

A CRITICAL REVIEW OF EMPIRICAL STUDIES ON DETERMINANTS AND EFFECTS OF AGRICULTURAL EXPORTS IN DEVELOPING NATIONS

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Article Info

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Abstract

This systematic literature review examines the determinants of agricultural exports in developing nations and their impact on economic growth during the period 2000-2020. Through random sampling techniques, we analyze empirical studies from various sources and find that production, producer price, domestic price, export price, real exchange rate, and real interest rate significantly affect agricultural exports in developing nations. We also establish that agricultural exports play a vital role in the growth of industry and economy, although some studies exhibit mixed or conflicting results. Our findings have crucial implications for policymakers in developing economies to design appropriate policies that encourage and promote agricultural exports for increased income generation and economic growth

Introduction

The growth of agriculture exports and its relationship with economic growth has been a subject of interest for policymakers and scholars for several decades. Agriculture is a vital sector that contributes significantly to the economic development of developing nations. Countries like India, China, and Brazil have experienced remarkable growth in agricultural exports in recent years, which has contributed to their overall economic growth. However, the determinants of agricultural exports and their impact on economic growth remain unclear and have not been thoroughly examined.

This literature review systematically explores the factors determining agricultural exports in developing nations over two decades, from 2000 to 2020. We use various databases such as Research Gate, Science Direct, Sage, Springer, Scopus, and National Digital library to collect data, and random sampling techniques to select literature on given sample variables. The study reveals that production, producer price, domestic price, export price, real exchange rate, and real interest rate are essential determinants of agricultural exports in developing nations. We also establish that agriculture exports have a crucial impact on the growth of industry and economy, although there are mixed or conflicting results in some studies. Our study highlights the need for policymakers in developing economies to design appropriate policies to encourage and promote the development of agriculture

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exports. It is important to identify and address specific factors that govern agricultural sector exports, which will ultimately contribute to overall economic growth. The systematic review is relevant to scholars, researchers, and policymakers who aim to understand the drivers of agricultural exports and their impact on the economy. Our findings have significant implications for policymaking in developing nations, which should focus on encouraging and promoting agriculture exports, serving as an engine for economic growth.

1. Research Methodology

The main purpose of this paper is to explore and make a systematic literature survey on empirical studies related to agricultural exports determinants and association of Agri-exports and economic growth of the economies. This systematic survey of literature will help in finding the determinants which effect the agricultural exports and their inter-relatedness with economic growth. This study is descriptive in nature and has used random sampling technique to select the literature on given sample variables. The data has been collected for the period of 2000 to 2020 from various databases such as Research Gate, Science Direct, Sage, Springer, Scopus and National Digital library etc. However, some earlier studies have also been used to envy the prevailing researches of present study.

2. Literature Evidences

3.1. Determinants of Agricultural Exports

The inelastic demand of primary agricultural products in developing countries enforces them to depend upon the production growth rate of developed nations for growth in their export performance (Alkhateeb & Sultan, 2015). The demand for agricultural products can be inelastic in developing countries but this theory doesn't apply in case of individual economy. Perhaps, an individual economy can control their export mechanism through competitive pricing system and other government restrained measures (Thomas & Nash, 1991). In this view, numerous efforts have been made to ascertain the key determinants of agricultural exporting products, which capitulate the promising results for economy, business and trade. Table 1 depicts the empirical researches made on key drivers of agricultural exports across various nations by eminent scholars, academician and core researchers.

Table 1. Determinants of agricultural exports.

