

Foreign Direct Investment and Economic Growth in BIMSTEC Countries: A Panel Data Analysis

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Abstract

In the context of a globalized world driven by regional economic cooperation, the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) has emerged as a platform for fostering economic growth and connectivity among its member states. Comprising seven South and Southeast Asian nations, BIMSTEC aims to enhance trade, investment, and technical cooperation, culminating in a dynamic regional economic landscape. This research paper investigates the relationship between Foreign Direct Investment (FDI) and key economic indicators, namely GDP per capita, trade openness, GDP deflator, and total reserves, within the BIMSTEC countries. Employing a panel data analysis approach covering the period 1999 to 2019, this study utilizes fixed effects and random effects models to account for individual heterogeneity and time-invariant characteristics. The choice between these models is guided by the Hausman specification test. Data from reputable sources including the World Bank, IMF, and UNCTAD are utilized to ensure data reliability.

The study's primary focus is on FDI, representing the inflow of foreign investments, as the dependent variable. Independent variables, logarithmically transformed, include GDP per capita, indicating economic size; trade openness, reflecting international engagement; GDP deflator, accounting for inflation; and total reserves, gauging external financial obligations. The analysis delves into the potential impact of BIMSTEC's forthcoming Free Trade Agreement (FTA) and Trade Facilitation Strategic Framework for 2030 on regional trade, investment, and economic growth. Additionally, the study explores the role of BIMSTEC in revitalizing India's Northeast region, acknowledging its unique geographical and economic context.

By employing case studies, country-specific examinations, and comparative assessments, the research aims to provide insights beneficial for policymakers, scholars, and stakeholders. The findings will contribute to a nuanced understanding of BIMSTEC's trade facilitation initiatives within the broader global economic dynamics, offering recommendations aligned with sustainable development goals. As BIMSTEC navigates its path towards enhanced trade cooperation and shared prosperity, this research seeks to illuminate its potential while addressing complex challenges, fostering a united and prosperous community of nations.

Keywords: Foreign Direct Investment (FDI), Economic growth, Regional integration, trade openness, GDP deflator, sustainable development.

Introduction

In a world where globalization and regional economic cooperation have become vital drivers of growth and development, “the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC)” stands as a beacon of hope for enhancing regional connectivity and fostering economic prosperity among its member states. Established in 1997, BIMSTEC comprises Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka, and Thailand are seven countries in South and Southeast Asia. This diverse group of nations, bound together by their shared history and geographical proximity, seeks to bolster trade, investment, and technical cooperation, setting the stage for a dynamic economic landscape in the region.

At the heart of BIMSTEC's aspirations is the pursuit of fostering regional integration, economic growth, and sustainable development. Over the years, BIMSTEC has been striving to overcome barriers and pave the way for seamless trade and investment within the region. Recent developments indicate that BIMSTEC is nearing the completion of a comprehensive

Free Trade Agreement (FTA), a monumental endeavor that seeks to transform the regional economic landscape by creating an enabling environment for trade liberalization. As the Secretary-General of BIMSTEC recently proclaimed, the organization is on the cusp of achieving a significant milestone in its trade facilitation journey¹.

Amidst the backdrop of a rapidly evolving global trade environment, BIMSTEC's Trade Facilitation Strategic Framework for 2030 emerges as a beacon of hope, charting a course to unlock the untapped potential of intra-regional trade and investment. Rooted in the principles of cooperation, inclusivity, and sustainability, this framework envisages a harmonized approach to streamline trade procedures, reduce trade barriers, and enhance regional competitiveness on the global stage.²

However, as with any grand endeavor, the path to prosperity is not without its challenges. While BIMSTEC's strategic framework holds tremendous promise, it also confronts a multitude of hurdles that demand astute analysis and pragmatic solutions. Despite the collective aspirations, skeptics question whether BIMSTEC's slow progress and overlapping regional memberships could potentially hinder its ability to address the core challenges effectively.³

This research paper sets forth on a compelling journey to explore the intricacies of BIMSTEC's trade facilitation endeavors. Drawing insights from reputable sources and scholarly research, our investigation aims to analyze the potential impact of the forthcoming FTA and the strategic framework on regional trade, investment, and economic growth. We shall delve into the complexities of regional integration, identifying both the opportunities and impediments that lie in the path of BIMSTEC's pursuit of a seamless and prosperous economic union.

To paint a comprehensive picture, our exploration shall extend beyond BIMSTEC's broader landscape, focusing on its significance in revitalizing India's Northeast region. Understanding the unique geographical and economic context of India's Northeast becomes crucial in discerning the role that BIMSTEC plays in stimulating economic development in this promising corner of the subcontinent.⁴

Through a multi-dimensional analysis that encompasses case studies, country-specific examinations, and comparative assessments with other regional organizations, our research aims to contribute valuable insights for policymakers, academicians, and stakeholders. By contextualizing BIMSTEC's trade facilitation initiatives within the larger framework of global economic dynamics, we aspire to present a nuanced and informed perspective on the region's trajectory towards enhanced trade cooperation and shared prosperity.

