

The Impact of Chinese Foreign Direct Investment (FDI) on Economic Growth in Bangladesh: An Empirical Analysis

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Abstract

There is widespread consensus that foreign direct investment (FDI), which helps in building up capital, transferring technology, and increasing productivity, is one of the main sources of growth in developing countries. In this context, this paper aims to empirically explore the influence of Chinese FDI on the economic growth of Bangladesh using annual time series data between 1980 and 2023. This study explores the long-run and short-run relationship between Chinese FDI flows and GDP of Bangladesh, keeping other determinants such as domestic investment, openness to trade, inflation, and exchange rates constant using the Johansen cointegration test and Vector Error Correction Model (VECM). The empirical findings suggest that, in the long run, Chinese FDI positively influences the economic growth of Bangladesh, and an increase of 1% in Chinese FDI causes an increase in GDP by about 0.28%. But, the short-run effect is quite minimal due to the time involved in industrial and infrastructural developments. There is heterogeneity in the results due to the use of sectors, whereby the energy and infrastructural industries contribute significantly to the economic growth followed by the manufacturing sector. The presence of a large negative error correction term shows the confirmation of stable long-run equilibrium. The validity of the model is proven by the absence of any heteroskedasticity, serial correlation, and misspecification found during the diagnostic test. The findings of this study are that although Chinese FDI has been instrumental in the economic transition of Bangladesh, policy strategies are required to address the diversification of industries, debt sustainability, and technology spillovers to maximize the benefits from Chinese FDI. Recent data suggests that Chinese foreign direct investment (FDI) has a significant positive effect on green GDP compared to the traditional GDP.

Keywords: Chinese FDI, Economic Growth, Bangladesh, VECM, Cointegration, Sectoral Analysis, Belt and Road Initiative

1. Introduction

For quite some time now, FDI has been viewed as a crucial factor for economic development, especially in developing economies, where domestic capital accumulation cannot adequately meet investment needs. Through FDI, capital inflows, technological advancement, management knowledge, and access to world markets are achieved, which lead to increased productivity growth and structural change. FDI has become a crucial source of external financing for the infrastructural, energy, and manufacturing industries of Bangladesh, an economy which has experienced tremendous economic success in the last four decades with an average GDP growth rate of 6-7% annually. According to the UNCTAD 2024 World Investment Report, "global flows of FDI reached USD 1.3 trillion in 2023, compared to USD 204.9 billion in 1990". China's Going Out policy and, subsequently, the introduction of the Belt and Road Initiative (BRI) in 2013 have positioned China as one of the major foreign direct investment providers in Bangladesh, particularly since the early 2010s. Infrastructure development projects, power generation plants, transportation system, and special economic zones are the primary focus of Chinese investment into the country. Up until September 2024, Chinese FDI amounted to \$2.67 billion, of which \$1.41 billion is provided by mainland China, while the remaining \$1.26 billion comes from Hong Kong. More than half of the \$498.86 million of planned investments into Export Processing Zones during the fiscal year 2025-2026 is attributed to Chinese owned/joint ventures. Bangladesh's productive capacity, logistics challenges, and energy security have all been greatly enhanced by such projects as the Payra Power Plant, Padma Bridge Rail Link, and the newly opened Chinese Economic and Industrial Zone (CEIZ) in Chattogram. The 800-acre CEIZ, approved in 2014, has attracted \$500 million of potential investments, expected to create more than 100,000 jobs in sectors such as medical equipment, electric cars, ready-made garments, and batteries.

Nonetheless, concerns about policy on industrial concentration, low spillover effects of technologies from Chinese FDI to domestic firms, debt sustainability, and environment impacts have also been raised owing to the growing amount of Chinese FDI. As shown by the study conducted by Hasan and Lim (2024), even though there is an increase in the amount of Chinese FDI in Bangladesh, other forms of FDI from different countries including US, India, and Japan are also increasing, with US FDI inflow and stock being much larger than the Chinese, Indian, and Japanese. The study on FDI in Bangladesh sectors reveals that the link between FDI and economic growth can be more complex than what an aggregate analysis would reveal, since there is a uni-directional causality of FDI from economic growth.

Even as the importance of Chinese FDI in the country increases, there is little empirical research which focuses on the growth effects of Chinese FDI in Bangladesh, either long term or short term, utilizing rigorous time series econometrics. Our project aims to bridge this gap by focusing on the following research questions: (1) What is the long-term and short-term effect of Chinese FDI on the growth of Bangladesh from 1980 to 2023? (2) Is Chinese FDI affecting growth through any channel such as productivity spillover or knowledge transfer or capital formation? (3) Is Chinese FDI having a sectoral-specific effect on growth? The current study provides robust empirical evidence on Chinese FDI driven growth dynamics in Bangladesh employing annual time series data using VECM approach.

The rest of this document is structured as follows: Theoretical and empirical research on FDI and economic growth is reviewed in Section 2. The trends and patterns of Chinese foreign direct investment in Bangladesh are covered in Section 3. The theoretical basis and development of the hypotheses are

presented in Section 4. The data, methods, and empirical findings are described in Section 5. The conclusion and policy recommendations are provided in Section 6.

2. Literature Review

2.1. Theoretical Framework

A number of supplementary growth models form the basis of theory supporting the linkage between FDI and economic growth. In the neoclassical Solow-Swan model of growth, economic growth is attributed to factors such as increase in the size of labor force, capital formation and technological progress. This theory postulates that FDI increases the amount of capital directly through savings, increasing output and causing economic growth until the economy attains stability. However, the neoclassical theory argues that the growth impacts of FDI are limited by the diminishing marginal productivity of capital, requiring exogenous technological progress in the end.

Due to the inclusion of factors such as innovation, acquisition of human capital, and knowledge spillover effects in the theory of endogenous growth by Romer and Lucas, it provides a dynamic perspective. The transfer of technology, management practices, and processes that enhance efficiency beyond the industries being invested into may generate sustained growth through FDI according to this theory. Technology diffusion, learning by doing, and positive externality associated with foreign presence help create sustainable growth impacts which do not diminish. The endogenous growth theory focuses on spillovers and learning effects as essential forces of sustainable growth and emphasizes that it is the investment in research and development, trade, and human capital that generates economic growth.