S. No	Author	Country	Period	Tools	Findings
1	Gbetnkom and Khan (2002)	Cameroon	1971-1972 to 1995-1996	OLS (Ordinary least square)	The finding of this study reveals that Producer Prices significantly impact the export supply of cocoa and coffee products and export prices significantly influence the export supply of banana.
2	Chand (2004)	India	1990-91 to 1995-96 and 1996-97 to 2001-02	Regression analysis	The findings indicate that the real exchange rate and international prices have a significant impact on domestic prices of agricultural commodities,
3	Majeed and Ahmad (2006)	75 Developing countries	1970 – 2004	Fixed effect model	Evidence from the analysis reflects that a sustainable

					economic growth rate, development of
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S. No	Author	Country	Period	Tools	Findings
					communication facilities, and stable exchange rate policy promotes the export growth and sustained export performance.
4	Yusuf and Yusuf (2007)	Nigeria	1970 to 2002	Error correction mechanism regression analysis	The authors revealed that previous year's GDP has a significant contribution in stimulating the cocoa exports from Nigeria however real GDP have a significant contribution in palm kernel exports. Though the real exchange rate is most likely key driver to introduce competitiveness in agricultural exports of Nigeria.
5	Eckaus (2008)	China and India	1998 to 2005	Regression analysis	The results have given the proof of discouragement in China's export supply due to the valueadded tax regime. On the other hand, aggregate income of importing countries also regulates the demand for Chinese and Indian exports. It was also noticed that relative wages have more fluctuation causes for Chinese and Indian exports than the exchange rate.
6	Abolagba, Onyekwere, Agbonkpolor,	Nigeria	1961-69, Pre SAP (1970-85), SAP (1986-94), Post	OLS	The findings of this study reveal that variable; production, price, and the real interest rate have a positive

	and Umar (2010)		SAP (1995-2005)		significant impact on the rubber exports of Nigeria
7	David (2013)	Ghana	1964 to 2010	RCA, RSCA, multiple regression technique	The finding states that there is a significant positive association between the export of Cocoa and lagged output, real producer price, real-world price to real producer price ratio of Cocoa and the depreciated value of the domestic currency.
8	Kannan (2013)	India	1991-92 to 2010- 11	OLS	The production of natural rubber in India is influenced by exports of natural rubber, Stock, and domestic price. However, the factors which affect the export of natural rubber are their stock, world market price, domestic price, and world population.
9	Amoro and Shen (2013)	Cote d'Ivoire	1961 to 2005	OLS	The findings reveal that rubber export is significantly influenced by domestic rubber production, producer price, exchange rate, domestic consumption, and interest rate.
10	Kingu (2014)	Tanzania	1970 to 2010	Co-integration and error correction model	It was found that the real exchange rate and agricultural productivity have a significant impact on cotton lint exports of Tanzania.
11	Boansi (2014)	Chad	1983 to 2011	Co-integration analysis	The author reveals that production, competitiveness in exports, the volume of world exports, and export price are the key determinants of cotton-lint exports from Chad.

12	Boansi, Lokonon, and Appah (2014)	Ghana	1984 to 2009	OLS	This study reflects a positive association of both value and volume of products with production, openness to trade, improvement in quality & share of exports.
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S. No	Author	Country	Period	Tools	Findings
13	Alkhateeb and Sultan (2015)	India	1980 to 2014	ARDL (Autoregressive distributed lag)	The findings represent the existence of long-run cointegration relationship between real effective exchange rate (REER), demand & supply of agricultural products, India's per capita income, and Indian agricultural exports. All these determinants Granger cause agricultural export of India in both short-run and long-run period.
14	Udah, Nwachukwu, Nwosu, and Mbanasor (2015)	Nigeria	1970 to 2010	OLS	Findings reveal that agricultural export growth of Nigeria has a significant positive relationship with export intensity, and trade openness
15	Adhikari, Sekhon, and Kaur (2016)	India	1980-81 to 2012-13	Compound growth rate, instability index and Markov Chain analysis	The findings of the study suggest that determinants, namely, export price, international price, lagged production, domestic consumption, and exchange rate play a major role in determining the rice export from India.
16	Atif, Haiyun, and Mahmood (2017)	Pakistan	1995-2014	Stochastic frontier gravity model	The results state that there is consistency in using the gravity model for agricultural exports of Pakistan and it estimates that bilateral