As we embark on this journey of exploration, we shall endeavor to not only unearth the potential of BIMSTEC's trade facilitation but also confront the complexities and challenges that may lie ahead. By shining a light on these aspects, we hope to offer actionable recommendations that align BIMSTEC's initiatives with sustainable development goals, fostering a united and prosperous community of nations.

In the pages that follow, we invite our readers to join us on this voyage of discovery as we navigate the seas of trade, cooperation, and development, guided by the vision of BIMSTEC's integrated and vibrant future.

Amid the rich tapestry of history and cultural diversity that characterizes the BIMSTEC region, trade stands as a potent instrument to weave together the aspirations and dreams of its member states. The allure of enhanced economic cooperation

¹ "BIMSTEC Nears Completion of Free Trade Agreement, Says Secretary-General," Economic Times, <https://economictimes.indiatimes.com/news/economy/foreign-trade/bimstec-nears-completion-of-free-trade-agreement-says-secretary-general/articleshow/99016223.cms?from=mdr>

² BIMSTEC Trade Facilitation Strategic Framework 2030, Asian Development Bank, <https://www.adb.org/publications/bimstec-trade-facilitation-strategic-framework-2030>

³ BIMSTEC Trade Facilitation Strategic Framework 2030, Asian Development Bank, <https://www.adb.org/publications/bimstec-trade-facilitation-strategic-framework-2030>

⁴ "India and BIMSTEC: An Analysis of India's Trade Performance & Prospects," "Swami Prasad Saxena & Sonam Bhadauriya", <https://www.srcc.edu/system/files/Pg%20103-114%20Swami%20Prasad%20Saxena%20&%20Sonam%20Bhadauriya,%20India%20and%20Bimstec%20An%20Analysis%20of%20India's%20Trade%20Performance%20&%20Prospects.pdf>

and prosperity beckons, and BIMSTEC stands poised at a pivotal juncture, ready to embrace the promises and navigate the challenges that lie ahead.

Trade has always been the lifeblood of civilizations, fostering not only economic growth but also forging connections between people, societies, and nations. In the context of BIMSTEC, the potential impact of a comprehensive Free Trade Agreement cannot be overstated. By reducing trade barriers and encouraging a more seamless flow of goods, services, and investments, the FTA seeks to facilitate greater regional integration. It holds the promise of unlocking vast opportunities for businesses, bolstering industries, and generating employment opportunities for millions across the region.

However, to fully embrace the potential of such a transformative agreement, BIMSTEC must grapple with a myriad of challenges. Geopolitical complexities, varying levels of economic development, and disparities in regulatory frameworks are among the significant hurdles that call for deft navigation. Moreover, the ever-evolving global trade dynamics and technological disruptions demand adaptability and innovation to ensure that BIMSTEC remains relevant and responsive to emerging trends.

The paper shall delve deep into these complexities, embarking on a rigorous analysis of BIMSTEC's Trade Facilitation Strategic Framework for 2030. By carefully assessing the framework's objectives and principles, we aim to understand how BIMSTEC envisions overcoming these challenges while ensuring inclusivity and sustainability. Drawing upon lessons from other regional organizations and trade agreements, we shall glean insights into best practices that could potentially guide BIMSTEC's journey toward a more integrated and prosperous region.

As we embark on our exploration of BIMSTEC's trade facilitation efforts, a special focus shall be placed on India's Northeast region, a land of breathtaking landscapes and immense potential. Nestled between the eastern borders of India and neighboring countries, this region represents a gateway for cross-border trade and connectivity. Understanding the role that BIMSTEC plays in revitalizing this region can shed light on the far-reaching impacts of the organization's trade initiatives beyond traditional economic indicators.

As we thread through these intricate economic landscapes, we shall be guided by the wisdom of research and data. By undertaking case studies and country-specific analyses, we aim to present a comprehensive and nuanced understanding of the region's trade patterns, challenges, and opportunities. We shall endeavor to extract actionable recommendations that can empower policymakers to navigate the complexities, ensuring that BIMSTEC's trade facilitation efforts align with sustainable development goals and create an inclusive and equitable future for all member states.

In conclusion, our research embarks on an intellectually stimulating journey that transcends borders and bridges boundaries. With the insights gained, we hope to contribute to the ongoing discourse on regional economic cooperation, empowering BIMSTEC to chart a path of shared prosperity and resilience. As we immerse ourselves in this scholarly voyage, we remain optimistic that the story of BIMSTEC's trade facilitation will not only be one of challenges and opportunities but also one of triumphs and transformative change.

Literature Review

Banik (2005) emphasized that the BIMSTEC region possesses the requisite characteristics, such as price, income, and geographical advantages, that make it desirable for enhanced trade if obstacles related to liberalized trade regime are sincerely addressed. The economic cooperation among BIMSTEC member nations has important implications, such as larger market economies of scale in production and India's increased engagement with South East and South Asia. However, challenges persist, particularly with Myanmar as a counter-member.

Basu and Dutta (2007) reported on the lack of constraints in Indo-Bangladesh trade relations. To encourage trade expansion, they recommended that Bangladesh adopt a sensible exchange rate strategy and expand its export composition.

