023) shows that while inflation has a positive impact on economic growth**.** The dependent variable is also strongly positively impacted by liquid liabilities (LL) Hussein et al., (2021), which stand for financial development. At the 1% level, both the FMOLS and DOLS coefficients are significant at (0.0188) and (0.0256), respectively. This suggests that long-term inflationary pressure is tightly linked to greater liquidity in the banking system. GCF and trade continues to have a positive and significant impact on GDP growth Ibrahim, (2018b). TRADE has little negative coefficient in both FMOLS and DOLS, while GCF is somewhat positive in FMOLS and slightly negative in DOLS, indicating their modest impact in this model setting.

Table 16: Panel FMOLS and Panel DOLS results for Model 2

Variables	Methods	
	PFMOLS	PDOLS
INF	-0.0346***	-0.0401***
	(0.0074)	(0.0104)
GCF	0.0043	-0.0045
	(0.0058)	(0.0111)
TRADE	-0.0027	-0.0046
	(0.0028)	(0.0032)
LL	0.0188***	0.0255***
	(0.0022)	(0.0041)

Source: Author's calculation from WDI

Note: *** Represents 1% significance level respectively. Figures in () are standard errors. LGDP stands for Log of GDP, LL describes Liquid liability, Where the INF stands for inflation, GCF For Gross Capital Formation and Trade represents Trade Openness.

The panel FMOLS and DOLS estimates for Model 3, in Table 4.15. These estimates further confirm the reliability of the PMG results. With

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coefficients of (-0.0221), in FMOLS and (-0.0311), in DOLS, inflation (INF) has a negative and statistically significant effect on the dependent variable in both approaches. Inflation continues to have a negative impact on economic growth by reducing real income study by Dar and Nain (2023) shows that while inflation has a positive impact on economic growth, with values of (0.0235), and (0.0300), respectively, gross capital formation (GCF) and the dependent variable continue to be positively and substantially correlated study showed that GCF continues to have a positive and significant impact on GDP growth Ibrahim, (2018b). Where growth is strongly positively impacted by secondary school enrollment (SSE), which is a proxy for human capital at the 1% level, the FMOLS and DOLS coefficients for SSE are (0.0151), and (0.0131), respectively economic progress is highlighted by Asghar et al. (2024) on SAARC nations, Trade openness (TRADE), on the other hand, has minor negative coefficients and is statistically insignificant in both models, suggesting that its influence may be indirect or limited, financial development, institutional quality, and human capital have a favourable impact (Asghar et al. 2024). The robustness of the PMG estimates is generally supported by the consistency of results across FMOLS and DOLS, promoting economic growth.

Table 17: Panel FMOLS and Panel DOLS results for Model 3

Variables	Methods	
	PFMOLS	PDOLS
INF	-0.0221***	-0.0310***
	(0.0059)	(0.0093)
GCF	0.0234***	0.0299***
	(0.0040)	(0.0063)
TRADE	-0.0009	-0.0011
	(0.0021)	(0.0029)
SSE	0.0151***	0.0131***
	(0.0012)	(0.0015)

Source: Author's calculation from WDI

Note: *** Represents 1% significance level respectively. Figures in () are standard errors. LGDP stands for Log of GDP, SSE is using for Secondary School Enrollment, Where the INF stands for inflation, GCF For Gross Capital Formation and Trade represents Trade Openness.

COUNCLUSION AND RECOMMENDATIONS

The relationship between financial development and human capital is investigated and the term interaction model is included. This term compatibility has shown that these two sectors and the focus of these policies are aimed at providing more stable and effective results, so that economic development and two variables exist that their combined effect is greater than their individual effects. These results are not only statistically significant, but also show the difference in ability and performance, but the search for doing this work also has social and economic importance. The results of the research are clear and immediate: the number of countries that have not been divided, the development point of view is far from the most integrated strategies towards the world, Therefore, it is necessary to study the results of the objectives of the economic clan and the labor, financial and educational sectors that have created structural changes in the bar and the balancing of policy issues that have provided the corresponding increase. By developing the methodology, human capital from different aspects, such as health, professional skills and ability, will be examined more accurately and better understood. In addition, the special characteristics of the review of different policy measures and the impact of the results. A well-trained workforce has not been implemented,

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and technical changes have been adjusted accordingly, and a targeted educational strategy through human capital, especially in secondary and higher enrollment schools, has been developed and educational standards have been established. In addition, all faiths and actions are not tangible tools, and the financial development and human capital of organizations is also not improved. These policies are not separately targeted, they are not effective, so they are not a solution, although they do not have enough positive effects

Lastly, even though our study did not find trade openness to be a significant driver, improving trade facilitation policies and lowering barriers within the SAARC area may eventually support the development of financial and human capital, increasing the region's economic integration and competitiveness. This indicates that human capital and financial development are both essential to promoting economic growth in SAARC countries individually as well as together, in addition to being significant on their own. These results highlight the vital necessity for coordinated policy approaches that support both industries concurrently to promote long-term economic growth and raised living standards for the people of the area.

