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EXAMINING THE RELATIONSHIP BETWEEN INSTITUTIONS, GDP, TRADE, FDI, AND HUMAN DEVELOPMENT IN BANGLADESH: AN ARDL APPROACH

***Mohammad Mokammel Karim Toufique**

Associate Professor, Department of Economics, Noakhali Science and Technology University, Bangladesh.

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ABSTRACT

Aims: This study examines the impact of Institutional quality, GDP, trade, and FDI on human development in Bangladesh from 1996 to 2022. **Methodology:** An autoregressive distributed lag (ARDL) model is used to analyse short-run and long-run relationships. Institutional quality is measured using three different indexes. Additionally, the Toda-Yamamoto Granger causality test is conducted to explore causal links. **Results:** Institutional quality has a negative and significant long-run impact on human development, while GDP and trade have positive and significant long-run effects. However, the short-run impacts of GDP and trade are negative and significant, whereas all other short-run coefficients are insignificant. In all three models, the error correction term is negative and falls between 0 and 1, indicating that the system moves back toward equilibrium following short-term shocks. The ARDL bounds test does not provide conclusive evidence of a long-run relationship among the variables. The three models reveal consistent bidirectional and unidirectional causal links, each showing two bidirectional and six unidirectional relationships. **Conclusion:** Bangladesh experiences "development without governance," where economic growth and trade drive progress, but weak institutions hinder long-term human development. Strengthening governance is crucial to ensure sustainable development.

Keywords: Human Development, Institutions, GDP, Foreign Direct Investment (FDI), Trade Openness, ARDL Model, Bangladesh, Time Series Analysis.

INTRODUCTION

Improvements in health, education, and income—key components of human development—are vital for sustainable development. Although GDP growth has long been considered a key engine of development, modern research underscores the interconnected roles of governance, openness, and foreign direct investment (FDI) in promoting equitable outcomes. Bangladesh, often lauded for its rapid socioeconomic improvements despite ongoing institutional weaknesses, offers a unique context to explore this interplay. Over recent decades, the country has witnessed robust economic expansion averaging around 6% annual GDP growth since 2000, a rise in export-driven sectors like ready-made garments, and rising FDI inflows. However, its Human Development Index (HDI) increased from 0.387 in 1990 to 0.67 in 2022—though concerns regarding governance inefficiencies, bureaucratic bottlenecks, and unequal service access persist. Although human development tends to be linked with economic growth over time, this relationship is not automatic or guaranteed[1], [2]. Various institutions, directly or indirectly, shape human development.

The link between institutional quality and human development has been explored empirically by a number of studies. The general argument is that institutional quality play a vital role in promoting capabilities of people as well as output productivity[3]. Rigobon and Rodrik emphasized the importance of institutions like democracy and rule of law for better economic outcome and for reducing inequality[4]. The importance of rule of law in sustainable economic and human capital development has been underscored other studies[5]. Evidence from 49 African countries finds that effective governance, controlling corruption, political stability, and lowering violence and terrorism were boosting human development[6]. For 33 African countries, Shuaibu also underscores the importance of institutions for human capital development[7].

***Corresponding Author: Mohammad Mokammel Karim Toufique,**
Associate Professor, Department of Economics, Noakhali Science and Technology University, Bangladesh.

A number of studies have documented the importance of economic growth in human development[8], [9]. For instance, studies have identified positive impacts of growth on HDI in the ASEAN countries[10], [11]. Fidella finds that regional GDP affects HDI in Indonesia significantly[12]. Van, using data on 130 countries, finds GDP affecting HDI positively both in the short run and long run[13]. Another study of 84 countries identifies GDP per capita as an important determinant of HDI[14]. For five South Asian countries, the evidence is in favor of the HDI-promoting impact of economic growth[15]. The evidence from Pakistan is not strong – one showing a significant positive impact while another showing an insignificant impact of growth on HDI[16], [17].

The impact of trade on human development has been examined by a few studies. Davies and Quinlivan found trade improving social welfare reflected by increases in HDI[18]. In a study of 87 countries, the evidence yields support for trade having greater impact on HDI compared to income-increasing policies[19]. A study on Pakistan reveals trade having a negative impact on HDI[16]. Also, for BRIC countries, there is evidence that a two-way causation exists between trade and HDI[20].