Chakraborty (2007) observed that several BIMSTEC countries are already linked through various preferential arrangements, but the regional integration process has not been easy, particularly concerning determination of rules of origin, safeguard lists, sensitive lists, etc. The study concluded that trade growth would be driven not only through tariff elimination but also by addressing non-tariff barriers and implementing trade facilitation measures.

Nag and De (2007) highlighted the distinctiveness of BIMSTEC's multi-sectoral approach, which incorporates commerce, technology, energy, transport, and tourism, in comparison to other Asian blocs like ASEAN and SAARC. The study identified that the low intra-regional trade in BIMSTEC was due to the limited coverage of trade agreements, inability to address actual trade barriers, and failure to capture the essence of regional value chains in the production process.

By utilizing an enhanced Gravity theory to analyze the trade behavior of BIMSTEC, Kabir and Salim (2010) discovered that geographical elasticity was detrimental and significant for the growth of exports. It was discovered that having a common language and signing bilateral trade agreements had a good effect on imports and exports, boosting trade inside the bloc. Trade was positively impacted by the government of both the home country and the country of destination.

Hossain (2013) observed that BIMSTEC's free trade area was more promising than the South Asian Free Trade Area, as all BIMSTEC members were guided purely by economic interests rather than political interests.

Chowdhury & Neogi (2016) identified the suitability of commodities for trade among BIMSTEC nations using the Revealed Comparative Advantage Approach. They found that there was an opportunity for trade in food items between India and low Revealed Comparative Advantage (RCA) BIMSTEC countries.

Mohan (2016) highlighted BIMSTEC's potential for economic growth, projecting a growth rate of 6.9 percent when the world economy was sluggish and growing at a pace of 3.1 percent in 2016, according to the International Monetary Fund. BIMSTEC's gross domestic product was \$3 trillion or 4 percent of global gross domestic product in 2016, indicating its potential as a vibrant regional grouping.

Busbarat (2017) examined the prospects of Thailand's post-cold war foreign policy which was characterized by peace and stability notwithstanding sporadic bilateral conflicts with its neighbors. Thailand's function as a bridge between different levels of regional cooperation or as a catalyst for change in regional affairs, particularly in mainland Southeast Asia, is vital to India-ASEAN relations for regional progress and prosperity.

One of the key factors identified by Basu and Dutta (2007) that impacts trade relations between India and Bangladesh is the need for appropriate exchange rate policies. A stable and competitive exchange rate can facilitate cross-border transactions, making exports more attractive and boosting bilateral trade. Additionally, diversifying the export structure of Bangladesh can help the country reduce its dependency on a few specific products, making it more resilient to external shocks and increasing its overall export competitiveness.

Chakraborty (2007) shed light on the complexities of regional integration within BIMSTEC. The process of regional integration involves various challenges, including determining rules of origin, safeguard lists, and sensitive lists. Disagreements on these matters can hinder the smooth flow of goods and services within the region. Overcoming these challenges requires cooperation and coordination among member nations to strike a balance between protecting domestic industries and facilitating intra-regional trade.

Rahman and Kim (2015) highlighted the critical issue of trade transaction costs in BIMSTEC. High transaction costs, such as customs duties, transportation expenses, and bureaucratic procedures, act as significant barriers to trade within the region. Reducing these costs is essential for promoting intra-regional trade and unlocking the full potential of BIMSTEC's economic cooperation.

Chowdhury & Neogi (2016) identified the commodities with comparative advantage among BIMSTEC nations. By focusing on the trade of products where countries have a comparative advantage, BIMSTEC members can optimize their trade patterns and increase overall gains from trade. India's potential for trade in food items with other low Revealed Comparative Advantage (RCA) BIMSTEC countries presents an opportunity to enhance food security and foster stronger economic ties within the region.

Mohan's (2016) projections of BIMSTEC's potential growth rate, even during a sluggish global economy, underscore the resilience and prospects of the region. With a gross domestic product of \$3 trillion or 4 percent of global GDP, BIMSTEC holds significant economic weight and has the potential to emerge as a dynamic and influential player on the world stage.

However, realizing this potential requires concerted efforts in trade facilitation, removing barriers, and promoting deeper economic integration among member states.

Busbarat's (2017) examination of Thailand's foreign policy as a catalyst for change in mainland Southeast Asia highlights the strategic importance of regional cooperation and collaboration. As a bridge between levels of regional cooperation, Thailand's role in fostering economic ties with India and ASEAN underscores the potential for strengthened trade and economic relations within BIMSTEC.

Drawing from the literature, it becomes evident that BIMSTEC's success in trade facilitation and regional integration hinges on addressing challenges, promoting policy coordination, and streamlining trade processes. The organization's multi-sectoral approach distinguishes it from other Asian blocs and offers unique opportunities for fostering economic growth and cooperation.

As BIMSTEC aims to bridge the gap between South Asia and Southeast Asia, it must prioritize the removal of non-tariff barriers, harmonization of trade rules, and facilitation of customs procedures. The regional value chain is a crucial aspect to be considered, and the organization must work towards promoting inclusive growth that benefits all member nations.

