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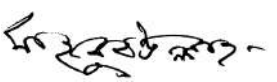
Editor's Note

The *Bangladesh Journal of Political Economy* (BJPE) continues its commitment to advancing rigorous, policy-relevant scholarship reflecting Bangladesh's evolving political economy. As our nation deepens its engagement with global markets and searches for sustainable paths toward inclusive development, the research presented in *Volume 40, Number 1* provides timely and essential insights into financial architecture, external flows, and socio-economic integration.

This issue delivers critical examinations of the mechanisms that sustain long-term economic resilience. Focusing on capital markets and financial infrastructure, authors analyze the challenges facing Sukuk bond market development and employ an ARDL approach to map the dynamic nexus between financial inclusion and economic growth (2004–2021). Grounding macroeconomic flows in local reality, a case study of Cumilla District scrutinizes how household remittances are utilized to buffer systemic fragilities. Furthermore, researchers dissect the causal connectivity among foreign direct investment (FDI), financial development, and trade openness in emerging economies.

The volume culminates philosophically with an examination of poverty alleviation through a collaborative rapprochement framework, proving that sustainable economic growth remains incomplete without structural social stewardship and human dignity.

On behalf of the Editorial Board, I express my sincere appreciation to the authors, peer reviewers, and editorial staff whose diligence ensures the continued excellence of this publication. We trust these articles will stimulate meaningful debate among scholars, policymakers, and practitioners dedicated to equitable growth.



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Challenges of Sukuk Bond Market Development in Bangladesh

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Abstract

Shariah-compliant Sukuk have recently been recognized as a promising financial product among Islamic financial institutions and are among the world's fastest-growing sectors. Furthermore, Sukuk plays a crucial and influential role across multiple aspects of the economy and financial services, and it also holds a privileged position in financial markets and international money markets. Bangladesh's path to Sukuk was fraught with difficulties. Bangladesh started its journey toward Sukuk with a bag of challenges. The paper empirically investigates challenges related to Sukuk market development in Bangladesh. Descriptive statistics were used to identify the existence and dimensions of challenges facing Islamic financial organizations' Sukuk in Bangladesh. The study found that the selected challenges affected the development of Sukuk in Bangladesh. Finally, the paper proposed policies to address challenges with Bangladesh's Sukuk bonds.

Keywords: *Sukuk bond · Financial markets · Development · Challenges.*

JEL Classification: *E44 · G12 · O16*

1. Introduction

An Islamic shariah-based financial certificate known as a "Sukuk" represents a share of ownership in a portfolio of active or admissible assets in Islamic nations. Sukuk is an alternative financing mechanism based on Islamic Shariah principles that symbolizes undivided ownership of an underlying asset, specialized project, or investment activity. It provides the investor with evidence of ownership in an underlying asset, as well as other financial responsibilities when engaging in trade and other commercial operations. The term "investment sukuk" is defined in Shariah Standard No. 17 of the "Accounting and Auditing Organization of Islamic Finance Institutions (AAOIFI)". Because Islamic law prohibits lending with interest, it forbids the use of conventional bonds for financial transactions. A Sukuk is not a debt obligation because the profits from the certificate are used to purchase an asset in which the investor has a partial ownership share. A variety of Bangladeshi

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investors now have access to Sukuk, also known as Islamic Bonds. Sukuk offers a diversifying investment opportunity for long-term funding in crucial areas such as Bangladesh's infrastructure development initiative. As some nations struggle to secure long-term funding sources, sukuk appears to be a potential alternative to expand the funds available to finance investments and promote growth in Bangladesh. The absence of a solid issuance framework from regulatory institutions is one of the most significant hurdles in structuring a corporate Sukuk issue in Bangladesh.

2. Objectives of the Studies

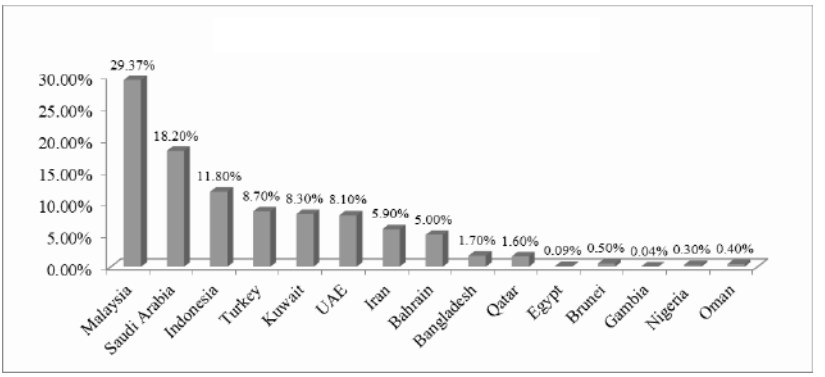

Chart 1. Total Sukuk Issuances by Country
Source: The International Financial Standards Board (IFSB)

In Bangladesh, sukuk bond issuance is an alternative financial solution for Islamic banks' excess liquidity, enabling them to invest in long-term development projects rather than relying primarily on interest-bearing financial products. In addition, the issuance of Islamic Sukuk will result in tangible assets that will contribute to economic growth. As an outcome, the purpose of our research is to examine the definition, historical context, and characteristics of SUKUK bonds. (ii) The current situation of Sukuk bonds in Bangladesh; (iii) The role of Sukuk bonds in Bangladesh's economic growth; (iv) Bangladesh's Sukuk Bond growth Challenges; and (v) Policy Recommendations for overcoming the barriers to Sukuk bond development in Bangladesh.

3. Data Source & Preliminary Analysis

The study is a descriptive research study. It is based on empirical data and on the existing literature, both extracted from multiple sources. Secondary data from the Bangladesh Bank and annual reports from a range of local and foreign financial institutions are analyzed. The resources for this study were compiled and consulted from scholarly journals, research reports, and working papers. Since this is a new experience for us, we used a descriptive approach in this study to highlight the significance of Islamic bonds (Sukuk) as an alternative investment instrument under Islamic law to aid Bangladesh's economic growth.

We explain why a Sukuk bond was necessary in Bangladesh, the global Sukuk market landscape, potential challenges in developing the Sukuk market, and the future prospects of the Sukuk bond in Bangladesh.

4. Literature Review

Sukuk, unlike conventional bonds, gives governments and enterprises access to the vast and growing Islamic liquidity pool. Bangladesh has made significant progress in Islamic banking, introducing sukuk through various financial initiatives. Sukuk issues are the subject of an increasing number of studies worldwide.

M. N. Hoque (2014) outlines several key topics and challenges. He emphasized capital guarantees, Shariah issues, a scarcity of qualified experts, economic issues, and contractual frameworks in all of their forms. The paper also examines Shariah rule harmonization and the challenges in identifying the governing law for sukuk issuance in the Bangladesh capital market.

W. S. Alowaiyesh, M. T. Mohamad, and M. S. M. Noh (2020) evaluate the legal and regulatory framework for sukuk in Kuwait. The most significant issues and concerns, according to the report, are related to the benchmark yield curve, public understanding, and sukuk ratings. The research study concludes with an agenda of proposed solutions, all of which require further coordination among government agencies and connected stakeholders.

Cakir and Raei (2007) assess the impact of sukuk on the expense and risk basis of investment portfolios using the Value-at-Risk (VaR) approach. The article examines whether the issuer's secondary-market behavior for Eurobonds and sukuk differs enough to provide diversification benefits. The authors created two hypothetical portfolios for their research: one consisting solely of Eurobonds and the other of both Eurobonds and sukuk. The authors find that the sukuk lowers the second portfolio's VaR.

Abdullah, Abdul Aziz, et al. (2014) discuss the issues related to issuing sukuk to fund infrastructure projects. According to the authors, sukuk issuance has become a popular funding option for infrastructure projects, surpassing traditional bonds. However, they note that supporting infrastructure projects poses certain challenges. The paper identifies a common risk across both Islamic and conventional capital markets when raising project funding. Among these are legal and regulatory risk, liquidity risk, market risk, credit and counterparty hazards, operational risk, organizational and capital risk, currency risk, and other challenges.

M. A. B. Al-Amine (2008) identifies several critical issues and barriers in the sukuk market. The authors specifically examine capital guarantee, contractual

frameworks, price, and asset replacement in the context of ijarah sukuk, musharakah sukuk, and their many variants. It also discusses issues such as sukuk ratings, harmonizing Shariah law, and the difficulties in drafting laws to regulate sukuk issuance.

Kamil, K. H., Abdullah, M., Shahimi, S., and A. G. Ismail (2010) examine Islamic securitization through the use of sukuk structures. The authors examine risk-sharing behavior in Islamic financing through several forms of mudharabah and musharakah sukuk, structured via asset securitization. They do this using descriptive, analytical, and comparative methodologies. The research asserts that sukuk structures based on partnership principles are also considered risk-sharing arrangements rather than risk-shifting arrangements. The study has important ramifications for risk management strategies, particularly regarding sukuk architecture. As they focus on risk-sharing ideas that may lead to higher mobilization of savings and investment, originators and special-purpose vehicles (SPVs) may pay closer attention to more sukuk based on partnership principles.

5. Shariah-based Bonds (Sukuk) Vs Non-Shariah Bonds

Shariah-compliant bonds (sukuk) primarily differ from conventional bonds(non-shariah) in the manner in which returns are earned—through profit-sharing or lease income rather than fixed interest—and in the linkage of principal to underlying assets rather than ordinary debt, although the overall maturity periods are normally comparable.

5.1 Differences between Shariah-compliant Bonds and Non-Shariah-compliant Bonds in Terms of Yield and Maturity

The basic differences between Shariah-based bonds and non-Shariah bonds in terms of yield and maturity are given below –

Table 1. Shariah-based bonds Vs non-Shariah bonds in terms of yield and maturity

Aspect	Shariah-based bonds (sukuk)	Non-Shariah bonds (Conventional)
Yield/Return source	Profit/rent from specific underlying Shariah-compliant assets or ventures.	Fixed interest on a debt obligation.
Form of yield	share of profit or rental/lease income from underlying Shariah-compliant assets or projects	Yield is mainly a function of the fixed coupon, credit spread, and market interest rates.
Risk–yield linkage	Asset-backed, risk-sharing; spreads are often less sensitive to equity volatility and sometimes narrower.	Pure credit and interest rate risk; spreads broaden with volatility.
Maturity Structure	Contractual maturity is often similar to the tenors of bonds.	Contractual maturity across standard tenors.
Principal at maturity	Represent ongoing ownership, with maturity returns tied to the underlying assets' current value or agreed sale price.	Repayment of face value debt, independent of asset values.

5.2 The Reason for the Borrowers' Preference for Shariah-based Sukuk Bonds over the Existing Non-Shariah Bonds

Borrowers (issuers) tend to prefer Shariah-compliant sukuk over conventional bonds due to the prospect of attracting a broader investor base, complying with Islamic and ethical standards, and possibly enhancing pricing, credibility, and balance sheet management.

Access to a broader investor base:

- Sukuk enables governments and corporations to access investors who are unable or unwilling to invest in interest-based debt, including Islamic financial institutions and Shariah-compliant retail investors.

- The broader demand can elevate subscription levels and assist issuers in securing large-scale transactions that may be challenging to finance solely through traditional bonds

Potential funding cost and pricing benefits:

- Empirical and industry research indicate that sukuk can attain comparable or occasionally lower effective funding costs due to robust demand and a limited supply of high-quality Shariah-compliant instruments.

- Asset underlying and increased transparency necessary for sukuk structures may improve perceived credit quality, potentially resulting in narrower spreads for certain issuers.

Alignment with Shariah, ESG, and reputation:

- Sukuk are suitable for Islamic banks, Takaful firms, and Shariah-compliant corporates as they do not demand explicit interest (riba) and only finance kosher economic activity.

- Sukuk's ethical and asset-linked character aligns with ESG and socially responsible investing, enabling issuers to demonstrate responsible finance and build reputational capital.

Balance-sheet, risk, and project-finance features:

- Sukuk structures, such as ijara, musharakah, and mudarabah, can be customized to match project cash flows and share risk, which is especially appealing for projects involving a lot of assets and infrastructure.

- Sukuk markets help diversify funding sources beyond bank loans and conventional debt, and asset backing may enhance liquidity and capital metrics for Islamic banks issuing sukuk.

Strategic and market development reasons

- Governments in Islamic finance centers issue sukuk to establish Shariah-compliant capital markets and serve as standards for corporate issuers.
- Firms issuing sukuk gain awareness among global Islamic and Middle Eastern investors, thereby facilitating future capital-raising and cross-border expansion.

5.3 Reason for lenders' preference towards Shariah-based Sukuk Bonds over the Existing Non-Shariah Bonds in the Market

Lenders (investors) could prefer Shariah-compliant sukuk due to their combination of regular earnings, asset-backed structure, ethical adherence, and diversification advantages that set them apart from traditional bonds.

Asset backing and potential value gain

- Sukuk provides investors with ownership or beneficial interest in certain assets or projects, rather than relying just on the issuer's debt repayment promises.
- Sukuk's value can vary with asset performance, potentially leading to capital appreciation. In contrast, traditional bonds are generally based on interest rates and credit spreads, rather than asset performance.

Regular income with risk-sharing

- Sukuk investors earn Shariah-compliant income through monthly profit or rental distributions from underlying assets, rather than interest payments.
- Sukuk's risk-sharing principles link returns to asset performance, providing a more transparent and equitable return profile than fixed interest on loans.

Ethical and Shariah compliance

- Sukuk are ideal for Muslim investors seeking faith-based or ethical investments as they do not involve riba (interest), uncertainty, or financing of restricted sectors.
- Sukuk, often known as socially responsible or ESG-style securities, allow lenders to meet religious and ethical investment objectives while owning fixed-income assets.

Diversification and risk characteristics

- Adding sukuk to a bond and equities portfolio helps diversify returns and risk factors due to their unique structures and investor base, unlike ordinary bonds.
- Sukuk markets provide lenders with exposure to underutilized areas

and sectors, such as GCC infrastructure and real assets, that are not typically included in regular bond indices.

Security and transparency of structure

- Sukuk bonds with specified assets and clear cash-flow mechanisms, such as ijara leases and murabaha sales, offer greater transparency and perceived security than unsecured bonds.

- Particular structures offer investors greater security and ownership rights compared to unsecured creditor status.

6. Sukuk and Islamic Finance Principles

Islamic religious law in the context of Islamic finance is founded on religious and moral ideas, conceptions, and laws created over the course of Islamic history, principally based on the Qur'an and Sunnah. Fiqh (also referred to as Islamic jurisprudence) is the study and application of the Shari'ah's practical regulations and rules based on the sources. Islamic currency, including sukuk, has its origins in and is built upon the Islamic Shari'ah. Islamic financial rules also make sure that lenders and borrowers maintain a mutually beneficial balance and contractual clarity. Any financial transaction conducted according to Islamic law entails direct participation in asset performance (referred to as the "asset layer") and assigns specific rights and obligations to financiers in exchange for which they are eligible for a corresponding return in the form of state-contingent payments. Shari'ah law prohibits the exchange and purchase of debt contracts for the purpose of earning an interest gain (riba), profit taking without engaging in legitimate economic activity, asset transfer, and the existence of any conflict about the legitimacy of commitments. Only interest-free methods of financing connected to activities that do not involve pork, alcohol, guns, adult entertainment, or gambling are permitted in Islamic finance. However, if the lender and borrower share the investment risk and gains are produced in accordance with Shari'ah laws, Shari'ah does not prohibit profit-taking or payment for asset usage. Profits cannot be promised in advance and will only be realized if the investment is profitable. Debt trading is permissible in some countries under the Bai al-Dayn concept.

7. Classification of Sukuk

The three forms of sukuks offered are asset-backed, asset-based, and hybrid. An asset-backed sukuk's credit risk is completely based on the performance and creditworthiness of the underlying asset. The asset in an asset-based sukuk is there to meet Shariah rather than to generate revenue or cash. Hybrid sukuks, which permit the use of shariah-compliant financial contracts for refinancing purposes, have been introduced to the market to aid in mobilizing funds. According to Shariah Contracts, Safari et al. (2014) classified Sukuk into the following main categories:

(i) Musharakah Sukuk; A musharakah contract is a partnership arrangement between two (or more) persons in which the musharaka partners split the musharaka's earnings according to predefined ratios and divide the musharaka's losses based on their initial capital commitment.

(ii) Murabahah Sukuk; Murabahah is a sort of selling transaction in which both the cost of products and the profit on the sale are disclosed to both parties in advance. The purchase price, selling price, and profit margin are all explicitly disclosed at the time of the transaction.

(iii) Ijarah Sukuk; Ijarah Sukuk are based on the Islamic leasing basis. "Fixed payout" securities are another name for them. The repayment share and growth rate are agreed upon from the outset: the borrower receives Ijarah payments, while the holders receive monthly rental payments for ownership of the principal assets.

(iv) Mudarabah Sukuk; In a mudarabah, one party contributes capital while the other contributes labor and expertise. The latter does this by investing funds in a planned business and assigning each investor a share of the earnings based on the criteria established at the time of investment. Because just one party provides the capital, that party also bears all of the risk of loss.

(v) Istisna Sukuk; An Istisna sale contract directs a manufacturer to make a certain item for the customer. The Istisna Sukuk funds are used for manufacturing purposes, such as the production of commodities or construction. Payments to the holder are made in pre-agreed amounts in installments. Payments to the possessor are made in pre-agreed amounts in installments.

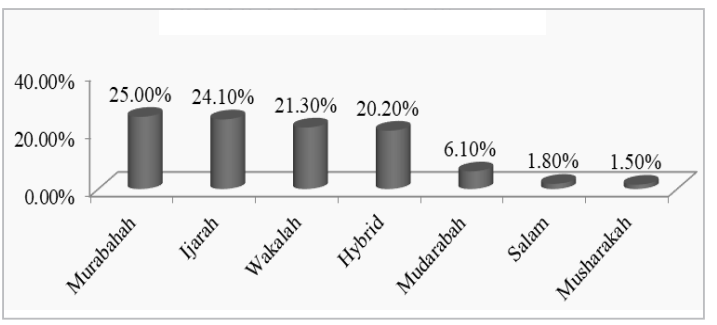

Chart 2. Global Sukuk Issuance by Structure

Source: International Investment Financial Market (IIFM) Study on SUKUK, 2021

vi) Salam Sukuk; In such agreements, the financial institution pays a down payment to acquire assets that must be delivered on a specific date by the seller. In exchange for an advance payment, the contractual parties agree on a future date for the delivery of items of a specific amount and quality.

In addition, many forms of Sukuk have emerged in light of modern information technology and environmental concerns. These are the ones: e-Sukuk: An e-Sukuk is a Sukuk issued and traded on an electronic platform. In September 2020, the Malaysian government introduced the first digital sukuk, available on digital banking networks and open to both institutional and individual investors. The participation of retail individuals, as well as corporate and sophisticated investors, contributed to the extraordinary success of this sukuk offering (International Investment Financial Market (IIFM) Study on SUKUK, 2021).

Green Sukuk: Green Sukuks are Shariah-compliant investments in renewable energy and other environmentally beneficial assets. Malaysia's first green sukuk was issued on June 27, 2021. The identification of green resources and projects is a big barrier to green sukuk. A Green Sukuk can be used to support reforestation, disaster relief, agriculture, sustainable land use, forests and natural resources, pollution prevention and control, and other projects. It may also be used to support resilient infrastructure, cleaner transportation, energy efficiency, waste management, and other projects (Source: World Bank report).

8. Development of the Sukuk Market in Bangladesh

Bangladesh possesses one of Asia's most rapidly expanding economies and the world's highest proportion of Muslims. As Bangladesh's economy grows, infrastructure construction is accelerating. On October 8, 2020, the government issued the 'Bangladesh Government Investment Sukuk Guideline (BGIS), 2020' to issue and administer sukuk under Shariah-based investment agreements (Source: Debt Management Department, Bangladesh Bank). Bangladesh launched its first sovereign investment sukuk (Ijarah Sukuk) on December 29, 2020, to seek funding for a project titled "Safe Water Supply for the Whole Country". The first sukuk was oversubscribed by over 4 times, indicating that investing in such a sukuk could offer a new potential channel for Bangladesh's financial markets. The large oversubscription of this inaugural sukuk demonstrated investors' interest in Islamic financial instruments in the capital market and the growing share of Islamic banking in Bangladesh. Moreover, the issue of such sukuks enables the Bangladesh government to study funding possibilities for Shariah-compliant ventures. Table 2 describes the auction allotment data for BGIS.

Table 2: Bangladesh Government Investment Sukuk (BGIS)

Sukuk Project	Tenor	Underlying Contacts	Issuing Date	Maturity Date	Profit / Rental rate	Profit / Rental Frequency	Tradability	Outstanding BDT (Cr.)
1. Safe Water Supply to the Whole Country	5 Y	Ijarah	2020-12-29	2025-12-29	4.69%	Half Yearly	Tradable at a negotiated price	8000
2. Need-Based Infrastructure Development of the Government Primary Schools Project (1st Phase)	5 Y	Ijarah	2021-12-30	2026-12-30	4.65%	Half Yearly	Tradable at a negotiated price	5000
3. IRIDP-3 Social Impact Sukuk	5 Y	Istisna'a and Ijarah	2022-04-20	2027-04-20	4.75%	Half Yearly	Tradable at a negotiated price	5000
4. CDWSP Social Impact Sukuk	5 Y	Istisna'a and Ijarah	2024-06-06	2029-06-06	10.40%	Half Yearly	Tradable at face price	1,000.00
5. CIBRR-2 Socio-Economic Sukuk	7 Y	Istisna'a and Ijarah	2025-03-13	2032-03-13	9.25%	Half Yearly	Tradable at face price	3,000.00
6. RDIRWSP Socio-Economic Development Sukuk	7 Y	Ijarah	2025-05-20	2032-05-20	10.50%	Half Yearly	Tradable at face price	2,000.00

Source: Bangladesh Bank.

Since the successful issuance of the first auction, the Bangladesh government has launched sukuk auctions six times. The last issuance of sukuk (Ijarah-based), titled "RDIRWSP Socio-Economic Development Sukuk," was held on May 20, 2025. Due to the enormous demand for Shariah-compliant securities, the offering was oversubscribed by over 4 times, and Sukuk has been hailed as a game-changer.

Sukuk certificates are mostly allotted among Shariah-based Islamic banks, FI & Insurance Islamic branches, and windows of conventional banks and insurance companies. Getting it more popular among individual investors and conventional banks is a challenge ahead for developing the Sukuk Markets in Bangladesh. The government of Bangladesh issued Islamic Sukuk bonds to fund various socio-economic development projects, including health, education, social, and rural infrastructure. Bangladesh Bank hosted an auction to offer Sukuk bonds to qualifying banks, NBFIs, insurance firms, and individuals. The central bank completed the necessary preparations for shariah-based bonds as a special-purpose vehicle for the issuance of government securities (Source: BSEC/Bangladesh Bank).