FDI can affect human development directly or indirectly via economic growth[21], [22], [23], [24], [25]. FDI can raise human development through technology transfer and up gradation of domestic workers' skill[26], [27], [28], [29]. The current evidence regarding FDI's impact on HDI in mixed – some showing positive impacts while some showing negative impacts[30], [31]. FDI creates more jobs and help reduce inequality[32]. Also, it can harm domestic firms and affect human development negatively[33].For a panel of African countries, it has been found that FDI's impact on poverty is negative in the long run, but positive in the short run suggesting that FDI might need more time to reduce poverty and raise human development in the FDI receiving countries[31]. Also, evidence from Pakistan indicates that FDI was affecting human development negatively[16]. A cross country study of 143 countries finds that FDI affect HDI positively[34].

Prior research on Bangladesh's development has largely ignored the impact of the quality of institutional frameworks on human development. This oversight is striking given Bangladesh's dual identity as an economic success story grappling with governance deficits. Addressing this gap, this study employs an Autoregressive Distributed Lag (ARDL) model to assess time series data for the 1996–2022 periods. This work adds to the debates on "development without governance," providing new empirical insights from Bangladesh. We examine the impact of institutional quality on HDI in the presence of GDP, trade, and FDI. Hence, we answer the question: How do institutional quality, GDP, trade, and FDI affect Bangladesh's human development?

The paper is structured as follows: Section 2 details the methodology, Section 3 discusses the findings, and Section 4 concludes.

METHODOLOGY

We define an ARDL model where human development is explained by institutional quality, GDP, trade and FDI. The Human Development Index from the UNDP is used to represent human development. Institutional quality is assessed using data from two sources: the World Bank's Worldwide Governance Indicators (WGIs) and the Quality of Government Index from the ICRG. From the WGIs, we create two indexes: $\ln Q_1$ is a composite index derived through principal component analysis (PCA), while $\ln Q_2$ is the simple average of the six indicators, following the method proposed by Alonso and Garcimartín[35]. The index from the ICRG is indicated by $\ln Q_3$. GDP reflects per capita GDP (current US$), trade is represented by trade's GDP share, and FDI is proxied by the GDP share of net FDI inflows. The WGIs are available since 1996, the ICRG data are available since 1984 and the HDI became available in 1990. Hence, we use data for the 1996-2022 periods.

For the 1996–2022 periods, we estimate the model using three distinct institutional quality indicators: $\ln Q_1$, $\ln Q_2$, and $\ln Q_3$. Some summary statistics of the relevant variables for the 1996-2022 periods are reported in Table 1. For each variable, mean, median, standard deviation, minimum, and maximum values – these five summary statistics are displayed. For example, HDI has a mean of .552, a median of .541 and a standard deviation of .067. The values of HDI range from .441 to .67. All other variables in Table 1 can be interpreted in a similar way.

Table 1. Summary Statistics (1996-2022)

Variable	Mean	Median	Std. Deviation	Minimum	Maximum
HDI	.552	.541	.067	.441	.67
$\ln Q_1$	-.000	.4195	1.583	-4.336	1.516
$\ln Q_2$	-.863	-.856	.126	-1.143	-.617
$\ln Q_3$	.410	.430	.051	.282	.462
GDP	1013.932	698.503	732.637	387.384	2687.899
Trade	34.376	32.098	7.189	26.076	48.110
FDI	.732	.635	.457	.029	1.735

To carry out the analysis, we first check the stationarity of the variables in the model. For that we employ three unit root tests – Augmented Dicky-Fuller (ADF), Phillips-Perron (P-P) and modified Dicky-Fuller (DF-GLS). After ensuring that none of the variables are integrated of order higher than 1, we proceed to estimate the ARDL models. With a maximum of p lags for the dependent variable and a maximum of k lags for the independent variables we can outline the ARDL equations.

Model 1:

$$lnHDI_t = \beta_0 + \sum_{i=1}^{p} \beta_i \, lnHDI_{t-1} + \sum_{i=0}^{k} \gamma_i \, lnInQ_{1,t-i} + \sum_{i=0}^{k} \delta_i \, lnGDP_{t-i} + \sum_{i=0}^{k} \rho_i \, lnTrade_{t-i} + \sum_{i=0}^{k} \rho_i \, lnFDI_{t-i} + \varepsilon_t \quad (1)$$

Model 1':

$$lnHDI_t = \beta_0 + \sum_{i=1}^{p} \beta_i \, lnHDI_{t-1} + \sum_{i=0}^{k} \gamma_i \, lnInQ_{2,t-i} + \sum_{i=0}^{k} \delta_i \, lnGDP_{t-i} + \sum_{i=0}^{k} \rho_i \, lnTrade_{t-i} + \sum_{i=0}^{k} \rho_i \, lnFDI_{t-i} + \varepsilon_t \quad (2)$$