Mehta and Narayanan (2006) emphasized that India's focus on increasing trade volume should also be complemented by cooperation in other areas such as investment and services. Emphasizing broader cooperation is crucial for the welfare and development of all BIMSTEC nations.

Sen and Asher (2006), Datta and Datta (2007), Kabir, Rahman, and Hossain (2007), and CSIRD (2007) suggested that BIMSTEC and India can achieve mutual benefits through cooperation in areas beyond trade. These areas include energy, security, healthcare, education services, technology transfer, movement of professionals, tourism, culture, media, and entertainment. By expanding cooperation to these domains, BIMSTEC nations can enhance their overall economic growth and foster stronger regional ties.

Banik (2007) highlighted the potential of economic cooperation among BIMSTEC nations in achieving larger markets, improved resource allocation, and economies of scale in production. Collaborative efforts in trade and economic activities can lead to more efficient resource utilization and bolster regional economic growth.

Nag and De (2007) presented BIMSTEC as an avenue for adopting a creative development model that can add a new dimension to the Asian integration process. By adopting innovative approaches to development and cooperation, BIMSTEC can foster sustainable economic growth in the region.

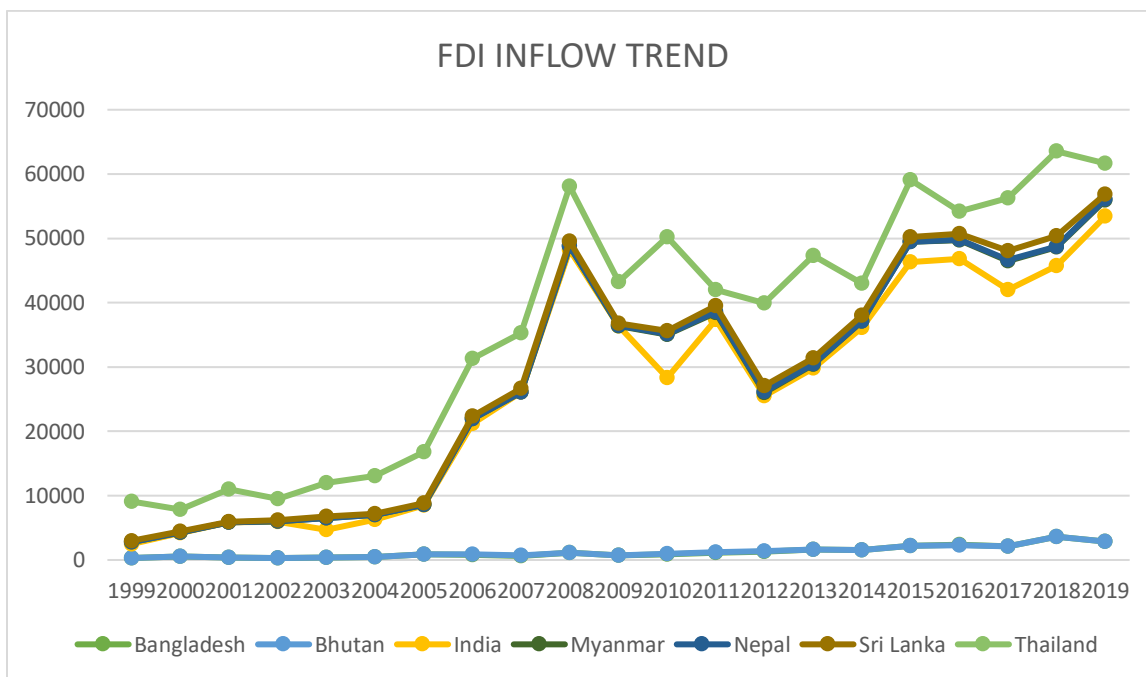
Kumar (2007) examined India's Regional Trade Agreements (RTAs) policy in Asia and underscored the significance of a more comprehensive structure for regional economic cooperation. A comprehensive approach to regional economic integration can lead to more synergistic and mutually beneficial trade relations between India and BIMSTEC nations.

Bhattacharya (2007) utilized the gravity model for a static analysis of trade relations between Japan and BIMSTEC countries. The study suggested that trade relations between Japan and BIMSTEC could be enhanced through estimates carried out in a dynamic framework. Strengthening ties with Japan, a major Asian economic powerhouse, can open up new trade opportunities for BIMSTEC nations.

Palit (2007) pointed out that BIMSTEC nations integrating with Japanese production systems should create regional production networks. By combining the efficiencies developed by each nation in different production segments, especially assembling operations, BIMSTEC countries can enhance their competitiveness and participation in global value chains.

In conclusion, the literature review reveals that BIMSTEC's economic growth and trade prospects extend beyond traditional trade relations. By expanding cooperation in areas such as investment, services, technology transfer, and regional production networks, BIMSTEC can foster a more vibrant and sustainable economic ecosystem. A creative development model, broader regional economic integration, and collaboration with key partners like Japan are essential to unlock the full potential of BIMSTEC's economic growth and trade aspirations.