9. The Corporate and Institutional Development of the International Sukuk Market

Sukuk financing reduces the need for financial institution funding since the asset pool is available to investors without the need for financial intermediaries. This type of financing allows enterprises and institutions that are unable to obtain cost-effective funding due to their credit ratings to access the capital markets. Despite the apparent benefits of sukuk to the corporate/institutional sectors, these sectors have not taken advantage of the sukuk market to the extent anticipated. Despite sluggish entry into the corporate/institutional market, the few corporate and institutional sukuk issued thus far have spanned a diverse range of business activities. The inaugural issue of the Islamic Development Bank (IDB) was very impressive and drew significant market attention. The Middle East accounted for 70 percent of worldwide investors, Asia-Pacific for 16 percent, and European institutions for the remaining 14 percent. According to sources, the IDB is considering a second sukuk offering. The first corporate sukuk from Saudi Arabia (excluding IDB) refers to a combination of asset classes used to issue acceptable securities, such as Sukuk Al Ijara (MEED Magazine, August 1, 2003). Meanwhile, Freddie Mac's (the US Federal Home Loan Mortgage Corporation) offering was historic since it was the first Islamic mortgage securitization in the US. Although the sukuk market is still relatively new, it is clearly deepening, as evidenced by the quantity, size, and diversity of issues observed over the last two years. Sukuk, a byproduct of the rapidly expanding Islamic finance industry, has demonstrated its feasibility as an instrument for mobilizing long-term savings and investment from a broad

investor base ready to participate in Islamic Shariah-compliant structures. The sukuk market's rise can also be related to its ability to manage liquidity, which is one of the essential aspects identified as necessary for the Islamic banking and finance industry's future development (Adam, N. J. 2005, November). Unfortunately, most Islamic nations, including Bangladesh, will continue to rely on external resources in the absence of robust internal markets. The absence of established legal and regulatory frameworks for most nations' capital markets will be a challenge, particularly for private foreign investments.

10. Challenges of Developing a Sukuk Bond in Bangladesh

According to analysts, there are several opportunities for sukuk bonds in the Bangladesh Capital market. However, there are a number of challenges, including the absence of a financial market and financial infrastructure, a formal legal foundation, central bank attention, an Islamic capital market, and knowledge of Shariah law. The growth of sukuk in Bangladesh can be accelerated by overcoming several challenges and constraints. Some of them are discussed below:

i. Structural Complexity Challenge

The complicated structure of the sukuk market is a key impediment to its expansion (Michael Bennet & Zamil Iqbar, 2012). Financial products with highly complex structures are particularly difficult to appraise and unwind in the event of default. During the financial crisis, several complicated products suffered major downgrades and defaults, and they are also the market leader in sukuk structuring. As a result, many investors and issuers who have had negative experiences with structured securities may remain turned off by the intricacy of sukuk arrangements. Sukuk bonds are stiff in this situation since they don't engage in any interest-based activities. The aforesaid restrictive environment in Bangladesh's capital market has severely limited investment prospects for Sukuk bonds and, hence, avenues for lawful earnings.

ii. The Challenge of Establishing a Legal Framework

The long-term viability of the Sukuk bond is greatly dependent on the legal and Shariah-based structure. It ensures the enforceability of Islamic financial contracts, provides sufficient protection for users of Islamic finance, and has a robust legal redress system. While it is simply unrealistic for parties to include all applicable Islamic laws in their contracts, many of the regulations left out are often just as essential as the outcomes of Islamic principles, such as the prohibition on interest (riba) and on undue risk and uncertainty (gharar). Therefore, even if the losing party argues that the contract is unlawful under Islamic law, the government's national legislation may enforce clauses that permit such practices, such as the payment of interest. At the same time, if the parties have agreed to terms forbidden by Islamic law, they may not be

valid under local law. Amendments to existing regulations and the enactment of new legislation that promote the efficient operation of the Islamic capital market are a sine qua non for its continued expansion. Countries that introduce Sukuk bonds should amend current laws and regulations to provide an enabling environment for the Islamic financial system. Iran's and Malaysia's Islamic capital markets have legal backing.

iii. Regulatory Challenge

In Bangladesh, the Sukuk market is not yet fully regulated, and there is no standardized, recorded Sukuk transaction structure. For example, in the event of default, Shariah law is poorly regulated in Sukuk transactions. The lack of unified legislation governing Islamic finance, especially Sukuk, is a key hindrance to the market's continued expansion. AAOIFI2 and IFSB3 are two international organizations established to develop standards and guidelines. Its aims are to create accounting, auditing, and regulatory standards to guarantee that international financial institutions run smoothly. In November 2002, the worldwide Financial Standards Board (IFSB) was established in Kuala Lumpur, Malaysia, with the objective of defining globally prudential and supervisory standards for financial institutions worldwide.

iv. Shariah Compliance Challenges

Islamic finance principles and Shariah law control sukuk structures. Shariah compliance should always be guaranteed throughout the whole Sukuk structure, from issue to maturity. A Shariah board should approve each Sukuk issue to ensure compliance with Islamic law. Given the current Shariah Scholar criticism of the non-Islamic character of the majority of contemporary Sukuk, this kind of danger becomes even more important. It may be extremely damaging to an issuer's image to release financial products that are not Shariah-compliant, and it may take a while to regain investor trust (Obaidullah, M., 2009). Shariah law is based on the Quran and the Sunnah, but as these sources do not address every circumstance, certain Fatwas are based on Ijtihad, or subjective judgment. As a result, many of the researchers' findings are predicated on their ability to extrapolate from the data and make judgments. The decisions made by each Shariah board, as a consequence, vary substantially.

v. Challenge from Diversified Market Players on the Supply and Demand Sides

Investors who can strike a balance between social duty and profit maximization are in short supply. Retail investors aren't participating. There is a scarcity of long-term sukuk offerings to meet the requirements of long-term investors such as retirement fund funds, insurance companies, and takaful firms. Lack of investor diversification; banking institutions dominate, with NBFIs providing little intermediation. Long-term issues that fund infrastructure projects to meet the interests of long-term investors are either nonexistent or inadequate. There

aren't enough institutional investors to make a difference. Financial inclusion issues affect a tiny proportion of the working population compared to the country's overall population. Neither the federal nor the state governments has issued any benchmarks for sovereign sukuks. There is a scarcity of long-term sukuk offerings that meet the needs of long-term investors, such as pension funds. (COMEC, 2018).

vi. Liquidity Challenges

Liquidity risk is crucial in Islamic finance in general, and in Sukuk in particular. International financial institutions have fewer resources to manage liquidity due to Shariah prohibitions on trading in debt and other commodities. Islamic banks are unable to obtain "last resort" credit from the central bank or short-term interbank loans, as Riba is illegal. The traditional bond market is less liquid than the stock market, although it is more liquid than the Sukuk market. Bond trading is primarily done "over-the-counter" (OTC), rather than on recognized exchanges. Traditional financial institutions, on the other hand, have access to a wide range of liquidity management tools. As a result, the formation of a healthy secondary market is more important for Sukuk than for ordinary bonds. The expansion of the primary market, on the other hand, has a significant impact on the secondary market. Sufficient supply should be available to meet the increasing demand for Sukuk. According to Tag El-Din (2007), governments should be more active in issuing Sukuk with varying maturities and risk profiles to develop a liquid secondary market.

vii. Challenges of Default (Credit risk)

The possibility that the counterparty will not fulfill its obligations to pay principal or interest on its debts is known as credit risk or default risk. The investment's entire cash flow and earnings are distributed to Sukuk holders in accordance with their respective portions and the Sukuk's structure. The volume of Sukuk issued, however, is not actually asset-backed. Asset performance, for instance, is no longer a concern for holders of Ijarah Sukuk. At maturity, the borrower consents to buy back the asset for the remaining Sukuk's face value. Sukuk holders are interested in collecting coupon payments when their securities mature. As a result, the borrower risks missing a payment on either the coupon or the Sukuk's face value at maturity. Sukuk will be fully backed by assets if rigorously issued in accordance with Shariah, thereby eliminating credit risk (Junaid & Azhar, 2010, p. 41). Due to Shariah's prohibition on debt trading, any debt rescheduling to achieve greater profit is prohibited under Sukuk. Because Sukuk issuers are more likely to default than traditional bond issuers, Sukuk default risk is higher (Tariq, 2007, p. 32).

viii. Market Challenges

Sukuk is subject to market risks, such as interest rate and currency rate risks.

Rate of return risk (interest rate risk): The unpredictable nature of interest rates on loans and savings accounts over time is referred to as interest rate volatility. Because a large portion of current Sukuk offerings have a specified payment, the rate-of-return risk is comparable to the fixed-rate risk in conventional bonds. As a result, a Sukuk loses value when the market interest rate increases. If Sukuk are designed as legitimate Shariah-compliant instruments with rewards based on actual revenues from the underlying asset, this sort of risk can be substantially minimized or even eliminated.

Foreign exchange rate risk: Both Sukuk certificates issued in another nation and Sukuk with an underlying asset denominated in that country's currency are subject to foreign exchange rate risk. Exchange rate volatility, as defined by I. Ozturk (2006), is the risk associated with unexpected exchange rate movements. According to Tariq (2007), in this case, currency rate oscillations could result in a loss for the investor or issuer. This kind of risk is hard to prevent since Sukuk is a global financial asset. Sukuk can be used by overseas investors as a hedging instrument to reduce exchange rate risk and by Islamic institutions to diversify their investment portfolios when issued in local currency.

ix. Asset-related Challenges

All Sukuk offers must be backed by physical assets, but selecting the right one might be difficult. The asset must be able to produce appealing returns and be compatible with Shariah. In non-Muslim countries, the differentiation between halal (activities allowed by Shariah regulations) and haram (activities forbidden by Shariah regulations) is frequently misleading and more complicated than in nations where Shariah principles are well-established (Nanaeva, 2010). For the most recent Ijarah Sukuk issuance, certain inventive structures were developed to address this problem. The originator, who is the owner of an asset, has the right to substitute all or a portion of the pool of investments with a product of identical worth under these frameworks. By selling alternative assets and using the proceeds to fund the project's next phase, he will eliminate asset-related risk and generate additional resources.

11. Other Sukuk-related Challenges

In Islamic finance, there is a critical shortage of experts. Because Sukuk trades on traditional markets, such experts should be well-versed in both traditional instruments and basic Shariah judgments. The lack of research, empirical studies, and historical data on Sukuk performance is the biggest obstacle to Sukuk development. The lack of openness and the reluctance of international Islamic organizations to provide enough information are other obstacles. Sukuk cannot escape double taxation, unlike regular bonds, which have the "tax shield" of interest payments. The initial expenses of the offering may be higher than those for regular bonds due to specific Shariah criteria for Sukuk financing and the lack of harmonization (Al-Sayed, O., 2013).

12. Policy Initiatives and Recommendations

Bangladesh Bank recently issued instructions to diversify investments, including measures to reduce risk by increasing the number of investable products in the capital market and allowing private entrepreneurs to invest in asset-backed green Sukuk. To encourage investment, the government has decided to exempt individual Sukuk bonds from income tax beginning in fiscal year FY22. These Sukuk-related judgments are encouraging for the development of the Sukuk bond in Bangladesh. Apart from that, several initiatives are suggested for the growth of the Sukuk market and the economic development of Bangladesh:

(i) Establishment of a sukuk market for Bangladesh that promotes the United Nations' Sustainable Development Goals (SDGs), thereby increasing its attractiveness and positioning in mainstream financial markets.

(ii) Adoption of a distinct legislation for Islamic capital markets, as well as amendments to associated acts, rules, and regulations to allow sukuk bonds to be included in the financial system.

(iii) Development of a comprehensive framework for using sukuk issuance to fund various short and long-term projects.

(iv) The establishment of a centralized Shariah authority to supervise the standardization of legal texts, sukuk forms, and Shariah judgments; and the adoption of a Shariah-based legal, regulatory, and oversight framework for Sukuk.

(v) Sukuk bond issuance to a wide range of investors, both private and institutional, such as insurance businesses and retirement funds, requires long-term investments as well as secondary market listing and trading.

(vi) Expansion of the Islamic money market and increase secondary trading liquidity. Efforts should be undertaken to strengthen macroeconomic stability at the government and monetary policy levels.

(vii) Infrastructure and institutional capacity building for the sukuk market.

13. Conclusions

The Islamic finance business in Bangladesh has experienced immense growth and development. There is a need for increased investment in infrastructure, as major development activities are underway in the ongoing mega projects. Bangladesh will require substantial infrastructure investments to achieve its Sustainable Development Goals (SDGs) target of attaining upper-middle-income status by 2031, and Sukuk could obviously help close that gap. However, in Bangladesh, this system has several difficulties. Despite having a

flourishing sector (apart from banking regulations), Bangladesh is still trying to build a comprehensive regulatory and legal system for the Islamic bond market. In the absence of a comprehensive set of guidelines for specialized organizations such as sukuk, amendments to fundamental laws, such as the Companies Act, Income-Tax Ordinance, Registering Act, Bankruptcy Act, Trust Act, and Securities rules and regulations, might serve as an entry point. Official acknowledgment of sukuk (both legally and financially) is required to establish its track record in infrastructure project finance. This also points to a significant opportunity for the local market to issue sophisticated financial products, such as sukuk, in a well-planned manner, boosting infrastructure development. The challenges and opportunities confronting Bangladesh's Islamic finance sector, the potential for diversifying Islamic products, and the facilitation of Shariah-compliant investment flows are all significant topics that the government must address to influence Bangladesh's Islamic capital market. The government must also strengthen the bond market's qualitative attributes, including macroeconomic conditions, institutional strength, stock market performance, financial sector accountability, and corporate governance.

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Remittance and Its Utilization by Recipient Households in Bangladesh: A Case Study of Cumilla District

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Abstract

This study analyzes household remittance utilization and its socio-economic impact in Cumilla district, Bangladesh, focusing on factors affecting remittance inflows. Results indicate that migration increases household spending on food, education, and clothing, yet investment growth lags behind. Investment is found mainly in agriculture, livestock, and business, but limited knowledge (55.83%), lack of investment opportunities (22.5%), and low motivation (21.67%) hinder further investment. Only 24% of remittance-receiving households are attempting new businesses. Additionally, 65% of expatriates engage in informal remittance channels. Analysis shows positive influences on remittance inflows from household size (0.404), monthly income (0.558), and years abroad (0.191), while technical training (-0.321) does not enhance inflows. The study suggests government intervention to raise awareness of remittance spending and investing, and to encourage the use of legal remittance channels. Initiatives in agriculture, trade, and local industries, such as "khadi" textiles, as well as tax relief for new businesses, are recommended to boost effective utilization.

Keywords: *household remittance · financial success · migrants · socio-economic conditions*

1.1 Background of the Study

Bangladesh is a developing, stable market economy with a low- to middle-income level. This economy has characteristics such as low annual growth rates, income inequality, widespread poverty, high labor force unemployment, and reliance on imported fuel. Rapid economic expansion has been secured by resilient remittance inflows, sustained demographic dividends, and strong ready-made garment (RMG) exports during the last two centuries. The country aims to achieve the Sustainable Development Goals (SDGs) by 2030, to

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establish middle-income status by 2031, and to become a rich nation by 2041, driven by sustained economic growth. Remittances and financial success are key contributors to GDP and encourage economic growth (Sutradhar, 2020). Remittances are defined as the portion of migrant workers' income returned to their nation of origin from their country of employment. Remittance recipient families are households that receive remittances from a family member living and working in another nation or region. Remittances are often money transfers sent to migrants' home countries or communities to financially assist their families and improve their socio-economic conditions. These remittances are an important source of income for many families in under developed nations and regions, and they can significantly improve recipients' living standards and overall well-being. Families who receive remittances frequently use this money to meet vital needs such as food, healthcare, education, housing, and other necessities. People migrate from their own countries to other nations in search of better jobs, living conditions, and salaries. These expatriates contribute to a nation's economic growth by sending remittances. The country's per capita income and overall GDP both rise as remittances do. To strengthen the country's economic foundation, remittances should be used for productive rather than consumption purposes (Golder et al., 2022). Economic growth can be sustained by improving financial development and expanding private-sector investments, which ultimately benefit the public sector (Hasan et al., 2015). But in most developing countries, like Bangladesh, remittances are not used productively. Shrestha (2017) shows that raising remittances increases spending on food, education, and non-durables. Acharya (2017) found that households spend more remittances on health and education. Kumar et al (2018) show that Bangladesh migrants send money home for a variety of reasons, including altruism, loan payback, and exchange motives. Just 50.01 percent of remittances are used for food consumption, and only a small percentage of households use them for investment objectives such as businesses, real estate, savings, and other activities that could create more employment opportunities. Remittances also have a negative effect, as the transfer of remittances to the recipient countries entails repaying those countries for the brain drain caused by immigration (Odugbesan et al., 2021).

In 2020, Bangladesh had 7.40 million migrants living overseas (McAuliffe, 2022). Bangladesh has received the seventh-largest amount of remittances from migrants, and the sixth-largest in migrants' countries of origin, according to the World Bank (2022). The nation ranked eighth among the world's top remittance-receiving countries.

There are about 1 crore 25 lakh foreign workers worldwide, especially in the Middle East. These Bangladeshis are primarily in Saudi Arabia. There are around 1.2 million of them.

In addition, foreign nationals work in several nations, including South Africa, the United Arab Emirates, Kuwait, Qatar, Oman, and Jordan. In 2022, over 11.35 lakh Bangladeshis migrated to other countries, the biggest number in the country's history. The majority of the 11.35 lakh workers went to Saudi Arabia, accounting for 612,418 of the total outgoing migrants from Bangladesh.

According to the Bureau of Manpower, Employment and Training (BMET) data, a total of 5,280,960 workers have gone to Saudi Arabia since 1976. The second- and third-most-popular destinations were Oman and the United Arab Emirates, which attracted 179,612 and 101,775 Bangladeshi migrant workers, respectively. Last year, Singapore, Malaysia, Qatar, and Kuwait were among the top seven employers of Bangladeshi employees. According to BMET data, 64,383 workers went to Singapore, 50,090 to Malaysia, 24,447 to Qatar, and 20,422 to Kuwait. International migrants sent $548 billion in remittances to their home countries in 2019, far exceeding the overall government development assistance of $152 billion that year (World Bank, 2021). The amount of remittances sent by expatriates was 2.37 million dollars in the 1970s, and it climbed to 195 million dollars in 2000. At the moment, it has risen to $2478 million. Remittances contribute over 6% of GDP. Remittances have also greatly increased the nation's foreign exchange reserves.

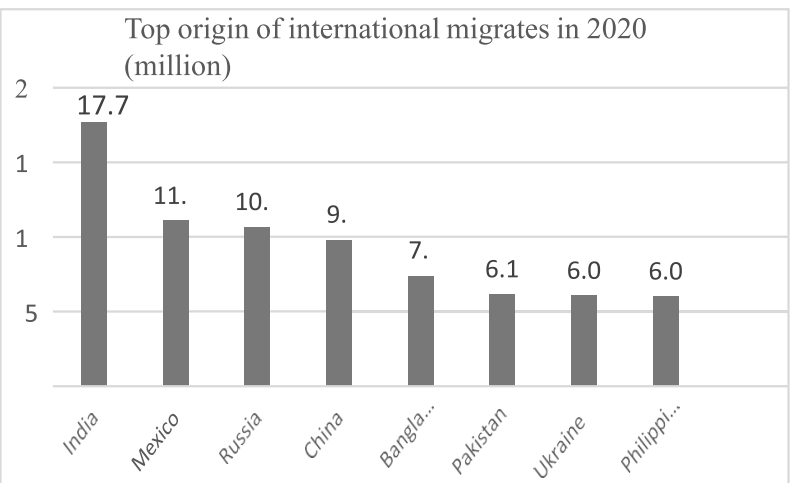

Figure 1.1 Number of Migrants in 2020
Source: IOM

Figure 1.1 shows Bangladesh ranked 5th in global labor supply in 2020. Almost 7.4 million labor supply from Bangladesh in 2020.

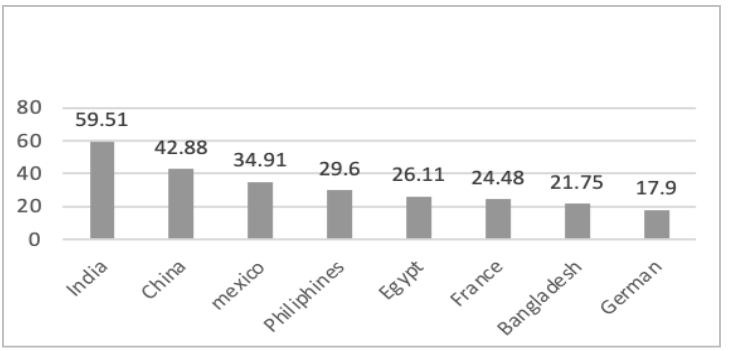

Figure 1.2 World's Top Remittance Recipients in 2020 (billion)
Source: World Bank

Figure 1. 2 shows that Bangladesh ranked 7th among the world's top remittance recipients in 2020. Bangladesh received 21.75 billion dollars in the year of 2020. This remittance accounted for 6.6% of the economy's GDP this year.

The contribution of expatriates to the economy is the second-highest after ready-made clothing, which is significantly improving the national economy. We can infer from the explanation above that remittances are the most important part of Bangladesh's economy. Additionally, based on the above information, we acknowledge that a large number of Bangladeshis leave the country each year in search of better living conditions and self-employment opportunities. The bulk of these migrants are unskilled laborers who send remittances, bolstering the nation's economy. If these foreign workers are relocated overseas with the necessary skills and abilities, they will have a better chance of finding higher-paying jobs, and the country's economy will be strong. Besides, every year, remittance recipient families receive a large amount of income from expatriates, but they have no money left at the end of the month for saving or investment because of unhealthily high expenditures. This is not a good practice for individual development or the nation's economy.

However, Comilla's economy, which is mostly based on agriculture, has thrived via commerce and cottage businesses, particularly the 'Khadi' cloth. In order to promote regional economic growth, the "Bangladesh Export Processing Zone Authority" developed the "Comilla Export Processing Zone" in the Comilla Airport area in 2000. It is a vital trading and commercial center, as well as a center for agricultural trade and commerce. The city's advantageous position, close to Chittagong Port and Dhaka, and also close to the east by the Indian state of Tripura, contributes to its economic importance. Because of this regional advantage, they have many opportunities to invest their remittances. For this reason, in Comilla, there is great potential for the recipient family to utilize those sectors by investing through remittances.

At last, the study aims to find out how recipients' family utilize their money. The study also aims to determine how remittances contribute to changing households' socio-economic status. Additionally, this study aims to investigate how remittances affect various aspects of well-being, including income, access to healthcare, education, and housing. Further, this study examines the factors that influence migrants to send more remittances to their home country. Furthermore, this study shall investigate how remittances contribute to the establishment of small enterprises, job creation, and local economic growth.

1. 2 Objective of the Study

The main objective of the study is to investigate how the recipient family utilizes their remittances. Other objectives are:

a) to analyze the changes in the socio-economic conditions of the household;
b) to identify factors that influence remittance inflow;
c) to find out the relationship between Remittances and Entrepreneurship.