Pakistan	India	Bhutan	Bangladesh	Sri Lanka	Nepal	Maldives

APPENDIX

Table 18: List of SAARC Countries used for Estimation

REFERENCES

Akinlo, T., & Oyeleke, O. J. (2020). *Human Capital Formation and Economic Growth in Sub-Saharan African Countries : An Empirical Investigation*. https://doi.org/10.1177/0019466220972848

Asghar, M. M., Safdar, R., Zubair, M., & Hanif, M. (2024). Exploring the Influence of Financial Development, Institutional Quality and Trade Openness on Inclusive Growth in SAARC Countries. *Pakistan Journal of Humanities and Social Sciences*, *12*(2), 1450–1461. https://doi.org/10.52131/pjhss.2024.v12i2.2221

Balach, R., & Law, S. H. (2015). Effects of Financial Development , Institutional Quality , and Human Capital on Economic Performance in SAARC Countries. *The Empirical Economics Letters*, *14*(February), 131–141.

Bangake, C., & Eggoh, J. C. (2012). Pooled Mean Group estimation on international capital mobility in African countries. *Research in Economics*, *66*(1), 7–17. https://doi.org/10.1016/j.rie.2011.06.001

Barro, R. J., & Lee, J. W. (2014). American Economic Association International Measures of Schooling Years and Schooling Quality. *Source: The American Economic Review*, *86*(2), 218–223.

Bildirici, M. E., & Kayikçi, F. (2013). Effects of oil production on economic growth in Eurasian countries: Panel ARDL approach. *Energy*, *49*(1), 156–161. https://doi.org/10.1016/J.ENERGY.2012.10.047

Dar, M. H., & Nain, M. Z. (2023). Revisiting the financial development and economic growth nexus: empirical evidence from SAARC countries. *Journal of Financial Economic Policy*, *15*(6), 645–659. https://doi.org/10.1108/JFEP-06-2023-0154

ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 2 • June 2026

Demetriades, P., & Law, S. H. (2006). *FINANCE , INSTITUTIONS AND ECONOMIC DEVELOPMENT*. *260*, 245–260.

De Silva et al., (2018). (2019). *Europe PMC Funders Group Copy-number signatures and mutational processes in ovarian carcinoma*. *50*(9), 1262–1270. https://doi.org/10.1038/s41588-018-0179-8.Copy-number

Eltayeb Elfaki, K., & Musa Ahmed, E. (2024). Globalization and financial development contributions toward economic growth in Sudan. *Research in Globalization*, *9*(December 2023), 100246. https://doi.org/10.1016/j.resglo.2024.100246

Evans, A. D., Green, C. J., & Murinde, V. (2002). Human capital and financial development in economic growth: New evidence using the translog production function. *International Journal of Finance and Economics*, *7*(2), 123–140. https://doi.org/10.1002/ijfe.182

Hahn, J., & Shi, R. (2021). *Breusch and Pagan ' s (1980) Test Revisited*. *1980*.

Human, Z., Allub, L., & Gomes, P. (2023). *Human Capital and Financial Development : Firm-Level Interactions and Macroeconomic Implications **.

Hussein, M. A., Ahmed, S. A., & Ahmed, H. M. S. (2021). Impact of Financial Development on Economic Growth in Sudan: Short-Run and Long-Run Analysis. *International Journal of Management*, *11*(12), 2919–2932. https://doi.org/10.34218/ijm.11.12.2020.274

Ibrahim, M. (2018a). Interactive effects of human capital in finance–economic growth nexus in Sub-Saharan Africa. *Journal of Economic Studies*, *45*(6), 1192–1210. https://doi.org/10.1108/JES-07-2017-0199

Ibrahim, M. (2018b). Interactive effects of human capital in finance–economic growth nexus in Sub-Saharan Africa. *Journal of Economic Studies*, *45*(6), 1192–1210. https://doi.org/10.1108/JES-07-2017-0199

Ibrahim, M., & Alagidede, P. (2018). PT SC. *Journal of Policy Modeling*. https://doi.org/10.1016/j.jpolmod.2018.08.001

Johamen, S., & Jtiselius, K. (1990). Maximum likelihood estimation and inference on cointegration-with applications to the demand for money. *Oxford Bulletin of Economics and Statistics*, *52*(2), 169–210.