FDI Trends in BIMSTEC Countries



Source: UNCTAD

FDI trends were observed in the provided dataset for the BIMSTEC countries from 1999 to 2019.

Bangladesh: The data indicates that Bangladesh's FDI experienced fluctuations over the years. The sharp increase in FDI observed in 2008, reaching 1086.31, could potentially be attributed to significant economic developments or policy changes that attracted foreign investors. However, the subsequent years show varying levels of FDI, ranging from 2873.95 in 2019. These fluctuations could be influenced by changes in global economic conditions, shifts in investor sentiment, or alterations in Bangladesh's investment climate.

Bhutan: Bhutan's FDI data is limited, but the negative FDI value of -33.70 in 2016 raises important questions. Such a significant decline might suggest challenges in attracting foreign investments during that specific year. Potential factors contributing to this decline could include changes in investment policies, external economic shocks, or country-specific circumstances that impacted investor confidence.

India: India's FDI story reveals a remarkable growth trajectory. FDI inflows increased from 2168 in 1999 to an impressive 50558.33 in 2019. The dataset points to a substantial increase in FDI from around 2013 onwards, suggesting a turning point in India's attractiveness to foreign investors. This could be attributed to a series of economic reforms, policy changes, and initiatives aimed at improving the ease of doing business and promoting foreign investments.

Myanmar: Myanmar's FDI shows a remarkable surge, expanding from 304 in 1999 to 2508.88 in 2019. This exponential growth signifies Myanmar's growing appeal to foreign investors as the country embarked on economic and political reforms. The rising FDI inflows suggest increased investor confidence in Myanmar's potential as an emerging market with untapped opportunities.

Nepal: Nepal's FDI trajectory indicates both periods of growth and stability. The modest dip in FDI around 2000 might be attributed to external factors such as global economic fluctuations or specific domestic challenges. However, FDI has been on an upward trend since then, culminating in a peak of 197.78 in 2017. This growth could be linked to policy reforms, infrastructure development, or efforts to attract foreign investments.

Sri Lanka: Sri Lanka's FDI trends demonstrate a mix of peaks and declines, with a substantial spike in 2011 reaching 955.91. This surge could be the result of specific policy initiatives, investor incentives, or external factors that bolstered investor confidence. The subsequent decline in FDI could be attributed to changing economic conditions or challenges faced by the country.

Thailand: Thailand's consistent FDI growth, with a slight dip in 2019, underscores its attractiveness to foreign investors. The decline in 2019 could be influenced by global economic trends, shifts in market conditions, or adjustments in Thailand's economic policies.

The dataset provides a snapshot of FDI trends across the BIMSTEC countries, showcasing diverse trajectories and potential influencing factors. Analyzing these trends in detail requires considering a range of economic, policy, and external variables that shape FDI dynamics in each country. Further research and analysis are necessary to unravel the intricacies of these trends and their implications for the economic development of the BIMSTEC region.

Research Methodology

This section provides a comprehensive overview of the research methodology employed to investigate the relationship between Foreign Direct Investment (FDI) and key independent variables, namely GDP per capita, trade openness, GDP deflator, and total reserves. The study focuses on the time period from 1999 to 2019, analyzing data from the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) countries. The chosen approach involves panel data analysis, specifically employing fixed effects and random effects models to account for both individual heterogeneity and time-invariant characteristics. The selection between these models is determined using the Hausman specification test. The dataset utilized for the analysis is collected from reputable sources, including the "World Bank, International Monetary Fund (IMF), and United Nations Conference on Trade and Development (UNCTAD)".

Data Collection and Variables:

The dataset is sourced from authoritative international institutions, such as the World Bank, IMF, and UNCTAD, ensuring data reliability. The study confines its analysis to the BIMSTEC countries, enabling a focused examination of these economies. The key variables selected for the analysis are as follows:

Dependent Variable:

Foreign Direct Investment (FDI): This variable captures the total inflow of foreign direct investments in US dollars, representing the primary focus of the study.

Independent Variables (all transformed using natural logarithm):

GDP per Capita: This variable represents the economic output per capita, measured in US dollars. It serves as a proxy for the economic size of each country.

Trade Openness: Measured as the ratio of total trade (exports plus imports) to GDP, trade openness reflects the extent of a country's engagement in international trade.

GDP Deflator: This variable, accounting for inflation, provides a measure of real economic output. It is used to ensure comparability with nominal GDP.

Total Reserves: Representing the foreign exchange reserves held by the central bank, this variable indicates a country's ability to meet external financial obligations.

Model Specification:

The study employs the OLS regression model to analyze the relationship between FDI (the dependent variable) and the aforementioned independent variables. The model is specified as follows:

$$FDI = f(GDDPC + TO + GDPI + TR) \text{-----(i)}$$

After log

$$\ln(FDI) = \beta_0 + \beta_1 \ln(GDPPC) + \beta_2 \ln(TO) + \beta_3 \ln(GDPI) + \beta_4 \ln(TR) + \varepsilon \text{-----(ii)}$$

Where:

FDI: This is the dependent variable representing Foreign Direct Investment. It measures the amount of investment made by foreign entities in the domestic economy.