Model 1":

$$lnHDI_t = \beta_0 + \sum_{i=1}^{p} \beta_i \, lnHDI_{t-1} + \sum_{i=0}^{k} \gamma_i \, lnInQ_{3,t-i} + \sum_{i=0}^{k} \delta_i \, lnGDP_{t-i} + \sum_{i=0}^{k} \rho_i \, lnTrade_{t-i} + \sum_{i=0}^{k} \rho_i \, lnFDI_{t-i} + + \varepsilon_t \quad (3)$$

The ARDL bounds test is formulated as below[36]:

Model 1:

$$\Delta \ln HDI_t = \beta_0 + \sum_{i=1}^{p} \beta_i \, \Delta \ln HDI_{t-i} + \sum_{i=0}^{k} \gamma_i \, \Delta lnInQ_{1,t-i} + \sum_{i=0}^{k} \delta_i \, \Delta lnGDP_{t-i} + \sum_{i=0}^{k} \rho_i \, \Delta lnTrade_{t-i} + \sum_{i=0}^{k} \theta_i \, \Delta lnFDI_{t-i} + \lambda_1 lnHDI_{t-1} + \lambda_2 lnInQ_{1,t-1} + \lambda_3 lnGDP_{t-1} + \lambda_4 lnTrade_{t-1} + \lambda_5 lnFDI_{t-1} + \varepsilon_t \quad (4)$$

Model 1':

$$\Delta \ln HDI_t = \beta_0 + \sum_{i=1}^{p} \beta_i \, \Delta \ln HDI_{t-i} + \sum_{i=0}^{k} \gamma_i \, \Delta lnInQ_{2,t-i} + \sum_{i=0}^{k} \delta_i \, \Delta lnGDP_{t-i} + \sum_{i=0}^{k} \rho_i \, \Delta lnTrade_{t-i} + \sum_{i=0}^{k} \theta_i \, \Delta lnFDI_{t-i} + \lambda_1 lnHDI_{t-1} + \lambda_2 lnInQ_{2,t-1} + \lambda_3 lnGDP_{t-1} + \lambda_4 lnTrade_{t-1} + \lambda_5 lnFDI_{t-1} + \varepsilon_t \quad (5)$$

Model1":

$$\Delta \ln HDI_t = \beta_0 + \sum_{i=1}^{p} \beta_i \, \Delta \ln HDI_{t-i} + \sum_{i=0}^{k} \gamma_i \, \Delta lnInQ_{3,t-i} + \sum_{i=0}^{k} \delta_i \, \Delta lnGDP_{t-i} + \sum_{i=0}^{k} \rho_i \, \Delta lnTrade_{t-i} + \sum_{i=0}^{k} \theta_i \, \Delta lnFDI_{t-i} + \lambda_1 lnHDI_{t-1} + \lambda_2 lnInQ_{3,t-1} + \lambda_3 lnGDP_{t-1} + \lambda_4 lnTrade_{t-1} + \lambda_5 lnFDI_{t-1} + \varepsilon_t \quad (6)$$

Δ is the first difference operator, t is the time index, i is the lag, and ε is the error term. The null hypothesis assumes that there is no co-integration, while the alternative hypothesis indicates that co-integration is present.

$$H_0: \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = 0 \quad (7)$$

$$H_1: \lambda_1 \neq 0, \lambda_2 \neq 0, \lambda_3 \neq 0, \lambda_4 \neq 0, \lambda_5 \neq 0 \quad (8)$$

Following the work of Sapnken*et al.,* and Rahman and Kashem, we assess Granger causality between the variables using an augmented VAR model with the Toda-Yamamoto method[37], [38].

RESULTS AND DISCUSSION

ARDL Results

Table 2 presents a summary of the unit root tests for the relevant variables for the 1996-2022 periods. Following the results of the ADF test we find that lnHDI, $\ln InQ_1$, $\ln InQ_2$, lnTrade, and lnFDI, are stationary at their levels. The remaining two variables, $\ln InQ_3$and

lnGDP are stationary at the first difference. Two variables are level-stationary according to the P-P test while the remaining five are first difference-stationary. Also, as suggested by the DF-GLS test, three variables are level stationary while the rest are stationary at the first difference. If we look at a single variable, for example, lnHDI, we see that it is level stationary following ADF and P-P tests and DF-GLS identifies it as stationary at the first difference. lnGDPis I(1), and all other variables are either I(0) or I(1) depending on the test considered. Hence, all the variables are either I (0) or I (1), making the data suitable for ARDL techniques. We use AIC to determine the order of the ARDL. The orders of the models are: Model 1 ARDL (1 2 1 1 1), Model 1' ARDL (1 2 1 1 1), and Model 1"ARDL (1 2 1 1 1).