2. 1 Literature Review of International Aspects

Abdullah et al. (2021) discovered that remittances greatly improved households' socioeconomic status. Households primarily use remittances to start new enterprises or expand current ones. Similarly, remittances are spent on debt repayment, house development, and maintenance. Similarly, remittances were used to improve family livelihood, health, and children's education. Furthermore, financial standing increased social status by enabling the ownership of vehicles and participation in social activities.

Ajide and Osinubi (2022) showed that foreign aid and remittances play a beneficial role in boosting entrepreneurial growth in Africa. A solid institutional environment is critical for fostering entrepreneurial success. These conclusions are not affected by other estimations.

Murakami (2020) found that, over one year, remittance inflows decreased by 14-20%, while household spending per capita decreased by 1-2%, including food expenditure, which decreased by 2-3%.

John (2020) finds that total remittance distribution should always be supported by a predictable, sound, and proportionate regulatory framework to encourage the participation of reputable international financial organizations through risk management practices and good governance.

Perera and Wijeratne (2017) found that remittances have no appreciable effect on the productivity of rural primary education, using a two-sample t-test to compare primary education levels between migrant and non-migrant families.

Javaid (2017) showed a favorable link among remittances, consumption, and

investment. The study also revealed that household consumer and investment behavior was beneficial.

Latif and Ashfaq (2013) showed that the households of the migrants who had left behind used the majority of the remittance on household consumption, home construction or improvement, the purchase of luxuries, etc., while only a small amount of the remittances was used in productive investments (like agricultural land, livestock, etc.

Dahal (2014) found that increasing remittance inflows in Nepal are positively associated with financial development and human capital accumulation, but negatively associated with international trade. In terms of two productivity characteristics - entrepreneurship and manufacturing - that are possibly connected with remittance inflows, it finds a positive correlation with entrepreneurship, but a negative association with manufacturing.

2.2 Literature Review of Bangladesh Aspects

Akhter et al. (2022) find that a household's income before migration, expatriates' education, household head non-land asset value, and age of the migrant member are significant factors of internal migration remittances. Additionally, these members' education programs for migrants encourage them to wire money to family members they have left behind. The study found that domestic remittances have a favorable effect on the welfare of Bangladeshi farm households. Ahmed et al. (2023) show an increase in remittance inflows into Bangladesh; the probability of children aged 6 to 18 dropping out of school is projected to decrease. Aside from the positive impacts.

Golder et al. (2022) find both positive and negative trends in financial development and that remittances enhance Bangladesh's economic development. Furthermore, to build the country's economic base, remittances should be used for productive purposes rather than solely for consumption.

Kumar (2019) reveals that the incidence, depth, and severity of poverty among remittance-receiving households are significantly lower than among remittance-non-receiving households. According to the study's empirical findings, around 6% of remittance recipient families are poor, compared to 48% of non-receiver households.

Kumar et al. (2018) find that household size, education, skills, years spent abroad, and income significantly affect Bangladesh's overseas remittances. This shows that migrants send money home for a variety of reasons, including altruism, loan payback, and exchange motives. The survey also reveals that just 50.01 percent of remittances are used for food consumption.

Kohinoor Aktar (2021). Remittances significantly improved the social and

economic conditions of expatriate households. The majority of expatriates are low-skilled or semi-skilled, and this survey also found that selling or mortgaging land, obtaining loans from NGOs, banks, relatives, or the informal sector are the main sources of funding for migration expenses.

Ahmed et al. (2018) found that the entry of overseas remittances had a favorable and significant impact on housing conditions, the availability of drinking water and sanitary facilities, household accessories, household education and health status, household financial status, and household spending. According to the findings, international remittances have a significant and beneficial impact on household well-being.

Kumar et al. (2020) show that foreign remittances improve household welfare but have no effect on women's empowerment in the studied area. This chapter also discovers that receiving international remittances can boost a household's welfare by Tk. 3167.49. As a result, this chapter advocates measures to encourage higher remittance inflows and their proper use for economic purposes.

Islam et al. (2021) show that migrants have contributed millions of dollars to improve household status, including housing, education, and healthcare facilities and services. Eliminating poverty has already benefited their families and society.

Wadood et al. (2016) discovered that while women's empowerment in the study area is unaffected by overseas remittances, household welfare does improve. The study also finds that a household's welfare may increase by Tk. 3167.49 if it receives international remittances. Therefore, this chapter calls for policies that will encourage greater remittance inflows and ensure their productive use.

2. 3 Research Gap

There are many studies demonstrating that remittances raise household welfare and examining the reasons for migration in the Comilla region, but little is known about how households use their remittances and the relationship between remittances and entrepreneurship. Besides, it is not clear what factor affects remittance inflow.

3. 1 Study Area and Procedure to Select Sampling

The Comilla district of Bangladesh has been chosen as the research area. The majority of residents leave the Comilla district each year in search of better economic opportunities than they can find elsewhere. Due to most residents leaving the Comilla district. So, Comilla is considered the research area.

This study has used a multi-stage random sampling technique to choose sample households. There are 16 police stations in the Comilla district, and

three upazilas (Chaddogram, Sadar Dakkhin, and Burichang) were selected from the district using a simple random sampling method. Then, two unions are randomly chosen from each police station. One village from each union is then randomly selected for the next step. Finally, 20 houses are randomly selected from each community using a random sampling method. So, the study's sample size is 120.

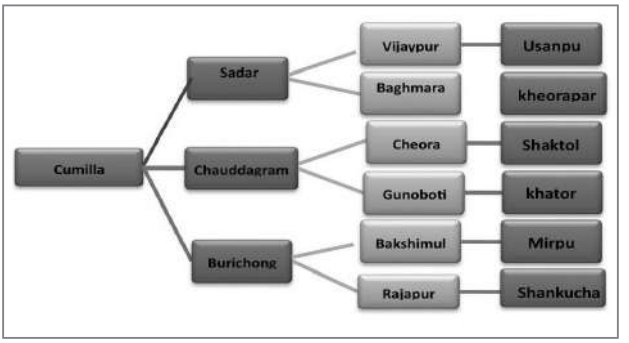

Figure 3.1 Way of selecting data by location name

This study collected data through face-to-face interviews using a structured questionnaire from 120 respondents from August to September 2023. Furthermore, this study uses SPSS-21 and Excel to analyze data using descriptive statistics, the Wilcoxon signed-rank test, and OLS regression.

3. 2 Model Specification

As remittances affect the Bangladesh economy in many ways, it is necessary to identify the significant factors influencing international remittances. In doing so, the study secondly applies a multiple regression model. Because the dependent variable is continuous, the study employs OLS to determine the causal relationship between the total amount of remittances transmitted each year and the set of explanatory variables, following Goschin and Roman (2012), Havolli (2009), Unan (2009), and Kumar (2018). Equation 1 states the relationship as follows:

$$\text{Remittance Inflow} = ax_2 + u_i \cdots\cdots\cdots\cdots (1)$$

Where Remittance Inflow represents the total amount of remittance transmitted per year, and x is a collection of explanatory factors that influence the total amount of remittance transferred per year. As a result, the following model is specified for multiple regression:

$$\text{Remittance inflow} = a_0 + a_1 \text{ age} + a_2 \text{ household size} + a_3 \text{ education qualities} + a_4 \text{ training} + a_5 \text{ earnings} + a_6 \text{ years of abroad} + u_i \cdots\cdots\cdots\cdots (2)$$

Where, Remit inflow is the total amount of remittance transmitted each year,

a1....a7 are estimated parameters, and 'ui' is the stochastic disturbance term. The following table explains the explanatory variables used in the preceding model:

Table 3. 1 Hypothesized Explanatory Variables and Expected Outcomes

Variables	Description	Expected sign	Reasons
X1	Age (years)	+	A higher age level tends to send more money.
X2	Household Size	+	A large household needsmore money, which induce send more money
X3	Education qualities	+	More education helps them earn more money and induces them to send more remittances.
X4	Training (1 = get training, 2 = do not gettraining)	+	Training helps them earn more money and induces them to send more remittances.
X5	Earnings (money)	+	More earnings help to Send more money.
X6	years of abroad(years)	+	More experience helps earn more money, which in turn induces more remittances.

4.1 Descriptive Analysis

The socio-economic conditions and demographic profile have been analyzed in this chapter, which provides an overall picture of the respondent. The demographic profile includes age, gender, educational qualifications, marital status, etc., and is analyzed using bar graphs and pie charts.

4. 1. 1 Age of the Respondent

Age is a fundamental demographic characteristic that is important in many disciplines of study.

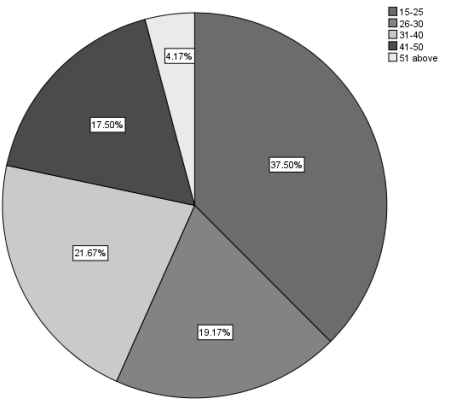

Figure 4. 1 Age of the Respondent

This study shows that among 120 respondents, the majority of workers are aged 15-25, accounting for 37.50 percent. The second-highest worker's age range is 31-40

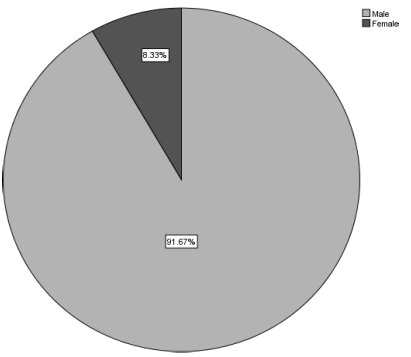

Figure 4. 2 Gender of the Respondent

which is 21.6 percent. Further, 19.1 percent were in the 25-30 age group, 1.50 percent in the 41-50 age group, and 4.17 percent in the 51+ age group. 4.1.2 Gender of the respondent: In the case of the foreign worker workforce, it may vary by gender because of social and safety problems.

The study shows that the majority of workers are male (91.67% of the 120 respondents), whereas female workers constitute only 8.33%. This shows that female workers do not feel safe working abroad or feel better in their home country.

4. 1. 2 Education Qualities of the Respondent

A literate worker can be more productive, helping them earn more income than an illiterate worker.

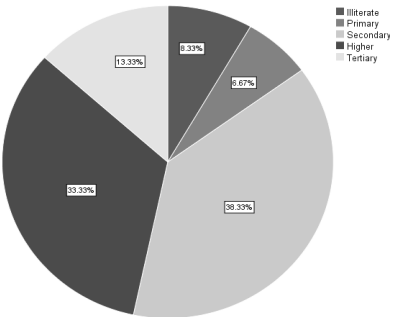

Figure 4.3 Education Qualities of the Respondent

Figure 4.3 *shows* that the majority of migrants have completed secondary education, with 38.33 percent of 120 respondents having completed secondary education. It also shows that 33.33 percent of expatriates completed higher education, 13.33 percent completed tertiary education, 6.67 percent completed primary education, and only 8.33 percent were illiterate. The study found that after completing their studies, they face job crises in their home country, which is why they prefer to work abroad.4.1.4 Technical training from the institution of migrant:

Training is the most important factor for migrant workers, as it helps them find jobs more easily and earn higher incomes. The lack of skills among migrant workers means they do not survive as well as they expected before migration.

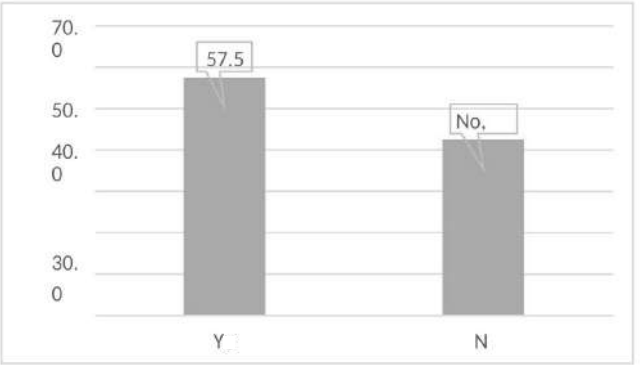

Figure 4.4 Technical Training From The Institution of Migrant

The bar graph shows the percentage of trained and untrained migrants. From this chart, we see that most of them are untrained. About 57.50 percent is

untrained, whereas 42.50 percent is untrained. It reveals that migrants were not interested in preparing for work abroad before migration.

4. 1. 3 Migrate Country of the Respondent

Most people choose a country to migrate to based on their neighbors' previous migration experiences.

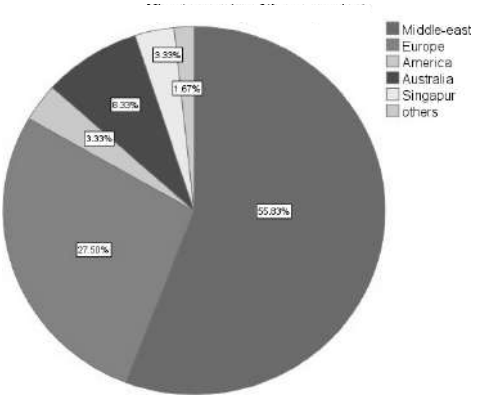

FIgure 4.5 Migrate Country of the Respondent

The study finds that most people migrate to the Middle Eastern country. Around 67.5 percent migrate to Middle Eastern countries, where 15.8 percent migrate to Europe, 8.3 percent to Australia, 3.3 percent to America and Singapore, and only 2 percent to other countries. The table shows that most people tend to migrate to Middle Eastern countries.

4. 1. 4 Monthly Income of the Respondent

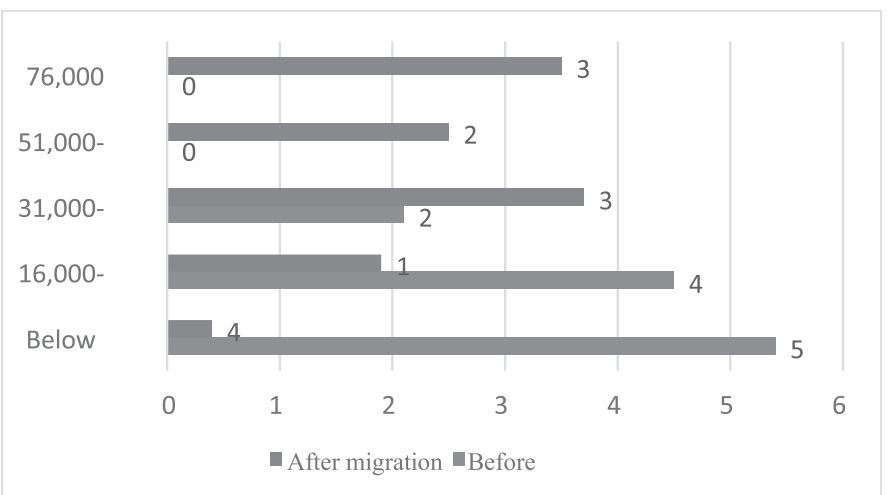

Figure 4.6 Range of Monthly Income by Migrants Before nd After Migration

Figure 4. 6 shows the range of monthly income by migrant's household before migration and after migration. From the figure, we can say that after migration, the income has significantly increased. Before migration, 54 migrants had an income below 15,000; after migration, only 4 had an income below 10,000. Again, before migration, 45 migrants had incomes between 16,000 and 30,000, whereas after migration, 19 migrants had incomes in this range. Before migration, 21 migrants had incomes between 31,000 and 50,000; after migration, 37 migrants had incomes in this range. Again, before migration, none of the migrants had an income between 51,000 and 75,000, and after migration, 25 migrants had an income in this range. The figure shows that before migration, none of the migrants had an income above 76,000; after migration, 35 did.

The table below shows the changing pattern of monthly income before and after migration by the migrant households. From the table, it is seen that after migration, the incomes of 4 migrant households are ranked negatively. That suggests that income was higher before migration than after. Again, the income of 104 migrant households increases after migration, and only 12 households' income remains the same as before migration.

Table 4.1 Changing pattern of Monthly Income

Income before and after migration	Rank	N	p-value
Monthly income of the respondent after migration- Monthly income of the respondent before migration	Negative	4	.000
	Positive Ranks	104	
	Ties	12	
	Total	120	

Data source: Author's calculation using 'IBM SPSS Statistics 21.
Note: *shows a significant level.

4. 1. 5 Money Sending Method of the Respondent

The method of money transfer is important for the national economy. If remittance inflows occur legally, they might expand the economy; otherwise, they might harm it, as with Hundi, which encourages money laundering.

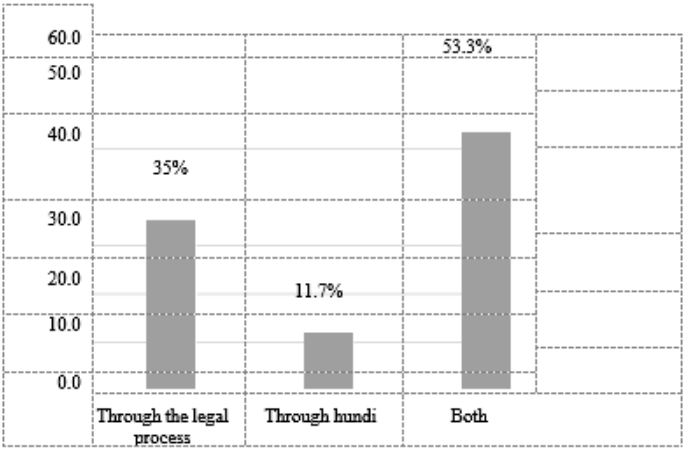

Figure 4.7 Money Sending Method Of The Respondent

This figure shows that 53.33 percent of migrant people choose both legal and illegal processes to send their remittance in Bangladesh, where only 35 percent choose the legal process and 11.67 percent choose hundi. It shows that most migrants are indifferent to the method of remittance sending. They choose methods based on their needs, without considering other factors.

4. 1. 6 Saving Tendency of the Respondent

Migrant households try to save some money for uncertain future conditions and a better life. Sometimes they are not interested in investing this money due to a lack of knowledge or a reluctance to take risks.

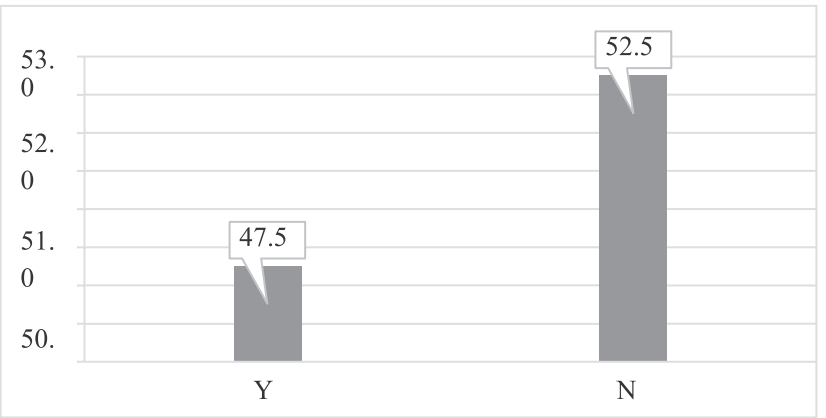

Figure 4.8 Saving Tendency Of The Respondent.

Figure 4.8 shows that 52.50 percent of migrants tend to save remittances, whereas 47.50 percent do not, which is lower. It shows people spend more money than they save for future needs.

4. 1. 7 Increase Entrepreneurship

Entrepreneurship is essential for economic growth and innovation, as it creates jobs, fosters competition, and drives productivity. Ultimately, it contributes to a thriving and dynamic economy. Recipient households receive a large sum of money at the beginning of the month, which they can use to start a new business.

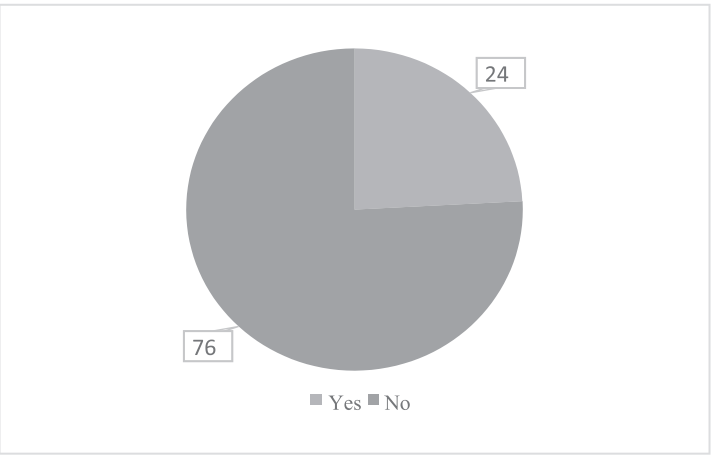

Figure 4.9 Entrepreneurship Tendency of The Recipient Family

The study shows that 76 percent of recipient households are not interested in engaging them to create a new business, whereas only 24 percent engage them to run the new business. It reveals that a few recipient households are interested in starting a new business.

4. 1. 8 Problem of Proper Utilization of Remittance

Proper utilization of remittances is significant for both the migrant household and the home country. However, it is still difficult for developing countries like Bangladesh to ensure proper utilization.

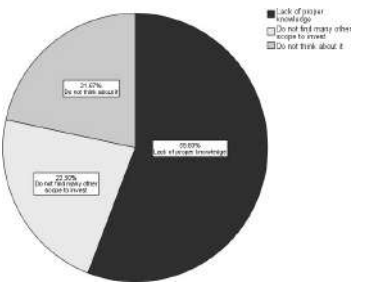

Figure 4.10 Problem of Proper Utilization of Remittance

Figure 4.10 shows different types of remittance-related migration gaps for the proper utilization of remittances. Among 120 respondents, 55.83 percent

lack proper knowledge, 22.50 percent do not find many other investment opportunities, and 21.67 percent do not consider proper utilization of remittances. It shows that migrant people lack knowledge about utilization and investment.

4. 1. 9 Satisfaction with the living status of the respondent family

Remittance improves the household's well-being. It helps alleviate poverty and improves the socio-economic conditions of the recipient family. So, they might be satisfied with their livelihood. satisfaction with the living status of the respondent's family:

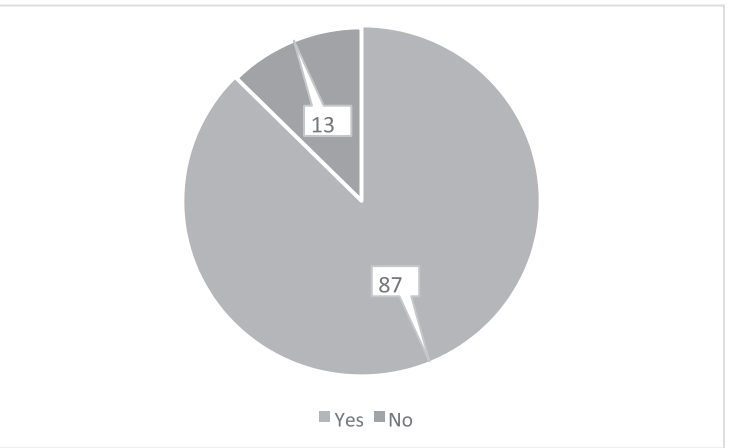

Figure 4.11 Satisfaction with The Living Status of The Respondent Family

Figure 4.11 shows that about 87.50 percent of migrants are satisfied with their living conditions, with 120 respondents, whereas only 12.50 percent are not satisfied. A study reveals that remittances significantly improve the satisfaction with living conditions for migrant people.