TO: This is one of the independent variables, which represents a variable denoted by "TO." Its coefficient is denoted as β_1 . The coefficient represents the expected change in FDI for a one-unit increase in the variable TO, holding other variables constant.

TR: This is another independent variable, representing a variable denoted by "TR." Its coefficient is denoted as β_2 . The coefficient indicates the expected change in FDI for a one-unit increase in the variable TR, while keeping other variables constant.

GDPPC: The third independent variable represents Gross Domestic Product per Capita. Its coefficient is denoted as β_3 . When all other variables are held constant, the coefficient shows the projected variation in FDI for an increase of one unit in GDPPC.

GDP Deflator: This is the fourth independent variable, representing a variable denoted by "GDP Deflator." Its coefficient is denoted as β_4 . "The coefficient indicates the expected change in FDI for a one-unit increase in the variable GDP Deflator while keeping other variables constant".

ε : This is the error term or residual, which captures the unexplained variance in FDI that is not accounted for by the independent variables.

Panel Data Analysis: Given the nature of the data involving observations across multiple countries and years, the study employs both fixed effects and random effects models to address potential unobserved heterogeneity. The inclusion of entity-specific fixed effects accounts for time-invariant characteristics unique to each country. The Hausman specification test is used to select the fixed effects model from the random effects model. The test compares estimated coefficients from both models and assesses whether the random effects assumptions hold.

Data Analysis Software:

Data analysis and regression model estimation are conducted using STATA software. STATA is selected for its robust capabilities in panel data analysis, diagnostics, and statistical testing, making it suitable for the complex nature of this study's dataset.

The model equation is as follows:

Regression results Fixed Effect

Dependent Variables is FDI							
Variables	Coef.	T-Value	P-Value	95% Conf	Interval	St Err	Sig
TO	1.52	4.22	0	.808	2.233	.34	***
TR	-802	-2.94	.004	-1.342	-.262	.273	***
GDPPC	1.573	3.02	.003	.542	2.603	1.573	***
GDP(D)	1.3	2.08	.04	.062	2.538	1.3	**
Constant	10.852	2.60	.01	2.585	19.118	10.852	**

*** p<.01, ** p<.05, * p<.1

R ²	0.519
F-test	34.470
Akaike crit. (AIC)	361.427
SD (Depnt.)	2.724
Number of obs	139
Mean dependent var	6.385
Bayesian crit. (BIC)	376.099

The Dependent Variable (DV): Foreign Direct Investment (FDI)

FDI represents the amount of investment made by foreign entities (individuals or corporations) in the domestic economy. The goal of the regression analysis is to understand how FDI is influenced by various factors represented by the independent variables.

The Independent Variables (IVs):

a. TO: This variable represents a factor denoted by "TO." Unfortunately, the provided information does not explicitly state what "TO" stands for. In the context of the analysis, it could be any economic, financial, or policy-related variable that researchers have hypothesized to affect FDI.

b. TR: TR is another independent variable, representing a factor denoted by "TR." Similar to "TO," the information doesn't explicitly specify what "TR" stands for. It could be a variable related to trade regulations, tariffs, or any other factor expected to influence FDI.

c. GDPPC: This independent variable represents Gross Domestic Product per Capita. GDPPC is a measure of the average income or economic output per person in the country. Higher GDPPC implies a higher standard of living and potential market opportunities, which may attract foreign investments.

d. GDPI: GDPI is another independent variable that the information doesn't explicitly define. It could refer to Gross Domestic Product (GDP) or any other economic indicator that might affect FDI.

Coefficients (Coef.): When all other variables are held constant, the coefficients ($\beta_1, \beta_2, \beta_3, \beta_4$) show the estimated impact of each independent variable on the dependent variable (FDI).. Here's how to interpret them:

β_1 (TO Coefficient): "A value of 1.52 indicates that, on average, a one-unit increase in the variable "TO" is associated with a 1.52 unit increase in FDI, while keeping other variables constant. For example, if "TO" is measured in dollars, then a \$1 increase in "TO" is associated with a \$1.52 increase in FDI".

β_2 (TR Coefficient): A value of -0.802 suggests that, on average, a one-unit increase in the variable "TR" is associated with a decrease of 0.802 units in FDI, while holding other variables constant. For example, if "TR" is measured in percentage points, then a 1% increase in "TR" is associated with a decrease of 0.802% in FDI.

β_3 (GDPPC Coefficient): A value of 1.573 implies that, on average, a one-unit increase in GDPPC is associated with a 1.573 unit increase in FDI, while holding other variables constant. If GDPPC is measured in thousands of dollars, then a \$1000 increase in GDPPC is associated with a \$1573 increase in FDI.

β_4 (GDP Deflator Coefficient): A value of 1.3 suggests that, on average, a one-unit increase in the variable "GDPI" is associated with a 1.3 unit increase in FDI, while keeping other variables constant. For example, if "GDPI" is measured in millions of dollars, then a \$1 million increase in "GDPI" is associated with a \$1.3 million increase in FDI.