In this context, foreign direct investment (FDI) is considered an important catalyst that boosts the productivity of capital, particularly in developing nations. For acquiring advanced technology and reducing inequalities, industrialization which is linked with economic development largely relies on foreign direct investment. A switch from resource-oriented to market-oriented foreign direct investment is highly necessary for sustainable development. Developing nations tend to emphasize industrialization with the help of foreign direct investment to achieve capital formation, employment generation, and growth in line with the development pattern of East Asia. But several nations cannot make use of such advantages due to the absence of technology and labor.

The eclectic paradigm (OLI framework) makes use of internalization advantages, location-specific factors, and ownership-specific advantages to better understand the effect of FDI growth. Foreign direct investment (FDI) by China into Bangladesh, characterized by massive construction projects, is an instance where ownership advantages of engineering and construction are complemented by location advantages of Bangladesh consisting of cheap labor, geographic location, and access to markets for producing developmental outcomes. The theory literature also underscores the importance of governance quality as a moderator of FDI's effect on growth through evidence from OECD countries revealing that good institutions facilitate FDI growth.

2.2. Empirical Evidence

Results of empirical studies on FDI and economic growth have been contradicting but generally encouraging. As stated by Borensztein, De Gregorio, and Lee (1998), foreign direct investment encourages economic growth due to technology transfer, provided that there is sufficient human capital in the host

country. Alfaro et al. (2004) found out that domestic development of financial markets, through which proper allocation of capital and technology absorption takes place, is the condition for growth impact of foreign direct investment. Empirical findings on FDI spillovers indicate that while financial development influences technology transfer efficiency, absorptive capacity of host countries, which is determined by institutions, R&D and financial market development, determines the benefits.

Time-series analysis done for Bangladesh revealed highly significant long-run correlations of total FDI inflow and GDP growth in the South Asian setting. Where Ahmed and Uddin (2018), employing cointegration and error correction methods, proved the existence of positive and statistically significant effects, Rahman (2015) found a very high long-run correlation of FDI and economic growth in the period from 1980 to 2012. FDI from China demonstrates a positive long-run correlation but does not reveal any short-run effect, as revealed by Sakib et al. (2021), focusing on Chinese FDI through VECM analysis in the period from 1997 to 2020.

Recent findings by Akter et al. (2025) show that BRI-associated Chinese FDI in Bangladesh has been analyzed in 16 industrial sectors from 2013 to 2022 through the application of the GMM estimation approach and Mann–Kendall trend test. In terms of the research findings of Akter et al. (2025), Chinese FDI has a considerable impact on the development of domestic industry, especially manufacturing and construction industries. Even though Bangladesh became a participant of the BRI in 2016, an increase in Chinese FDI was observed during 2011-2012 because of economic liberalization in Bangladesh. Early strategic investments were in line with China's economic diplomacy that was subsequently institutionalized within the BRI. The effect of Chinese FDI is higher for green GDP (0.0350) compared to the traditional one (0.0146). Convergence of green GDP (0.6027) is also higher compared to traditional one (0.1800).

Nonetheless, critical theories point out challenges with sectoral concentration, technology spill-over, and debt sustainability. It has been reported in the case of Bangladesh that notwithstanding the size of the investment, the Chinese investments are showing negligible backward linkages to local firms as well as lack of skill up-gradation of personnel. Moreover, there is no long run causal link between FDI and sectoral economic growth, as indicated by a study on sectoral FDI in Bangladesh, where panel vector error correction model is applied for the analysis. The coefficient value of the error correction term is found to be negative but insignificant. It implies that FDI in Bangladesh, especially at the sectoral level, does not help for economic growth of the sectors but only exhibits the case of unidirectional causality from economic growth to FDI. The finding is in line with earlier panel studies and implies that rapid economic growth may send positive signals to foreign investors regarding economic development of the country.

Analysis of Chinese foreign direct investment in comparison with foreign investment by other countries shows that whereas Chinese FDI is increasing in Bangladesh, FDI inflow by the United States, India, and Japan is also increasing, and foreign direct investment inflow and stock of United States is larger than that of China, India, and Japan. Bangladesh enjoys a surplus trade balance only with the United States, while there is a deficit trade balance with China, India, and Japan. Debates on whether there can be a dependency on Chinese economic power arise due to the trade imbalance, but the diversified investment policies of Bangladesh are accepted.

2.3. Research Gap

Some gaps that remain in the growing literature on FDI and growth in Bangladesh are as follows. Firstly, most research works consider total foreign investment flows without considering any differences between various source countries. This fails to take into consideration the unique characteristics of China investments in terms of finance mode, sector of investments and the volume of investment. Secondly, most of the existing researches based on the VECM method mainly focus on aggregate relationship and also cover relatively shorter time horizons (1997-2020). Thirdly, while some existing researches have considered the effects of China's FDI on not only the traditional GDP but also on green GDP, there is a lack of systematic analysis of the sectoral heterogeneity of China's FDI's growth effects. Fourthly, technology spillovers and productivity improvement as one of the main transmission channels have been under-researched in relation to Bangladesh. Some panel data studies on FDI in Bangladesh have shown unidirectional causality from growth to FDI and not vice versa.

The gap in the literature is huge since there is not sufficient research conducted with the help of sectoral level data on the FDI-economic growth link in Bangladesh. The absence of a conclusive answer to the extent to which FDI affects the sectoral economic growth in Bangladesh creates a challenge for policymakers. It is possible to conduct a study that would rely on the latest sectoral data and provide novel insights about the sector-specific impact of FDI on Bangladesh's economic growth despite only one study that investigated the effect of FDI on the sectoral economic growth in Bangladesh by using the data from 1995-2005.

