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Research paper

Relationship of Agricultural Variables and Macroeconomic Indicators: The Case of The Philippines for The Period 2011 to 2017

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Abstract

The agricultural sector remains a fundamental component of the Philippine economy, historically contributing significantly to its gross domestic product. However, questions have been raised regarding the sector's evolving role amid shifting economic priorities. This study explores the statistical relationship between key agricultural variables and selected macroeconomic indicators in the Philippines from 2011 to 2017. The objective was to examine annual trends in agricultural variables—specifically value of production and gross value added—and compare them with real GDP growth rate, real inflation rate, and real interest rate. The study also aimed to determine whether statistically significant relationships exist between these sets of variables. A descriptive-correlational research design was used, employing secondary data from the Philippine Statistics Authority, Bangko Sentral ng Pilipinas, and the World Bank. Trend analysis was conducted to observe variable movement across time, while Pearson's correlation coefficient was applied to assess relationships between agricultural and macroeconomic indicators. While both agricultural and macroeconomic indicators exhibited yearly fluctuations, correlation analysis indicated no statistically significant relationships between the variables ($p > 0.05$). This suggests that during the study period, movements in agricultural performance were largely independent of changes in macroeconomic indicators. The findings confirm that agricultural variables such as production value and gross value added had no significant relationship with real GDP growth, inflation, or interest rates during the 2011–2017 period. Future research is recommended to incorporate additional variables and extended time frames to further investigate sectoral interdependencies.

Keywords: *Agriculture; Correlation; Economic Growth; Macroeconomic Indicators; Philippines.*

1. Introduction

The Philippines is primarily an agricultural country with a large portion of Filipinos living in rural areas and supporting themselves through agricultural activities. The agricultural sector has long been one of the major contributors to the Philippine Gross Domestic Product (GDP). In 2021, the sector generated a gross value added (GVA) of about 1.76 trillion pesos, equivalent to a 9.6 percent share of the country's GDP (Statistical Research Department, 2022).

However, there were debates regarding the lack of government budgets and programs in agriculture. According to Gamboa (2020), the Department of Agriculture (DA) has inadequate responses in reshaping the agriculture sector as an important contributor to economic growth. He said that the DA has been a hotbed of corruption during many administrations, wherein the money allocated to its programs has fallen into the pockets of greedy politicians, instead of poor farmers, fishers, and livestock growers. He added that productivity in the agriculture sector has become diminished with antiquated methods, a high cost of production, unavailable financing, and laws that may be well-meaning but generally ineffective.

This study aimed to prove the significance of the agricultural sector by (1) providing an analysis of its annual data in terms of the value of production and its gross value added, alongside with it is the analysis of the annual data of macroeconomic indicators namely: real GDP growth rate, real inflation rate and real interest rate; and (2) determining the relationship of the agricultural variables and macroeconomic indicators.

1.1. Research objectives

The study aimed to determine the relationship between agricultural variables and macroeconomic indicators of the Philippines. Specifically, the study deals with the following objectives:

1) To analyze the annual changes in the actual value of agricultural variables in terms of:
a) Value of production; and
b) Gross Value Added.

2) To analyze the annual changes in the following macroeconomic indicators in terms of:
a) Real Gross Domestic Product Growth Rate;
b) Real Inflation Rates; and
c) Real Interest Rates.
3) To determine the relationship between agricultural variables and macroeconomic indicators.
4) To propose an action based on findings.

1.2. Theoretical framework

This study is anchored on the Input–Output (I–O) model, originally developed by Wassily Leontief (1936, 1941), which describes the interdependence among sectors of an economy. The model demonstrates how the output of one sector becomes the input of another, capturing the circular flow of goods, services, and income within an economic system. Leontief's pioneering work laid the foundation for analyzing sectoral linkages and won him the Nobel Prize in Economics in 1973 (Leontief, 1986).

In the context of this study, agricultural variables (value of production and gross value added) are treated as sectoral inputs that may influence broader macroeconomic outcomes such as GDP growth, inflation, and interest rates. Conversely, macroeconomic conditions can act as feedback mechanisms, shaping agricultural performance through changes in investment, consumption, and resource allocation. This reflects the I–O framework's ability to quantify both forward linkages (agriculture supplying raw materials to industry and services) and backward linkages (agriculture depending on inputs such as fertilizer, machinery, and financial services) (Miller & Blair, 2009).