Table 2. Unit Root Tests

	ADF		**P-P**		**DF-GLS**		**I(?)**
	Level	*First Diff.*	*Level*	*First Diff.*	*Level*	*First Diff.*	
lnHDI	-10.976***		-9.120***			-3.360***	I(0), I(1)
$lnInQ_1$		-4.087***		-5.995***	-16.521***		I(0), I(1)
$lnInQ_2$		-2.936**		-3.967***	-8.961***		I(0), I(1)
$lnInQ_3$		-3.264**		-3.296**	-3.785***		I(0), I(1)
lnGDP		-3.179**		-3.128**		-3.083***	I(1)
lnTrade	-1.763**			-3.745***		-3.286***	I(0), I(1)
lnFDI	-4.189***		-4.053***			-3.180***	I(0), I(1)

****, and ** indicate significance at 1%, and 5% levels, respectively.*

Table 3 presents the ARDL model results along with the findings of the bounds test.

Model 1 with lnQ_1 Representing Institutional Quality

In this model, institutional quality, measured by lnQ_1, affects human development negatively and significantly in the long run. The long run impacts of GDP and trade are significant and positive. However, FDI fails to have any important bearing on human development in the long run. In the short run, the impacts of GDP and trade are negative and significant at 10% level. Other short run impacts are negligible. The ECT of -.478 suggest that if HDI is moved away from its long-term equilibrium owing to a short-term shock, approximately 47.8% of deviation is corrected in each period. Hence, the ECT indicates convergence towards the long run equilibrium. 64.7% of the variation in human development is explained by this model. Following the ARDL bounds test, all the variables in the model are cointegrated at 10%. The test is inconclusive at 5%.

Model 1' with lnQ_2 Representing Institutional Quality

In the long run, institutional quality, represented by lnQ_2, affects human development negatively and significantly in this model. The impacts of GDP and trade on human development are positive and significant in the long run. In the short run, institutional quality has no significant impact on human development. The short run impacts of GDP and trade on HDI are significant at 1% and 10% levels respectively. FDI's short run impact is insignificant. The statistically significant ECT of -.533 implies that 53.3% of the deviations are corrected each year if the dependent variable deviates from its long run equilibrium and the model converges to the long run equilibrium in a regular manner. The model's explanatory power is 66.60%. The results of the bounds test indicate that the variables in the model do not show any long run relationship, meaning that they are not cointegrated.

Table 3. ARDL Estimation

Y= lnHDI	**Model 1 (1 2 1 1 1)**	**Model 1' (1 2 1 1 1)**	**Model 1"(1 2 1 1 1)**
Variable	Long run		
$lnInQ_1$	-.024***(.008)		
$lnInQ_2$		-.116***(.029)	
$lnInQ_3$			-.085*(.042)
lnGDP	.176***(.005)	.171***(.004)	.174***(.006)
lnTrade	.073***(.024)	.046**(.021)	.069*(.033)
lnFDI	-.006(.008)	-.0009(.007)	.002(.010)
	Short run		
Δ $lnInQ_1$	.006(.005)		
Δ $lnInQ_1$(-1)	.0008(.004)		
Δ $lnInQ_2$		-.003(.026)	
Δ $lnInQ_2$ (-1)		.032(.026)	
Δ $lnInQ_3$			.021(.021)
Δ $lnInQ_3$(-1)			.007(.020)
Δ lnGDP	-.057*(.029)	-.065***(.030)	-.054*(.030)
Δ lnTrade	-.032*(.015)	-.028*(.014)	-.024(.015)
Δ lnFDI	.001(.003)	-.0007(.003)	-.001(.003)
Constant	-.946***(.283)	-.998***(.318)	-.821**(.285)
ECT(-1)	-.478***(.129)	-.533***(.155)	-.400***(.118)
R-squared	0.647	0.666	0.612
ARDL bounds test	Reject H_0 at 10%	Inconclusive at 5%	Inconclusive at 10%

Standard errors are presented in parentheses. ***, **, and * indicate significance at 1%, 5%, and 10% levels, respectively.