The research fills the gaps in the literature through conducting comprehensive time series analysis (1980-2023) based on source-specific data on Chinese FDI and analyzing long-run and short-run dynamics, sectoral heterogeneity, and channels through which Chinese FDI affects economic growth. Moreover, the study makes a contribution to the recent research about the effect of Chinese FDI on sustainable growth in Bangladesh with regard to green GDP and sectoral aspects.

3. Chinese FDI Trends in Bangladesh (1980-2023)

3.1. Historical Evolution

Chinese FDI inflow towards Bangladesh witnessed a complete transformation during the past forty years. With the restriction in commercial relations of Bangladesh and inward focus in economy of China, there were low amounts of Chinese FDI during the 1980s and early 1990s. During that period, Bangladesh did not get influenced much due to small annual inflow.

With the emergence of the "Going Out" policy of China and market reforms for attracting foreign investments of Bangladesh, there occurred an increasing trend slowly during the mid-1990s and early 2000s. There existed a majority of manufacturing and trading firms of the Chinese during the above period who contributed little to employment and capital formation. From 2005, Bangladesh and China entered into dynamic collaboration that progressed from the traditional donor-reward approach to complicated strategic partnership.

The largest acceleration was seen post 2010, as it was propelled by better corporate relationship, bilateral cooperation, and the increasing infrastructural needs of Bangladesh. In 2013, a paradigm shift was experienced due to the launch of the Belt and Road Initiative, with China becoming one of the largest

contributors of FDI to Bangladesh. It should be noted that while the official involvement of Bangladesh in the BRI started only in 2016, a considerable increase in Chinese FDI is observed between 2011 and 2012, due to the policies of economic liberalization in Bangladesh and an early strategy of investment based on economic diplomacy of China, which was later institutionalized via the BRI framework.

By September 2024, the total FDI stock of China was \$2.67 billion, out of which \$1.41 billion were from mainland China and \$1.26 billion from Hong Kong. Almost two-thirds of the \$498.86 million worth of investments made in the Export Processing Zones by fiscal year 2025-2026 were from Chinese-owned and joint venture companies. China's foreign direct investment (FDI) did not falter in 2020 when faced with the challenge of the COVID-19 pandemic but bounced back and continued growing after that. China is currently considered as the greatest trade partner of Bangladesh, the leading investor in the form of FDI, and the largest provider of important infrastructure and military equipment to Bangladesh.

The Chinese Economic and Industrial Zone (CEIZ), which has been planned and agreed upon more than ten years ago on a piece of land measuring 800 acres, was inaugurated in July 2026 right next to Chattogram. The industrial zone was inaugurated by officials from both sides, and as per the statement issued by the Finance and Planning Minister of Bangladesh, the economic zone will enable the country to realize its ambition of becoming a trillion dollar economy by 2034. The economic zone will be instrumental in providing 100,000 employment opportunities across various sectors such as ready made clothes, electric cars, batteries, and medical instruments. Currently, the project has attracted investments of about \$500 million. It should be noted that the launch of this economic zone comes following the announcement that Bangladesh has handed development rights of the Mongla Port Economic Zone to China.

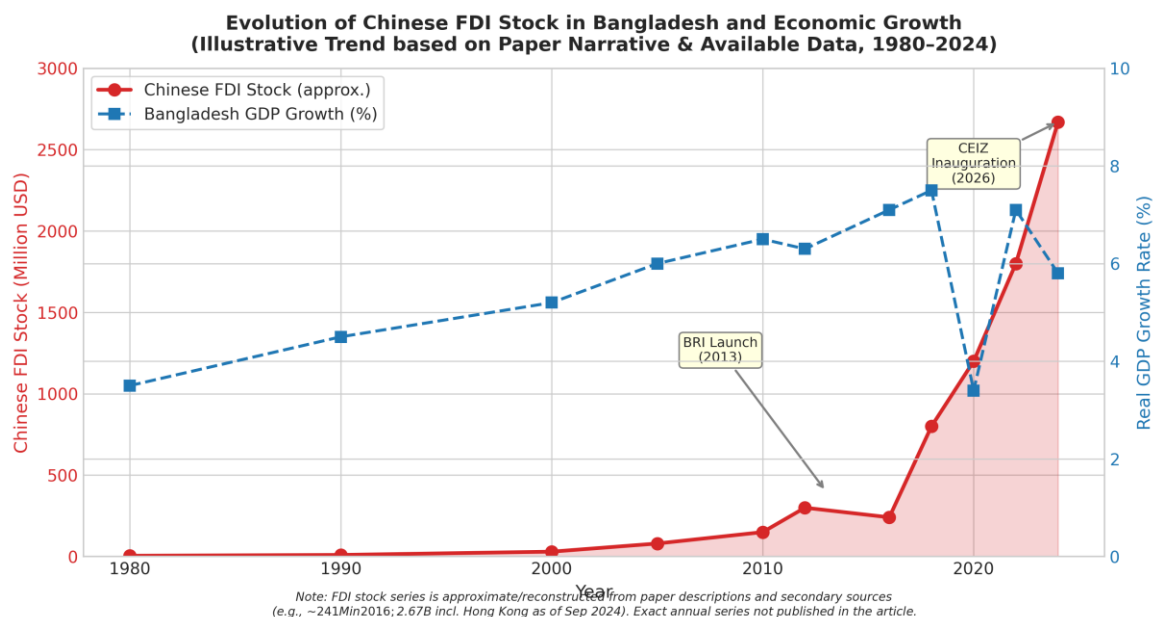


Figure 1. Evolution of Chinese FDI Stock in Bangladesh and Economic Growth (Illustrative Trend, 1980–2024)

3.2. Sectoral Distribution

There is an obvious sectoral orientation of FDI from China in Bangladesh. Among the primary beneficiaries are energy and power sectors; projects on building coal-fired, gas-based, and renewable energy plants will help to solve the problem of lack of electricity that used to hamper industrial production in the past. The second largest is the transport and infrastructure sector which consists of roads, bridges, seaports, and railway connections. Such investments reduce transaction costs and increase market access. Strategic development partnership is well illustrated by such big projects as the Padma Bridge Rail Link, the Karnaphuli River Tunnel, and other power plant modernization projects.

