JOURNAL OF CRITICAL REVIEWS

ISSN- 2394-5125 VOL 07, ISSUE 12, 2020

DOES AGRICULTURE PRODUCTION HAVE AN IMPACT ON ECONOMIC GROWTH? INDIA'S EXPERIMENTAL EVIDENCE

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ABSTRACT
The primary aim of the research is to address the question 'Matters of agriculture for economic growth?' In order to do this, over the period 1961 to 2016, we have to examine the connection between farming production and economic growth in India. In this research, the methods of vector error correction and co-integration are utilised to analyse the connection between farm production and economic growth. The Johnson test results show that the balance between agricultural production and economic development in India is long-lasting. The vector error correction test shows that University causalities extend over the long term, from economic growth to farming. This implies economic growth leads to farming, but agricultural production does not, in the long term, contribute to economic growth. But in the near term, there is a bidirectional causation between agricultural and economic growth. In the short term, economic growth leads to farming and production leads to economic growth.
Key Words: Production of agriculture, economic growth, co-integration, VECM.

1. INTRODUCTION

Agriculture is the Indian economy's most significant industry. Indian agriculture accounts for 17% of India's gross domestic product (GDP) and employs 53% of its labour force. India's pulses, rice, wheat, spices and spices are the world's biggest producers. There are numerous sectors for businesses in India, including dairy, meat, poultry, fish, food grains, etc. India has become the second biggest fruit and vegetable grower worldwide. Although Indian agriculture has decreased in GDP, it is a key component of India's overall socio-economic growth. The fast advances that have been made in agriculture are one of the greatest success stories of independent India. India is now not only autonomous in grain production but also has significant reserves for a country reliant on food imports to sustain its people. The new agricultural technology has evolved through agricultural research, water management, and plant safety, through the sensitive use of fertilisation, pesticides, and cultivation practices under the green revaluation of agricultural production, irrigation plant extension, and the use of a high yielding range of seeds. All these steps had a beneficial impact on farm output. In addition, the government has made initiatives to promote private investment in the food processing sector in agriculture. Low output still exists in the agricultural sector. The reason for the decline in the Indian agricultural growth rate GDP in the sector is that the average farms in this sector are very small and, in turn, productivity is low, as is often the case with

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low levels of production, such as the low literacy rate, insufficient finance, and poor marketing of agricultural products. Furthermore, the GDP of the agriculture sector in India is decreasing since new technologies and agricultural techniques have not been implemented in this area. The GDP in India has declined owing to inadequate irrigation facilities available in India's agriculture. As a consequence, farmers rely on precipitation, although this is very unpredictable.

2. LITERATURE REVISION.

Salih Turan Katircioglu (2006) points to a stagnating growth in agricultural production and economic development, as assessed by real domestic gross product growth. So, of course, they are co-integrated. They have a long-term balance. They have a balance. Secondly, feedback is provided between these variables that shows the two-way causes of these variables over the long term.

Salih katircioglu (2006) analyses the potential co-integration and causal connection between Northern Cyprus's economic development and sector growth, including agriculture, industry and services in particular. The findings of this research show that agriculture remains the backbone of the economy of North Cyprus. It is a long-term balance of growth and it offers industry guidance on that sector's supply of raw resources. But economic growth as measured by actual Gross Domestic Product (GDP) growth does not have any direction.

Titus O. Awokuse (2009) reassesses the issue of whether agriculture may act as a motor for growth by making use of recent advances in time series econometric techniques. The results of an empirical study show that agriculture is an economic development engine. Moreover, the authors conclude that free trade affects GDP growth positively.

3. OBJECTIVES OF THE STUDY:

1. To investigate the long-term connection between integration between farming production and economic growth in India.
2. To investigate the causation between farming production and economic growth in India over the long term.
3. Examine the short-term causation of farming production in India with economic growth.

4. HYPOTHESES OF THE STUDY-:

Hypothesis -1

H0: Agriculture Production does not Granger Cause Economic Growth.

H1: Agriculture Production does Granger Cause Economic Growth.