Model 1" with lnQ_3 Representing Institutional Quality

Quality of institution, now represented by lnQ_3, has a negative influence on HDI which is significant at 10%. Both GDP and trade have significant positive impacts on HDI in the long run. The former is significant at 1% while the latter is significant at 10%. FDI fails to register any significant impact in the long run. GDP has a negative impact in the short run which is significant at 10%. No other short run impacts are significant. The ECT indicates a regular convergence towards equilibrium. The ARDL bounds test show that we do not have clear evidence of long run relationship at 10% level of significance. Model 2" explains 61.20% variations in HDI.

Granger Causality

Table 4 reports results of the Granger causality Wald tests which is adjusted for the sample size. Model 2 has two bidirectional causalities and six unidirectional causalities. Two-way causalities exist between institutions and GDP and between institutions and FDI. The six one-way causalities are: two running from trade and HDI to institutions, from GDP and trade to HDI and from trade to GDP and FDI. Model 2' also have two bidirectional causalities and six unidirectional causalities. The bidirectional causalities are between institutions and GDP and between institutions and trade. Unidirectional causalities run from institutions to FDI, HDI to institutions, from GDP and trade to HDI, from trade to GDP and to FDI. Model 2" is characterized by two bidirectional causalities and six unidirectional causalities. The bidirectional causalities are between GDP and institutions and between trade and institutions. Unidirectional causalities run from institution to FDI, from trade to institutions, HDI, GDP, and FDI and from GDP to FDI.

Table 4. Granger causality Wald tests

Model	Variables	F stat (*P*value)	Direction of Causality
Model 1	$lnInQ_1 \rightarrow lnGDP$	3.027*(.098)	Institutions Granger cause GDP
	$lnGDP \rightarrow lnInQ_1$	22.125***(.000)	GDP Granger causes institutions
	$lnInQ_1 \rightarrow lnFDI$	4.472**(.048)	Institutions Granger cause FDI
	$lnFDI \rightarrow lnInQ_1$	5.690**(.028)	FDI Granger causes institutions
	$lnTrade \rightarrow lnInQ_1$	5.016**(.038)	Trade Granger causes institutions
	$lnHDI \rightarrow lnInQ_1$	19.448***(.000)	Human development Granger causes institutions
	$lnGDP \rightarrow lnHDI$	26.05***(.000)	GDP Granger causes human development
	$lnTrade \rightarrow lnHDI$	15.383***(.001)	Trade Granger causes human development
	$lnTrade \rightarrow lnGDP$	20.795***(.000)	Trade Granger causes GDP
	$lnTrade \rightarrow lnFDI$	10.464***(.004)	Trade Granger causes FDI
Model 1'	$lnInQ_2 \rightarrow lnGDP$	5.038**(.038)	Institutions Granger cause GDP
	$lnGDP \rightarrow lnInQ_2$	19.561***(.000)	GDP Granger causes institutions
	$lnInQ_2 \rightarrow lnTrade$	3.506*(.078)	Institutions Granger cause trade
	$lnTrade \rightarrow lnInQ_2$	8.177***(.010)	Trade Granger causes institutions
	$lnInQ_2 \rightarrow lnFDI$	4.400*(.051)	Institutions Granger cause FDI
	$lnHDI \rightarrow lnInQ_2$	15.447***(.001)	Human development Granger causes institutions
	$lnGDP \rightarrow lnHDI$	44.619***(.000)	GDP Granger causes human development
	$lnTrade \rightarrow lnHDI$	55.896***(.000)	Trade Granger causes human development
	$lnTrade \rightarrow lnGDP$	28.543*(.000)	Trade Granger causes GDP
	$lnTrade \rightarrow lnFDI$	6.864**(.017)	Trade Granger causes FDI
Model 1"	$lnInQ_3 \rightarrow lnHDI$	3.23*(.089)	Institutions Granger cause human development
	$lnHDI \rightarrow lnInQ_3$	4.357*(.051)	Human development Granger causes institutions
	$lnInQ_3 \rightarrow lnGDP$	5.914**(.025)	Institutions Granger cause GDP
	$lnGDP \rightarrow lnInQ_3$	5.936**(.025)	GDP Granger causes institutions
	$lnInQ_3 \rightarrow lnFDI$	6.135**(.023)	Institutions Granger cause FDI
	$lnTrade \rightarrow lnInQ_3$	6.896**(.017)	Trade Granger causes institutions
	$lnGDP \rightarrow lnHDI$	37.163***(.000)	GDP Granger causes human development
	$lnTrade \rightarrow lnHDI$	20.771***(.000)	Trade Granger causes human development
	$lnTrade \rightarrow lnGDP$	26.245***(.000)	Trade Granger causes GDP
	$lnTrade \rightarrow lnFDI$	12.609***(.002)	Trade Granger causes FDI

The three models reveal consistent bidirectional and unidirectional causal links, each showing two bidirectional and six unidirectional relationships. All models have bidirectional causality between GDP and institutions. Model 2 links institutions and FDI, Model 2' links institutions and trade, and Model 2" links GDP with institutions bidirectionally. For unidirectional causality, the models differ slightly but generally show flows from institutions, trade, and GDP towards HDI, GDP, and FDI, reflecting nuanced variations in these interrelationships.