The strength of the I–O model lies in its capacity to trace direct, indirect, and induced effects across the economy. For example, empirical applications in agriculture have shown that shocks in crop production or livestock often transmit to manufacturing and services, influencing employment, trade, and household consumption (Temurshoev & Oosterhaven, 2014; Chen, 2020). Recent studies using I–O and Social Accounting Matrices (SAMs) have also highlighted the importance of agriculture in driving rural income and resilience, particularly in developing economies (Galanakis et al., 2021).

Applied to the Philippine context, the I–O framework is particularly relevant because agriculture remains a foundational sector for rural employment and food security, even as its share in GDP has declined. By situating agriculture within the I–O system, this study investigates whether agricultural performance is still statistically tied to aggregate economic indicators, thereby testing the extent to which traditional multiplier effects remain relevant in a transitioning economy.

Thus, grounding the study in the I–O model enhances its contribution to economic theory by (1) revisiting a classical model of sectoral interdependence and evaluating its explanatory power under contemporary Philippine conditions, and (2) empirically testing whether the hypothesized linkages between agriculture and macroeconomic indicators remain robust in the 2011–2017 period, or whether structural transformation has attenuated these relationships.

1.3. Hypothesis

There is no significant relationship between agricultural variables and macroeconomic indicators.

2. Review of Literature

Recent research continues to underscore the close linkages between agriculture and macroeconomic performance—via contributions to GDP, employment, income, and structural transformation—especially in developing and middle-income countries.

2.1. Agricultural variables

Agriculture has historically served as a foundation of economic growth in developing economies, particularly through its role in production, employment, and food security. Measures such as the value of production and gross value added (GVA) are commonly used to capture the sector's performance and its direct contribution to national income. These indicators provide insight into the scale and efficiency of agricultural activities, while also reflecting structural changes in the economy. Over time, global studies have emphasized that the performance of agricultural variables not only affects rural livelihoods but also influences the stability of broader economic systems through forward and backward linkages to industry, services, and trade (Chen, 2020; FAO, 2024). Reviewing the literature on these variables helps situate the Philippine agricultural sector within the context of international trends and domestic challenges.

2.1.1. Value of production

The value of agricultural production captures the total output generated by the sector and serves as a proxy for its contribution to the economy. Recent global studies highlight those fluctuations in agricultural production often reflect both domestic conditions (e.g., weather, technology, investment) and international trade dynamics. For instance, Chen (2020) showed that changes in China's agricultural production significantly affect downstream industries such as food manufacturing and logistics through input–output linkages. Similarly, Abdelhamid and Kamal (2023) demonstrated that in Egypt, agricultural production responds strongly to investments and labor inputs, suggesting that the value of production is sensitive to both resource availability and institutional support.

2.1.2. Gross value added (GVA)

Agricultural GVA measures the sector's net contribution to GDP, excluding intermediate consumption. International evidence suggests that agricultural GVA is declining as a share of total GDP across most countries, although absolute levels continue to grow (FAO, 2024). For example, Mottaleb and Rahut (2020) found that in South and Southeast Asia, structural transformation has steadily reduced agriculture's share of GDP, even when GVA in agriculture rose in absolute terms. In the Philippines, agriculture's GVA has hovered below 10% of GDP in recent years (Philippine Statistics Authority, 2023), underscoring its diminishing relative importance despite its continued role in employment and food security.

2.2. Macroeconomic indicators

The broader economy is shaped by key macroeconomic indicators such as GDP growth, inflation, and interest rates, which serve as barometers of stability and development. Real GDP growth reflects overall economic expansion; inflation captures changes in purchasing power and the cost of living, and interest rates influence credit access and investment flows. In theory, agriculture interacts with these indicators both directly and indirectly: output growth can contribute to GDP, food production shocks may drive inflation, and agricultural credit conditions can be affected by interest rate movements (Yu & Ciaian, 2020; Toaha & Mondal, 2023). Exploring these macroeconomic indicators in connection with agricultural performance provides an analytical basis for testing whether agriculture remains an engine of growth or whether its influence has diminished due to structural transformation and global integration.