Kagochi, J. M., Nasser, O. M. Al, Kebede, E., & Kagochi, J. M. (2013). *Does Financial Development Hold the Key to Economic Growth ?: The Case Of Sub-Saharan Africa DOES FINANCIAL DEVELOPMENT HOLD THE KEY TO ECONOMIC GROWTH ? THE CASE OF SUB-SAHARAN AFRICA*. *47*(2), 61–79. https://doi.org/10.1353/jda.2013.0035

Kao's (1999). (1999). Effects in kaon and antikaon production in nuclear collisions at subthreshold beam energies. *Physical Review Letters*, *82*(8), 1640–1643. https://doi.org/10.1103/PhysRevLett.82.1640

Kim, M. H., Mazenga, A. C., Simon, K., Yu, X., Ahmed, S., Nyasulu, P., Kazembe, P. N., Ngoma, S., & Abrams, E. J. (2018). *Burnout and self-reported suboptimal patient care amongst health care workers providing HIV care in Malawi*. 1–15.

Kumar, G., & Batra, S. (2023). Interrelationship Between Human Development, Financial Development and Economic Growth: Empirical Evidences from Indian Economy. *Indian Journal of Human Development*, *17*(1), 60–81. https://doi.org/10.1177/09737030221146022

Levine, R. (2013). *Economic Development and Financial and Agenda Growth : Views*. *35*(2), 688–726.

ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 2 • June 2026

Mansha, M., Yang, X., Ul Mustafa, A. R., & Nasim, M. M. (2022). Empirical Analytics of SAARC vs ASEAN in Perspective of Economic Growth and Capital Accumulation. *IRASD Journal of Economics*, *4*(2), 337–351. https://doi.org/10.52131/joe.2022.0402.0083

Mukherjee, A., & Satija, D. (2020). Regional Cooperation in Industrial Revolution 4.0 and South Asia: Opportunities, Challenges and Way Forward. *South Asia Economic Journal*, *21*(1), 76–98. https://doi.org/10.1177/1391561420908078

Nguyen, T. A. N. (2022). Financial Development, Human Resources, and Economic Growth in Transition Countries. *Economies*, *10*(6). https://doi.org/10.3390/economies10060138

Nurova Farogat Salohiddin kizi Dr. Disman, M. (2024). *HUMAN CAPITAL DEVELOPMENT AND ECONOMIC GROWTH IN UZBEKISTAN*. 109–117.

Pesaran, M. H. (2014). *Journal of Applied Econometrics*. *21*(August 2012), 1–21. https://doi.org/10.1002/jae

Pesaran, M. H. (2015). Testing Weak Cross-Sectional Dependence in Large Panels. *Econometric Reviews*, *34*(6–10), 1089–1117. https://doi.org/10.1080/07474938.2014.956623

Pesaran, M. H., Shin, Y., & Smith, R. P. (1999). Pooled Mean Group Estimation of Dynamic Heterogeneous Panels. *Journal of the American Statistical Association*, *94*(446), 621–634. https://doi.org/10.1080/01621459.1999.10474156

Qamruzzaman, M., Jianguo, W., Jahan, S., & Yingjun, Z. (2021). Financial innovation, human capital development, and economic growth of selected South Asian countries: An application of ARDL approach. *International Journal of Finance and Economics*, *26*(3), 4032–4053. https://doi.org/10.1002/ijfe.2003

Saroj, S., Shastri, R. K., Singh, P., Tripathi, M. A., Dutta, S., & Chaubey, A. (2024). In what ways does human capital influence the relationship between financial development and economic growth? *Benchmarking: An International Journal*, *31*(4), 1073–1091. https://doi.org/10.1108/BIJ-03-2023-0131

Saroosh, S. and. (2023). *ImpactofHumanCapitalonEconomicGrowth:ACaseofSAARCCountries*. *12*(112), 15–22.

Sarwar, A., Khan, M. A., Sarwar, Z., & Khan, W. (2021). Financial development, human capital and its impact on economic growth of emerging countries. *Asian Journal of Economics and Banking*, *5*(1), 86–100. https://doi.org/10.1108/ajeb-06-2020-0015

Sebastiana Viphindrartin1. (2022). *Tamansiswa Accounting Journal International Volume 5 , No 1 , April 2022*. *512022*(1). https://doi.org/10.54204/TAJI/Vol312021

Shahira El Gayyar, P. D. (2005). Human Capital and Economic Growth In South Asia. *Pakistan Development Review*, *44*(4 PART I), 455–471. https://doi.org/10.30541/v44i4ipp.455-478

ISSN (Online): 3006-2071 | ISSN (Print): 3006-2063
Volume 4 • Issue 2 • June 2026

Thathsarani, U., Wei, J., & Samaraweera, G. (2021). Financial inclusion's role in economic growth and human capital in south asia: An econometric approach. *Sustainability (Switzerland)*, *13*(8), 1–18. https://doi.org/10.3390/su13084303

Zhang, C., & Zhang, L. 2024. (2024). The relationship between toxic air pollution, health expenditure, and economic growth in the European Union: fresh evidence from the PMG-ARDL model. *Environmental Science and Pollution Research*, *31*(14), 21107–21123. https://doi.org/10.1007/s11356-024-32342-w