Hypothesis -2

H0: Economic Growth does not Granger Cause Agriculture Production

H1: Economic Growth does Granger Cause Agriculture Production

5. EMPIRICAL STUDY-:

5.1 Data and Variables-:

The present research examines the links between agriculture output and economic growth in India. Two variables are used in this research: India's agriculture output and economic growth. The annual data and the sampled yearly observation period are based on all series of data between 1961 and 2016. All the data has been gathered by HAND BOOK OF INDIA 2018 (RBI).

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5.2 Methods-:

Annual data from 1961 to 2016 is utilised in this research. Data from the Hand Book of India (RBI) 2018 has been gathered. Two variables are used in this research. The statistics are examined for the causation of agricultural production on India's economic growth. Agriculture and the economic growth of India are analysed. The data was converted into natural logarithms before examining the causal connection between agricultural production and economic growth, and the potential presence of the data unit roots was then investigated. By using the Augmented Dickey-Fuller root unit test, the stationarity of each series is examined. A Schwarz information criterion and an Akaike information criterion identify the number of lagging differences involved. Continue with the selection of the optimum lag length of the VAR time series model by the use of VAR lag order selection criteria to check the Granger Causality test for all series. Co-integration tests by Johansen are also used for co-integration tests. There are two objectives for the fundamental empirical examination. The first is a review of the long-term connection between farm production and economic growth, and the second is a review of the short-term causal relationship between agricultural production and economic growth. Three stages are needed for fundamental testing. The first step is to verify whether there is a unit root in the variables to validate the variable's stationarity. The Augmented Dickey–Fuller tests are done by employing (ADF). In the second phase, we are testing for the continuous co-integration of the variables. The Johansen co-integration test is used to accomplish this. Finally, the final step where all variables are integrated and co-integrated may be calculated using Engle and Granger's Vector Error Correction Model (VECM) technique (1987).

6. EMPIRICAL RESULTS-:

6.1 Result of Stationarity Test:

The order of integration is one of the main characteristics of the time series variable. In order to identify the sequence of integration of the series, first unit root tests are performed at different levels and initial differences. The standard Augmented Dickey-Fuller (ADF) test is required in order to test the integration order.

Variable	At Level		At First Difference		Conclusion
	ADF	Prob.	ADF	Prob.	
Agriculture Production	1.780912	0.9808	-7.1785	0.0000	I (1)
Economic Growth	4.605190	1.0000	-5.3721	0.0000	I (1)

From the above table, it is clear that the computed ADF statistics for level variables are lower than the crucial values in both instances, indicating that the variables are not level stationary. As seen in the above table, the ADF statistics for both variables indicate that they are first-difference stationary.

6.2 Result of Lag Order Selection Criteria for AP and GDP

When determining the optimal lag Length for co integration analysis, we used five criteria, which were as follows: the LR test statistic, the final prediction error, the Akaike information criteria, the Schwarz information criteria, and the Hannan-Quinn information criteria (LR test

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statistic and final prediction error). All of the factors pointed to a leg length of 4 as the most optimum leg length for this situation.

Table 2 VAR Lag Order Selection Criteria for AP and GDP

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-122.7490	NA	0.415735	4.798038	4.873086	4.826810
1	127.8697	472.3198	3.16e-05	-4.687294	-4.462151	-4.600980
2	132.4916	8.355024	3.09e-05	-4.711215	-4.335975	-4.567357
3	137.1020	7.979488	3.02e-05	-4.734690	-4.209356	-4.533289
4	146.2552	**15.13801***	**2.49e-05***	**-4.932891***	**-4.257461***	**-4.673947***
5	149.2965	4.795939	2.60e-05	-4.896019	-4.070493	-4.579532

* indicates lag order selected by the criterion

6.3 Result of Co-Integration Test Based on Johnson Juselius Method:

Once we have obtained the findings of unit roots, the following step is to determine whether or not there is co-integration by utilising the same order of integrated variables as we did in the previous step to establish whether or not there is co-integration. When examining the possibility of cointegration, the Johansen and Juselius (1990) method was used, which resulted in two test statistics for cointegration, namely the trace test and the maximum eigenvalue test.