					exchange and tariff rates, both affect the agriculture exports.
17	Rangarajan and Kannan (2017)	India	1992-93 to 2013-14	Econometric analysis	The real effective exchange rate and world exports are the main two variables which influence the demand for Indian exports. This study also indicates that maintaining domestic price stability, and improving the productivity of the export products are equally important.
18	Bilal and Rizvi (2018)	Pakistan	1980 to 2010	Johansen cointegration and vector error correction model	The results reveal that the production of rice, yield, and international demand is positively significant to rice exports of Pakistan while domestic price and export price are negatively significant to the rice exports,
19	Park (2019)	Korea	1995 to 2017	Panel regression analysis	The outcome depicts that GDP, per capita income, relative price index, and FTA agreements are the main factors that determine the expansion of Korea's agriculture exports.
20	Narayan and Bhattacharya (2019)	India	1961 to 2012	Regression analysis	This study has empirical evidence of factors; export restrictions, export price, domestic price, capital, labour, farm size, the Green Revolution, and preferential trade agreements affecting the REC of the considered commodities of India.

21	Lien, Feng, and Fei (2019)	China	2001-2014	Gravity model analysis	The empirical results revealed that GDP, population, income, exchange rate, production and price have a significant association with the total exports of China. Though Production and price have seen as the best predictor of China's total exports.
22	Daulika, Peng, and Hanani (2020)	Indonesia	1995 to 2017	Multiple regression model	The exchange rate, international rubber prices, and domestic consumption are the major factors that significantly impacted the export price of natural rubber in Indonesia
23	Kumari and Kakar (2020)	India	1991 to 2019	Johansen Cointegration, VECM and VEC granger	The determinants; consumer price index, producer price, real effective exchange rate, real
S. No	Author	Country	Period	Tools	Findings
				causality/ Wald test	interest rate, and agriculture input (land Use) have a short term and long-term causality effect on the Natural Rubber and Tea exports respectively in the post-reform period however real exchange rate has a significant association with Coffee exports in the short-run.
24	Roy (2020)	India	1980 to 2010	OLS regression	The empirical findings have given the evidence of predominant factors like lagged export, production and world income, which determines the Indian agriculture exports. However, in case of rice and wheat, stock

					with the government have more influence on their exports rather than the production.
25	Sugiharti, Purwono, and Padilla (2019)	Indonesia	2007 to 2017	Gravity model	The empirical findings suggest that income and market size is an important driver for growth than the agreements. Whereas, agricultural goods have more impact of price factors and raw goods are more influenced of price and exchange rate both.
26	Nguyen (2022)	Vietnam	2000 to 2018	Stochastic frontier gravity model	The researcher identified that “behind-the-border” is the main constraint, which is significant to rice and coffee exports of Vietnam. Further on, technical efficiency and potential exports are also one of the main causes to ascertain the increase in rice and coffee exports of Vietnam.

Note: From all above listed literature, the authors report that a continuous effort has been made to measure the impact of agricultural export determinants in various developing economies such as India, China, Nigeria, Pakistan, and Indonesia. The rationale behind these studies is that the explanatory variables; production, producer price, domestic price, export price, real exchange rate, real interest rate have a significant positive impact on exports of agricultural commodities from developing nations. For instance, findings indicating that producer price has a significant effect on coffee exports of Cameroon (Gbetnkom & Khan, 2002), stable exchange rate policy has a significant impact on the export growth of developing economies (Majeed & Ahmad, 2006) and the factors; stock, world market price, domestic price, and the world population has a significant impact on exports of natural rubber in India (Kannan, 2013), etc., showcase the influence of former on the latter. Similarly, in most of the cases, a significant impact of the former has been seen on the latter. Thus, the authors conclude that there is a positive link exist between the agricultural exports and their determinants in developing nations.