The household accessories are improved

Remittances may help the household improve its standard of living and access other facilities. Table 5 shows that 80.8% of recipient households improved their water facilities, whereas only 5.8% were unable to do so, and 13.3% were neutral, with their facilities remaining the same before and after migration. Electricity facilities are also increasing rapidly. From Table 5, we see that electricity facilities improved in about 78.7 percent of households, whereas they did not improve in 11.3 percent, and 10 percent remained the same before and after migration. Further, we see that gas facilities also improved significantly. About 66.7 percent of households improved their Gas facilities, 18.3 percent were unable to do so, and 15 percent were indifferent before and after migration. We also see that after migration, 80.8 percent of people improved furniture facilities, 86.7 percent of households improved their mobile phone

facilities, 55 percent of households improved computer facilities, 8.7 percent of households improved air condition facilities, 32.5 percent of households improved Motorcycle facilities, and only 3 percent of households improved car facilities. Besides it also seen that after migration 9.2 percent of households were not able to improve furniture facilities, 5.8 percent of households were not able to improve mobile phone facilities, 35.8 percent of households were not able to improve computer facilities, 89 percent of households did not able to improve air condition facilities, 55 percent households did not able to improve Motorcycle facilities and 97 percent households improved car facilities. Furthermore, the data table shows that 10 percent of the households became indifferent to furniture facilities, 7.5 percent of households became indifferent to mobile phone facilities, 9.2 percent of households became indifferent to computer facilities, 3.3 percent of households became indifferent to air conditioning facilities, 12.5 percent of households became indifferent to motorcycle facilities, and no household became indifferent to car facilities. It shows that, in the case of necessity, facilities remittance can help improve rapidly.

Table 4.2 Access to Household Accessories has Improved

Household accessories	Agree (percentage)	Disagree (percentage)	Neutral (percentage)
Water facilities	80.8%	5.8%	13.3%
Electricity facilities	78.7%	11.3%	10%
Gas facilities	66.7%	18.3%	15%
Furniture facilities	80.8%	9.2%	10%
Mobile phone facilities	86.7%	5.8%	7.5%
Computer facilities	55%	35.8%	9.2%
Air-condition facilities	8.7%	89%	3.3%
Motorcycle facilities	32.5%	55%	12.5%
Car facilities	3%	97%	-

Data Source: Author's calculation using 'IBM SPSS Statistics-21.

4.2 Empirical Analysis

4. 2. 1 Monthly Expenditure of the Household

Monthly expenditure may change after migration. Households increase expenditure according to their needs through remittance.

Table 4. 3 Test of Significance In Expenditure Portfolio by the Migrant Household Before and After Migration using the Wilcoxon Signed-Rank Test

Monthly Expenditure Before and After Migration	Rank	N	P-valume
Monthly expenditure on food after migration–Monthly expenditure on food before migration	Negative Ranks	9	.000*
	Positive Ranks	77	
	Ties	40	
	Total	120	
Monthly expenditure on education after migration–Monthly expenditure on education before migration	Negative Ranks	19	.011*
	Positive Ranks	53	
	Ties	48	
	Total	120	
Monthly expenditure on cloth after migration–Monthly expenditure on cloth before migration	Negative Ranks	25	.016*
	Positive Ranks	50	
	Ties	45	
	Total	120	
Monthly expenditure on housing after migration-Monthly expenditure on housing before migration	Negative Ranks	21	.000*
	Positive Ranks	59	
	Ties	40	
	Total	120	
Monthly expenditure on Donation after migration -Monthly expenditure on Donation before migration	Negative Ranks	4	.000*
	Positive Ranks	49	
	Ties	67	
	Total	120	
Monthly expenditure on loan payment after migration–Monthly expenditure on loan payment before migration	Negative Ranks	10	.000*
	Positive Ranks	46	
	Ties	94	
	Total	120	

Data Source: Author's calculation using 'IBM SPSS Statistics 21.
Note: * shows a significant level.

Table 6 depicts the changing pattern of expenditure before and after migration. It also shows whether this change is significant using the Wilcoxon signed-rank test. The data table shows that, after migration, 9 migrant households' food expenditure decreased, whereas 71 households' food expenditure increased, which is 64.17%, and the rest of the 40 migrant households' food expenditure remained the same as before migration, and this change is significant at 1% significance level, as the p-value is 0.000*. After migration, 19 migrant households' expenditure on education is negatively ranked, and 53 households' expenditure is positively ranked, accounting for 44.17%, whereas 48 households remain the same as before migration; this change is statistically significant, with a p-value of 0.011*. Again, expenditure on cloth has increased after the migration, as the table shows. After migration, 25 households' expenditure is reduced, but 50 households' expenditure is increased by 41.17%, whereas 45 households' expenditure amounts remain the same as before. This changing pattern of business investment is statistically significant, with a p-value of 0.016*. Housing is the most common expenditure sector for migrant households. The data table shows that 21 households are negatively ranked in housing expenditure, 59 migrant households are positively ranked, and 40 households' expenditure remains the same as before migration. This change is significant at the 1% significance level, with a p-value of 0.000*. The number of households whose expenditure on donations has also increased after migration. Only 4 households' bank deposits are decreased after migration, whereas 49 households' expenditure is increased, and 67 households' expenditure remains the same as before migration, and this change is significant at 1% significant level, 0.000*. It is seen that after migration, 16 migrant households' expenditure on loan payments increased, 10 households' expenditure decreased, and 96 households' housing expenditure remained the same as before migration.

4. 2. 2 Monthly Investment of Household

Investment may rise after a household's migration. It may or may not invest properly. Investment patterns are important for households and countries alike.

Table 4.4 Test of significance in investment portfolio by the migrant household before and after migration using the Wilcoxon signed-rank test.

Investment before and after migration	Rank	N	p-value
Monthly investment on agriculture land after migration- Monthly investment on agriculture land before migration	Negative Ranks	14	.000*
	Positive Ranks	41	
	Ties	65	
	Total	120	
Monthly investment on livestock after migration-Monthly investment on livestock before migration	Negative Ranks	7	.000*
	Positive Ranks	36	
	Ties	77	
	Total	120	
Monthly investment on business after migration-Monthly investment on business before migration	Negative Ranks	15	.000*
	Positive Ranks	31	
	Ties	74	
	Total	120	
Monthly investment in goldafter migration- Monthly investment in gold before migration	Negative Ranks	17	.000*
	Positive Ranks	46	
	Ties	57	
	Total	120	
Monthly investment on bank deposit after migration- Monthly investment on bank deposit before migration	Negative Ranks	14	.000*
	Positive Ranks	55	
	Ties	54	
	Total	120	
Monthly investment on housing after migration-Monthly investment on housing before migration	Negative Ranks	10	.000*
	Positive Ranks	52	
	Ties	58	
	Total	120	
Monthly investment in the market after migration- Monthly investment in the capital market before migration	Negative Ranks	0	.180
	Positive Ranks	2	
	Ties	118	
	Total	120	

Data source: Author's calculation using 'IBM SPSS Statistics 21.
Note: * shows a significant level.

Table 4.3 depicts the changing pattern of investment before and after migration. It also shows whether this change is significant using the Wilcoxon signed-rank test. The data table shows that, after migration, 14 migrant households' agricultural land investment decreased, whereas 41 households' investment increased, which is 34.17%, and the rest of the 65 migrant households' investment remained the same as before migration, and this change is significant at 1% significance level, as the p-value is 0.000*. After migration, 7 migrant households' livestock investment is negatively ranked, and 36 households' investment is positively ranked, representing 30%; 77 households remain the same as before migration, and this change is statistically significant (p-value = 0.000*). Again, investment in business is increased after the migration, as the table shows. After the migration, 31 households' business investment is reduced, whereas 15 households' investment increases by 12.5%. The investment amounts for 74 households remain the same as before, and this changing pattern of business investment is statistically significant (p-value = 0.000*). Jewelry is the most common investment sector for migrant households. The data table shows that 17 households are negatively ranked in jewelry investment, 46 migrant households are positively ranked, and 57 households' investment remains the same as before migration. This change is significant at the 1% significance level. The number of households holding bank deposits has also increased after migration. Only 14 households' bank deposits decreased after migration, whereas 55 households' bank deposits increased, and 51 households' bank deposits remained the same as before migration. This change is significant at the 1% level (0.000*). It is seen that after migration, 52 migrant households' investment in housing (flat or plot) increased, 10 households' investment decreased, and 58 households' housing (flat or plot) remained the same as before migration. Almost all migrant households are not interested in capital market investments; only 2 households invest in this sector after migration, and this change is not significant, as the p-value is 180.

4. 2. 3 Determination of Remittance Inflow

Remittance inflow might be influenced by many other factors that induce migrant workers to send remittances to their home country. The OLS regression is used to analyze those factors influencing migrants' decision to send remittances to their home country. The model can be written.

$$\begin{aligned} &Remittance\ inflow \\ &\quad = 0.802 + 0.057\ age + 0.404^{*}\ household\ size \\ &\quad - 0.051\ education\ qualities - 0.321^{**}\ technical\ training \\ &\quad + 0.558^{*}\ monthly\ income + 0.191^{***}\ years\ in\ abroad \end{aligned}$$

Here, $R^2 = 0.517$

Note that *, **, and *** indicate the 1%, 5%, and 10% levels of significance, respectively.

There may be heteroscedasticity in the data because the study is based on primary data. The study also computes VIFs to test for multicollinearity, and the VIF scores suggest no multicollinearity among the explanatory variables. The Durbin-Watson test demonstrates that there is no autocorrelation in the model. According to the study, age, household size, training, years spent abroad, and income have a role. Although all variables reflect the predicted sign. In this model, the dependent variable is remittance inflow. An interpretation of this given model is given below.

Age: this variable had a positive effect on remittance inflow. A 1-year increase in age is associated with a 0.057 increase in remittance inflows. This shows that if workers' ages rise, remittance inflows can increase. But it has no significant impact.

Household size: this variable had a positive, significant impact on remittance inflows. For each additional household, remittance inflows increase by 0.404 units.

Education quality negatively affected remittance inflows. A 1-unit increase in education quality reduces remittance inflows by 0.051 units. But it has no significant impact on remittance inflow.

Technical training: this variable also had a negative effect and was significant on remittance inflow. If technical training rises by 1 unit, remittance inflows decline by 0.321 units.

Monthly income: this variable had a positive and significant impact on remittance inflow. If one unit of Monthly income increases, then the remittance inflow increases by 0.558 units.

Years abroad: This variable had a positive and significant impact on remittance inflow. If one unit of years abroad increases, then the remittance inflow increases by 0.191 units.

In summary, the study found that household size, monthly income, and years abroad increase migrants' remittance flows to their home country. Technical training does not increase migrants' remittance sending. However, it tends to decrease remittance inflow.

Conclusion

The study investigates remittances and their utilization in three Upazilas in Comilla district. The study has especially focused on the socio-economic condition of households in this area. Comilla district ranks 1st in Bangladesh for the highest number of expatriates, with more migrants than from any other district. Most migrants are male, and expatriates are mostly young people. It is

also seen that almost 38.33% of expatriates complete secondary education, and 33.33% complete higher education. So, most of the expatriates are educated. But they are unskilled. 58.50% of migrants do not receive any training before migration, which makes it difficult for them to get better jobs. They migrate to other countries because they face job crises or believe they can earn more in a higher-income country. For migration, most expatriates choose the Middle East, specifically countries in the Comilla district. From this district, 67.50% of expertise migrated to Middle Eastern countries. The government should train and encourage people to choose countries for migration based on their expectations and migrate to higher-income countries. It has been seen that almost 86.67% can able to raise their income level after migration, which is the most important reason for migration. The most important thing is that people earn higher incomes after migration, but they do not use them properly. The main reasons for this problem are that 55.83% lack adequate knowledge, 22.50% do not find many other investment options for their remittances, and 21.67% do not think about it. This problem is not beneficial to households or the country's economy. But it is a great opportunity to boost the economy. It is seen that households use most of their remittance for expenditure purposes. After migration, food expenditure increased by 64.17%, education expenditure by 44.17%, clothing expenditure by 41.17%, and so on, but investment did not rise proportionately with expenditure. This study shows that agricultural investment increased by 34.17%, Livestock investment by 30%, and business investment by only 25%. It reveals that only 24% of recipient households engage them to run the new business.

The study finds that this remittance inflow is influenced by many other factors, like family size, age, income level, and years abroad, which have positive and significant effects. These factors led expatriates to send more money back to their home countries. However, this study shows that most households can improve their socio-economic conditions. Necessary utilities that are essential for the livelihood improvement of the recipient family. It is seen that water facilities increased by 80.8%, electricity facilities by 78.7%, gas facilities by 66.67%, furniture facilities by 80.8%, and mobile phone facilities by 86.7%. The study shows that remittances help recipient households improve their family's well-being. These remittances are influenced by many other factors. The study shows that household size, monthly income, and years abroad have a positive and significant impact on remittance inflows. Lastly, the study shows that remittances reach Bangladesh both legally and illegally, which harms the economy. 65% expertise in the illegal remittance process. It also encourages money laundering, which directly affects the national economy. The government should focus on this and make the process of sending money to the home country easier, so that experts can send money legally without hassle. It also encourages experts to send money legally and makes it more beneficial for experts.

Overall, we see that remittances benefit individual households and the home country. It may be more beneficial for both if the government and local authority take some initiative, especially regarding utilization, investment patterns, and remittance-sending methods. If an effective policy can be put in place in this case, migrants will benefit, as the country's economy will also benefit from this sector.

Recommendation

- Government should ensure practical-based education, so that they can do a better job in their home country as well as foreign countries.
- The government should encourage people and make the process easier so that they choose a higher-income country and do not choose a Middle Eastern country exclusively.
- The government should be concerned about people so that the recipient family does not make unnecessary expenditure of remittances, and help them to find a way so that they can invest remittances in a good way.
- The government should focus on methods of remittance and make the process of sending money to their home country easier so that experts can send money easily in a legal way and do not face any hassle when sending money to their home country. Also, encourage expatriates to send money legally and make it more beneficial for them.

Limitation

- The time is too limited to conduct the whole population. So, it is not possible to show the overall scenario of Comilla district.
- The study was conducted based on primary data, which requires more budget. The research was constrained by limited funding, which affected the scope of data collection and access to certain resources.
- The sample size in this study was relatively small, which may limit the generalizability of the findings to a broader population.

Suggestions for Future Research

Future studies on remittances in Bangladesh should examine longitudinal changes in remittance utilization, the impact of government policies, and the role of technology in enhancing remittances' impact on recipient households. This multidimensional approach will provide an extensive overview of how remittances might be used to promote long-term development.

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Causal Connectivity in Emerging Economies: Insights from Bangladesh's FDI, Financial Development, and Trade

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Abstract

Foreign Direct Investment (FDI) is considered to be a vital source of external finance for lower-middle-income countries, such as Bangladesh. Although the existing literature predominantly focuses on the causal relationship between FDI and economic growth, this study advances a discourse by examining the dynamic interdependencies among FDI, financial sector development, and trade openness within a cointegration and error-correction framework. Applying a Vector Error Correction Model (VECM) on data from 1972 to 2017, the analysis reveals a long-horizon relationship between the variables observed under the error correction mechanism, although no short-run causality is observed. The results show a positive association between the exchange rate and financial development, but a negative relationship between trade openness and FDI. These findings suggest that while a developed financial sector can enhance the benefits of FDI, trade openness alone may not be sufficient to attract FDI. The study offers valuable guidance for policymakers and investors by highlighting the strategic importance of macroeconomic factors in attracting FDI.

Keywords: *FDI · financial development · trade openness · VECM · Block Exogeneity*

JEL Classification: *F21 · G21 · P45*

1. Introduction

Bangladesh is regarded as one of the Next Eleven (N-11) economies, a classification introduced by Goldman Sachs to highlight countries with strong long-term growth prospects. This group comprises 11 nations: Bangladesh, Egypt, Indonesia, Iran, Mexico, Nigeria, Pakistan, the Philippines, South Korea, Turkey, and Vietnam (Energy Education, 2005). Over recent years, the country has posted notable economic progress, with several periods of solid single-digit GDP expansion. According to the World Bank, Bangladesh

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recorded a growth rate of 7.8% in 2019, marking one of its most significant economic performances in recent times (World Bank, 2026). Despite challenges, such as political instability, insufficient infrastructure, and energy shortages, the country has maintained a steady growth trajectory. However, the industrial sector remains underdeveloped, with limited specialization and a predominance of micro, small, and medium-sized enterprises (MSMEs), many of which lack access to credit, government support, and technical assistance.

Foreign Direct Investment (FDI) plays a crucial role in enhancing market efficiency, easing technology transfer, generating employment opportunities, and developing managerial capacity. In an increasingly competitive global economy, multinational corporations seek cost-effective production environments with accessible markets. Developing countries, such as Bangladesh, with relatively low labor and land costs, are attractive destinations for such investments.

Historically, Bangladesh's FDI inflows were minimal due to post-independence nationalization policies. Policy reforms during the 1980s, followed by the liberalization of key sectors such as telecommunications and energy in the 1990s, substantially increased foreign direct investment inflows. Despite these improvements, Bangladesh still lags behind its regional counterparts, such as India and Pakistan, in attracting foreign investment.

While several studies have examined the role of foreign direct investment (FDI) in Bangladesh's economic performance, most of this work has focused either on the direct FDI–growth relationship or on isolated macroeconomic variables, offering limited insight into the broader interaction among financial development, trade openness, and FDI. Existing research tends to analyze these factors separately, which leaves an important gap in understanding their combined long-run and short-run dynamics within a unified empirical framework. Moreover, although Bangladesh has undergone major structural and financial transformations over the past decades, relatively few studies apply advanced time-series techniques to evaluate how these changes shape the country's capacity to attract and benefit from FDI. The FDI–financial development–trade nexus thus remains underexplored, particularly with respect to causal direction and equilibrium adjustments specific to Bangladesh's economic context. Addressing this gap, the present study integrates FDI, financial development, trade openness, and exchange rate behavior into a comprehensive cointegration and error-correction model, providing new evidence on their long-run relationships and causal linkages. This approach offers a more complete understanding of how Bangladesh can strengthen its investment climate and economic integration.

2. Literature Review

Foreign Direct Investment (FDI) is widely recognized as a key driver of economic growth, particularly in developing economies. It contributes to increased total productivity, capital accumulation, and employment generation. Consequently, many countries actively pursue policies to attract FDI, aiming to harness its potential benefits for both host and home economies.

A substantial body of empirical research has investigated the nexus between foreign direct investment (FDI) and export performance. For instance, Athukorala & Menon (1995), Jongwanich & Kohpaiboon (2013), and Zhang & Felmingham (2001) emphasized the role of FDI in promoting exports in developing countries. However, the size and direction of this impact vary across nations. In many cases, the expected export-enhancing effects of FDI have not materialized due to limited technological advancement or weak absorptive capacities.

Balasubramanyam et al. (1996) demonstrated that foreign direct investment (FDI) positively influences economic growth across 46 countries during the period 1970–1985, with the effect particularly significant in economies implementing export-oriented trade policies. Conversely, countries with inward-looking trade strategies experienced limited or even adverse effects. Similar conclusions were drawn by Athukorala and Menon (1995), who highlighted the importance of trade regimes in shaping FDI outcomes.

Aitken et al. investigated the cross-sectoral impacts of FDI within the garment industry, observing that Korean multinational enterprises played a pivotal role in fostering the growth of local export-oriented firms. In China, (Hu & Khan, 1997) Attributed the country's rapid economic growth from 1952 to 1994 to market-driven reforms and the "open-door" policy, which significantly boosted FDI and trade.

(Kneller & Pisu, 2007), along with (Greenaway et al., 2002) Found that FDI can generate positive spillovers for domestic firms in similar industries, particularly in export-oriented sectors. However, contrasting evidence from Barrios et al. and Ruane and Sutherland (in the context of Spain and Ireland, respectively) suggests that such spillovers are not guaranteed and may depend on local conditions and firm capabilities.

Yeats highlighted that FDI has been particularly impactful in sectors involving complex manufacturing, such as electronics and engineering, with similar patterns seen in India.

The nexus between financial development and the capacity to harness the benefits of foreign direct investment (FDI) has long been a focal point of

scholarly inquiry. Alfaro et al. (2004) argue that well-developed financial markets are a critical prerequisite for optimizing the growth-enhancing effects of FDI, as they facilitate efficient capital allocation and strengthen absorptive capacity in host economies. They argued that in the absence of efficient financial institutions, the potential benefits of FDI, such as productivity gains and technology transfer, may not be fully realized. (Gmech, 2006) Further supporting this view, it suggests that capital market development eases entrepreneurial activity and the adoption of best-practice technologies.

From a theoretical standpoint, FDI is often analyzed through the lens of imperfect markets and asymmetric information.(Cho, 2003). (Eicher et al., 2012) have investigated the determinants of FDI inflows, including labor market conditions, market size, tax policies, and geographic proximity.

The exchange rate has appeared as a particularly contentious factor in determining FDI. While some studies(Dai, 2012; Froot & Stein, 1991; Kogut & Chang, 1996) report a direct association with currency movements between exchange rate appreciation and FDI inflows, others (Dees, 1998; Lily et al., 2014) Find a negative or insignificant effect. These discrepancies are often attributed to the dual role of exchange rates in influencing cost structures and investment motivations.

Moreover, (Combes et al., 2012; Jongwanich & Kohpaiboon, 2013) suggest that FDI inflows can themselves influence exchange rate movements by altering demand for the domestic currency. This bidirectional relationship complicates the analysis of the causal relationship between exchange rates and FDI.

Finally, the global financial crisis and subsequent tightening of external financial conditions have underscored the importance of financial development in sustaining FDI flows. The UNCTAD (2010, 2014) reports highlight that despite a surge in FDI between 2002 and 2015, inflows declined sharply in 2016–2017, partly due to constrained access to external capital. This underscores the need for robust domestic financial systems to support and attract sustainable FDI.

The paper is organized as follows: a brief introduction to Bangladesh's economy and FDI inflow is provided in Section 1, while selected studies on trade openness, FDI, and the relationship between exchange rate and financial development are reviewed in Section 2. The theoretical model is presented in Section 3. The data set and method are described in Section 4, and Section 5 presents the empirical results. Lastly, the discussion and conclusion are given in section 6.

3. Theoretical Foundation

This study employs a four-variable framework for analyzing the key factors influencing Foreign Direct Investment (FDI) in Bangladesh. The model hypothesizes that FDI is a function of trade openness (TO), exchange rate (ER), and financial development (FD), and is specified as follows:

$$FDI_t = f(TO_t, ER_t, FD_t)$$

Where FDI represents annual FDI inflow as a proportion of GDP, TO stands for trade openness as a proportion of $\frac{\text{Export+Import}}{\text{GDP}}$. ER represents the official exchange rate, and FD represents financial development. Financial development is measured by private credit (private), which is bank credits to the private sector as a share of GDP. All data were collected from the World Bank Data Bank to test the model. A total of 46 data points were collected from 1972 to 2017.

