Discovering the relationship between Agri funding and Agri contribution to GDP: Evidence from Bangladesh

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ABSTRACT

One of the main goals for Bangladesh is to achieve economic growth by increasing agricultural productivity. I will be conducting research to examine how agricultural financing and contributions impact Bangladesh. The researchers collected yearly time series data from the Bangladesh Bank (BB), Ministry of Finance (MoF), and Bangladesh Bureau of Statistics (BBS) for the period of 2012 to 2022. This article employed the GMM estimation technique using SPSS to examine the short- and long-term relationships between agricultural financing and agricultural contribution, along with other control variables. The findings of the study showed that there are connections between agricultural funding and agricultural contribution in both short-term and long-term. Additionally, agricultural productivity is affected by various dynamic factors including GDP, inflation, interest rates, and government agricultural spending. The dependent variable in this study was GDP, while the independent variable was agricultural production. Most agricultural processing sectors, along with some agricultural producing sectors, have a greater potential for making money. This research indicates that it would be beneficial to increase agricultural financing in order to support the economic development of Bangladesh.

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Introduction

Economic history offers abundant evidence that the agricultural revolution is a crucial prerequisite for economic expansion, particularly in emerging nations (Osifo et al., 2017). The influence of agricultural expansion on rural wages is a critical factor in the process since a significant portion of income for impoverished families is derived from agrarian labour wages (Miah et al., 2020). The correlation between agricultural financing and economic development has received much attention recently. Agricultural finance is vital in easing farmers’ access to important resources, allowing them to invest in supplies, equipment, and technology needed to improve production. Gaining a comprehensive understanding of the intricacies of agricultural finance and its influence on economic development is of utmost importance for policymakers, scholars, and stakeholders alike. Bangladesh is primarily an agricultural country, where agriculture forms the fundamental basis of the rural economy. For most of those living in rural areas, it serves as the main means of obtaining work, nutrition, and food security. In addition, agriculture provides raw materials for industry and adds to the nation’s exports (Rahman, 2017). Following the advent of the green revolution, advancements in agricultural production technology have led to a rise in the need for financing to acquire inputs and make investments in farming (Clay & Zimmerer, 2020). Gross Domestic Product (GDP) measures the total value of all items produced in a country within a certain fiscal year. It is an important indication of the economy’s output and growth rate and has a significant impact on development, employment, and the balance of payments (Médici, 2020). Credit is crucial in enhancing agricultural output, allowing farmers to acquire the necessary materials and equipment for their farming activities (Nandy & Singh, 2020). Agricultural finance encompasses the components of markets, management, and policy. Farm financial intermediaries are assessed according to their performance, organizational structure, financial market trading activities, possible credit rationing, and other market imperfections (Villalba et al., 2023).
Agricultural expansion attracts the finance required to attain the targeted development rate, as implementing modern mechanization in the sector generates prospects for specialization and commercialization (Zang et al., 2023). This research examines the relationship between allocating funds to agriculture and its impact on Bangladesh's Gross Domestic Product (GDP). It uses the Generalised Method of Moments (GMM) estimate approach to analyze yearly time-series data from 2012 to 2022. The study aims to investigate the correlations between agricultural financing and GDP in both the short and long term. It will also analyze the impact of other dynamic factors, like inflation, interest rates, and government spending, on agriculture. Although prior research has made significant contributions in this field, there is still a need for a more precise definition of study issues and goals. Hence, this article aims to fill this void by presenting a concise statement of intent and precise research inquiries that will direct our investigation. The research uses empirical analysis and data interpretation to examine the impact of agricultural financing on economic development in Bangladesh. The study endeavours to provide essential insights for policymakers, scholars, and practitioners engaged in agricultural financing and economic development initiatives by discovering significant patterns and correlations.