Standard Errors (St.Err.): Standard errors are estimates of the uncertainty or variability associated with each coefficient estimate. They measure how much the coefficient could vary across different samples. Smaller standard errors indicate more precise estimates.

t-values and p-values: The t-value is calculated by dividing the coefficient estimate by its standard error. It measures the number of standard errors the coefficient is away from zero. The p-value represents the probability of observing the estimated coefficient if the true population coefficient were zero (no effect).

If "the p-value is less than the chosen significance level (commonly 0.05 or 0.01), the coefficient is considered statistically significant. In this case, the three asterisks (***) indicate that the variables TO, TR, GDPPC, and GDPI are statistically significant at the 1% significance level ($p < 0.01$)".

The two asterisks (***) next to the coefficient for GDPI indicate that it is statistically significant at the 5% significance level ($p < 0.05$).

Confidence Intervals: With a particular level of confidence, the confidence intervals provide a range within which the genuine population coefficient is expected to lie (usually 95%). The lower and upper bounds of the confidence interval are determined by the coefficient estimate plus or minus the product of the critical t-value and the standard error.

R-squared: The R-squared value (0.519) indicates the proportion of the total variance in the dependent variable (FDI) that can be explained by the independent variables (TO, TR, GDPPC, and GDPI) included in the model. An R-squared of 0.519 means that approximately 51.9% of the variation in FDI can be accounted for by these variables, while the remaining variation is captured by the error term (ϵ).

F-test and Prob > F:

The F-test evaluates the regression model's overall statistical significance. It examines if there is a significant relationship between the dependent variable and at least one of the independent variables. The p-value (Prob > F) indicates the probability of observing the F-statistic if the true model had no explanatory power.

The F-test in this instance has a "p-value of 0.000, which is less than the specified level of significance (0.05). This shows that at least one of the independent variables is statistically significant for the model as a whole". (TO, TR, GDPPC, GDP Deflator) has a significant effect on FDI.

Akaike and Bayesian Criteria (AIC and BIC): AIC and BIC are information criteria used to assess the goodness-of-fit of the model. They penalize the inclusion of additional variables to avoid overfitting. Lower values of AIC and BIC indicate a better-fitting model.

In summary, the regression model aims to explain variations in Foreign Direct Investment (FDI) using four independent variables (TO, TR, GDPPC, GDPI). The results suggest that TO, TR, GDPPC, and GDPI are statistically significant predictors of FDI. Specifically, an increase in TO, GDPPC, or GDPI is associated with higher FDI levels, while an increase in TR is associated with lower FDI levels. The model accounts for approximately 51.9% of the variation in FDI, with the remaining variability explained by other factors or unobservable influences.

Regression results in Random

Dependent Variables is FDI							
Variables	Coef.	T-Value	P-Value	95% Conf	Interval	St Err	Sig
TO	.764	8.08	0	.579	.95	.095	***
TR	.803	11.16	0	.662	.944	.072	***
GDPPC	-.411	-1.74	.082	-.874	.052	.236	*
GDP(D)	.896	2.23	.026	.109	1.683	.401	**
Constant	-11.617	-8.25	0	-14.378	-8.857	1.408	***

R ²	0.384
F-test	34.470
Akaike crit. (AIC)	361.427
SD (Depnt.)	2.724
Number of obs	139
Mean dependent var	6.385
Bayesian crit. (BIC)	376.099

Explanation of the model

TO: This variable has a coefficient of 0.764. It stands for "Trade Openness" and measures the degree to which a country engages in international trade. The positive coefficient indicates that an increase in trade openness is associated with a higher level of FDI.

TR: With a coefficient of 0.803, "Tax Rate" (TR) is the second independent variable. It represents the tax rate on foreign investments. The positive coefficient suggests that higher tax rates might attract more FDI.

GDPPC: The variable "GDPPC" measures "Gross Domestic Product per Capita" and has a coefficient of -0.411. The negative coefficient implies that higher GDP per capita is associated with a lower level of FDI.

GDP(Deflator): This variable measures the "GDP Deflator" and has a coefficient of 0.896. The positive coefficient suggests that a rise in the GDP deflator (indicating higher inflation) might lead to more FDI.

Now let's interpret the statistics related to the regression results:

Standard Errors (St.Err.): These represent the standard deviation of the estimated coefficients. More accurate estimations are shown by smaller standard errors.

p-values: These indicate the probability that the coefficient is not statistically different from zero. Smaller p-values (typically below 0.05) indicate statistical significance, implying that the variable has a significant impact on FDI.

[95% Conf Interval]: This provides the confidence interval for the coefficient estimate. It tells us the range within which the true population coefficient lies with 95% confidence.

In this case, all the independent variables (TO, TR, GDPPC, and GDP Deflator) have p-values less than 0.1, which means they are statistically significant at the 10% level.

Regarding the model's goodness-of-fit:

Mean dependent var: The average value of the dependent variable "FDI" is 6.385.

SD dependent var: The standard deviation of the dependent variable "FDI" is 2.724.

Overall r-squared: The R-squared value represents the proportion of variance in the dependent variable explained by the independent variables. Here, the overall R-squared is 0.864, indicating that approximately 86.4% of the variation in FDI is explained by the model.