Discussion

Across all three ARDL models, the long-term impact of institutional quality on human development in Bangladesh is negative, no matter which index is used. Two of these effects are highly significant at the 1% level, while one is significant at the 10% level. In contrast, the short-term effects of institutional quality are not significant. This suggests that human development in Bangladesh is happening without strong governance support. In the short run, better institutions can create hope, attract investment, and improve public services, leading to quick benefits. However, in the long run, weak institutions, inefficient bureaucracy, and structural problems can undo these early gains and slow down progress. If reforms are weak, poorly planned, or politically motivated, they may lead to poor resource management, lower public service quality, and less trust in the economy. North argues that institutional reforms that work in the short term can become rigid over time, slowing down human development[39]. Khan, focusing on Bangladesh, suggests that anti-corruption efforts are effective at first but lose impact as political networks return[40]. Similarly, Easterly warns that without long-term political commitment, early progress can fade away[41].

GDP has a positive and significant impact on human development in the long run, but its short-term effects are mostly negative and not significant. Over time, GDP growth helps human development by increasing income, improving living conditions, and supporting key sectors like healthcare, education, and infrastructure. However, in the short run, economic changes, policy shifts, or structural adjustments

may cause temporary setbacks. Inflation, poor resource distribution, or economic disruptions can strain public services and increase inequality, delaying the benefits of growth. These findings align with earlier studies[12], [15].

Trade also has a positive and significant impact on human development in the long run, while its short-term effects are negative. Over time, trade supports economic growth, job creation, and better access to services. However, in the short term, market changes, economic shifts, and poor resource distribution may cause difficulties. Trade liberalization may first increase inequality and environmental damage before leading to long-term benefits. The UNDP has cited Vietnam and Bangladesh as examples where trade initially increased informal employment and income gaps but later helped improve education, healthcare, and incomes [42].

The impact of FDI on human development is unclear and not significant in both the short and long run, showing that its effects depend on the situation. This may be because some types of FDI, like resource extraction, harm human development through environmental damage and worker exploitation, while technology-based FDI can improve skills and productivity. Weak governance and poor regulations may allow foreign companies to take resources without sharing the benefits locally, leading to negative outcomes. While FDI can create jobs and support development, these benefits may take time or require supportive policies, such as investment in education and infrastructure, which may be missing. The lack of significant results may also mean that FDI does not align well with Bangladesh's development needs, or that key conditions—such as skilled workers and strong infrastructure—are not in place to fully benefit from FDI [43], [44].

CONCLUSION

This study analyzes the effects of institutional quality, GDP, trade, and FDI on human development in Bangladesh for the 1996-2022 periods using an ARDL approach. The results indicate that institutional quality negatively affects human development in the long run, while its short-term impact is not significant. This suggests that weak governance, bureaucratic inefficiencies, and structural barriers limit long-term progress. Although institutional improvements can bring short-term optimism, their long-term success depends on consistent and effective reforms. Poor governance and weak policies may lead to inefficient resource allocation and declining public service quality, ultimately slowing development.

Both GDP and trade contribute positively to human development over time, though their short-term effects are mixed. GDP growth supports better income, living conditions, and investment in key sectors like education and healthcare. However, short-term economic fluctuations may delay these benefits. Trade promotes job creation and economic growth in the long run, but in the short term, it can cause disruptions and widen income inequality. The impact of FDI on human development remains unclear, with no significant effect in either the short or long run. FDI's success depends on governance quality, regulations, and how well it aligns with the country's development needs. Without strong institutions and supportive policies, its potential benefits, such as employment and skill development, may not be fully realized. Overall, this study highlights the importance of governance in ensuring that economic growth, trade, and foreign investment contribute effectively to human development.

Competing interests

None

Authors' Contributions

Mohammad Mokammel Karim Toufique conceptualized the research, conducted the analysis, and prepared the initial and final drafts.

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