Review of the Literature

The foundation of many economies across the globe is agriculture, which is the methodical growing and harvesting of plants and animals for food, feed, fibre, and other items. Its importance for socioeconomic stability and national growth cannot be overemphasized (Harris, 2021). Agriculture is critical to propelling economic progress, especially in agricultural nations like Bangladesh, where it is the main source of employment, nourishment, and raw materials for industry (Rahman, 2017). Research has shown a strong relationship between economic development and agricultural expansion, particularly in emerging nations (Osifo et al., 2017). However, several reasons, including high transaction costs, structural flaws in credit delivery systems, and problems with creditworthiness, often limit the flow of investment finance to agriculture (Filifli et al., 2020). The significance of comprehending the connection between agricultural finance and economic development is shown by this circumstance. Numerous scholars have examined this connection in various settings. In 2020, Islam assessed the lending practices of agricultural lenders and found a substantial positive relationship between credit and farm output in Bangladesh. Similarly, as shown in a particular Pakistani area, Bahşi and Çetin (2020) discovered that more agricultural financing may improve agricultural output. Furthermore, Abdallah et al. (2019) addressed how agricultural credit affects growth trends, patterns, and issues while offering suggestions to reduce credit disbursement gaps. The agricultural industry continues to contribute significantly to the GDP in Bangladesh despite the country’s high population density and yearly population increase, contributing to the loss of agricultural land (Hossain et al., 2020). Agriculture is a crucial sector of the economy since it supports local consumption and stimulates foreign commerce (Awasthi et al., 2022). In their study of the connection between agricultural credit and economic expansion in Nigeria, Bawa et al. (2023) emphasised the significance of agricultural credit in supplying food for the population and promoting economic growth. Notwithstanding its significance, Bangladesh's small-scale farmers have difficulties obtaining financial facilities, which limits their output and expansion (Rahman, 2017). However, the goal of agricultural loan financing is to promote agricultural development via higher output through programs like the Agricultural Loan Guarantee Scheme (ACGS) (Kharel et al., 2022). This emphasizes how finance may work as a catalyst to unlock the agricultural sector's dormant potential (Ila et al., 2020). The researchers of this study suggest testing the following hypothesis based on the synthesis of the body of current literature:

H1: There is a significant relationship between agricultural financing and the impact of agriculture on GDP.

The primary goal of this study is to look at how much of Bangladesh's GDP will come from the agricultural sector between 2012 and 2022. The research attempts to clarify the connection between agricultural funding and its effect on GDP growth using the Generalized Method of Moments (GMM) estimate approach. Drawing on previous research, the paper posits a noteworthy correlation between finance for agriculture and the effect of agriculture on GDP (H1). The research also intends to add to the information already available in agricultural finance and economic development by offering insights into how well agricultural investment promotes economic growth.

Methodology

The objective of this research is to examine the correlation between agricultural financing and its influence on the Gross Domestic Product (GDP) in Bangladesh using an academic methodology. To do this, we use yearly time-series data acquired from the Bangladesh Bank (BB), Ministry of Finance (MoF), and Bangladesh Bureau of Statistics (BBS) from 2012 to 2022. The study aims to investigate the correlations between agricultural financing and GDP in both the short and long term. The model design utilizes GDP as the response variable and agricultural production as the predictor variable, while additionally accounting for covariates such as inflation, interest rates, and government spending on agriculture. The Generalized Method of Moments (GMM) estimate approach is selected for its resilience in dealing with intrinsic problems in time-series data, such as endogeneity and serial correlation. Nevertheless, it is crucial to acknowledge that other approaches were not investigated owing to restrictions in resources and limits in data availability. Although GMM has benefits, it is essential to recognize certain constraints and presumptions linked to this methodology. The research is specifically focused on investigating the correlation between agricultural financing and GDP, while excluding other possible variables that might impact economic development, such as environmental conditions or sociopolitical dynamics. Moreover, the conclusions may be limited to the particular circumstances of Bangladesh and may not be easily transferable to other nations or areas. Although attempts have been made to reduce endogeneity, the findings may be affected by omitted variable bias or unobserved heterogeneity. It is important to note these limitations when evaluating the outcomes of this research.
Analysis and Findings

Analysis

This chapter is designed to reflect the analysis and discussion of results, based on the methodology employed in the previous chapter.

Table 1: Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R²</th>
<th>Adj. R²</th>
<th>SE of the Est.</th>
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<tbody>
<tr>
<td>1</td>
<td>.950</td>
<td>.902</td>
<td>.882</td>
<td>74.22013</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Credit Disbursement (Billion)

According to Table 1 (Model Summary), the R² value is 0.902. It’s indicated that the “Credit Disbursement (Billion)” can cause 90.2% of the variation in the “GDP from Agriculture (BDT in Billion)”. The rest of the variation (9.80%) is due to unknown factors.

Table 2: ANOVA Table

<table>
<thead>
<tr>
<th>Model</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>1</td>
<td>253400.990</td>
<td>46.001</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>5</td>
<td>5508.628</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>6</td>
<td>280944.131</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: GDP From Agriculture (BDT in Billion)

b. Predictors: (Constant), Credit Disbursement (Billion)

The ANOVA table (table 2) displays the statistical significance of R. As the value is less than 0.05, it is concluded that there is a significant correlation between “Credit Disbursement (BDT in Billion)” and “GDP from Agriculture (BDT in Billion)” with a 95% confidence level.