2.2.1. Real GDP growth rate

Agriculture's contribution to GDP growth varies across countries depending on productivity and sectoral integration. Adebayo (2024) found that agricultural value added exerts a strong positive effect on GDP growth in Pakistan, suggesting that agriculture can be a growth driver when well-integrated into the economy. However, in economies undergoing structural transformation, the impact is often weaker. Lao and Luo (2025) observed that in South and East Asia, agriculture's role in GDP growth has been overshadowed by industry and services, but its indirect effects through employment and rural income remain critical.

2.2.2. Real inflation rate

Agriculture influences inflation mainly through food prices, which constitute a large share of consumer baskets in developing economies. Yu and Ciaian (2020) found that agricultural shocks—such as poor harvests or supply chain disruptions—can fuel inflation volatility globally. However, the effect is mediated by imports and trade policies. In the Philippines, food inflation spikes have often coincided with agricultural production shortfalls, though government imports of rice and corn have at times moderated these effects (World Bank, 2022).

2.2.3. Real interest rate

The linkage between agriculture and interest rates is less direct, as interest rates are largely set by monetary policy. However, credit access is critical for agricultural investment. Toaha and Mondal (2023) demonstrated in Bangladesh that agricultural credit has a significant long-run effect on GDP growth, suggesting that lower real interest rates can stimulate investment in the sector. Conversely, high interest rates may constrain farmers' ability to borrow for inputs, thereby dampening productivity and production growth. This highlights the importance of financial intermediation policies that make credit more affordable and accessible to farmers.

3. Methodology

This outlines the methodological framework adopted in this study, describes how data were collected and analyzed, and justifies the choice of the research design in relation to the research objectives and questions. The purpose is to provide transparency and rigor in how the study was conducted, thereby enabling the reader to assess the reliability and validity of the findings (McCombes & George, 2025).

3.1. Research design

In the study, a descriptive correlational research design (quantitative) was used. This determined the relationship between the agricultural variables and macroeconomic indicators of the Philippines from 2011 to 2017.
On one hand, descriptive design was used to present the value of production in agriculture and its Gross Value Added, as well as the real GDP growth rate, real inflation rate, and real interest rate. On the other hand, the correlational research design was used to find the relationship between the agricultural variables and macroeconomic indicators.

3.2. Data gathering procedure

The study utilized information through secondary data analysis. The information was obtained from online resources. The data from the World Bank, Bangko Sentral ng Pilipinas (BSP), and Philippine Statistics Authority (PSA) were utilized.

3.3. Statistical treatment of data

Quantitative methods of data analysis were used. The trend analysis and Pearson's correlation coefficient analysis were utilized to analyze and interpret the data gathered.
On one hand, trend analysis was used to ascertain the pattern of the annual changes in agricultural variables and macroeconomic indicators from 2011-2017. On the other hand, Pearson's correlation coefficient was used to ascertain the relationship between agricultural variables and macroeconomic indicators.

4. Data Analysis

This chapter, therefore, describes how the dataset gathered (including primary questionnaire data, secondary financial, and accounting records) will be processed and analyzed. It outlines the steps of data cleaning, coding, tabulation, descriptive summary, hypothesis testing, and, where applicable, advanced modelling techniques. It also details the software tools used and schemes to assure data quality (for example, handling missing values, outlier detection, and assumptions of checking). By doing so, the reader is provided with a transparent account of how results arise from data, not simply what the results are.

4.1. Annual changes in the actual value of agricultural variables

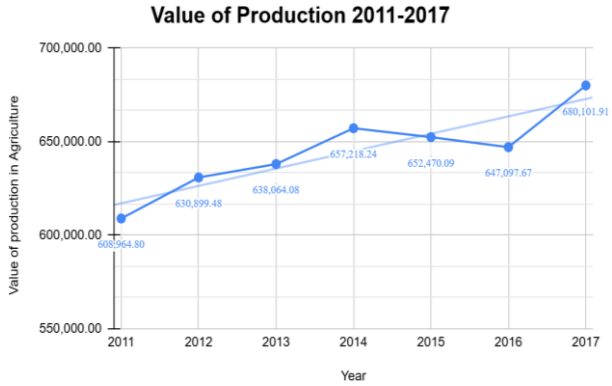

Fig. 1: Value of Production in Agriculture 2011 – 2017 from the Philippine Statistics Authority.