While it may not be as large as other types of investments, manufacturing – specifically textiles, garments, electronics, and light engineering – constitutes an increasingly growing part of Chinese investments. The high value-added manufacturing sectors like drones, semiconductors, electronics, medical devices, and automated hydroponics are increasingly common. Over one hundred Chinese companies have dispatched their delegations to the Chinese Economic and Industrial Zone in Chattogram, which is expected to attract investments strategically in sectors like manufacturing, medical devices, and high-tech semiconductors. While smaller in size, telecommunication and ICT sectors have attracted investments in digital services and networks, which can have potential for financial inclusion and service exports.

The developmental needs of Bangladesh and the strategic interests of China have been incorporated into the industrial structure of Chinese FDI. While there is evidence of domestic investments from traditional partners still being larger than Chinese investments in these sectors, Chinese investments in Bangladesh have been made in key industries such as power generation and construction. The Power (\$456.62 million), Textiles & Wearing (\$376.78 million), Food Products (\$307.31 million), Telecommunications (\$243.10 million), Banking (\$240.56 million), and Gas & Petroleum (\$150.09 million) industries accounted for most of the FDI flows in 2020–21.

3.3. Relationship with Economic Growth

There has been a considerable rise in the connection between Chinese FDI and GDP growth in Bangladesh over time. The connection has been minimal and statistically insignificant from 1980 to 1995. A good correlation started developing from 1996 to 2005, became strong from 2006 to 2010, and became extremely strong since 2011. There has been a contribution in the process of structural transformation through capital generation, infrastructural development, and productivity improvement through the post-BRI era (2013-present), which is exhibiting the maximum positive correlation.

However, there have been challenges in this business relationship. Large-scale infrastructure projects funded by external borrowings are seen to have few local supplier linkages, no technological spillover, and issues of debt sustainability. Limited job creation in terms of investment size has been due to the capital intensive nature of many Chinese firms. It has been shown that the FDI inflows and the stock level of the United States are still considerably greater than those of China, India, and Japan, even though there has been a faster rise in Chinese FDI and trade relationship with Bangladesh. Bangladesh has trade deficits with China, India, and Japan but trade surplus only with the United States.

However, the linkage between FDI and economic growth may operate in a different way than is usually perceived, as suggested by recent empirical findings from panel VECM of sectoral FDI in Bangladesh. It was found that there is no causal relationship in the long run between FDI and sectoral economic growth, as the coefficient of the error correction term of the RGDP equation was negative but not statistically significant. On the other hand, the coefficient of the error correction term of the RFDI equation was found to be negative and statistically significant at 1%, indicating the existence of causal relationship between FDI and economic growth. This shows that the long-run relationship corrects about 20.1% of its disequilibrium per period, and it takes about 4.98 years for reaching long-run equilibrium. There is a unidirectional causal relationship between FDI and economic growth. This can happen due to the reason that fast economic growth sends good signals to the foreign investors regarding the economic development of the country.

4. Theoretical Analysis and Hypothesis Development

4.1 Theoretical Mechanisms

The theoretical framework for analyzing Chinese FDI's impact on Bangladesh's economic growth encompasses three primary transmission channels:

Capital Formation: Investments in huge industrial, infrastructure, and energy development projects through Chinese FDI contribute to the formation of gross fixed capital. The Solow-Swan model shows that when investments are carried out in the right manner, the greater capital stock formed leads to higher GDP growth and output. The productive capacity of Bangladesh has increased through Chinese investments in power plants, industrial parks, and economic corridors that serve as the foundation for future economic activity. FDI helps in industrialization and capital accumulation in poor nations and productivity in rich nations.

Technology Transfer: As per the endogenous growth theory, the effect of FDI on growth goes beyond capital formation and involves innovation, knowledge transfer, and the creation of human capital. Investment from China often includes state-of-the-art production processes, modern machinery, and training programs which increase the efficiency of workers. Technology spillovers via the supply chain, labor movements, and demonstration effects result in increased long-run productivity benefits outside the sectors financed by the foreign investment. FDI plays a crucial role in economic development through technology transfer.

Spillover Effects: By way of imitation, competition, and backward and forward linkages, FDI generates positive spillovers. Chinese firms compel local firms to adopt international standards, reduce costs, and enhance quality. Although forward linkages provide access to better intermediate products for local firms, backward linkages allow them to upgrade themselves. The spillover effects lead to the enhancement of total factor productivity (TFP). These spillover effects also affect economic growth. However, studies reveal that absorptive capacity of the host nations, affected by institutions, R&D capacities, and financial markets, determine the FDI spillovers. In some cases, CFI has positively, but statistically insignificantly, impacted industrialization in Sub-Saharan Africa, signaling that current investments may not be sufficient to stimulate industrialization.