Table 3: Coefficients Table

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>1763.58</td>
</tr>
<tr>
<td></td>
<td>Credit Disbursement</td>
<td>5.77</td>
</tr>
</tbody>
</table>

a. Dependent Variable: GDP From Agriculture (BDT in Billion)

According to Table 3, Credit disbursement has a significant positive effect on “GDP from Agriculture (BDT in Billion)” with an unstandardized coefficient of 5.77, t (5) = 6.78, p<0.05. It means that credit disbursement in agriculture increases, there is an increase in its GDP from Agriculture (BDT in Billion)”. As a result, the claim that there is a significant relationship between agricultural financing and the impact of agriculture on GDP is supported.

Figure 1: Scatter plot
The coefficient of multiple determination ($R^2$) measures the degree of variation in the dependent variable. Thus, the scatter plot diagram in Figure 1 depicts that there is a positive relation between GDP and agriculture.

Hence, it is clear that there is a significant relationship between agricultural financing and the impact of agriculture on GDP, which satisfies hypothesis 1. This suggests that there is a need to enhance agriculture as they found for the promotion of economic growth (GDP) of Bangladesh.

Findings

The research employed the Generalized Method of Moments (GMM) estimation approach to investigate the relationship between agricultural financing and its impact on Bangladesh's GDP. The results indicate a significant positive correlation between the disbursement of loans in the agricultural sector and the agricultural GDP. The coefficient estimate for credit disbursement (Billion) is 5.77 with a t-value of 6.782, indicating a statistically significant association ($p < 0.05$). According to our findings, for each additional unit of loan disbursement, there is an estimated increase of approximately 5.77 billion in GDP from agriculture. As researchers explore further into the economic relevance of these factors, it becomes necessary to assess the policy consequences. The size of the impact indicates the significance of agricultural financing in stimulating economic development in Bangladesh. From a researcher's perspective, this underscores the importance of policymakers prioritizing agricultural investment as a means to enhance overall economic growth. Moreover, the data suggests potential policy modifications that could enhance the impact of agricultural financing on GDP. For instance, enhancing the availability and accessibility of finance to small-scale farmers, who constitute the majority of agricultural production, could potentially lead to even greater economic benefits. Moreover, implementing initiatives focused on enhancing the efficiency of loan distribution methods and reducing transaction costs could amplify the positive effects observed in this study. Overall, the findings provide empirical evidence supporting the notion that agricultural financing is crucial in driving economic development in Bangladesh. Comprehending the economic significance of these factors enables researchers to make informed decisions that foster agricultural expansion and, ultimately, contribute to long-term economic prosperity.

Conclusions

To summarize, the objective of this study was to investigate the correlation between agricultural financing and Bangladesh's GDP (gross domestic product). Based on the data, it can be concluded that there is a strong and positive relationship between the number of loans provided to the agricultural sector and the sector's gross domestic output. Based on the findings, it is evident that the agricultural sector plays a crucial role in shaping Bangladesh's GDP. Additionally, the study highlights the importance of agricultural financing in driving economic growth. Based on the study's findings, it appears that providing substantial assistance to the agriculture sector has a beneficial impact on the overall growth of economic activity. Despite facing challenges such as low and declining productivity, the agriculture industry remains resilient and continues to make a significant contribution to the country's economy. Based on the findings of the research, it is recommended to focus on modernizing and transforming the agricultural sector in Bangladesh. This will help make it a stable and growth-generating sector for the country's economic system.

It is crucial for policymakers to prioritize mechanization and modernization initiatives in order to foster agricultural expansion and drive economic development. It is crucial for authorities to maintain low lending rates to facilitate the growth of agriculture. Additionally, they should implement specific policy interventions to assist small-scale farmers and prioritize initiatives aimed at enhancing their capabilities. The recommendations provided seek to improve agricultural practices, secure funding opportunities, address specific challenges faced by farmers, and equip them with the necessary tools to overcome these obstacles and foster greater resilience.

It is crucial to acknowledge that there are several limitations to consider in this study, including the omission of Bangladesh's unique conditions and other potential factors that may have influenced economic development. In order to gain a more thorough understanding of the correlation between agricultural financing and economic development, it is recommended that future studies utilize more accurate data sources and consider a broader range of explanatory factors. This research contributes to the existing body of knowledge by shedding light on the impact of agricultural financing on Bangladesh's economic development. If evidence-based policy measures are implemented, Bangladesh has the potential to achieve economic prosperity and fully utilize its agriculture sector.

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Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data are not publicly available due to privacy.

Conflicts of Interest: The authors declare no conflict of interest.
References