Figure 1 shows that there was an increase in the value of production from 2011 to 2014 due to the substantial increase in total agricultural production attributable to the advent of new technologies, innovations, and process improvements in the farm sector (Philippine Statistics Authority, 2012). According to Brown, Decena, and Ebora (2018), the sudden decrease that occurred from 2014 to 2016 was due to the poor performance of the crop sector brought about by typhoons and El Niño, which affected the rice and corn production. They added that in 2017, the abrupt increase was observed due to the adoption of the Philippine Development Plan, which aimed at the long-term vision of achieving a prosperous, healthy, and resilient society.

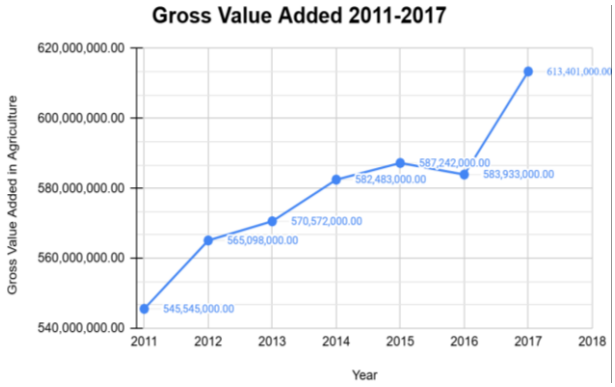

Fig. 2: Gross Value Added in Agriculture 2011 – 2017 from the Philippine Statistics Authority.

Figure 2 shows that fluctuations in the gross value added in agriculture from 2011 to 2017 were evident, with the highest increase from 2016 to 2017, with 5.6 percent, and a dip in value for both 2016 with a decrease of 0.6 percent. The dip in agricultural gross value added in 2016 and the subsequent sharp rebound in 2017 reflect a sector that is highly sensitive to external shocks yet capable of rapid recovery when conditions improve. In 2016, the agricultural sector in the Philippines contracted by around 1.4 % due largely to major typhoons that disrupted crop and fishery production (Simeon, 2017). The 2017 recovery, with nearly 4 % growth, was driven by a combination of more favorable weather conditions, expanded harvested areas, and improved yields—returning the sector to growth (Philippine News Agency, 2018).

4.2. Annual changes in macroeconomic indicators

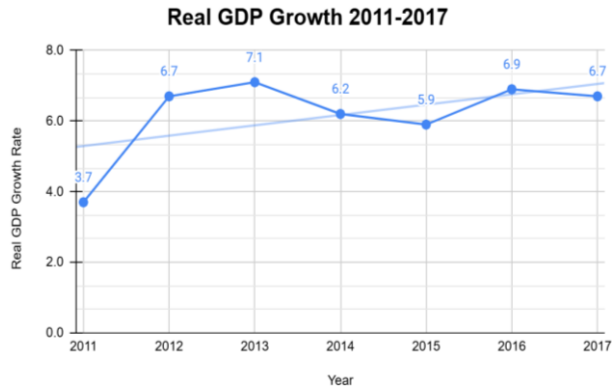

Fig. 3: Real GDP Growth Rate 2011 – 2017 from Bangko Sentral ng Pilipinas.

Figure 3 shows that the real GDP growth rate fluctuated for the period 2011 to 2017. During 2011 to 2013, the performance of the services sector continued to improve with robust performance in real estate, renting, and business activities; trade and financial intermediation sustained by the accelerated growth of the industry sector. Investments in fixed capital also increased, reinforced by consumer and government spending, and the robust growth in external trade (Philippine Statistics Authority, 2013).

However, there was a decrease in growth rates from 2013 to 2015. During this period, the industry and the entire agriculture both decelerated by 6.0 percent and 0.2 percent from 7.9 percent and 1.6 percent, respectively. Further, in 2016 and 2017, growth rates increased with an almost 7 percent mark due to various manufacturing, trade, real estate, renting, and business activities (Philippine Statistics Authority, 2018).