4. Estimation Techniques and Model Specification

Stationarity may occur if the order of integration is the same. The series are cointegrated, as all variables are stationary linear combinations, indicating a long-run relationship (Engle & Granger, 1987). The autoregressive distributed lag model is most widely used to check for cointegration. This test estimates the number of cointegration equations using two likelihood-ratio (LR) tests (Johansen & Juselius, 1990; Johansen, 1988). At the same time, trace statistics perform in the first and second tests based on the largest eigenvalue. The Cointegration test does not reveal the direction of the causal relationship, but it does indicate the presence of a causal relationship between the two series. The Vector Error Correction Model (VECM) is used to determine the causality relationship. The VECM offers advantages over Granger Causality tests, as it can detect both short-term and long-term dynamics among variables. The long-run cointegration relationship is obtained from the VECM. This result is used to examine the dynamic Granger causality (Engle & Granger, 1987).

The following VECM is applied.

$$\Delta FDI_t = \alpha_1 + \sum \beta_{1i} \Delta FDI_{t-i} + \sum \gamma_{1i} \Delta TO_{t-i} + \sum \gamma_{2i} \Delta ER_{t-i} + \sum \gamma_{3i} \Delta FD_{t-i} + ECT_{t-1} + u_{1t}$$

Where Δ is the difference operator, ECT is the error-correlation term. Johansen's maximum likelihood method is used to obtain the ECTs from the long-run cointegrating relationships, denoted as us (i = 1, 2, 3, ...). This refers to error terms that exhibit no serial correlation and maintain an average value of zero. The relationships between FDI, trade openness, exchange rates, and financial development are examined using Equation 1. Equation 1 illustrates that ECTt1, which is a lagged function, affects exchange rates, trade openness,

FDI, and financial development, or a combination of any two of these. Through the ECT, the ECM opened an additional channel for Granger causality. The statistical significance of the following tests can use to determine Granger Causality; (i) The t-test is applied to assess the significance of the lagged error-correction terms, (ii) a joint test assessing the significance of the combined lags of each explanatory variable $s\gamma(')$, with the aid of a joint F or Wald χ^2 test, (iii) a combined test of all the terms in (i) and (ii) using a joint F or Wald χ^2 test (i.e., considering each of the parenthesized terms independently; the $s\,\gamma 1(')$ in equation 1). The dependent variables are econometrically exogenous when the F, t, or Wald χ^2 test in the VECM is insignificant. (Masih & Masih, 1996).

The VECM helps to illustrate the relationship between variables and distinguish between short-run and long-run Granger causality. Suppose the variables are cointegrated and keep a long-run equilibrium. That changed in the dependent variable for the short run. FDI responds to the long-run relationship if cointegration errors drive it. Otherwise, it responds only to the short-run component of the stochastic process. Short-term causal relationships are identified using F-tests for the explanatory variables.

In contrast, the "t" test(s) are used to figure out the long-run causal relationship. Cointegrating relationships are used to derive the long-run relation by employing lagged numbers in the error-correction term. The significance of the error-correction term coefficient, often referred to as the speed of adjustment (ξ), serves as a key indicator for testing long-run causality. A significant ξ indicates that the long-run equilibrium has a direct influence on the dependent variable.

The error correction term and the lagged first differences of the endogenous variables are included in the ECM. EC records the degree of deviation from the long-run equilibrium relationships in the earlier period. The ECT coefficient represents the speed of adjustment and indicates the level of disequilibrium in the next period.

5. Empirical Results

5.1 Unit Root Test

The unit root test is the first step in assessing the stationarity of a dataset. The Augmented Dickey-Fuller (Dickey & Fuller, 1979) is used to test unit roots. The Dickey-Fuller test derives from the regression equation:

$$Y_t = \gamma_0 + \gamma_1 t + \delta Y_{t-1} + \epsilon_t \qquad -1 \leq \delta \leq 1 \tag{2}$$

Here, Yt follows a random walk with drift and a stochastic trend, while ϵ_t denotes a white noise error term assumed to be uncorrelated with other components. If δ=1, Yt is not stationary.

An alternative approach involves estimating the model as follows:

$$\Delta Y_t = \gamma_0 + \gamma_1 t + \varphi Y_{t-1} + \epsilon_t \quad (3)$$

φ=(δ−1), where Δ denotes the first-difference operator. The null hypothesis is φ = 0, which implies δ = 1 and the presence of a unit root, indicating non-stationarity. The ADF test addresses this by including lagged differences of Yt when error terms are correlated. Subsequently, the accompanying repetition assesses unit root testing:

$$\Delta Y_t = \gamma_0 + \gamma_1 t + \varphi Y_{t-1} + \alpha_i \sum_{j=1}^{q} \Delta Y_{t-j} + \mu_t \quad (4)$$

In equation (4), Y_t follows a random walk with a stochastic trend, while μt denotes a white noise error term. Δ represents the first-difference operator, and q is the number of lags in the dependent variable. Under the null hypothesis of a unit root, the coefficient of Y_{t-1} equals zero; rejecting this hypothesis indicates stationarity. It is not necessary to see the difference in the series to check for stationarity. This study employs unit root tests to assess stationarity in the log-transformed series and their first differences. The Augmented Dickey–Fuller (ADF) test is used to determine the integration properties of the variables. Although the narrative suggests all variables are I (1), Appendix Table 1 indicates that ER (exchange rate) and TO (trade openness) reject the unit-root null at level (p = 0.0160 and p = 0.0063), implying they are I(0) with trend and intercept. In contrast, FDI and FD do not appear stationary at the level but are stationary in first differences, i.e., I (1). So FDI and FD are treated as first differences in the VEC model to capture the VECM presumption. The next step involved using the Final Prediction Error (FPE), the sequential modified LR test statistic (LR), the Schwartz Information Criterion (SIC), the Akaike Information Criterion (AIC), and the Hannan-Quinn information criterion (HQ) to estimate the proper lag length. The number of lags in the dependent variable is four based on the Akaike Information Criterion (AIC). Table 2 holds the VAR results, which are given below:

Table 2. Lag Length Selection Criteria

VAR Lag Order Selection Criteria						
Lag	LogL	LR	FPE	AIC	SC	HQ
1	79.94591	NA	5.61e-07	-3.045043	-2.383074*	-2.802405*
2	98.66169	30.30173*	5.01e-07	-3.174366	-1.850427	-2.689090
3	115.7316	24.38559	4.99e-07	-3.225314	-1.239406	-2.497400
4	135.9247	25.00095	4.50e-07*	-3.424985*	-0.777107	-2.454433

* Indicates lag order selected by the criterion.
FPE: Final Prediction Error
LR: Sequential modified LR test statistic (each test at 5% level)
SC: Schwarz Information Criterion
HQ: Hannan-Quinn Information Criterion
AIC: Akaike Information Criterion

5.2. Test for Cointegration

All variables have the same integration properties. A cointegration test is conducted to determine whether the variables exhibit a long-run relationship. A cointegration test (see Table 3) is conducted to assess the existence of a long-run relationship among the variables. Johansen (1988) suggested that the likelihood ratio (LR) trace test be applied to determine the order of r in this test.

$$\lambda_{trace}\,(q,n) = -T\,\sum_{i=q+1}^{k} \ln(1-\hat{\lambda}i\,) \quad (5)$$

From the above equation, r 0,1, 2,..., k-1, T is the number of observations used for estimation. The largest estimated i^{th} eigenvalue is λ_i. The maximum eigenvalue likelihood ratio (LR) test statistic, as proposed by Johansen, is defined as follows:

$$\lambda_{max}\,(q, q+1) = -T\,ln\{1-\lambda\_(q+1)\} \quad (6)$$

Suppose the test statistic fails to reject the null hypothesis. Therefore, a cointegrating relation exists between the variables ($r \leq 1$). Alternatively, the test statistics reject the null hypothesis of cointegration among the variables (r=0).

The Unrestricted Cointegration Rank Test (Trace and Maximum Eigenvalue) is used to detect cointegration relationships. The test statistics used to determine the maximum number of cointegrating equations are presented in Table 3, which examines the relationship among exchange rates, Financial Development, and international trade. Eigenvalue and trace tests reveal two cointegrating vectors in both models.

5.3. Vector Error-Correction Model and Granger Causality

The variables exhibit a cointegrated relationship, and according to the Granger representation theorem (Engle & Granger, 1987), this can be modeled using a Vector Error Correction Model (VECM). The VECM framework ensures that short-term fluctuations and future adjustments converge toward the long-run equilibrium. Equation 1 shows the specified VEC function. The estimated FDI model report is in Table 5 (Appendix). The table reports both long-run and short-run dynamics, including the significance of each estimated parameter and its associated test statistic. The VECM specification indicates that the structure of FDI flow is significantly affected by the exchange rate, financial development, and trade openness.

Moreover, the explanatory variables and the lag of FDI have a significant role in explaining the relationship. The VECM provides insights essential for short-term forecasting, as the short-term analysis process includes a mechanism to

adjust toward long-term equilibrium. The error correction term is negative and significant, implying that trade openness, exchange rate, and financial development have a long-term impact on FDI. The coefficient of error correction (-0.1695) is significant at the 5% level under the VECM. These findings reflect the long-run adjustment speeds of the independent variables, as identified through Granger causality tests. Table 4 presents the results of the Granger Causality Test.

Table 4. Block Exogeneity Wald Tests

Dependent Variable: ΔFDI			
Excluded	Chi-sq	Df	Prob.
ΔER	0.565228	1	0.4522
ΔFD	0.487628	1	0.4850
ΔTO	1.417845	1	0.2338
All	1.723079	3	0.6318

The Wald test results (see Table 4) indicate that the exchange rate, trade openness, and financial development do not have a short-run relationship with FDI. There is no Heteroscedasticity (see Table 6) and Autocorrelation (see Table 7) in the FDI VECM. The VECM residuals do not follow a perfect normal distribution, mainly due to component 2(see Table 8). However, VEC models often remain reliable even when normality is not fully satisfied (Lee et al., 2015).

6. Conclusion and Policy Implications

Foreign direct investment influences exchange rates at both short- and long-term horizons, especially within the context of trade openness in Bangladesh. It is examined in this study. This study employs a Vector Error Correction Model (VECM) to examine the short-term and long-term interrelationships among foreign direct investment (FDI), the exchange rate, financial development, and trade openness. The findings reveal no short-run causality between FDI and the other variables, while demonstrating significant long-run relationships with the exchange rate, financial development, and trade openness. Moreover, FDI has a notable long-term influence on financial development, consistent with recent empirical studies that underscore its importance. A valuable policy implication is that FDI can play a significant role in economic growth, primarily through efficiency improvements rather than capital accumulation.

Notwithstanding, the economic impact of FDI also varies across countries. The importance of offering incentives to multinational companies seems unjustified. Better policies should be formulated to improve local firms' relationships. Foreign companies increase their access to finance, inputs, and

technology, and simplify the processes involved in selling inputs. Domestic conditions should also improve, as it has the dual ability to attract foreign investment. (Alfaro et al., 2004) Moreover, allow host economies to fully benefit from such foreign investment.

Furthermore, Table 5 indicates that trade openness is negatively associated with FDI inflows. The statistical significance of the trade openness coefficient at the 10% level suggests that trade openness, by itself, is insufficient to attract FDI inflows in developing economies. However, trade opening alone can reduce a country's FDI inflows.

This study highlights the influence of exchange rate movements on Bangladesh's markets, noting that currency appreciation affects FDI inflows in two distinct ways, depending on cost considerations and the underlying investment objectives. When the host country's currency appreciates, it increases its FDI inflows if the objective of the FDI is to support the local market. Otherwise, it reduces the country's FDI inflows if the FDI objective is based on cost reduction or re-export.

Farrell et al. (2004) highlight a relationship between FDI and exchange rates, noting that exchange rate movements exert no short-term impact on FDI inflows, despite their potential influence. Given the variability in exchange rate effects across countries, these findings raise questions about the role of exchange rates in attracting FDI. Although this study identifies an insignificant short-term relationship, exchange rates may still influence FDI over the long term. The analysis focuses on aggregate FDI flows, leaving sector-specific dynamics unexplored, which could yield differing responses to exchange rate changes. Furthermore, government intervention in foreign exchange rate management introduces uncertainty about the currency's actual value, which may affect the long-run FDI–exchange rate nexus. Future research should investigate the composition of foreign investment inflows to provide deeper insights into sectoral dynamics. Given the long-term implications of investment decisions, this study further recommends that monetary policies incorporate exchange rate considerations to strengthen FDI inflows and promote sustained economic growth.

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Appendix

Table 1. Summary of Unit Root Test Results

ADF Test at Level with trend and intercept			ADF Test at first difference with trend and intercept		
Variable	T-Statistics	P-Value	Variable	T-Statistics	P-Value
FDI	-3.115637	0.1151	ΔlnFDI	-6.965724***	0.0000
ER	-4.002431**	0.0160	ΔlnER	-6.859986***	0.0000
FD	-2.906602	0.1702	ΔlnFD	-7.892468***	0.0000
TO	-4.350774***	0.0063	ΔlnTO	-6.629253***	0.0000

Note: ***P < 0.01 denotes significant at 1% level, **P < 0.05 denotes significant at 5% level, *P < 0.10 denotes significant at 10% level

Table 3. Summary of Johansen and Juselius (1990) Cointegration Test

Hypothesized No. of CE(s)	Trace Rank test		Maximum Eigenvalue	
	Eigen value	Trace statistic	Eigen value	Max-Eigen Statistic
r* = 0	0.551876	69.20255	0.551876	35.31811
r* ≤ 1	0.408209	33.88445	0.408209	23.08247
r ≤2	0.182813	10.80198	0.182813	8.883031
r ≤ 3	0.042675	1.918953	0.042675	1.918953

Trace test indicates 2 co-integrating equation(s) at the 0.05 level
* denotes rejection of the hypothesis at the MacKinno-Haug-Michelis (1999) p- 0.05 level **

Table 5. Vector Error Correction Estimates
Table 5.1. Long run Estimates

Cointegrating Eq:	$ECM_{1,t-1}$	$ECM_{2,t-1}$
LFD_{t-1}	14.14721** (6.09872)	-0.064157 (-0.58802)
LTO_{t-1}	-28.02165 ** (-4.95944)	-1.134908** (-4.27053)
C	-84.39509	-5.381620

Notes: The numbers in parentheses refer to t-statistics. The numbers in brackets indicate p-values following the chi-squared distribution. *Significant at the 5% level of significance.

Table 5.2. Short-run Estimates

Error Correction:	D(LFDI)	D(LER)	D(LFD)	D(LTO)
ECM_1	-0.169520 (-1.82027)	0.015762 (3.53504)	-0.026866 (-2.91388)	0.006203 (0.50305)
ECM_2	4.125293 (1.96254)	-0.402181 (-3.99625)	0.505501 (2.42905)	0.143213 (0.51460)
$D(LFDI_{t-1})$	-0.136275 (-0.95017)	-0.010470 (-1.52470)	0.014404 (1.01439)	0.010648 (0.56076)
$D(LER_{t-1})$	-2.119794 (-0.75182)	0.598339 (4.43234)	0.428209 (1.53400)	1.630645 (4.36816)
$D(LFD_{t-1})$	1.147998 (0.69830)	-0.040411 (-0.51342)	-0.110746 (-0.68043)	-0.004171 (-0.01916)
$D(LTO_{t-1})$	-1.132400 (-1.19073)	-0.106698 (-2.34335)	0.079031 (0.83939)	0.060398 (0.47969)
C	0.124590 (0.48178)	0.026540 (2.14357)	0.056907 (2.22272)	-0.080928 (-2.36368)

Table 6. VEC Residual Heteroscedasticity Test

Chi-sq	Df	Prob.
289.7670	270	0.1951

Table 7: VEC Residual Serial Correlation LM Tests

Null Hypothesis: No Serial correlation at lag h

Lag	LRE* stat	Df	Prob.	Rao F-stat	df	Prob.
1	20.69384	16	0.1906	1.336637	(16,92.3)	0.1925
2	18.27320	16	0.3081	1.165521	(16,92.3)	0.3104

Null Hypothesis: No Serial correlation at lag 1 to h

Lag	LRE* stat	Df	Prob.	Rao F-stat	df	Prob.
1	20.69384	16	0.1906	1.336637	(16,92.3)	0.1925
2	48.09758	32	0.0337	1.625444	(32,97.5)	0.0366

* Edgeworth expansion corrected likelihood ratio statistic.

Table 8: VEC Residual Normality Tests

Component	Jarque-Bera	df	Prob.
1	2.408913	2	0.2999
2	24.94562	2	0.000
3	0.119198	2	0.9421
4	1.338161	2	0.5122
Joint	28.81189	8	0.0003

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Poverty Alleviation by Rapprochement System and Sustainable Economic Development

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Abstract

This paper proposes and develops a new model for understanding how institutional justice affects sustainable economic development. Conventional economics emphasizes budget size, whereas the proposed model emphasizes the justice score. This is because budget effectiveness is based on a "justice score" that ranges from 0 to 1. By comparing Denmark and Bangladesh, I show how a lack of justice reduces the effectiveness of government spending. The study also explains how anti-corruption measures and social protection can increase economic stability. Despite constant GDP growth, Bangladesh's development score is limited to 33.08% due to a deficit in institutional justice. However, Denmark has achieved a sustainable development score of 78.35% with the same resources. This model seeks to demonstrate that a justice score below 50% signals a heightened risk of political instability and authoritarian rule. The presence of a dictator indicates a low level of justice, and the model also predicts it even when justice is low. An attempt has been made to demonstrate that justice serves as a moral factor in the economic system by mathematically analyzing the GDP growth rates of different countries and the average value of justice. This study concludes that justice is an economic multiplier, arguing that policymakers should prioritize institutional fairness and equitable resource distribution over capital accumulation alone to ensure long-term socio-economic sustainability and political stability.

Keywords: *Justice Score · Sustainable Development · Mathematical Modeling· Economic Justice · Moral Multiplier · Political Instability · Mudarabah· Musharaka · Anti-corruption · Binary Logic · Institutional Fairness · Qard al-Hasan, Bangladesh.*

Introduction

This study focuses on the crisis facing economic and political systems. The wheel of history is constantly turning, and the entire world is witnessing the inevitable change in the system of governance. Historical data from the 20th and 21st centuries include the Arab Spring and recent regime changes in South Asia. The review and continuity of the situation show that the lack of justice in dictatorships and economic inequality provoke mass uprisings. The

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investigation of these changes reveals reasons such as corruption, economic inequality, and the erosion of rights, showing that even if people can tolerate oppression for a long time, the final coup closes all avenues for the ruler's survival. According to the World Justice Project's average index, all these countries have a justice score below 0.50, which accelerates the change of power. Neopatriarchy and Institutional Degradation: Neopatriarchy is a form of governance in which a particular group uses democracy to maintain power by appointing unqualified loyalists to key positions. Research has shown that such regimes, which often last 25 to 35 years, eventually undergo regime change because they prioritize individual and party interests over the national good, leading to institutional instability.

Injustice is Creating Poverty and Refugees

According to the Bangladesh Progress Report 2020, 8.6 percent of the world's population, or 736 million people, live below the poverty line, with a daily per capita income of less than $1.90. According to the United Nations Development Program (UNDP) 2018 survey data, if inequality and deprivation in healthcare access, education, and standard of living are considered instead of just income, it is revealed that 1.3 billion people worldwide are victims of multidimensional poverty. Currently, the increasing number of refugees resulting from man-made injustice, unfairness, and aggression is raising the global poverty rate. Internal inequality and injustice within a country create opportunities for aggression. Aggression tramples upon justice. World Bank international poverty lines ($1.90 per day for low-income countries, $3.20 for lower-middle-income countries, $5.50 for upper-middle-income countries, and $21.70 for high-income countries).[1]

Due to war and aggression, 117 million people worldwide are displaced, including 42.5 million registered refugees, a vast population living in poverty as victims of political injustice who would not be among the impoverished if political fairness existed. Justice is not merely about trials and dispute resolution; inequality is deeply linked to the access to justice, which can eliminate disparity because, firstly, equal access leads to the equitable distribution of outcomes; secondly, justice acts as a level playing field that ignores arbitrary differences to provide consistent results for similar cases, creating opportunities and fostering trust in a fair society; and thirdly, the principles of equity and need in distributive justice have impacts that lead toward true equality. (Source: Hiil Report 2021).

[1] Authors: Dr. Martin Gramatikov, Rupinder Kaur, Isabella Banks, Dr. Kavita Heijstek-Ziemann, The Hague Institute for Innovation of Law Poverty and Access to Justice (Hiil) 2021 www.hiil.org.

Table 1. Global Refugee Statistics (2025-26) by Country

Country of Origin	Number of Refugees (Million)	Primary Cause of Displacement
Syria	6.5	Civil War & Conflict
Afghanistan	6.1	Political Instability & Human Rights.
South Sudan	2.3	Internal Violence & Famine
Myanmar	1.2	Ethnic Cleansing & military Aggression
Ukraine	5.8	invasion & War
Others	20.6	Global Conflicts & Injustice
Total Registered	42.5	

Source: UNHCR. (2024). *Global Trends: Forced Displacement in 2023-2024*. United Nations High Commissioner for Refugees.

Empirical Evidence: Justice Scores and Regime Stability

The sustainability of a political regime is intrinsically linked to its performance across key governance metrics. The study utilizes the Rule of Law Index, which evaluates eight critical factors: Constraints on Government Powers, Absence of Corruption, Open Government, Fundamental Rights, Order and Security, Regulatory Enforcement, Civil Justice, and Criminal Justice. An analysis of 37 historical and contemporary cases of regime change between 1917 and 2024 reveals a significant correlation between a low Justice Score (JS) and political instability. As summarized below (detailed in Appendix A), every government analyzed that was ousted through mass uprisings, coups, or institutional failure had a Justice Score below 0.50.

Statistical Summary of Evaluated Regimes (N = 37)

Indicator	Observed Findings
Total Sample Size	37 Regimes
Justice Score Range	0.10 to 0.49
Average Score Threshold	<0.50

Primary Data Sources: World Justice Project (2006-2024) & Historical Archives.

Data Interpretation

The empirical data support the hypothesis that a Justice Score below the 0.50 threshold serves as a critical indicator of systemic vulnerability. Unlike stable democracies, which typically maintain scores above 0.70, these 37 nations failed to uphold fundamental principles of administrative justice, leading to a breakdown of the social contract. This quantitative evidence validates the proposed Justice Model as a tool for predicting long-term national stability. (See Appendix A).