3.2. Agricultural Exports and Economic Growth

There exists a substantial body of empirical and theoretical evidence that elucidates the role of exports in fostering economic growth and development within a country. Prominent classical economists, such as Adam

Smith and David Ricardo, have argued that international trade serves as the primary catalyst for economic growth, emphasizing the importance of specialization for attaining greater economic gains (Murugesan, 2019). According to Keynesian theory, an increase in exports leads to heightened income growth in the short term through the foreign exchange multiplier effect. Additionally, exports generate a greater inflow of foreign exchange, which can be utilized to acquire manufactured goods, capital, transportation, technology, petroleum products, chemicals, and agricultural products (Murugesan, 2019). This contributes significantly to the economic growth of the nation. Table 2 presents a compilation of previous studies conducted to examine the relationship between agricultural exports and economic growth in various countries.

Table 2. Agricultural exports and economic growth.

S. No	Author	Country	Period	Tools	Findings
1	Goyal, Pandey, and Singh (2000)	India	1970-1998	Compound Growth Rate and instability indices	The high volatility in exports was exhibited by tobacco, coffee, oil cakes, and raw cotton, rice, spices, and fish products and the study contemplated that the share of agricultural exports in the total world exports was low but it was increasing over the years.
2	Tiffin and Irz (2006)	85 Developing countries	1972-2002	The estimated Var model and granger causality test	Agricultural value added is the causal variable in the developing countries which means that agriculture plays a role of the engine in the economic growth of the nation and that growth in agricultural productivity is necessary to keep economy moving.
3	Sanjuán-López and Dawson (2010)	42 Developing countries	1970-2004	Panel co-integration methods	The finding of the study represents that there is a long run relationship between the GDP and agricultural and non-agricultural exports and

S. No	Author	Country	Period	Tools	Findings
					total exports Granger causes the GDP of the country and this study also supports the argument that agricultural export can play the role of an engine of

					economic growth of the countries.
4	Tekin (2012)	Least developed countries	1970-2009	Co-integration and granger causality analysis	The author has confirmed the presence of unidirectional causality between exports and GDP of Haiti, Rwanda and Sierra Leone however in case of Angola, Chad and Zambia, one way causality has been seen from GDP to exports which promotes the export-led growth hypothesis followed in the countries.
5	Goyal and Berg (2012)	India	1980-81 to 2009-10	Co-integration analysis and error correction model	There is no causality among the variables in the short-run but there is strong evidence for unidirectional long-run Granger causality between the export growth and export instability of the country.
6	Gilbert, Linyong, and Divine (2013)	Cameroon	1975-2009	Co-integration Analysis, VECM and granger causality	This study gives strong evidence of the existence of a significant association between the banana and coffee exports and economic growth of the Cameroon however there is no relationship has been seen in the case of cocoa exports. This study also identifies the controllable variables Capital, labour force and inflation which effect the economic growth of the nation. These variables collectively have a significant impact on economic growth of the country.

7	Ramphul (2013)	India	1970–1971 to 2009–2010	Vector error correction model and granger causality test	The study shows that there is a positive long-run equilibrium between the India's agriculture exports and the Gross Domestic Product (GDP) of agriculture and the agricultural exports granger causes the growth of the agricultural GDP.
8	Ronit and Divya (2014)	India	1969-2012	VAR and granger causality test	The growth of exports positively depends on growth of GDP of the economy whereas GDP growth causes export growth in Indian economy. Moreover, there is sharp increase has been seen in exports through a slight shift in GDP of the country.
9	Kumari and Malhotra (2014)	India	1980-2012	Co-integration analysis and granger causality analysis	There is no long run association exists between the exports and economic growth (GDP per capita) of India in the period of 1980 to 2012. Although, there is bi-directional causality has been seen between the economic growth and exports of India.
10	Yifru (2015)	Ethiopia	1973-2013	Co-integration model, error correction model, and granger causality model	The findings of this study reveal that coffee and oilseeds export has a positive and significant relationship with economic growth, while pulses have a negative and insignificant effect on economic growth. Thus, the export-led growth hypothesis is applicable in the case of coffee and oil exports only.
11	Saxena et al. (2015)	SAARC Nation	2001-2013	Co-integration analysis and granger causality test	The findings of the study show that India makes with 74 percent of the agricultural exports from the region and 55 percent of the agricultural imports of the region and a unidirectional causality occurs between GDP