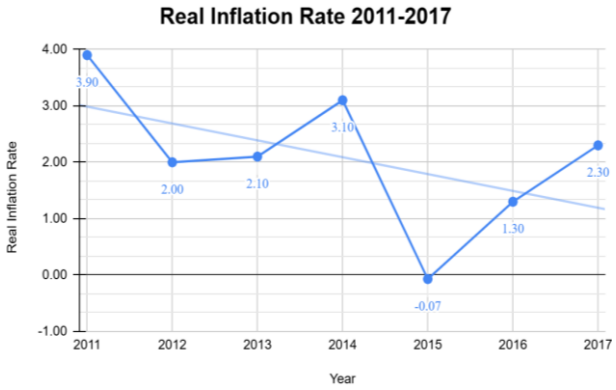

Fig. 4: Real Inflation Rate 2011 - 2017 from World Bank.

Figure 4 shows that the real inflation rates had been changing during the period 2011 to 2017. According to Rappler (2013), the low inflation environment from 2011 to 2013 somehow made up for the 6% appreciation of the peso as OFW remittances and earnings of Business Process Outsourcing (BPO) firms ensured the steady inflow of dollars into the system. In 2014, it accelerated due to price increases in selected food and energy items.

It was in 2015 when there was a drastic decrease largely due to favorable supply-side factors such as relatively lower domestic retail prices of corn, oil, and rice; lower international oil prices; and the contraction in the prices of housing and other utilities (Rappler, 2016). It increased in 2016 and continued to accelerate in the following year due to mixed movements in the annual growths with higher annual mark-ups in the food and non-alcoholic beverages, among others.

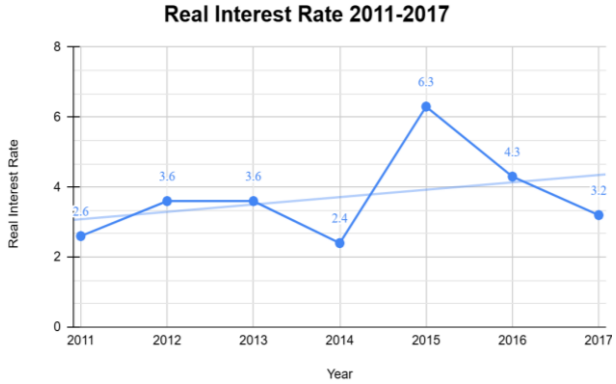

Fig. 5: Real Interest Rate 2011 - 2017 from World Bank.

Figure 5 shows that from 2011 to 2013, there was an increase in the real interest rate due to the increase in the cost of borrowing. Also, a contributing factor was the incentive to save and invest rather than to consume increased. It fell in 2014 and dramatically increased by 6.3 percent as the Bangko Sentral ng Pilipinas tried to regulate the deflation experienced in the same year. It continued to decrease from 2015 to 2017 to manage inflation in the near term, even as it hiked its 2019 average inflation forecast to 3.2 percent from 3.1 percent previously (Villanueva, 2017).

4.3. Effect of agricultural performance

The regression analyses were conducted to determine the effect of agricultural performance, measured through Value of Production in Agriculture and Gross Value Added in Agriculture, on selected macroeconomic indicators, namely Real GDP Growth Rate, Real Inflation Rate, and Real Interest Rate.

Table 1: Regression Results on Constant Variable Value of Production and Other Dependent Variables

*Constant Variable	Value of Production in Agriculture			
*Dependent Variable	R	R Square	Adjusted R Square	Std. Error of the Estimate
Real GDP Growth Rate	.600(a)	0.36	0.232	1.02013
Real Inflation Rate	.343(a)	0.118	-0.059	1.49699
Real Interest Rate	.165(a)	0.027	-0.167	1.41472

Table 2: Regression Results on Constant Variable Gross Value Added and Other Dependent Variables

*Constant Variable	Gross Value Added in Agriculture			
*Dependent Variable	R	R Square	Adjusted R Square	Std. Error of the Estimate
Real GDP Growth Rate	.592(a)	V.350	0.22	1.02839
Real Inflation Rate	.413(a)	0.17	0.004	1.45171
Real Interest Rate	.252(a)	0.064	-0.124	1.38816

For the Real GDP Growth Rate, results showed a moderate positive relationship with both agricultural indicators (R = 0.600 for Value of Production and R = 0.592 for Gross Value Added). The R-squared values (0.360 and 0.350, respectively) suggest that approximately 35–36% of the variance in GDP growth can be explained by agricultural performance. However, both models yielded p-values greater than 0.05, indicating that the results are not statistically significant. Despite this, the positive coefficients imply that improvements in agricultural productivity may be associated with higher economic growth, although the effect requires further validation with larger datasets or additional control variables.