Objectives

The objective of this research is to maximize human well-being by eliminating poverty, deprivation, and discrimination. This research has identified the root causes of these problems and found ways to solve them, giving special importance to "justice" as a determining factor. The great Creator created man on this earth for two purposes. The first is that Allah says, "I have created the jinn and mankind only to worship Me" (Surah Az-Zariyat, verse: 56), and the second is that Allah says, "When you judge between people, judge with justice" (Surah An-Nisa, verse: 58). This concept of justice is not limited to resolving disputes; it applies to family, social, economic, national, and global matters. The study proposes that the head of any organization will act as a 'processor'. Like a computer processor, it operates on a binary system. Binary relationships are observed throughout economics and sociology. In this framework, loss or destruction is symbolized by 0 (zero), and prosperity or complete development is symbolized by 1 (100%). In economics, behavioral satisfaction is both qualitative and mathematical. The analysis of this study's data shows that the lack of justice leads to government instability. In a country, institutional poverty is often experienced when spending is less than 50% of GDP. This study introduces the concept of a "development score" based on the World Justice Project's 0-1 score. A score below 50% on the "development score" indicates that a country is underdeveloped. Other things being equal, the development and justice scores serve as indicators of poverty, regime change, inequality, and the rise of authoritarianism. The term 'binary' has been used before by economists such as Amartya Sen, J.M. Keynes, and the Hill Report; this study shows how a ruler can maximize welfare in an economy by applying a binary system to the way a processor produces output.

Literature Review

The theoretical basis of this study integrates classical political philosophy with modern welfare economics to define justice as a measurable economic driver. Ibn Khaldun (1332-1406 AD) argued in his book 'Al-Muqaddimah' that injustice is the main cause of the destruction of civilization. He described a causal relationship in which the level of justice determines motivation for human labor and economic initiative. Professor Amartya Sen has emphasized that state intervention through appropriate government policies is necessary to ensure justice. His analysis of equitable distribution and duality provides a framework for administering justice in the economic system. Furthermore, J.M. Keynes argued that government spending can increase public welfare if managed through effective government policies. The 'rule of law' acts as an important mediator of economic activity.

The decline of administrative justice creates systemic weaknesses, where rising income inequality and inflation create a self-perpetuating cycle of inequality.

Research by Dimitri Lorenzani and Federico Lucidi suggests that civil justice reforms accelerate economic growth by attracting foreign direct investment (FDI) and increasing business dynamism. There is a link between poverty and the economy, as shown by the Hill Report. But research shows that as the Justice Score increases, the Development Score also increases. OLS reports, P values, and R-squared means have been proven. Professor Amartya Sen, as the originator of the Capability Approach, argues that equality is not simply the equal distribution of wealth or utility; rather, economic justice is about ensuring that individuals have the basic capabilities and real freedoms they need to live the lives they value.

In this framework, the focus is on how effectively an individual can use education, healthcare, and other opportunities to improve his or her standard of living; this concept is highly relevant to the formulation of a Justice Score. Rawls's seminal work, 'A Theory of Justice,' has profoundly influenced the 'distributive justice' of economics. He proposed the maximin principle, which holds that the greatest benefit should be given to the most disadvantaged members of a just society. Vilfredo Pareto (1948-1923) spoke of social welfare. The founder of Islam, Hazrat Muhammad (PBUH), born in 570 AD, established an economic system that ensured social welfare throughout his 63-year life. Amartya Sen's theory of the death of social welfare then raises questions.

Shah Sahib (born 1704 AD) (R) mentioned in the book Hujjatullah Baligha, The founder of the Qur'an has said about economic justice, "The historical reality says that at the time of the Prophethood of Muhammad (peace be upon him), the Persian and Roman empires were at the peak of development, but due to lack of economic justice, their roots are gradually becoming empty. [2] "Hobbes said that without a sovereign state, it is not possible to say anything coherently about fairness.

Research Methodology

This study focuses on achieving economic development through qualitative transformations, specifically by establishing justice through freedom from hunger, aggression, and blockades; eradicating unemployment and corruption; monitoring markets; ensuring banking sector independence; shifting political philosophy; and promoting interest-free banking and production incentives to eliminate inequality. As this research seeks to develop a new theoretical framework for problem-solving, it is classified as Fundamental Research, yet it also qualifies as Applied Research given its goal of fostering societal, national, and global progress. The objective is to use this methodology to mitigate political instability and inequality, steering toward sustainable development in which economic, political, and social welfare are integrated. The research demonstrates that the global shift from capitalist and socialist systems toward

mixed economies validates this proposed method, showing that establishing justice increases the Development Score, which, in turn, elevates various economic indicators through a multiplier effect. By using secondary data from the World Justice Project and GDP records, the application of a multiplicative methodology has been instrumental in ensuring data reliability and achieving positive analytical outcomes.

1. The Mathematical Framework

The research demonstrates that establishing justice increases the Development Score (DS), which, in turn, elevates various economic indicators through a multiplier effect. The relationship is expressed as:

$DS=I \times JS$

Where:

- DS (Development Score): The actualized state of sustainable development ($0 \leq DS \leq 1$).
- I = (Input Variable): Normalized value representing GDP expenditure and resources.
- JS (Justice Score): The multiplier derived from the World Justice Project (WJP) index $0 \leq JS \leq 1$

2. Data Application

By utilizing secondary data from the World Justice Project and GDP records, the application of a multiplicative methodology has been instrumental in ensuring data reliability. For example, the model compares the stability of Denmark (JS = 0.90) with that of countries with systemic justice deficiencies (JS < 0.50), validating the global shift toward justice-centered mixed economies.

Research Questionnaire

This study raises some questions. It also answers some questions. The question may be whether justice has any relation to economics. Justice is not just about dispute resolution. It is clearly related to equitable distribution. Poor people cannot afford to pay enough to get justice. The Hill Report has shown the relationship with poverty in this regard. Is justice related to welfare? Justice plays an important role in ensuring that deprived people receive what they deserve. Economic justice can address the distribution of wealth.

Justice Score in Developed and Developing Countries

The World Justice Project Rule of Law Index 2023 is pleased to present the latest edition, enabling a wide variety of stakeholders to identify rule-of-law strengths, weaknesses, progress, and setbacks across 142 countries and jurisdictions. The Index offers original, independent data organized into eight

factors that encompass the rule of law: Constraints on Government Powers, Absence of Corruption, Open Government, Fundamental Rights, Order and Security, Regulatory Enforcement, Civil Justice, and Criminal Justice. Scores range from 0 to 1, with 1 indicating the strongest adherence to the rule of law.

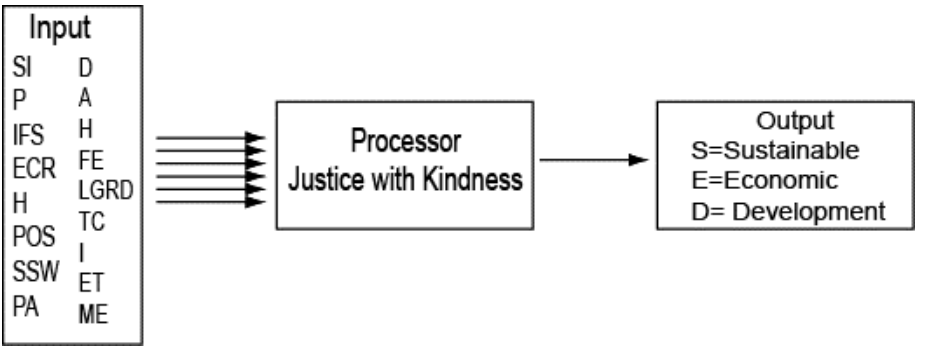
Table 2. Justices' Score Developed and Developing Country

Developed Country			Developing Country		
Country/ Jurisdiction	Overall Score	Global Rank	Country/ Jurisdiction	Overall Score	Global Rank
Denmark	0.90	1	Honduras	0.41	119
Norway	0.89	2	Nigeria	0.41	120
Finland	0.87	3	Mali	0.40	121
Sweden	0.85	4	Congo. Rep	0.40	122
Germany	0.83	5	Zimbabwe	0.40	123
Luxembourg	0.83	6	Gabon	0.39	124
Netherlands	0.83	7	Uganda	0.39	125
New Zealand	0.83	8	Iran	0.39	126
Estonia	0.82	9	Bangladesh	0.38	127
Ireland	0.81	10	Mozambique	0.38	128

Table 2 shows the Justice Scores for 10 developed and 10 developing countries, based on the World Justice Project Rule of Law Index 2023. The Justice Score of developed countries is above 0.50, while that of developing countries remains below 0.50; this low Justice Score indicates poverty, labor unrest, the fall of governments, and the rise of autocrats. Ref: World Justice Score Rule of Law Index: 2023 Developed and developing countries.

Block Diagram Analysis

In the context of Bangladesh's budget, the sectors of expenditure are considered as 'Input,' the Head of State as the 'Processor,' and sustainable economic development as the 'Output.' This conceptual framework is modeled after the functional process of a computer processor. The processing method can be shown in the form of a block diagram:



$$Development\ Score = f(SI, P, IFS, ECR, H, POS, SSW, PA, D, A, H, FE, LGRD, TC, I, ET, ME) \times Js = SED$$

Figure 1. Block Diagram of Processing Methods

The block diagram shows that sustainable development will be possible if the input elements are processed with justice. The 17 budget components are presented briefly as inputs, which are then processed by the Processor. The resulting output is Sustainable Economic Development. This is a conceptual diagram where the state or the head of society is envisioned as the Processor, responsible for ensuring Justice within the system. Input: The input unit provides instructions to the computer for solving specific problems, along with the necessary data to execute them. This unit receives data and programs from various media, converts them into electrical signals, and stores them in the computer's memory. In other words, devices or components that provide instructions or information to the computer are called input devices. Output: After the input is provided, the computer processes the data and presents various types of information in a human-understandable format. The devices that produce these results are known as output units or components. Any device that allows the computer to provide results is called an output or emission device. Processing: Generally, the internal hardware within the system unit (computer casing) is referred to as processing hardware. These hardware components are directly or indirectly involved in data processing.

Justice

Project Rule of Law Index of Bangladesh (Ref: World Justice Project-2023)

Overall Score	Regional Rank (South Asia)	Income Rank (Lower Middle)	Global Rank
0.38	4/6	28/37	127/142

Table 3. Bangladesh Category 8 on the Justice Report

	Factor Score	Score change	Regional Rank (South Asia)	Income Rank (Lower Middle)	Global Rank
Constrains on Government Power	0.37	0.00	5/6	26/37	120/142
Absence of Corruption	0.33	-0.01	4/6	23/37	117/142
Open Government	0.40	0.00	5/6	21/37	106/142
Fundamental Rights	0.20	-0.01	5/6	34/37	137/142
Order and Security	0.63	0.00	4/6	25/37	108/142
Regulatory Enforcement	0.38	-0.01	4/6	30/37	126/142
Civil Justice	0.36	-0.01	5/6	32/37	133/142
Criminal Justice	0.30	-0.02	5/6	28/37	123/142

According to the revised budget, the total expenditure target for the financial year 2022-23 has been estimated at Tk 660507 crore, which is 14.8 percent of GDP. Of this, operating expenditure is Tk 4,329.42 crore (9.7% of GDP), and development expenditure is Tk 227,566 crore (5.1% of GDP). According to provisional estimates, iBAS++ shows that the total expenditure up to March 2023 for the financial year 2022-23 was Tk 300,820 crore, with operating expenditure of Tk 227,987 crore and development expenditure of Tk 62,105 crore. Source: Bangladesh Economic Survey 2023. There are 17 expenditure sectors in Bangladesh's budget. Source: Budget Sahajapath, FY 2022-2023, Publisher Development Coordination.

Table 4. GDP Item 17

SL No.	Input Element	Compressed	Ratio
1	Subsidies & Incentives	SI	5.80
2	Pension	P	4.70
3	Industrial and Financial Services	IFS	0.70
4	Entertainment, Culture & Religion	ECR	0.80
5	Housing	H	1.10
6	Public Order and Security	POS	4.70
7	Social Security and Welfare	SSW	5.00
8	Public Administration	PA	7.60
9	Defense	D	5.50
10	Agricultural	A	3.60
11	Health	H	5.40
12	Fuel & Electricity	FE	4.60
13	Local Government and Rural Development	LGRD	7.00
14	Transport & Connectivity	TC	11.70
15	Interest	I	11.40
16	Education & Technology	ET	15.70
17	Miscellaneous Expenses	ME	4.70
		Total =	100 %

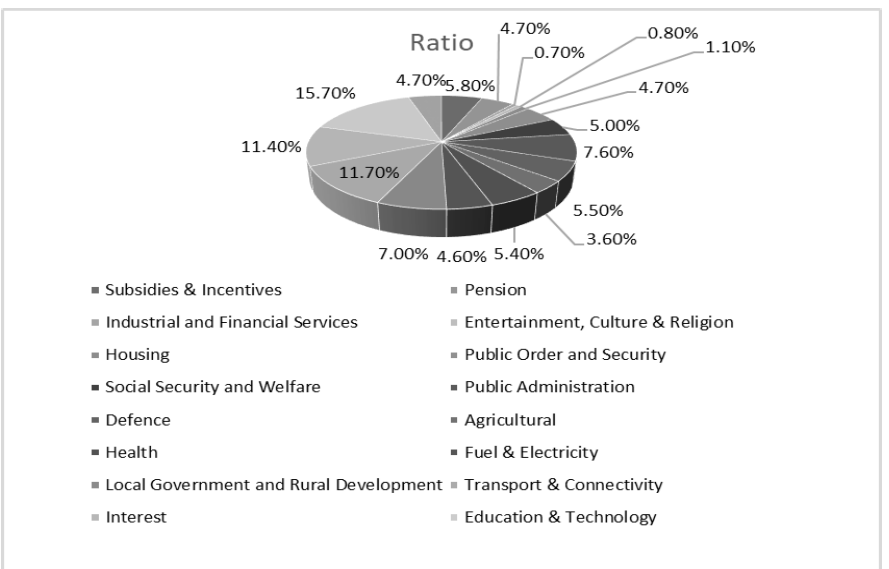


Chart 1. GDP Expenditure in Pie Chart

Obtaining the Development Score

The reason for using the averaging formula here is to derive a score by multiplying the Justice Mean Value by the budget expenditure as a percentage

of GDP, which is 14.8%. I have named this the 'Development Score.' This score is calculated by applying statistical averaging and regression formulas to the mean Justice Scores of various countries and their respective budget-to-GDP percentages. An analysis of this development metric suggests that countries with a score below 50% remain trapped in poverty. Furthermore, when the mean Justice Score falls below 50%, it creates conditions leading to political instability and the eventual fall of governments.

Rule: Formula for Average Explain

$$Development\ Score = f(SI, P, IFS, ECR, H, POS, SSW, PA, D, A, H, FE, LGRD, TC, I, ET, ME) \times Js = SED$$

$$= f(x_1, x_2, x_{13} \dots\dots\dots\dots\dots\dots x_n \times Js \quad \text{.....(1)}$$

$$= \sum_i^n x \ \ Js$$

∑x: (Expenditure Sector/ Input) Represented by the mathematical symbol x. This is the sum of all expenditure sectors. (Table-4)

- Value x =14.8% (Note: This is the simplified sum of 17 different components. (Table-4)

Number of Items (n): Represented by the symbol n. This indicates the total count of elements or sectors being measured.

- Value: n = 17

Justice Score (J): Represented by the symbol J. This is the resulting metric or index value.

- Value: J = 0.38 (WJP 2023)

Index (i): This serves as the counter for the elements, ranging from 1 to n.

Where

- Score: Represents the calculated Average.
- ∑: The Greek capital letter Sigma, which denotes Summation (The total sum of all elements)
- Elements: Represents the value of the "i" the element (or input).
- I = 1,2,3.....n: The index or counter for each element in the set.
- n: The Number of Elements / Input the set.

Variable Meaning

n	:	Number of Elements / Input
i	:	1,2,3.....n, (Index for summation)
∑	:	Summation (Sum of all inputs)
Js	:	Justice Score (Related to Ihasan =(Kindness K hide)- This suggests the score might be influenced or weighted by a "Justice Score" or that "Justice Score" is the resulting "Score".
Development Score	:	DS - This could imply a specific type of average or calculation method beyond the simple arithmetic mean (e.g., weighted average, geometric mean, etc.).

The two conditions place constraints on the resulting score values
1. Justice Score (Js) Constraint

$$0 \leq Js \leq 1$$

Explanation: This means the Justice Score (Js) must be a value between zero (0) and one (1), inclusive. This is common when a score is normalized (scaled) to be a fraction or a percentage (where 1 represents 100%).

2. Average Input Constraint: $0 <$ Average of the Input ≤ 1

Explanation: This means the final calculated Average Score must be greater than Zero (0) and equal to or less than one (1). The inputs themselves or the final average are constrained to this range, implying that the inputs are likely already normalized values (e.g., probability, satisfaction rating out of 1, etc.).

The core rule is the Formula for Average, the accompanying variables and conditions define a Specific model where the average is referred to as a "Score" (possible a "Justice Score"), the input is recessed via a "PM" (Processing Method), and both the score and its components are constrained to be within the range (0, 1) (or (0, 1) for the Justice Score).

Data Analysis
The Impact of Justice Scores in 34 Countries Across the World
In a study of 142 countries, it was found that 78 nations maintain a Justice Score of 50% or higher, while 64 countries—including Bangladesh, India, Sri Lanka, Mexico, Thailand, and various other developing or underdeveloped nations—fall below this threshold. This low Justice Score is identified as a primary catalyst of political instability and the rise of authoritarianism, in contrast to high-scoring nations like Denmark, where robust justice systems

drive high development. The validity of this methodology is evidenced by the fact that 35 heads of state have recently resigned following mass uprisings against systemic inequality in countries where low Justice Scores have long served as a precursor to poor development outcomes and social unrest.

Comparative Analysis of Budget Expenditure as a % of GDP over the Last 5 Years: 9 Developing Nations vs. 1 Developed Nation

This analysis compares nine developing countries—including Bangladesh, India, Sri Lanka, Nepal, and Thailand—with Denmark, which stands at the peak of the development index. Currently, the budget expenditure as a percentage of GDP in these developing nations is only one-third that of Denmark. The data suggests that if these nations can improve their Justice Scores, they can achieve developed status even with their existing budget allocations.

Table 5. Expenditure as a percentage of GDP: 10 Countries.

Country	2020	2021	2022	2023	2024 (Estimated)
Bangladesh	13.3%	13.0%	13.1%	14.8%	14.3%
Denmark	53.9%	50.8%	46.3%	47.9%	47.4%
India	29.7%	30.4%	28.5%	28.7%	28.4%
Sri Lanka	19.3%	20.3%	18.6%	19.5%	19.3%
Nepal	27.2%	26.7%	26.3%	25.1%	22.1%
Thailand	25.4%	26.9%	25.7%	22.8%	23.1%
Egypt	26.6%	25.9%	21.4%	21..7%	24.7%
Libya	70.5%	64.7%	62.2%	65.4%	94.8%
Yemen	15.1%	14.1%	15.6%	15.3%	8.9%
Iran	18.5%	19.0%	18.1%	16.4%	14.2%

Source: IMF World Economic Outlook Database 10 Countries

The percentage of GDP a country spends reflects its level of development. In developed nations, the total expenditure-to-GDP ratio is typically above 50%, with Libya the only exception.

Economic growth (GDP) does not guarantee social stability in the absence of political and social justice. Example: Libya.

Table 6. 1994-2017 GDP Expenditure. (Bangladesh).

Fiscal Year	Total Expenditure (% of GDP)
1994-1995	14.43%
1999-2000	14.54%
2000-2001	14.75%
2004-2005	14.54%
2005-2006	14.20%
2006-2007	14.30%
2007-2008	17.48%
2008-2009	15.31%
2009-2010	13.09%
2010-2011	13.59%

The following data illustrates the total expenditure-to-GDP ratio for Bangladesh spanning 10 years from 1994-2011

Sources: IMED, Ministry of Planning; Finance Division, Ministry of Finance; The National Financial System 1995–2008, Principal Zahirul Islam Shikder, Confidence Publications, 2011, Page 146.

Even if total expenditure is below 50% of GDP, the country still lacks political stability.

Data Analysis of Various Countries

An analysis of the Justice Scores of countries, including Iran, Yemen, Libya, Egypt, Bangladesh, Sri Lanka, Uganda, Nepal, Mexico, the Philippines, and Syria, over at least the past ten years reveals that while Sri Lanka and Libya maintain a Justice Score around 50%, the remaining nations fall below this threshold. In this study, the comparison between the Justice Scores of Bangladesh and Denmark yields a specific value, the Development Score. Furthermore, when evaluating GDP data, it becomes evident that a low rate of GDP expenditure is a primary characteristic of underdeveloped nations. Iran, Yemen, Libya, Egypt, Bangladesh, Uganda, Nepal. Average Justice Score >50 from 2015 to 2024. These countries are underdeveloped, and political power changes are noticeable. The Justice Score status of these three countries is at a minimum. The average Justice Score for Sri Lanka over the past ten years has been at or near 50%. While a government instability did occur in Sri Lanka, it is believed that political stability was restored very quickly because the average Justice Score remained at the 50% threshold. (Appendix: B), Syria's Justice Score is -2.5, the Philippines' Justice Score is 0.46, and Venezuela's is 0.26. These low Justice Scores indicate that these countries lack good governance, face corruption and inequality, and experience low GDP growth rates, making

it almost impossible to overcome economic hardship and achieve sustainable development without ensuring justice. This supports this model.

Justice Score: An Indicator for Ensuring Human Development and Sustainable Growth

To support the Justice Score and long-term budgetary expenditure, it is necessary to strengthen the foundations of human development and the economy. The Human Development Index (HDI), including health, education, and standard of living, must be improved, as an educated and healthy workforce is the primary driver of rapid development. Public expenditure on education as a percentage of GDP must be increased (which is currently relatively low). This investment will enhance future productivity.

Apply The Formula of Average

To calculate the Economic Development Score from the Justice Score (comparing Bangladesh and Denmark), we apply the following average formula:

$= \sum_i^n x \;\; Js$ (Following the formula for average)

In the case of Bangladesh —

Here,

GDP Expenditure Sectors: x=14.8%, (GDP%), n = 17, Js = 0.38

Then,
Development Score

$= \sum_i^n x \;\; Js$

$= \frac{x}{n} \times Js$

$= \frac{14.8}{17} \times 0.38$

= 87.05′0.38

= 0.3308

= 33.08%: Which is less then 50%

= Developing Country (Lower middle GDP per Capita)

The Development Score functions like a thermometer; it can indicate the temperature, but cannot reduce it. A government, acting like a doctor, must take the necessary measures to lower the temperature. Similarly, while the Development Score illustrates the current state of progress, the government must function like a processor to implement the systems required for advancement. In this model, GDP expenditure is held constant, with Justice

as the independent variable. As Justice increases, the Development Score rises accordingly. Greater justice leads to reduced inequality and the eradication of poverty, ultimately resulting in national development. Although Justice is not the sole variable for development—as education, agricultural and industrial production, investment, and trade are also vital—it significantly influences every other factor. Here, Justice is not merely a tool for dispute resolution but a foundational pillar. If Denmark's level of Justice were applied to Bangladesh, the nation would transform into a developed country. Even without changing other economic components, increasing Justice alone can drive development, though enhancing those other factors alongside it would yield even better results.

Applying Denmark's Justice Score (0.90) while keeping the same input for Bangladesh

Here,

Expenditure Components of GDP x=14.8%, (GDP%), n = 17, J = 0.9 (Denmark)

Then,

$$\text{Development Score} = \frac{14.8}{17} \times 0.90$$
$$= 0.84.05´0.90$$
$$= 78.35\%$$

Which is Gretter then 50% = Developed (Upper middle GDP per Capita)

Result: It makes development.