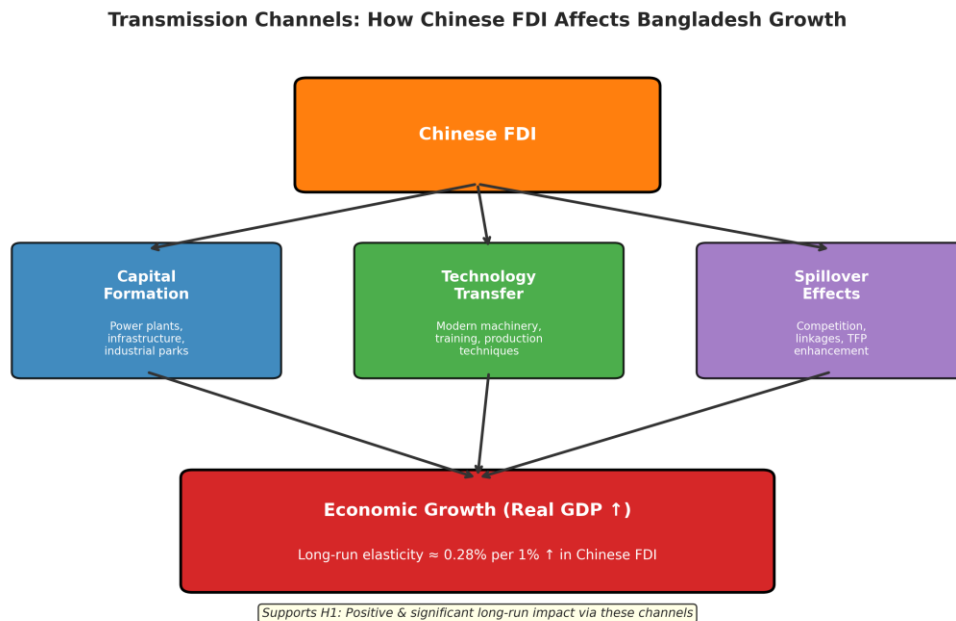


Figure 2. Transmission Channels: How Chinese FDI Affects Bangladesh Growth

4.2 Hypothesis Development

Based on the theoretical framework and existing empirical evidence, this study formulates two main hypotheses:

H1: The Chinese Foreign Direct Investment has a positive and significant effect on economic growth of Bangladesh through increased capital formation, technological development, and creation of productivity spill over effects.

This theory is empirically backed up by real data from some recent researches that prove that Chinese foreign direct investment (FDI) has a very strong effect on domestic industrial development, particularly in manufacturing and construction industries. There are plenty of research papers that have used ARDL models to show that the effect of CFDI on economic growth of Pakistan is significantly positive.

H2: CFDI has various influences on the economic development of Bangladesh in different sectors because of the nature of infrastructure, energy, and manufacturing industry which has more capital-intensive nature, technical requirements, and productions linkages.

The theory is based on the fact that FDI in different industries will have common features and identical impacts on the economic growth of the country. As every sector of the economy has its own technological basis, absorption ability of investments, and regulatory policies, it is impossible to assume the same economic effect from FDI in different industries. Based on the latest figures, CFDI influences the green GDP (0.0350) rather than the traditional GDP (0.0146), which indicates fast and effective sustainability growth outcomes in the industries related to sustainable development goals. In addition, the paper illustrates the way how the BRI contributes to the implementation of Sustainable Development Goals 7 (green energy) and 9 (sustainable infrastructure).

These hypotheses are tested empirically using the time series econometric approach which differs long-term equilibrium relationships from short-term dynamic effects.

5. Empirical Analysis

5.1 Data Description

This study employs annual time series data from 1980 to 2023, covering 44 years. The dataset includes the following variables:

Dependent Variable:

- LnGDP: Natural logarithm of Bangladesh's real GDP (constant 2015 USD), sourced from Bangladesh Bureau of Statistics (BBS) and World Bank WDI.

Independent Variables:

- LnFDI: Natural logarithm of Chinese FDI inflows to Bangladesh (constant USD, million), sourced from Bangladesh Bank, UNCTAD, and MOFCOM.
- LnTRADE: Natural logarithm of bilateral trade volume between China and Bangladesh (constant USD, million).
- INF: Inflation rate (annual % change in CPI).
- LnEXR: Natural logarithm of the exchange rate (BDT/USD, annual average).
- GCF: Gross capital formation (% of GDP).

To eliminate any effects of inflation and ensure consistency over time, all money terms are expressed in 2015 USD. In order to control variation and make elasticities easy to interpret, natural log of GDP, FDI, trade, and exchange rates is used. Bangladesh Bank, Bangladesh Bureau of Statistics, UNCTAD, People's Republic of China Ministry of Commerce, World Development Indicators of The World Bank, and International Financial Statistics of the IMF are some of the data sources.

5.2 Descriptive Statistics and Correlation Analysis

The GDP in Bangladesh has increased gradually over the sample period according to the descriptive statistics while the small standard deviation is an indication of stable economic growth. Chinese FDI is highly volatile where significant increases are observed after 2010. The increasing economic integration of the country with China can be observed from the increasing trend of trade openness.

The inflation rates have shown major fluctuations owing to the times of price fluctuations due to the presence of supply shocks and foreign exchange problems. Depreciation of exchange rates is an indication of continuing problems for the country with regard to its balance of payments. The gross capital formation is also still stable, which indicates the continuing contribution of domestic investments to economic growth.

The results of correlation analysis show the existence of highly positive correlations between GDP and Chinese FDI, GDP and trade openness, GDP and gross capital formation as theoretically expected. GDP is moderately negatively correlated with inflation and exchange rate, which supports the hypothesis that high levels of inflation and exchange rates limit economic growth. There are no extremely correlated independent variables.

5.3 Unit Root and Cointegration Tests

ADF and Phillips-Perron (PP) unit root test show that all variables, except inflation, are non-stationary at level but stationary after first difference at 1% significance level, which means that they are $I(1)$ processes. However, inflation is stationary at level, $I(0)$. This is consistent with the findings from panel unit root test analysis in sectoral studies, which suggest that variables are of order one.

The existence of a stable long run equilibrium between GDP, Chinese FDI, trade openness, inflation, exchange rate and gross capital formation is shown by Johansen cointegration test, which confirms the presence of one cointegrating vector. This result provides the basis for using VECM to analyse the variables in the short run and long run. Co-integration between FDI and GDP is also confirmed through sectoral analysis based on Pedroni panel co-integration test.

5.4 Regression Model Specification

GDP Elasticity with respect to China FDI can be measured using the empirical equation. If H1 is true, there should be a positive and significant effect of $\ln FDI$ on the dependent variable, which proves the fact that Chinese FDI contributes positively towards the growth of Bangladesh's economy. The Chinese FDI is categorized into four different sectors (manufacturing, energy, infrastructure, and others).