In terms of the Real Inflation Rate, the regression models revealed weak negative relationships with agricultural indicators (R = 0.343 for Value of Production and R = 0.413 for Gross Value Added). The negative coefficients suggest that increases in agricultural output could potentially contribute to lowering inflation, possibly through improved food supply and price stability. Nevertheless, the models were not statistically significant ($p > 0.05$), and the explanatory power was low (R-squared = 0.118 and 0.170). This indicates that while agriculture may play a stabilizing role in inflationary trends, other macroeconomic factors, such as monetary policy and external shocks, likely exert greater influence.

With respect to the Real Interest Rate, the regression models demonstrated very weak positive associations (R = 0.165 for Value of Production and R = 0.252 for Gross Value Added), with R-squared values of only 0.027 and 0.064. Both models were statistically insignificant ($p > 0.05$), suggesting that agricultural output has minimal to no impact on interest rate dynamics. This result aligns with expectations, as interest rates are more directly influenced by monetary policy, financial market conditions, and global capital flows rather than agricultural production

4.4. Influence of macroeconomic indicators

This section examines the influence of macroeconomic indicators—Real GDP Growth Rate, Real Inflation Rate, and Real Interest Rate—on agricultural performance, measured by Value of Production in Agriculture and Gross Value Added in Agriculture.

Table 3: Regression Result of Macroeconomic Indicators on Value of Production in Agriculture

*Constant Variable	Real Interest Rate, Real GDP Growth Rate, Real Inflation Rate			
*Dependent Variable	R	R Square	Adjusted R Square	Std. Error of the Estimate
Value of Production in Agriculture	.840(a)	0.706	0.412	17102.2763

Table 4: Regression Result of Macroeconomic Indicators on Gross Value Added in Agriculture

*Constant Variable	Real Interest Rate, Real GDP Growth Rate, Real Inflation Rate			
*Dependent Variable	R	R Square	Adjusted R Square	Std. Error of the Estimate
Gross Value Added in Agriculture	.788(a)	0.621	0.241	18366116.33

For the Value of Production in Agriculture, the regression model indicated a strong correlation (R = 0.840), with an R-squared of 0.706. This suggests that approximately 71% of the variance in agricultural production can be explained by the combined effects of the three macroeconomic indicators. However, the model did not achieve statistical significance ($p = 0.245$). The coefficients revealed negative relationships across all predictors: Real GDP Growth Rate (B = -10,189.93), Real Inflation Rate (B = -82,378.11), and Real Interest Rate (B = -84,233.71). These results imply that higher levels of GDP growth, inflation, and interest rates are associated with declines in agricultural output. Nonetheless, none of the predictors were statistically significant ($p > 0.05$), indicating that while the model shows a strong fit, the individual contributions of each variable to agricultural production are not robust enough to be conclusive.

In terms of Gross Value Added in Agriculture, the regression model produced a moderately strong correlation (R = 0.788) and an R-squared of 0.621, meaning that about 62% of the variance in agricultural value added could be explained by the macroeconomic indicators. Like the previous model, the overall regression was not statistically significant ($p = 0.348$). The coefficients for all three predictors were again negative: Real GDP Growth Rate (B = -7,309,966.01), Real Inflation Rate (B = -66,967,621.10), and Real Interest Rate (B = -66,897,286.90). These findings suggest that rising macroeconomic indicators tend to exert downward pressure on the value added in agriculture. However, the absence of statistical significance ($p > 0.05$) underscores the limited explanatory power of these indicators when considered individually.

4.5. Correlation analysis between agricultural variables and macroeconomic indicators

Table 5: Relationship between Agricultural Variables and Macroeconomic Indicators

Macroeconomic Indicators	Value of Production		Gross Value Added	
	p-value	Interpretation	p-value	Interpretation
Real GDP growth rate	0.154	Not significant	0.162	Not significant
Real Inflation Rates	0.451	Not significant	0.358	Not significant
Real Interest Rates	0.723	Not significant	0.586	Not significant

Table 5 shows that the relationships between each of the agricultural variables to each of the macroeconomic indicators were found to be insignificant (p-values > 0.05). This implies that it is unlikely that the two variables are tied at all – the relationship was probably detected by random chance instead of any causal mechanisms.