The results of the co-integration test are shown in Table 3. As can be seen, the Trace-Statistic value is higher than the crucial values at the 5 percent level. As a result, we reject the null hypothesis, which states that there is no cointegrated equation between the variables. As a result, we come to the conclusion that agricultural production and economic growth are co-integrated. The findings of the Maximum Eigen value test statistics are likewise the same as in the previous example. Finally, we may state that there is a long-term connection between agricultural production and economic growth.

Table: 3 Result of the Co-integration Test for AP and GDP

Johansen Test for Co-integration (Trace Test)				
Hypothesized No. of CE(s)	**Trace Statistic**	**0.05 Critical Value**	**Prob.**	**Conclusion**
None r = 0	8.952112	5.49471	0.0098	Co-integrated
At most 1 r > 0	0.007827	3.841466	0.9290	
Johansen Test for Co-integration (Maximum Eigen value Test)				
Hypothesized No. of CE(s)	**Max-Eigen Statistic**	**0.05 Critical Value**	**Prob.**	**Conclusion**
None r = 0	8.944285	4.26460	0.0008	Co-integrated
At most 1 r + 1	0.007827	3.841466	0.9290	

6.4 Long run Causality Test Based on VECM

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The VECM long term causality finding given in Table 4 demonstrates the existence of a causal connection between Agriculture Production and Economic Growth. In the co-integrating equation with Economic Growth as a dependent variable, the error correction term is negative but not statistically significant at one percent, indicating that there is no long-run connection between Agriculture Production and Economic Growth. The error correction term for the co-integrating equation with Agriculture Production as a dependent variable is negative and significant, indicating that there is a long run connection between Economic Growth and Agriculture Production in the long run.

Table: 4 Long run Causality Test Based on VECM:

Causality	ECM_{t-1}	T-Statistic	Prob.	Result
Long run causality from AP to GDP	-0.002973	-1.843803	0.0723	Uni directional Causality
Long run causality from GDP to AP	-0.123787	-2.457930	0.0182	

6.5 Short run Causality Test Based on VECM/ Block Exogeneity Wald Tests

Table 5 shows the results of the Short Run Causality Test between Agriculture Production and Economic Growth based on the VECM/Block Exogeneity Wald Tests that were conducted. The findings revealed that there is a short-run bidirectional causation between Economic Growth and Agriculture Productivity. In other words, in the short term, economic growth leads to agricultural production, and agricultural production leads to economic growth in turn.

Table: 5 Short run Causality Test Based on VECM/ Block Exogeneity Wald Tests

Causality	Chi-Statistics	P-Value	Result
Short run causality from AP to GDP	919.0212	0.0000	Bi directional Causality
Short run causality from GDP to AP	20.98899	0.0127	

7. CONCLUSION:

This study examines the connection between agricultural production and economic growth in India from 1961 to 2016. In this research, the connection between agricultural production and economic growth is examined using the Vector Error Correction Method and Co-integration methods, which are both used in the analysis. This shows that there is a long-run equilibrium connection between agricultural production and economic growth in India, according to the results of the Johnson Cointegration test. Using the Vector Error Correction test, we can see that there is unidirectional causation between economic growth and agricultural production in the long term. In other words, economic growth stimulates agricultural production, but agriculture production does not stimulate economic growth in the long term. However, in the short term, there is a bidirectional causal relationship between economic growth and agricultural production. As a result, in the near term, economic growth leads to agricultural production, and agricultural production leads to economic growth. Finally, we come to the conclusion that agricultural output has no effect on economic growth.

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8. RECOMMENDATION:

1. The green revaluation included increasing the amount of agricultural land under cultivation as well as expanding irrigation infrastructure.
2. The utilisation of seeds from high-yielding varieties of plants.
3. The employment of new agricultural technologies, such as fertiliser, herbicides, and cropping techniques, has had a positive impact on agricultural output in recent years.
4) The government has also taken the initiative in order to promote private investment in the area of agricultural and food processing technology.

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