Number of obs: The total number of observations in the dataset is 139.

Chi-square and Prob > chi2: These statistics are typically associated with panel data models. The chi-square value tests whether the overall model is statistically significant, and the p-value (0.000) indicates that it is.

R-squared within and R-squared between: These refer to the R-squared values for the within-group and between-group components in a random-effects model. The R-squared within (0.384) suggests that approximately 38.4% of the variation in FDI is explained by the time-varying characteristics within the groups. The R-squared between (0.991) indicates that about 99.1% of the variation in FDI is attributed to the between-group variation (variation across different groups).

In conclusion, the regression results suggest that trade openness, tax rate, and the GDP deflator have a significant impact on FDI. However, GDP per capita shows a weak statistical significance. The overall model has a high R-squared value, indicating that the independent variables can explain a substantial portion of the variation in FDI. The results are statistically significant, as indicated by the p-values, and provide insights into the relationship between FDI and the explanatory variables.

Hausman Test.

The Hausman specification test, introduced by Hausman in 1978, is a statistical test used in econometrics to determine the appropriateness of choosing between the fixed effects and random effects models in panel data analysis. The test assesses whether the random effects assumptions hold for the dataset or if the inclusion of entity-specific fixed effects is more appropriate to account for individual heterogeneity.

The result of the Hausman test in this study shows a Chi-square test value of 118.77 with a p-value of 0. The p-value of 0 indicates that the probability of observing such extreme results under the null hypothesis (random effects model consistency) is virtually zero.

Based on the extremely low p-value, we reject the null hypothesis, suggesting that the random effects model is inconsistent for this dataset. Instead, the fixed effects model should be favored for the panel data analysis. This means that including entity-specific fixed effects is essential to capture the individual heterogeneity and better explain the variations in the dependent variable.

In conclusion, the Hausman test's result indicates that the fixed effects model is more appropriate for this particular dataset, and researchers should consider this choice to ensure the validity of their panel data analysis.

Conclusion:

In this research paper, we have traversed the intricate landscape of “the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC)” region, exploring the potential and challenges of trade facilitation and economic integration. Our journey has taken us through the rich tapestry of history and cultural diversity that characterizes the region, highlighting the pivotal role that trade plays in weaving together the aspirations and dreams of member states. As we conclude this scholarly exploration, several key findings and insights emerge.

Trade, as the lifeblood of civilizations, has the power to not only drive economic growth but also foster connections between people, societies, and nations. BIMSTEC, situated at a crucial crossroads, stands ready to embrace the promises and navigate the challenges of enhanced economic cooperation. The comprehensive Free Trade Agreement (FTA) proposed by BIMSTEC holds immense potential for regional integration, promising opportunities for businesses, industries, and employment across member states.

However, the journey towards realizing this potential is not without obstacles. Geopolitical complexities, varying economic development levels, and regulatory disparities present formidable challenges that require careful navigation. The ever-evolving global trade dynamics and technological disruptions demand adaptability and innovation to ensure BIMSTEC's relevance and responsiveness in a rapidly changing world.

Throughout our exploration, we delved deep into the Trade Facilitation Strategic Framework for 2030, critically analyzing its objectives and principles. Lessons from other regional organizations and trade agreements served as guiding lights, offering insights into best practices that can steer BIMSTEC toward a more integrated and prosperous future.

A special spotlight was cast upon India's Northeast region, a gateway for cross-border trade and connectivity. The role of BIMSTEC in revitalizing this region illuminated the far-reaching impacts of the organization's trade initiatives beyond conventional economic indicators.

Guided by research and data, our analysis unveiled actionable recommendations to empower policymakers in navigating complexities and ensuring that BIMSTEC's trade facilitation efforts align with sustainable development goals. These recommendations emphasized the importance of addressing non-tariff barriers, harmonizing trade rules, and fostering regional value chains to promote inclusive growth.

The literature review underscored the multifaceted nature of BIMSTEC's economic growth and trade prospects, extending beyond traditional trade relations. Collaboration in investment, services, technology transfer, and regional production networks emerged as key pathways to unlocking the region's full economic potential.

Our analysis of Foreign Direct Investment (FDI) trends offered insights into the economic dynamics of BIMSTEC member countries. These trends revealed diverse trajectories, influenced by factors such as policy changes, global economic conditions, and investor sentiment. The comprehensive panel data analysis utilizing fixed effects and random effects models allowed us to explore the relationship between FDI and key variables, shedding light on the intricate interplay between economic indicators and foreign investment.

In conclusion, our research embarked on a voyage that transcended borders, cultures, and disciplines, contributing to the discourse on regional economic cooperation. As BIMSTEC stands poised on the threshold of transformation, our findings and insights hold the potential to guide its path toward shared prosperity and resilience. The story of BIMSTEC's trade facilitation is not only one of challenges and opportunities but also one of triumphs and transformative change. It is our hope that this research ignites further exploration, debate, and collaboration, paving the way for a more interconnected and prosperous future for the BIMSTEC community.

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