The regression analyses revealed that all models were statistically insignificant ($p > 0.05$), suggesting that no meaningful relationships exist between agricultural variables and macroeconomic indicators during the study period. Agricultural variables such as value of production and gross value added showed moderate positive correlations with GDP growth and weak negative correlations with inflation, yet these results lacked statistical strength. Similarly, the models linking agricultural performance to interest rate dynamics showed very weak associations, which aligns with expectations since interest rates are influenced more directly by monetary policy, financial markets, and global capital flows rather than agricultural output. Conversely, when macroeconomic indicators were regressed against agricultural performance, the models exhibited relatively high explanatory power (R^2 above 0.60). However, all predictors—real GDP growth, inflation, and interest rates—produced negative coefficients, and none were statistically significant, indicating that these indicators do not independently explain fluctuations in agricultural outcomes.

Several factors may explain the absence of significant relationships. First, structural inefficiencies in Philippine agriculture, including fragmented landholdings, low mechanization, inadequate infrastructure, and persistent productivity gaps, reduce the sector's ability to respond to macroeconomic changes or contribute significantly to overall economic performance (OECD, 2023). Even when agricultural

output fluctuates, these inefficiencies may prevent such changes from translating into measurable effects on GDP growth, inflation, or interest rates.

Second, data limitations may have constrained the results. The study covered only a short period (2011–2017) with limited annual observations, which weakens the statistical power of regression models and may have masked cyclical or lagged effects between agriculture and macroeconomic indicators. Furthermore, aggregated national-level data may obscure important variations across subsectors, such as crops, fisheries, and livestock, which respond differently to macroeconomic conditions (Gujarati & Porter, 2009).

Third, external factors may have overshadowed domestic linkages. The Philippines is highly vulnerable to global trade fluctuations, commodity price movements, and climate shocks. Extreme weather events such as typhoons, droughts, and El Niño episodes recurrently disrupt agricultural output, introducing volatility that weakens the stability of its relationship with macroeconomic variables (Micabalo et al., 2024; Philippine Star, 2025). For instance, Philippine agriculture contracted by 2.2% in 2024, its weakest performance in eight years, largely due to weather disturbances and pest infestations, while a strong rebound in 2025 significantly boosted GDP growth (Reuters, 2025). These examples demonstrate how sector-specific shocks and external conditions may exert greater influence on agricultural outcomes than macroeconomic indicators alone.

Taken together, the findings suggest that agriculture and macroeconomic indicators in the Philippines exhibit a degree of independence rather than strong interdependence. While correlations exist, the absence of significant relationships indicates that agriculture's direct influence on macroeconomic performance—or vice versa—remains muted. Instead, outcomes are more heavily shaped by sector-specific constraints and external shocks. This underscores the importance of targeted policy interventions in technology, infrastructure, and climate resilience to strengthen the agricultural sector, rather than relying solely on favorable macroeconomic environments to drive agricultural growth.

5. Conclusion

This study analyzed the annual agricultural data alongside its macroeconomic indicators and determined the relationship between the two variables for the period 2011 to 2017. Agricultural data—namely Value of Production in Agriculture and Gross Value Added in Agriculture—fluctuated during the period, with the highest increase recorded in 2014 at 5 percent, followed by slight declines in 2015 and 2016. Similarly, macroeconomic indicators showed variability: the Real GDP Growth Rate peaked in 2013 and fell to its lowest in 2011; the Real Inflation Rate reached its highest in 2011 and dipped in 2015; while the Real Interest Rate peaked in 2015 and was lowest in 2014.

Using Pearson's correlation and regression analyses, the study sought to determine the relationships between agriculture and macroeconomic indicators. The findings revealed that there is no statistically significant relationship between agricultural variables and macroeconomic indicators. The study therefore fails to reject the null hypothesis that no significant relationship exists between the two. Specifically, macroeconomic indicators—real GDP growth rate, inflation rate, and interest rate—do not significantly influence agricultural output and value added. Likewise, agricultural variables do not significantly explain fluctuations in GDP growth, inflation, or interest rates. This means that any fluctuations in macroeconomic indicators do not directly affect agricultural performance, and vice versa.