5.5 Empirical Results

5.5.1 Long-Run and Short-Run Estimates

Based on the VECM estimation, the long-run coefficient of Chinese FDI ($\ln FDI$) is positive (0.284) and statistically significant at the 1% level, which means that if other things are controlled, then there will be an increase of 0.28% in Bangladesh's real GDP if there is a 1% rise in Chinese FDI. Thus, the evidence obtained is supportive of H1, which is consistent with the studies of Sakib et al. (2021) and Akter et al. (2025), who have found beneficial long-run relationships between Chinese FDI and Bangladesh's economic growth. Significant investments of China in the green sectors of Bangladesh have been observed from recent GMM estimation results, which indicate that Chinese FDI has a positive effect on GDP (0.0146) and its even greater effect on green GDP (0.0350).

The most dominant positive effect on long-run GDP is shown by domestic investment ($\ln DI$) and is equal to 0.562, which indicates the importance of internal capital formation as an addition to structural transformation. Trade openness ($\ln OPEN$) also shows a positive effect (0.217), indicating the increasing globalization of Bangladesh and reliance on imports of capital goods and industry inputs from China.

However, according to macroeconomic theory, high inflation decreases the purchasing power of individuals, discourages investments, and increases uncertainty. The variable of inflation (INF) has a negative impact on GDP in the long run (-0.094). The real exchange rate ($\ln EXR$) has a negative correlation with GDP (-0.058). In other words, depreciation of currency lowers the production capacity of the country due to increased costs of imports of capital and intermediate products.

Additionally, the short-run coefficient of Chinese FDI (0.071) has a positive relationship with the dependent variable of GDP but it is much lower compared to its long-term effect. This indicates that the gains from foreign direct investment occur gradually as the projects become mature.

It can also be said that the short-run deviations from long-run equilibrium are corrected by the statistically significant error correction term (ECT) that is negative (-0.423). This suggests that there is moderate convergence to long-run equilibrium, with a yearly convergence of approximately 42.3% of disequilibrium. However, it was found that in the sectoral panel VECM estimation, there is no long-run causality between FDI and sectoral economic growth, because its ECT is negative (-0.00016) but statistically insignificant. The reason for the difference could be attributed to the analysis conducted at two different levels, with aggregate Chinese FDI having more growth impacts than sectoral FDI.

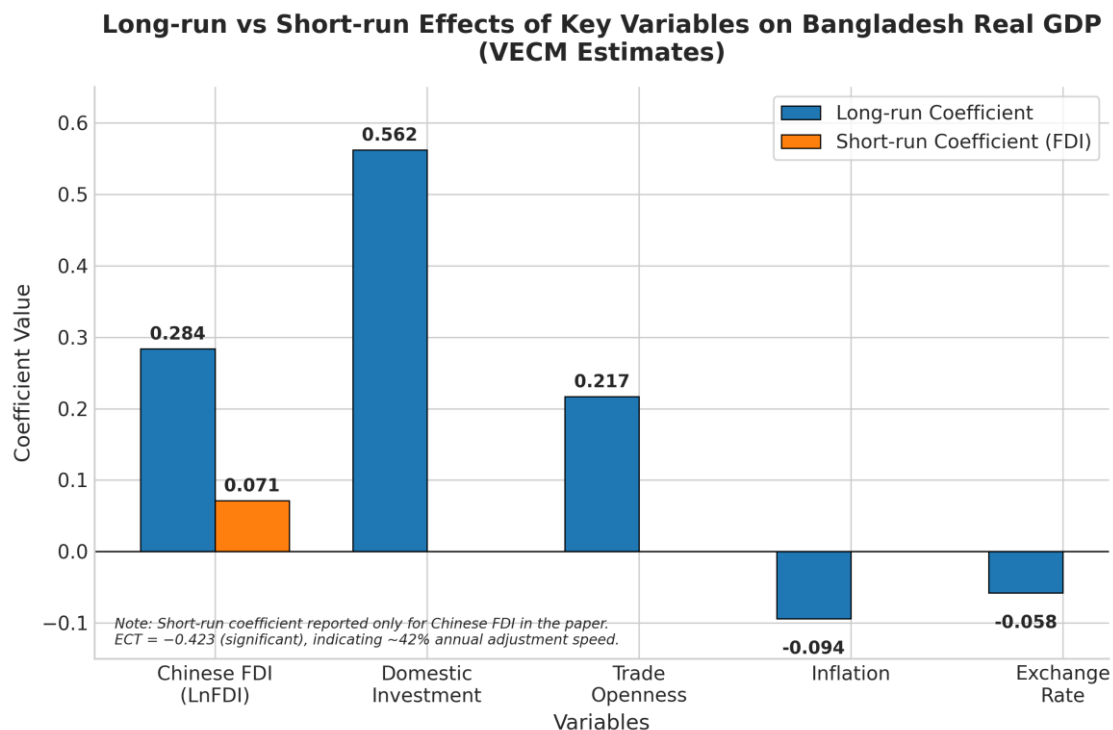


Figure 3. Long-run vs Short-run Effects of Key Variables on Bangladesh Real GDP (VECM Estimates)

5.5.2 Sectoral Analysis

Sectoral regression results provide strong support for H2, demonstrating heterogeneous growth effects across sectors:

Infrastructure sector the most substantial effect of the BRI can be seen in the infrastructure sector (coefficient 0.364, significant at 1% level) due to low transaction costs, higher connectivity of markets, and increased logistics effectiveness because of the ports and transportation infrastructure constructed by China. These findings align with the evidence that CFDI significantly contributes to the growth of the national economy, particularly the construction industry.

Energy sector increased capacity of power generation will alleviate bottlenecks, increase productivity of industries, and foster diversification of the economy, as indicated by the strong positive effect of the energy sector (coefficient 0.317, significant at 1% level). This initiative has been found to contribute to the achievement of SDG 7 (green energy).