Even without increasing expenditure, simply raising the level of justice raises the development score. This indicates a score of 78.35%.

By applying Denmark's GDP expenditure (47.9%) while keeping the Justice Score the same (0.38) and maintaining Bangladesh's input, the result is:

$$\text{Development Score} = \frac{47.9}{17} \times 0.38$$
$$= 2.817´0.38$$
$$= 1.0707$$

In the context of India:

$$\text{Development Score} = \frac{28.7}{10} \times 0.50$$
$$=2.87´0.50$$
$$=1.435$$

In the context of Denmark: Denmark's 10 Expenditure Sectors

Denmark categorizes its budget into ten specific categories: social protection, health, public services, education, economic affairs, defense, recreation and culture, public order and safety, environmental protection, and housing.

Using Denmark's Justice Score of 0.9, we find—

$$\text{Development Score} = \frac{47.9}{10} \times 0.90$$
$$= 4.79 \times 0.90$$
$$= 4.311$$

Regression and Analysis of Results: Evidence of development scores

OLS regression results in Table 7 show the determinants of the development score. The results were generated using STATA Software.

Table 7. OLS Regression Results: Determinants of Development Score.

Dependent Variable: Development Score	(1)
Justice Score	0.0165*** (0.0013)
GDP	0.0377*** (0.0020)
Constant	-0.0092*** (0.0005)
Observations	48
R-squared	0.9810
Adjusted R-squared	0.9802
Residual Std. Error	0.0012 (df = 45)
F Statistic	1162.480*** (df = 2; 45)

***p < 0.001; **p < 0.01; *p < 0.05

Note: Standard Errors are Reported in Parentheses below Coefficients

The regression results show that both justice and GDP have a statistically significant positive impact on development scores. Specifically, a one-unit increase in the Justice Score is associated with a 0.0165-unit increase in Development Score ($p < 0.001$), holding GDP constant. GDP has a larger effect, with a one-unit increase associated with a 0.0377-unit rise in Development Score. The model is highly robust, explaining 98.1% of the variance in development scores (R-squared = 0.9810), and the overall model fit is statistically significant ($F(2, 45) = 1162.48$, $p < 0.001$). With 48 observations, these findings provide strong evidence that justice independently contributes to development, even after accounting for economic output. By examining

the GDP and Justice Scores of 48 nations across Europe, Asia, Africa, South America, and Oceania, this research establishes that an improvement in the Justice Score significantly enhances the Development Score.

Denmark Vs Bangladesh

The core premise of this model is that a country's development score depends on its justice score. In statistical terms, this can be expressed through a simple linear regression model. The core thesis of this model is that a nation's Development Score (D) is fundamentally driven by its Justice Score (J), and the control variable of this analysis is GDP growth rate.

1. The Mathematical Formula

Equation: The relationship is expressed by the following linear equation:

$$D_i = \beta_0 + \beta_1 J_i + \beta_2 gdp_i + \epsilon_i$$

Intercept (β_0): This value shows what the development score would be if the justice score is zero. Based on the data analysis of this model, this value is assumed to be approximately zero (≈ 0)

Error Term (β_0): This term represents all other factors that lie outside the model's explanation. From the data, this has also been found to be nearly zero (≈ 0) as the calculations align almost perfectly.

2. Coefficient Calculation and Result

- Coefficient or Slope **(β_1):** This indicates the rate of change in Development Score for every unit change in Justice Score. From the ratio of the data for Bangladesh and Denmark (Development Score / Justice Score), the coefficient is approximately 0.7835.

- Final Equation: By substituting these values, the obtained final regression equation is: D = 0.7835 ×J

Observation: Plugging in J=0.38 for Bangladesh, the model predicts that D = 0.7835 × 0.38 approx. 0.2988, which is close to the model's 0.3308. Plugging in J=0.90 for Denmark, the model predicts that D = 0.7835, which is close to 0.90 = 0.7051, which is close to 70.51.

Statistical Interpretation

- **Impact of Justice Score:** The obtained coefficient of 0.7051 indicates that, holding all other factors constant, if the Justice Score increases by 1 unit, the Development Score will increase by approximately 0.7051 units.

- **Significance:** This high and positive coefficient proves that, according to this model, justice is a strong positive predictor of the Development Score. In other words, the lion's share of the reason why a country's development

score increases or decreases can be explained solely by the variance in the Justice Score.

This analysis provides statistical support for the core policy claim that good governance and economic justice are the most crucial drivers of a country's stable and sustainable development.

Application of Regression Model (Justice Score and Development Score) for India

Based on this Justice Score, a prediction for the Development Score for India can be generated. For this analysis, we use the coefficient from the previously obtained regression model. The prediction for India's Development Score will be provided based on the simple regression model developed in the prior analysis:

$D = 0.7835 \times J$

Where D is the Development Score, and J is the Justice Score. According to the latest World Justice Project (WJP) Rule of Law Index 2024, India's Justice Score (J) is 0.50 (Note: Bangladesh ranks 127th with a score of 0.39, while India ranks 79th with a score of 0.50).

We will generate the prediction using the obtained coefficient of 0.7835 and India's J = 0.50 value:

Development Score = 0.7835´ J

$= 0.7835 \times 0.50$

$= 0.3917$

Result and Interpretation:

Development Score: 0.3917 Or 39.17%

According to this model's criteria, countries with a score below 50% are classified as developing nations. Based on that, India would be classified as a developing country in this model. These results indicate that, in this model, India falls between Denmark (78.35%) and Bangladesh (33.08%). Since India's Justice Score (0.50) is higher than Bangladesh's (0.38), India's development score is higher than Bangladesh's even when using the same amount of input (expenditure). This prediction reinforces the model's core argument—whether a country is considered developed ultimately depends on the level of justice and good governance, as measured by my Justice Score.

Limitations of the Study

While this research provides significant insights into the relationship between

justice and development, it is subject to several limitations. First, reliance on secondary data sources may limit the precision of the results, as data quality can vary across developing nations. Second, although the "Justice Score" is a robust conceptual framework, quantifying subjective social and moral values remains inherently complex and may be influenced by regional cultural perspectives. Third, the study focuses primarily on economic and political variables, potentially overlooking other external factors such as global environmental changes or technological disruptions. Finally, the findings are specific to a given timeframe; thus, a longitudinal study would be necessary to further validate the long-term sustainability of the Justice Multiplier model across different historical cycles. Dominique Lapierre's observation in his book *The City of Joy* is profoundly significant: whatever human morality may dictate, in a land where hunger is the sole emotion and quenching the burning fire of the stomach is the primary practiced religion, upholding the pinnacles of moral idealism is itself a cruel injustice.

Conclusion

True economic development and social peace are achieved only when income and wealth are distributed fairly and equitably. This principle applies to individuals, societies, states, and international organizations. No matter how high the growth rate, if income is not distributed justly, it will not benefit the common people. Just as a digital processor handles data, an administrator, like a processor, fairly allocates the GDP input. As a result, growing inequality breeds public discontent, which inevitably creates institutional instability rather than sustainable growth. Just as a leaky pot can never be filled, chaotic distribution, no matter how much wealth there is, does not bring about lasting progress. Moreover, a system plagued by corruption or structural poverty cannot be expected to achieve equitable distribution. In this framework, an administrator, like a processor, is tasked with fairly allocating the GDP input. Therefore, just distribution is equitable distribution. This study, titled "Justice and Development Score: A Multivariate Modeling Analysis of Poverty Alleviation and Political Stability", uses binary logic, the arithmetic mean, and statistical regression to demonstrate that justice is a critical factor in poverty alleviation. The results are twofold: First, a Justice Score (JS) below 50% consistently limits the Development Score (DS) to below 50%. Second, increasing the Justice Score is a fundamental prerequisite for a stable and developed society. Developing countries can move toward prosperity more effectively by improving their Justice Score rather than simply increasing GDP expenditure. Justice serves as both a moral guide and a leading indicator of well-being. Therefore, ensuring distributive justice is the cornerstone of long-term political stability and sustainable global development. Based on my 2023 research across 48 countries, I find that as the Justice Score increases, the Development Score also increases. I used GDP growth as a control variable.

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Appendix A

Table 2: List of the Head of Government, country, resignation date, and justice Score

A	B	C	D	E	F
No.	Name	Country	Cause of Fall	Date of Fall	Justice Score
1	Sheikh Hasina	Bangladesh	Student-People Mass Uprising	August 5, 2024	0.38
2	Bashar al-Assad	Syria	Armed Rebellion & Fall of Capital	December 8, 2024	0.2
3	Gotabaya Rajapaksa	Sri Lanka	Economic Crisis & Mass Uprising	July 14, 2022	0.49
4	Ashraf Ghani	Afghanistan	Taliban Capture of Kabul	August 15, 2021	0.33
5	Omar al-Bashir	Sudan	Military Coup & Mass Protests	April 11, 2019	0.35
6	Robert Mugabe	Zimbabwe	Military Coup	November 21, 2017	0.36
7	Blaise Compaoré	Burkina Faso	Mass Uprising	October 31, 2014	0.42
8	Viktor Yanukovych	Ukraine	Maidan Revolution (Uprising)	February 22, 2014	0.45
9	Muammar Gaddafi	Libya	Civil War & NATO Intervention	October 20, 2011	0.21
10	Ali Abdullah Saleh	Yemen	Arab Spring & Resignation	February 27, 2012	0.35
11	Hosni Mubarak	Egypt	Mass Uprising (Arab Spring)	February 11, 2011	0.39
12	Zine El Abidine Ben Ali	Tunisia	Jasmine Revolution	January 14, 2011	0.46
13	Saddam Hussein	Iraq	US Invasion & Government Collapse	April 9, 2003	0.24
14	Slobodan Milošević	Serbia	Bulldozer Revolution	October 5, 2000	0.33
15	Mobutu Sese Seko	Congo (Zaire)	Civil War & Rebellion	May 16, 1997	0.27
16	Suharto	Indonesia	Student Protests & Economic Recession	May 21, 1998	0.32
17	H. M. Ershad	Bangladesh	Student-People Mass Uprising	December 6, 1990	0.35
18	Nicolae Ceaușescu	Romania	Mass Rebellion & Execution	December 25, 1989	0.3
19	Ferdinand Marcos	Philippines	People Power Movement	February 25, 1986	0.34
20	Idi Amin	Uganda	Tanzanian Invasion & Rebellion	April 11, 1979	0.25
21	Mohammad Reza Pahlavi	Iran	Islamic Revolution	February 11, 1979	0.37
22	Pol Pot	Cambodia	Vietnamese Invasion & Fall	January 7, 1979	0.15
23	Sheikh Mujibur Rahman	Bangladesh	Military Coup & Assassination	August 15, 1975	0.3
24	King Farouk	Egypt	Military Coup	July 26, 1952	0.4
25	Adolf Hitler	Germany	Defeat in World War II	April 30, 1945	0.1
26	Tsar Nicholas II	Russia	Bolshevik Revolution	March 15, 1917	0.25
27	Blaise Compaoré	Burkina Faso	Uprising & Seizure of Parliament	October 31, 2014	0.42
28	Viktor Yanukovych	Ukraine	Euro-Maidan Revolution & Exile	February 22, 2014	0.45
29	Jean-Claude Duvalier	Haiti	Bloody Protests & Exile	February 7, 1986	0.25
30	Manuel Noriega	Panama	US Military Intervention & Arrest	January 3, 1990	0.4
31	Alberto Fujimori	Peru	Corruption & Resignation via Fax	November 22, 2000	0.45
32	Evo Morales	Bolivia	Disputed Election & Mass Protests	November 10, 2019	0.38
33	Yahya Jammeh	Gambia	Electoral Loss & Regional Pressure	January 21, 2017	0.45
34	Mengistu Haile Mariam	Ethiopia	Capture of Capital by Rebels	May 21, 1991	0.28
35	Charles Taylor	Liberia	Civil War & International Pressure	August 11, 2003	0.22
36	Sukarno	Indonesia	Military Coup (by Gen. Suharto)	March 12, 1967	0.3
37	Mohammad Mossadegh	Iran	CIA-backed Military Coup	August 19, 1953	0.48

Sources: WJP 2006-2024 Report and newspaper.

Appendix B

Justice Score Sri Lanka: 2012–2024 (Past 12 Years)

Year	WJP Rule of Law Index (Score on a 0–1 scale)	World Ranking	Number of countries	Comments
2012-2013	Specific score not mentioned	High regional ranking.	97	
2014	0.62	48 Th	99	
2015	0.50	No specific ranking mentioned	102	
2016	0.51	,,	102	
2017	0.53	,,	113	
2018	0.53	,,	113	
2019	0.52		126	Consolidated Report for 2018–19
2020	0.52	,,	128	
2021	0.50	,,	139	
2022	0.50	,,	140	
2023	0.50	77th	142	
2024	0.51	75 th	142	2nd position in South Asia

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Nexus Between Financial Inclusion and Economic Growth in Bangladesh (2004-2021): ARDL Approach

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Abstract

The purpose of this paper is to assess the dynamic impact of financial inclusion on Bangladesh's economic growth, an emerging economy. In this study, Autoregressive Distributed Lag (ARDL) methods were used for analysis, focusing on the primary research question using time-series data spanning 2004 to 2021. The ARDL analysis indicates no significant relationship between financial inclusion and economic growth in Bangladesh in the short- or long-term. The study concludes that the development of financial institutions and improved use of banking services do not significantly contribute to the country's economic progress. Despite this, financial inclusion appears to drive economic expansion, but its effectiveness is hindered by factors such as the prevalence of the informal sector and the inadequate customization of financial services to meet the needs of lower-income groups. The assessment of financial inclusion's effectiveness may be incomplete if solely based on the expansion of financial institutions and banking services, as other factors, such as product diversity and utilization rates, could provide more accurate measures, while external shocks and economic cycles could significantly influence the relationship between financial inclusion and economic growth. The burgeoning position of Bangladesh's economy necessitates a thorough examination of initiatives for financial inclusion and their potential impact on GDP growth. Despite various obstacles and a noticeable lack of financial literacy among its citizens, there is a critical need to assess the effectiveness of these efforts. This research embarks on an innovative investigation into the causal link between indicators of financial inclusion and Bangladesh's economic progress. Significantly, this study represents a groundbreaking endeavor, supported by recent empirical evidence and collaborative efforts to promote financial inclusivity in Bangladesh's economic landscape. The implications of this study are poised to provide substantial insights beneficial to both financial institutions and policymakers.

Keywords: *Financial inclusion · financial institution · Economic growth · Developing country · emerging economy · Bangladesh*

JEL Classification: *G2 · G21 · G28*

1. Introduction

Financial inclusion, as defined by the World Bank, is the accessibility of affordable, easily attainable financial services and products that meet the

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needs of individuals and enterprises. This encompassing framework includes transactions, payments, savings, credit, and insurance, all provided ethically and sustainably. Access to transaction accounts serves as a fundamental gateway to a wide range of global financial services and is therefore crucial to achieving greater financial inclusion. Recognizing the pivotal role of financial institutions in fostering economic growth, elevating living standards, and bolstering the performance of small and medium-sized enterprises (SMEs), initiatives to enhance financial inclusion have garnered global attention. In Bangladesh, where financial inclusion remains a critical concern, initiatives such as agent banking, Corporate Social Responsibility (CSR) programs, and Mobile Financial Services (MFS) have been pivotal in extending the reach of formal financial services to previously underserved populations (Noor et al., 2022; Khanam, 2022; Ibne Afzal et al., 2023). Despite these efforts, significant segments of the population remain excluded from the formal financial system, presenting challenges to sustainable development (Islam, 2022).

Bangladesh stands as a compelling case study in the pursuit of financial inclusion, placing significant emphasis on integrating marginalized segments of society into the formal financial ecosystem. Notably, microfinance initiatives led by organizations like Grameen Bank have played a transformative role in extending financial services to historically underserved populations, particularly in rural areas. The overarching objective of these initiatives is to empower individuals and catalyze economic progress, thereby advancing broader socio-economic development. The correlation between financial inclusion strategies and economic growth is well-documented, with inclusive lending practices identified as catalysts for entrepreneurial endeavors and facilitators of overall prosperity. Moreover, the infusion of technology into financial services has emerged as a potent driver of transformation in Bangladesh, enhancing efficiency, accessibility, and inclusivity. The deployment of digital solutions not only enhances institutions' financial performance but also contributes to the broader financial inclusion agenda. Central to the discourse on financial inclusion is the regulatory framework, which shapes the dynamic between inclusive approaches in the financial sector and broader economic growth objectives. It is imperative to formulate and enforce regulations that champion inclusive practices while safeguarding the integrity and stability of the financial system. Such measures are essential for nurturing a resilient and harmonious financial environment conducive to sustainable economic growth. The adoption of mobile banking and inclusive financing practices has yielded promising outcomes, enhancing financial inclusion and catalyzing economic growth in Bangladesh (Uddin & Begum, 2023). Studies have indicated positive correlations between financial inclusion, poverty alleviation, and women's empowerment, underscoring the multifaceted benefits of inclusive financial services (Chakraborty & Abraham, 2023; Islam, 2023). However, the literature lacks a comprehensive exploration of the causal relationship between financial inclusion indicators and economic growth in Bangladesh. In this context, this

paper explores the relationship between financial inclusion and economic growth in Bangladesh, considering two key dimensions: the penetration of banking institutions and the availability and access to banking services, shedding light on the transformative impact of inclusive financial practices on socio-economic development. Through a comprehensive analysis of microfinance interventions, technological innovations, and regulatory frameworks, this research aims to provide valuable insights into the multifaceted dynamics of financial inclusion and its implications for economic prosperity in Bangladesh.

This study aims to address this gap by conducting an empirical analysis to elucidate the causal nexus between various indicators of financial inclusion and economic growth in Bangladesh. By leveraging existing literature and empirical data, this research aims to provide insights into the role of financial inclusion as a catalyst for economic development in an emerging economy such as Bangladesh. Through rigorous analysis, this study seeks to contribute to the growing body of knowledge on financial inclusion and its implications for sustainable economic growth, thereby informing policymakers, practitioners, and researchers alike.

2. Rationale of the Study

Financial inclusion has emerged as a critical aspect of economic development, particularly in developing countries like Bangladesh, where access to formal financial services remains limited for a significant portion of the population. This literature review synthesizes insights from a range of studies examining the relationship between financial inclusion and economic growth, with a particular focus on various empirical evidence and theoretical frameworks across different regions, especially Bangladesh, India, Nigeria, and African countries.

Financial inclusion aims to provide accessible financial services to all members of society, playing a crucial role in driving Bangladesh's economic development by expanding access and encouraging economic participation across different sections of society. Empirical evidence suggests a significant relationship between financial innovation and economic growth, with the circulation of credit to the private sector and effective monetary management identified as key factors (Qamruzzaman et al., 2017). Access to credit facilities is pivotal for individuals and businesses, particularly those in rural and underserved areas, to achieve financial inclusion and drive economic growth. Financial services that are easily accessible have been shown to facilitate the growth of new firms and foster innovation (Levine, 1997).

Theoretical frameworks, such as T. Hall's three-dimensional model of financial inclusion, which emphasizes financial participation, capability, and well-being, provide a comprehensive lens for understanding the multifaceted nature of financial inclusion and its potential impact on economic development

(Joshua et al., 2020; Noor et al., 2020). Financial inclusion has been found to have a significant positive impact on both economic growth and human well-being in Asian countries, with bank branches and loans to rural areas identified as key factors (Audi et al., 2019). Microfinance and microcredit initiatives have revolutionized rural areas of Bangladesh, empowering low-income households and small-scale entrepreneurs to enhance their livelihoods and contribute to economic development. Increased participation in financial services has been highlighted as crucial for driving GDP growth, particularly in low-income countries, with financial inclusion positively affecting financial efficiency and stability (Pal & Bandyopadhyay, 2022; Ahamed and Mallick, 2019). The stability of banks prioritizing financial inclusion is notably higher, benefiting small businesses and sectors and fostering economic growth (Ahamed and Mallick, 2019). Proactive regulatory policies and expanded financial literacy play significant roles in shaping outcomes related to financial inclusion in Bangladesh, with financial literacy contributing to inclusive finance and supporting the stability of the financial system (Khalily, 2016; Nawaz, 2010). Despite progress, challenges persist, including limited access, inadequate financial literacy, and high informal lending rates, hindering the effectiveness of financial inclusion initiatives, particularly among vulnerable populations (Amit et al., 2022). Addressing these challenges requires concerted efforts from policymakers to promote financial literacy, enhance regulatory frameworks, and leverage digital innovations to ensure inclusive growth.

Bangladesh has made notable progress in financial inclusion, particularly through microfinance initiatives like Grameen Bank. However, the literature reviewed underscores the importance of inclusive finance in promoting business growth and overall economic progress. Comprehensive strategies tailored to regional and population-specific needs are crucial for harnessing the potential of financial inclusion as a driver of sustainable economic development. The relationship between financial education, financial inclusion, and financial stability is intricate and crucial. Financial education plays a significant role in enhancing financial literacy and inclusion, potentially enabling individuals to benefit from the opportunities presented by big tech firms entering the financial sector (Jonker & Kosse, 2022; Saydaliev et al., 2022). Empirical studies suggest that financial literacy positively influences financial inclusion, with education status, age, and gender also being key determinants of inclusion (Jonker & Kosse, 2022). Therefore, a well-designed financial education program, coupled with appropriate regulatory frameworks, is essential to mitigate risks and ensure that financial inclusion contributes positively to overall financial stability. Financial education and financial inclusion, operating in tandem, contribute to greater financial stability by addressing both the supply side through increased access to financial services and the demand side through heightened awareness of the benefits and necessities of utilizing such services offered by banks and other financial institutions (Bhaskar, 2013).

Table 1: Literature review on existing work of Bangladesh

Author	Topic	Methodology	Variables	Findings	Gap
Noor & Shirazi (2022)	Effects of Financial Inclusion on the Economic Growth of Developing Countries: An Empirical Analysis of the Bangladesh Economy from 2011 to 2020	Multiple regression analysis was used	Financial inclusion is assessed by the number of Automated Teller Machines (ATMs) and the credit-deposit ratio (CDR)	Financial inclusion plays a crucial role in economic development, with ATMs positively affecting GDP, whereas the CDR has a limited impact on GDP.	The study used only two determinants of financial inclusion, while the current study uses a financial index with the ARDL model
Audi et al. (2019)	Financial Inclusion, Economic Growth, and Human Well-Being Nexus: Empirics from Pakistan, India, China, Sri-Lanka, Bangladesh, and Malaysia	Panel pooled regression was used	Use GDP as a dependent variable and other independent variables, but do not use any financial inclusion index	The results show that financial development has a negative, insignificant impact on economic growth, but a negative, significant impact on human well-being.	The study was based on cross-country evidence, not specifically on Bangladesh, and they did not use the same variable as ours.
Saha et al. (2023)	The impact of financial inclusion on economic growth in developing countries	The two-stage system generalized method of moments (GMM) method was applied for the analysis	Used GDP per capita as the dependent variable and the financial inclusion index as an independent variable	Financial inclusion positively impacts economic growth in Bangladesh by expanding opportunities for lower-income individuals	This study is also a cross-sectional country study and our recent study found new insights and different results
Islam (2023)	Financial Inclusion as the Driver of Poverty Alleviation in Developing Economies: Evidence from Bangladesh	Ordinary Least Squares (OLS)	Income per capita is used as a dependent variable, and financial inclusion indicators are an independent variable	The study's empirical evidence suggests no statistically significant relationship between inclusive financing and poverty reduction in Bangladesh.	Though their finding was insignificant, it was not the study of the relationship between financial inclusion and economic growth
Amit et al. (2022)	Systemic Barriers to Financial Inclusion in the Banking Sector of Bangladesh	The study applied a qualitative approach, a focus group discussion. and key informants' interviews on identifying the existing number of challenges		RMG workers encounter barriers like insufficient documentation, financial illiteracy, and high fees from informal lenders, impeding access to financial services and exacerbating exploitation and debt.	This study identifies common barriers marginalized individuals face in accessing inclusive finance and thereby addresses a gap in understanding whether these barriers also impede economic growth.