Although some models showed moderate to strong correlations and relatively high explanatory power, particularly when macroeconomic indicators were regressed against agricultural outcomes, the results consistently lacked statistical significance. The negative coefficients observed for GDP growth, inflation, and interest rates suggest potential constraints on agriculture under adverse economic conditions, yet these relationships were not strong enough to be conclusive.

Overall, the results underscore that agriculture and the macroeconomy in the Philippines during the study period (2011–2017) exhibited independence rather than interdependence in statistical terms. This indicates that sector-specific factors—such as technological progress, infrastructure development, climate variability, and government policy interventions—likely played a more critical role in shaping agricultural performance than broader macroeconomic trends. Future research may benefit from extending the time frame, including more variables, and applying advanced econometric approaches to better capture the dynamics between the agricultural sector and the macroeconomy.

6. Policy Implications

The absence of statistically significant relationships between agricultural variables and macroeconomic indicators in the Philippine case suggests that agriculture's macroeconomic role is muted, despite its continued importance for livelihoods and food security. This finding has several implications for policy design and economic management.

First, it underscores the persistence of structural inefficiencies within Philippine agriculture. The sector's declining share in GDP, coupled with low productivity growth, implies that existing agricultural policies have not sufficiently strengthened its capacity to generate spillovers to the broader economy. Comparative evidence from South and Southeast Asia shows that agricultural gross value added has been declining as a share of GDP, even when absolute levels rise, as structural transformation progresses (Mottaleb & Rahut, 2020; FAO, 2024). Policy reform in the Philippines should therefore prioritize land consolidation, infrastructure development, and mechanization to unlock productivity gains and foster stronger linkages with industry and services.

Second, the results highlight the need for targeted investment and financial inclusion. International studies demonstrate that agricultural credit and investment significantly raise agricultural GDP and, by extension, broader economic performance (Abdelhamid & Kamal, 2023; Toaha & Mondal, 2023). Yet in the Philippines, financing constraints continue to inhibit farmers' access to modern inputs and technologies. Policies aimed at expanding concessional credit, crop insurance, and public–private partnerships in value chains could improve sectoral resilience and competitiveness (OECD, 2023).

Third, the weak correlation between agriculture and inflation in the Philippine context reflects the buffering role of trade and imports. However, reliance on external food sources exposes the economy to global price volatility, a risk heightened by climate shocks and global supply disruptions (Yu & Ciaian, 2020; World Bank, 2022). This necessitates policies for climate-resilient and self-reliant agriculture, including investments in crop diversification, irrigation, and research on climate-smart technologies (FAO, 2021).

Finally, the findings raise questions about how agriculture is positioned within macroeconomic policy. If agriculture is no longer a primary driver of aggregate indicators such as GDP growth or inflation, policymakers should reframe the sector's role as one of inclusive development and rural stability rather than aggregate growth. This implies integrating agricultural resilience and equity indicators into national economic planning, thereby ensuring that agriculture is valued not only for its direct economic contribution but also for its role in food security and poverty reduction (World Bank, 2022; Asian Development Bank, 2022).

The evidence suggests that agriculture's diminishing macroeconomic influence should not be interpreted as irrelevance but as a call for structural reform and strategic reinvestment. Strengthening productivity, resilience, and intersectoral linkages would allow Philippine agriculture to reassert its role as a foundation for inclusive and sustainable economic growth.

7. Limitations and Recommendations

The proposed action is further research on the relationship between the agricultural variables and the macroeconomic indicators. The researchers recommend including more agricultural variables to have an in-depth analysis. Moreover, employing all 6 macroeconomic indicators, namely: GDP growth rate, inflation rate, interest rate, foreign exchange rate, unemployment rate, and international trade, may provide results that the agricultural sector is significant to other indicators, and prove that the country should still pursue growth and development in agriculture.

Further, the researchers also recommend that future researchers extend the period of the study to have more data on the variables for the analysis of the trend of agricultural variables and macroeconomic indicators.

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