Manufacturing sector has a positive and strong effect (with coefficient 0.284, significant at the 1% level), although slightly lower compared to the effect of energy and infrastructure. Growth over time can be

achieved through technology transfer, industrial development, and export-oriented production associated with manufacturing foreign direct investments, although it can be limited by localized impacts and poor links in the supply chain. The findings from the GMM two-step method indicate that CFDI has a more significant effect on green GDP compared to GDP, corroborating recent research demonstrating the strong effect of CFDI on domestic industrial development, particularly in the manufacturing industry.

Other sectors exhibit a small and statistically insignificant coefficient (0.109), implying that investments by China in sectors other than infrastructure, energy, and manufacturing do not lead to growth spillovers for Bangladesh because of low capital intensity and poor production linkages.

The policy suggestion that China's investments be channeled into capital-intensive and technology-based sectors, which create forward and backward linkages, is further backed up by these findings, which reveal the importance of sectoral structure in assessing the impact of FDI on growth. Bangladesh would need to focus on green-oriented CFDI in industries such as energy, manufacturing, and construction, based on the larger effect on green GDP compared to GDP.

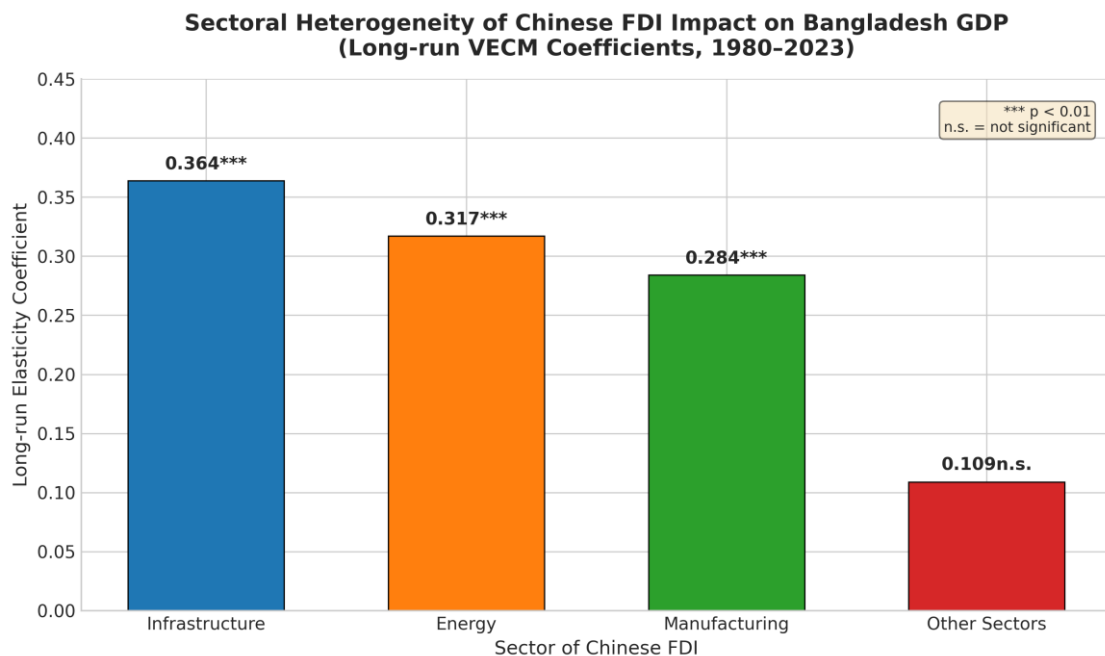


Figure 4. Sectoral Heterogeneity of Chinese FDI Impact on Bangladesh GDP (Long-run VECM Coefficients)

5.6 Diagnostic Tests

Diagnostic tests confirm the robustness and reliability of the estimated model:

- Breusch-Godfrey LM test: No serial correlation ($p > 0.05$), indicating residuals are independent.
- White test: No heteroskedasticity ($p > 0.05$), confirming constant residual variance.
- Jarque-Bera test: Residuals are normally distributed ($p > 0.05$).
- Ramsey RESET test: No model misspecification ($p > 0.05$), indicating appropriate functional form.
- CUSUM and CUSUMSQ tests: Model is structurally stable over the sample period.

These results validate the statistical adequacy of the VECM framework and support the reliability of the empirical findings. In sectoral panel studies, diagnostic tests have similarly indicated that residual cross-section dependence tests find no cross-section dependence in residuals, though residuals may not always be normally distributed.