					and agricultural exports, where agricultural exports Granger cause agricultural GDP but the opposite is not applicable.
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S. No	Author	Country	Period	Tools	Findings
12	Shah, Ul Haq, and Farooq (2015)	Pakistan	1972-2008	Co-integration analysis, VECM and granger causality tests	The empirical findings of this study suggest that the argument; agricultural exports are the engine of economic growth is not applicable in the case of a developing economy like Pakistan due to their inverse relationship with each other variable however this study also reveals that non-agricultural exports have a positive impact on the economic growth of the country.
13	Forgha and Aquilas (2015)	Cameroon	1980-2014	Johansen Cointegration and error correction modelling	The authors have emerged with the contribution that timber exports have an insignificant impact on the economic growth of Cameroon in the short run. However, on the contrary a positive significant impact has been seen of former on the later in the long-run.
14	Mehrara and Baghbanpour (2016)	34 Developing nations	1970-2014	OLS regression	There is positive and significant linkage exist between the industry exports and economic growth of the nations but same does not happen in case of agricultural exports. They have inclined towards a weak relationship between the agricultural exports and

					economic growth of developing countries.
15	Oluwatoyese, Applanaidu, and Abdulrazak (2016)	Nigeria	1981-2014	Co-integration analysis, VECM and granger causality tests	Their findings confirmed the existence of significant relationship between the agricultural exports, oil exports and economic growth of Nigeria. Thus, this study also supports the export-led growth hypothesis of the economy.
16	Alam and Myovella (2016)	Tanzania	1980-2010	Co-integration analysis and granger causality test	They have supported the argument of export-led growth hypothesis via examining the causality between agricultural exports and GDP of Tanzania.
17	Umar (2016)	Indonesia	2007-2013	OLS	Findings have inclined that Labour has a positive and significant impact on economic growth of Indonesia whereas exports have a negative but significant relation with the economic growth of Indonesia.
18	Edeme, Ifelunini, and Nkalu (2016)	ECOWAS nations	1980-2013	Fixed effect and random model	They have investigated the export-led growth theory and concluded in insignificant impact of former on the later. However, a combined effect of agricultural exports on economic growth of ECOWAS countries has been seen but the rate of impact was weaker.
19	Sertoglu, Ugural, and Bekun (2017)	Nigeria	1981-2013	Johansen multivariate test	It is found that variables such as Real GDP, agricultural output, and oil rents have a long-run equilibrium relationship by applying Johansen multivariate test and the study concluded that

					agriculture is a viable source of economic growth in Nigeria.
20	Bakari (2017)	South-Eastern European countries	2006-2016	Correlation analysis and static gravity model	This empirical analysis shows that agriculture exports have a positive strong correlation with GDP and it affects economic growth positively. The result of the study provides evidence that agriculture exports are the source of economic growth in southeast European countries.
21	Bakari (2017)	Tunisia	1970-2015	Co-integration analysis and vector error correction model (VECM)	The author has concluded that vegetable exports have both shortterm and long-term effect on the economic growth of Tunisia which implies that vegetable exports are the major source of economic growth in the country and it requires refine
S. No	Author	Country	Period	Tools	Findings
					investment in this sector.
22	Toyin (2016)	South Africa	1975-2012	Co-integration and causality analysis	The export-led growth hypothesis is not valid in the case of South Africa but the study recommends that export participation through agricultural incentives can fasten the economic growth of South Africa.
23	Kalaitzi and Cleeve (2018)	UAE	1981-2012	Johansen Cointegration and multivariate granger causality analysis	The authors have revealed that bidirectional causality exists between the manufacturing exports and economic growth of UAE in the short run however, growth-led exports hypothesis is valid in case of UAE for long run.