There are numerous cross-country and country-specific empirical studies that examine the causal relationship between financial inclusion and economic growth. These studies vary across countries, with most revealing a significant relationship. In the context of an emerging economy like Bangladesh, introducing financial inclusion through various channels faces numerous barriers, including a lack of financial education and a critical gap in research on the impact of financial inclusion on GDP growth. Given the limited existing research in this area, the present study aims to explore the causal relationship between various financial inclusion indicators and economic growth in Bangladesh, an emerging economy.

H01: There is no significant relationship between GDP Per Capita and financial inclusion.

3. Theoretical Framework and Data Source

This study's thorough quantitative analysis is supported by data from reliable sources, including the Global Financial Development Database (GFDD) and the International Monetary Fund's (IMF) Financial Access Survey, covering the years 2004 to 2021. This ensures a high degree of reliability, credibility, and consistency in their quantitative analyses by using data from these well-established and internationally recognized repositories. In this study, we investigated the contextual relationship between different financial inclusion measures and Bangladesh's economic growth to answer the research question. Indicators of banking institutions have been employed in numerous studies to measure financial inclusion (Dahiya & Kumar, 2020; Raza et al., 2019; Yakubu & Musah, 2022; Khalily, 2016; Saha et al., 2023; Sharma, 2016). Various banking indicators have been used in studies to gauge the extent of financial inclusion. Drawing on prior research and the critical role of banking institutions in promoting financial inclusion in Bangladesh, which relies heavily on banks, this study centers on three essential aspects of financial inclusion. The following measurements are:

(1) penetration of banking institutions

(2) availability or access to banking services, and

(3) usage of banking services by the general public (Sarma, 2008).

The following criteria have been used to determine banking institution penetration:

- number of deposit accounts held by commercial banks per 1,000 adults (DAC); and

- number of loan accounts held by commercial banks per 1,000 adults (LAC).

Access to banking services has been indicated in terms of the following:

- bank branches per 1,000 km. (BRK)
- bank branches per 0.1 million adults. (BAC)
- ATMs per 1,000 km; and (ATMK)
- ATMs per 0.1 m adults. (ATMP)

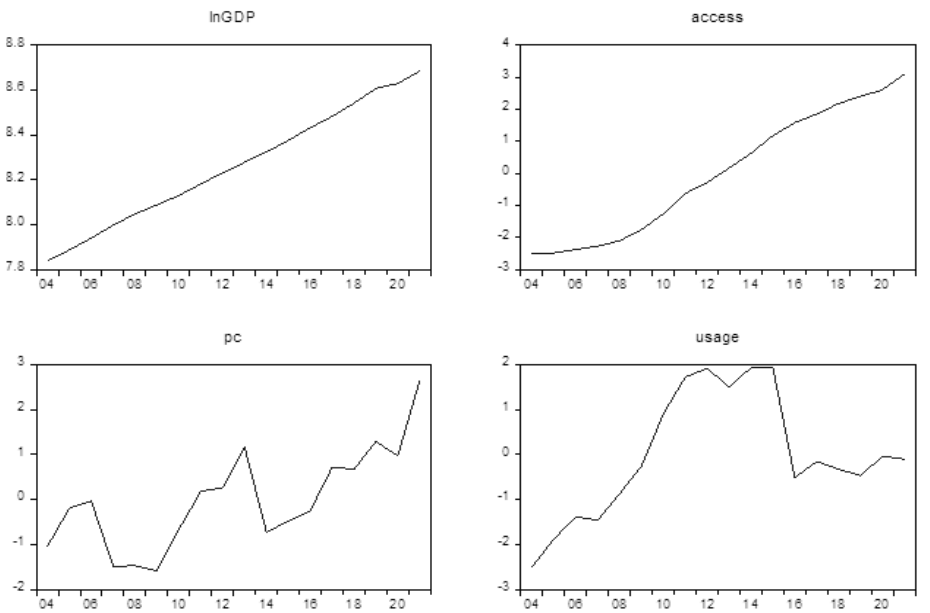
The following are included in the use of banking services:

• Outstanding deposit (% of GDP)

• Outstanding credit (% of GDP).

To investigate the short- and long-term relationships between composite dimensions of penetration, access, and usage with GDP, we developed an ARDL model for this study. We employed Principal Component Analysis to account for the composite dimension of penetration and access.

$$Penetration = f(DAC, LAC)$$
$$Access = f(BRK, BAC, ATMK, ATMP)$$
$$Usage = f(OD, OC)$$



Source: Global Financial Development Database (GFDD) & the International Monetary Fund's (IMF) Financial Access Survey

The linear functional association between the Dependent variables and independent variables stands:

GDP = f (Penetration, Access)

The empirical model stands as follows,

$$GDP_t = \beta_0 + \beta_1\, Penetrationt + \beta_2\, Accesst + \beta_3 Usage + \varepsilon_t \qquad (1)$$

Here,

$GDP_t = GDP$ per Capita at time t

Taking the natural log of the dependent variable, we get

$$ln\ GDPt = \beta_0 + \beta_1\, Penetrationt + \beta_2\, Accesst + \beta_3 Usage + \varepsilon_t \qquad (2)$$

4. Econometric Model

In this study, we will examine the effect of financial inclusion on Bangladesh's economic growth using time-series data from 2010 to 2021. We would apply the Autoregressive Distributed Lag (ARDL) methodology, which is the primary method recommended by Pesaran and Shin (1998). We believe this model is appropriate for representing the goal of our research because we intend to apply the Auto Regressive Distributed Lag (ARDL) approach in our investigation. Below is the description of the ARDL approach in an unrestricted error correction model (UCEM):

$$\begin{aligned} lnGDP_t = \ \alpha_0 \ + \sum_{i=1}^{p} \beta_i \ + \ ln\ GDP_{t-1} + \sum_{j=1}^{q} \beta_j\, Penetration_{t-1} \\ + \sum_{k=1}^{m} \beta_k\, Accesst_{t-1} + \sum_{l=1}^{n} \beta_l\, Usage_{t-1} \ + \ \lambda_1 lnGDP_{t-1} \\ + \lambda_2\, Penetration_{t-1} + \lambda_3\, Access_{t-1} \ + \ \lambda_4 Usage_{t-1} + \ \varepsilon_t \end{aligned}$$

Based on the derived model and data-set, we next explore the empirical association between per capita GDP and the financial inclusion dimension in Bangladesh. The error term is represented by ε, the exogenous variable subscripts, $t-1$ are the first difference operator and represent lags in the logarithm Δ. The short-run relationship is measured by the coefficients βs, and the long-run relationship is measured by the coefficientsλs. The model has intercept terms denoted by $\alpha 0$ and error terms denoted by $\P_t$.We then investigate the relationship between Bangladesh's financial inclusion dimension and per capita GDP in a developing nation, using the model and dataset generated.

5. Empirical Results and Discussion

The empirical findings and the relationships between the different aspects of financial inclusion and economic growth will be further discussed in this section. The descriptive statistics for the variables are shown in Table 2.

Table 2. Descriptive Statistics

Variables	Mean	Median	Std.	Jarque-Bera	Probability
lnGDP per Capita	8.26	8.25	0.26	1.0694	0.586
Penetration	1.67E-09	-0.112	1.24	0.76	0.68
Access	-5.00E-08	-0.06	1.99	1.68	0.43
Usage	1.67E-08	-0.203	1.38	0.77	0.67

Source: Author's own calculation.

The stationarity of the data series was verified using unit root test results (Table 3). The findings support stable data series, as each series rejects the null hypothesis of a unit root. With the exception of the access series, the series are stationary in levels and first differences. Our goal is to build a model using ln (GDP), PC, and usage. The variables at the second difference are not integrated. Therefore, the ARDL model makes sense.

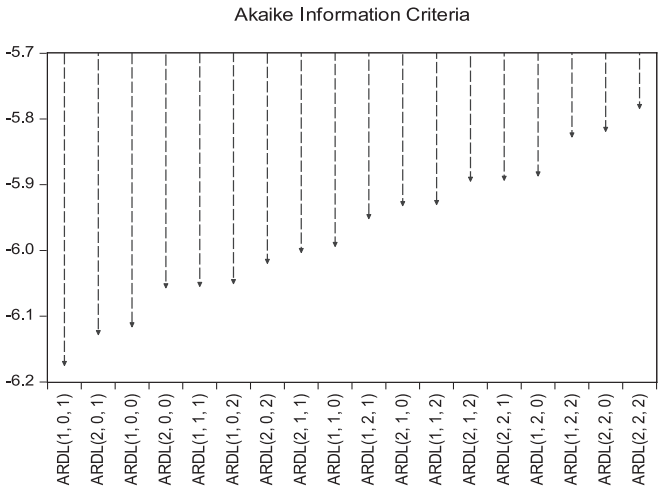
Table. 3. ADF Unit Root Test

Variables	ADF (Level)		
	Intercept	Trend & Intercept	Without Trend & Intercept
Ln GDP per Capita	0.0398 0.9501	-2.3546 0.3865	21.8054 0.9999
Penetration	-0.9267 0.7537	-3.8203** 0.0453	-1.0954 0.2364
Access	-0.1439 0.9282	-2.8203 0.2107	-0.7184 0.3894
Usage	-2.0023 0.2830	-1.4057 0.8208	-2.0196 0.0445
ADF (First Difference)			
Ln GDP per Capita	-4.6808*** 0.0023	-3.2437 0.1194	-0.2900 0.5629
Penetration	-4.3527*** 0.0044	-4.4797*** 0.0139	-4.2895*** 0.0003
Access	-2.2711 0.1918	-2.1232 0.4957	-0.2211 0.5908
Usage	-3.4455** 0.0247	-3.7308 0.0502	-3.5138* 0.0016

Notes: (*) Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1%. Source: Author's own calculation.

ARDL Estimation

We find the optimal lag for the suggested model once the dependent variable ln(GDP) passes the strict first-difference stationarity criterion in the ADF test above. Based on the minimum values of the selection-order criteria, the lag length is chosen to minimize the Akaike information criterion (AIC). Consequently, utilizing the AIC, we choose lag 1.



The results of the F-bounds statistic test are shown in Table 4. During the specified period, there was a discernible correlation among economic growth, the penetration of banking institutions, and the use of financial services. There exists a long-run relationship among variables, because the computed F-statistic is greater than the lower bound at all significant levels.

Table 4. Bound Test for Cointegration

F- Statistics	Level of Significance	Low Bound, I(0)	Upper Bound, I (1)	Long-run relationship
115.9231	10%	2.63	3.35	Exist
	5%	3.1	3.87	
	1%	4.13	5	

Source: Author's own calculation.

The ARDL model's short- and long-term coefficient estimations are displayed in Table 5. The model's variables appear to have a long-term, statistically significant relationship, as indicated by the bounds test. In the long-run equation, the individual coefficients for variables such as Usage and Penetration do not appear statistically significant on their own. This disparity could mean that although these variables work together to support a long-term equilibrium relationship, each variable's individual effect may not be as strong or may

depend on other variables that this basic model does not account for. The impacts of other variables (such as Penetration and Usage) are less evident and statistically insignificant, but the short-run coefficients indicate that past GDP values have a considerable and immediate impact on the dependent variable.

Table 5. Short-run and Long-run Estimates for the Dependent Variable, in GDP

Long-run coefficients				
Variable	Coefficient	Std. Error	t-statistics	Prob
Penetration	0.192087	0.188875	1.017004	0.3292
Usage	-0.053200	0.197308	-0.269627	0.7920
Short-run coefficients				
Variable	Coefficient	Std. Error	t-statistics	Prob
LNGDP (-1)	0.987905	0.015180	65.08030	0.0000
Penetration	0.002323	0.003064	0.758143	0.4630
Usage	-0.005906	0.003493	-1.690704	0.1167
Usage (-1)	0.005262	0.003365	1.563997	0.1438

Source: Author's own calculation.

In Bangladesh, the financial inclusion-growth relationship is not supported by data in either the short or long term, according to the ARDL model's overall analysis. So, our null hypothesis can't be rejected. Hence, the development of financial institutions and the usage of banking services have no bearing on Bangladesh's economic progress. These results run counter to those of Saha et al. (2023), who demonstrated that financial inclusion increases opportunities for lower-income individuals, thereby benefiting Bangladesh's economic growth. A nation's ultimate economic prosperity, therefore, does not result from the integration of the entire society into the financial system through efficient banking penetration and usage of financial services.

Table 6. Diagnostic Test

Test	Test statistics	P-value
Breusch-Godfrey serial correlation LM test	5.28	0.0272

Notes: At 1% significant level, no autocorrelation exists.

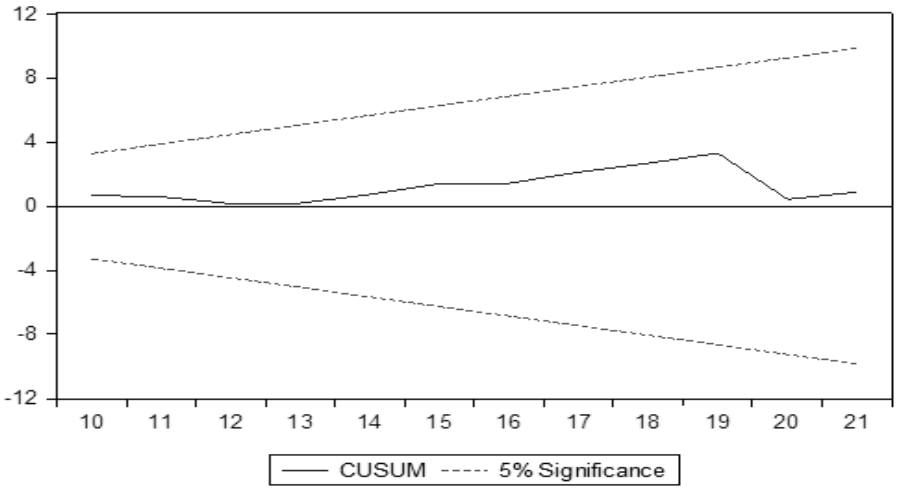


Figure 1. The CUSUM test as a stability test for Bangladesh from 2010 to 2021
Source: Author's own calculation.

The CUSUM (cumulative sum) was used to confirm the model's stability (Figure 1). The regression model parameters for Bangladesh exhibit a breakpoint. The CUSUM test reveals how the parameters move throughout the corridor.

6. Concluding Remarks and Policy Implications

This study aims to validate the relationship between finance and growth in the context of financial inclusion and economic growth in Bangladesh's rising economy between 2004 and 2021.

It is possible that the available financial services are not sufficiently customized to meet the demands of the most economically active parts of the population or the general public. Financial products that do not meet the needs of small enterprises or lower-income consumers may not be effective tools for promoting economic expansion. Bangladesh has a sizable informal sector that may not fully utilize official financial services due to various obstacles, including a lack of knowledge, trust, or context. The possible effect of financial inclusion programs on overall economic growth is lessened by this disparity. Significant economic consequences might not materialize below certain thresholds of financial inclusion. To maximize the impact of financial inclusion on economic growth in Bangladesh, authorities should focus on tailoring financial products for key sectors such as SMEs and agriculture, while improving financial literacy across all segments of society. To ensure that financial services are widely accessible, efforts should be made to strengthen both the physical and digital infrastructure. Regulatory reforms should also aim to protect consumer interests while fostering innovation.

7. Limitations

The standards by which financial inclusion is evaluated may not entirely capture the quality and efficacy of financial inclusion initiatives, as reflected in the growth of financial institutions and the use of banking services. The variety of financial products offered or the rates at which financial services are used may offer better indicators. The relationship between financial inclusion and economic growth may be significantly altered by exogenous shocks and larger economic cycles, which it may fail to account for.

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Footnoting and Writing Style Guidelines

Bangladesh Journal of Political Economy

I. General Submission Information

1. **Publication Schedule**: The *Bangladesh Journal of Political Economy* (BJPE) is published biannually in June and December.

2. **Submission Address**: Manuscripts (research articles, notes, reviews) in English or Bangla should be submitted electronically (preferred) or in triplicate to:

   The Editor, BJPE, Bangladesh Economic Association, 4/C Eskaton Garden Road, Dhaka-1000, Bangladesh.

3. **Abstract**: Include an abstract not exceeding 150 words.

4. **Formatting Basics**:

   - Double-spaced throughout (including references)
   - 12-point Times New Roman font
   - 1-inch margins on all sides
   - Page numbers in bottom right corner
   - Line numbers included for peer review

5. **Blind Review**: Author identification must not appear on the manuscript. Submit a separate title page containing full name(s), mailing address, telephone number, and paper title.

6. **Title**: Article titles should be concise. Brief, descriptive subheadings may be used. The Editorial Board reserves the right to modify titles for clarity or consistency.

7. **Duplicate Submission**: If a submitted manuscript is accepted elsewhere, the author must notify the Editor immediately. The author bears full responsibility for any resulting conflicts.

8. **Visual Elements**: Tables, graphs, and maps may be included. Each must have a clear title and source attribution.

II. Manuscript Structure and Section Numbering

9. **Standard Article Sequence**:

   - Introduction (background and problem statement)
   - Objectives and hypotheses
   - Methodological framework
   - Findings/Results

- Policy implications
- Limitations (if applicable)
- Conclusion(s)
  Empirical papers may adapt the IMRaD structure (Introduction, Methods, Results, Discussion, Conclusion) where appropriate.

10. **Hierarchical Section Numbering**:
    - **Main sections**: **1, 2, 3…** (bold)
    - *Subsections*: *1.1, 1.2, 1.3…* (italics)
    - <u>Sub-subsections</u>: <u>1.1.1, 1.1.2…</u> (underlined)
    - Avoid numbering beyond three levels to preserve readability. A fourth level is discouraged.

III. Tables and Figures

11. **Tables**:
    - Number consecutively (Table 1, Table 2…).
    - Place titles *above* the table, centred.
    - Use minimal horizontal lines (above/below column headers and at table bottom); avoid vertical lines.
    - Ensure legibility in black-and-white printing; use patterns, textures, or line styles instead of color.
    - Submit as editable text (not images) with minimum 9-point font.
12. **Figures**:
    - Number consecutively (Figure 1, Figure 2…).
    - Place captions *under* the figure, centred.
    - Design for grayscale: use distinct symbols (circles, squares, triangles), hatching, or line styles rather than color.
    - Ensure high resolution (300+ DPI) and legible fonts when scaled to column width.

IV. Citations and References (APA Style with BJPE Conventions)

13. **In-text citations** follow the author–date format: *(Author, Year)* or *Author (Year)*.
    - Example: *(Wilmore, 2000)* or *Wilmore (2000)* argues that…
    - For two authors: *(Bosworth & Yang, 2000)*
    - For three or more authors: *(Hoque et al., 2023)*

14. Reference list requirements:

- Appear at the end of the article, arranged alphabetically by first author's surname.
- Use hanging indents for all entries.
- Follow APA 7th edition conventions, adapted to BJPE's traditional formatting:

a) Book (single or multiple authors)

Format: SURNAME, Initial(s). (Year). *Title of book*. Place of publication: Publisher. *Example*: WILMORE, G.T.D. (2000). *Alien plants of Yorkshire*. Kendall: Yorkshire Naturalists' Union.

b) Chapter in an edited book

Format: SURNAME, Initial(s). (Year). Title of chapter. In Initial(s). SURNAME (Ed./Eds.), *Title of book* (chap. X, pp. xx–xx). Place: Publisher.

Example: NICHOLLS, G. (2002). Mentoring: the art of teaching and learning. In P. JARVIS (Ed.), *The theory and practice of teaching* (chap. 12, pp. 245–260). London: Kogan Page.

c) Journal article

Format: SURNAME, Initial(s). and Initial(s). SURNAME (Year). Title of article. *Title of Journal*, vol. X, no. Y, pp. XX–YY.

Example: BOSWORTH, D. and D. YANG (2000). Intellectual property law, technology flow and licensing opportunities in China. *International Business Review*, vol. 9, no. 4, pp. 453–477.

Note: Abbreviations *vol.*, *no.*, and *pp.* may be omitted if consistency is maintained throughout. When multiple journals share the same title, include the place of publication in parentheses (e.g., *International Affairs* (London)).

d) Electronic source

Format: ORGANIZATION/AUTHOR. (Year). *Title of document*. [Accessed online from Database/URL, Access Date].

Example: DIXONS GROUP PLC (2004). *Company report: profile*. [Accessed online from Financial Analysis Made Easy (FAME) database at http://www.bvdep.com/en/FAME.html, 13 Dec. 2005].

15. Footnotes and Endnotes:

- Footnotes are discouraged; integrate explanatory or supplementary content directly into the main text.
- If essential endnotes are required (e.g., for methodological clarifications or ancillary data), number them consecutively throughout the manuscript and place them *after* the main text but *before* the Reference list.

- Endnote citations in text should appear as superscript numerals: *...as demonstrated previously.*[1]

V. Additional Guidelines

16. **Language and Style**:
    - Define all abbreviations at first use.
    - Use italics for emphasis only; avoid bold or underlining in body text.
    - Maintain formal, precise academic English (or Bangla, where applicable).
17. **File Submission**:
    - Submit manuscripts in editable Word format (.doc or .docx).
    - Provide separate, clearly labeled files for tables, figures, and supplementary materials.
    - Ensure all embedded objects are editable and not flattened images.
18. **Editorial Process**:
    - The Editorial Board may request revisions, condensation, or rephrasing prior to publication. All proposed changes will be shared with the author for approval.
    - Authors are responsible for securing permissions for any reproduced tables, figures, or lengthy quotations.
19. **Disclaimer and Responsibility**:
    - The Bangladesh Economic Association disclaims responsibility for views expressed in published contributions. Authors bear full responsibility for the accuracy of data, originality of content, and ethical compliance of their work.
20. **Post-Acceptance**:
    - Unaccepted manuscripts are not returned.
    - Upon publication, each author receives one complimentary journal copy and five off-prints.

Consistency in punctuation, capitalization, and italicization across all reference entries is mandatory. Authors are advised to verify all URLs and access dates for electronic sources prior to submission.

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