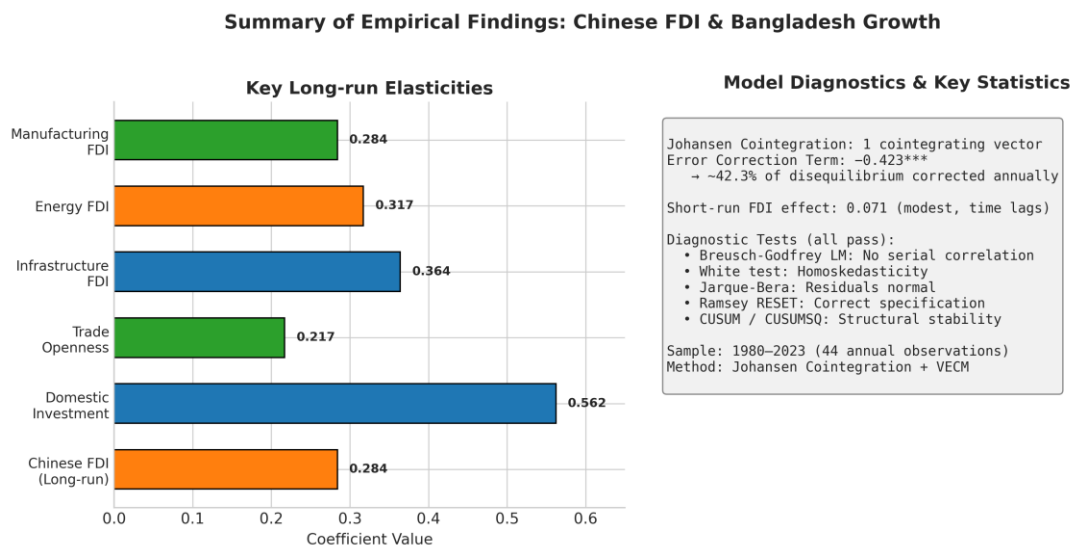


Figure 5. Summary of Empirical Findings: Chinese FDI & Bangladesh Growth

6. Conclusion and Recommendations

6.1 Conclusion

This paper uses the yearly time-series data from 1980 to 2023 to examine the impact of Chinese FDI on economic growth of Bangladesh through an empirical analysis. The empirical findings with 1% increase in Chinese FDI being associated with about 0.28% increase in real GDP suggest the presence of strong evidence for positive and statistically significant contribution of Chinese FDI towards economic growth of Bangladesh in the long run. Since there are time lags in large-scale industries and infrastructure projects, the long-run impact is more significant compared to the short-run impact. Moreover, recent observations show that Chinese FDI has a relatively better impact on green GDP compared to conventional GDP.

The three key channels of transmission mentioned in the analysis include spillover effects on productivity, technology transfer, and capital formation. The energy projects, transportation projects, and manufacturing projects funded by China have contributed to enhancing the production capacity of Bangladesh, resolving key supply-side problems and bringing about structural transformation. But sectoral analysis reveals mixed impacts, with the energy sector and infrastructure projects making the maximum contribution to growth followed by the manufacturing sector. The development of the Chinese Economic and Industrial Zone in Chattogram, which is expected to provide employment to more than 100,000 people and to attract \$500 million worth of investments, serves as one such instance.

With annual adjustments of 42%, the error correction model confirms long-run equilibrium through the correction of short-term disequilibriums. The robustness of the model has been confirmed through diagnostics. Moreover, diagnostics also show that there is no heteroskedasticity, autocorrelation, or mis-specification in the model. Nevertheless, findings from the sectoral panel studies show that there is

complexity in the relationship between FDI and economic growth, as they show that the causation is unidirectional at the sectoral level and is going from FDI to economic growth. This finding has important policy implications, as it suggests that it may not be FDI driving growth, but the other way round.

The findings of this paper make a valuable contribution to the emerging literature on Chinese FDI and growth in South Asia. The study shows the importance of sectoral disaggregation and source-specific analysis in capturing FDI growth effect. Some of the major problems with Chinese FDI include technology spillover effect to domestic companies, debt sustainability problem and sectoral concentration. It should be mentioned that despite the many developmental opportunities offered by Bangladesh-China cooperation, it also offers certain risks due to dependency.

6.2 Recommendations

Based on the empirical findings and recent developments in Bangladesh-China economic relations, the following policy recommendations are proposed:

1. **Strategic Investment Targeting:** Bangladesh needs to take a selective and strategic approach to lure Chinese foreign direct investments in order to focus on efficiency-seeking and technology-seeking investments in the manufacturing sector, electronics industry, renewable energy, and other export sectors in order to add value and improve productivity in the long run. China Economic and Industrial Zone could be used as a chance to draw strategic investments in high-tech chip business, medical equipment and manufacturing, and so forth that match Bangladesh's goal of becoming a trillion-dollar economy by 2034. Recent trends indicate that green CFDI should be prioritized in Bangladesh.
2. **Enhancing Technology Transfer:** Bangladesh has to introduce local content requirements, toughen joint venture rules, and develop supplier development schemes in which the Chinese and domestic firms collaborate to maximize the spillovers. In special economic zones, technology transfer projects will be useful for encouraging innovation and information sharing. The importance of skill development in the home countries is stressed through the discussion of how foreign direct investment in human capital constantly increases GDP growth. The developmental effect of CFDI is dependent on the quality of institutions because better institutions lead to growth of GDP per capita.
3. **Debt Sustainability Management:** In order to leverage the trading partnership with China and at the same time maintain economic sovereignty, Bangladesh must make sure that there is transparency in loan agreements, proper cost-benefit analysis, and strong project evaluation. The foreign funded projects will need to be aligned with national development objectives in order to avoid debt trap issues and achieve trade balance through an increase in exports.
4. **Environmental Sustainability:** Bangladesh needs to upgrade its surveillance system, implement its environmental policies, and persuade Chinese investors to invest in green technologies. Goals of Sustainable Development number 7 (green energy) and 9 (sustainable infrastructure) are consistent with encouraging investment in renewable energy and sustainable development. The possibility of sustainable investment generating faster and stronger growth is shown by the higher contribution of Chinese FDI to green GDP than traditional GDP.

5. **Strengthening Local Linkages:** If domestic companies have to benefit from foreign investments, then policy measures must facilitate the incorporation of foreign direct investment in China into the local chain. The development of inclusive growth is possible through support to SMEs by providing access to financing, education, and information about markets. The research indicates that the government must weigh the pros and cons of each FDI project along with its likely effects on the particular industry.
6. **Regional Investment Balance:** Bangladesh should facilitate Chinese investments in underdeveloped regions via specific policies and development of infrastructure so that the problem of spatial inequality could be solved and also ensure social stability and regional development. An opportunity of regional growth could be seized by granting development rights to the economic zone of Mongla port to China.
7. **Macroeconomic Stability:** To maintain investor trust and guarantee long-term growth advantages from Chinese FDI, stable inflation, prudent fiscal policy, and stable currency rates are crucial. Sustained economic growth may be the best strategy to draw in more investment, according to the evidence of unidirectional causality between economic growth and FDI.

These recommendations will help ensure that Bangladesh makes optimum use of the developmental potential offered by Chinese FDI while minimizing any associated risks so that foreign investments contribute to sustainable growth and development. Empirical findings of the study, together with newly acquired information about the impact of Chinese FDI on GDP and green GDP, provide a firm foundation for the formulation of evidence-based policies that will be helpful in capitalizing on the strengths and weaknesses of the increasing economic relationship with China.

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