24	Mahmood and Munir (2018)	Pakistan	1970-2014	Johansen Cointegration and angel granger causality test	The outcome revealed that agricultural exports of Pakistan have a positive but insignificant impact on the economic growth of the nation which implies that amount of export earnings have a slight contribution in economic growth of the country.
25	Matandare (2017)	Zimbabwe	1980-2016	OLS regression	This study has reflected that apart from agricultural exports variables; labour, exchange rate and inflation have a positive significant contribution in economic growth of the country.
26	Liang (2018)	China	1994-2016	Error correction model	The results of the study show that exports of agricultural product in China have a positive impact on GDP in the short run and a stable relationship in the long-run
27	Murugesan (2019)	India	1990-91 to 2016-17	Error correction model	This study reveals that agricultural exports and non-agricultural exports are important variables to stimulate economic growth in India.
28	Bashir et al. (2019)	Indonesia	1985-2017	Vector error correction model (VECM) and simultaneous equations model with 2SLS	They have stated that there is unidirectional causality exists between the industry added value, economic growth, and the agricultural added value in the longrun. But in the short run variables industry, added value and economic growth have two-way causality and This study suggests that the agriculture sector plays a vital role in fostering economic growth of the country.
29	Bashir et al. (2019)	China	1984-2017	ARDL bound test	The result of this study concludes that there has been seen a positive and significant

					impact of agricultural exports on the economic growth of the Chinese economy.
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Note: All the above studies define the relationship between the agricultural exports and economic growth of several nations for a different set of time frame using econometric tools; co-integration analysis, VECM, Granger causality test and through panel data approach and the most of the existing literature confirms the existence of a long-term association between the agricultural exports and the economic growth of the economies (Gilbert et al., 2013; Liang, 2018; Murugesan, 2019; Ramphul, 2013; Sanjuán-López & Dawson, 2010; Yifru, 2015) however, some of the authors such as Kumari and Malhotra (2014); Shah et al. (2015) and Toyin (2016) has given the contradictory conclusions for the paradigm that exports play the role of an engine in the economic growth of the nation. They have given the argument that there is no association exists between the exports and economic growth of the country and the export-led growth hypothesis is not viable. However, several authors have asserted that development of Agri-export sector always leads to the economic enrichment.

3. Conclusion and Implication

The listed empirical researches have tendered that agriculture export development is a prerequisite condition for overall growth of industry and economy while, some researches accumulate mixed or conflicting evidences that there exhibits the lack of conformity on the potential effect of Agri-exports on economy. Following the articles listed in Table 1 & 2, the present study is inclined to evoke the existing literature on determinants of agricultural exports across various developing nations which came up with the findings that the factors; producer price, domestic price, real exchange rate and real interest rate have a significant positive contribution in agricultural exports of developing nations. Moreover, this study also reveals the association of agricultural exports and economic growth of nations and most of the studies have confirmed the significance influence of former on the latter.

Thus, the findings of this study have implications for agriculture and allied sector of developing economies for designing the appropriate policies to encourage and promote the development of Agri-exports in such economies that plays a substantial role in their economic growth. On the other hand, this review of literature also emphasizes the factors that regulate the Agri-exports from various nations which can help policymakers in understanding their contribution to exports that lead to more income generation for country. Moreover, this study is also relevant for academicians, researchers and scholars to extend it further as a practical investigation which may ensure that agriculture exports could be an engine of economic growth of the nation.

4. Future Scope

The present study has further scope for more comprehensive results as it can be extended to a longer duration. Also, this study takes into account the studies from the developing nations which can further be extended to investigate the impact of Agri-exports on the developed nations such as UK, USA and Japan. Further on, to get better insights, empirical investigation can also be done to understand which factors have a positive and negative impact on the economy. On the end note, this study can also be conducted using modern literature review techniques such as PRISMA method, bibliometric analysis, and Thematic literature review, etc.

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