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Volume 20, Number 1, April 2022, pp 154 - 167

COMPETITIVENESS OF NIGERIAN PALM OIL IN THE WORLD MARKET: AN ECONOMETRIC ANALYSIS

Busari, A.O., Agboola, T.O., Akintunde, O.K. and Jimoh, L.O.
Department of Agricultural Economics and Agribusiness Management, Osun State University, Osogbo, Nigeria
Corresponding author's email: *hamed.busari@uniosun.edu.ng*

ABSTRACT
The dependence on crude oil exports as a dominant source of foreign exchange earnings has retarded the growth of agricultural export and earnings in Nigeria. The steady decline of competitiveness in the foreign agricultural export market has been of great concern. The study investigated competitiveness of Nigerian palm oil in the global market. Annual time-series data obtained from Food and Agriculture Organization Statistics (FAOSTAT) databases were used in the study. The time trend analysis was used to examine the trends in the movement of production, export supply and competitiveness (market share) of palm oil in the world market. Co-integration and error correction analysis was used to understand the relationship between the competitiveness (market share) of palm oil and its selected determinants. Results revealed an increasing trend in the domestic production of palm oil over the study period. The average domestic production of palm oil over the study period was 77632.40 tonnes. The export supply and market share of palm oil fluctuated over the period of the study reaching an average of 5762.41 tonnes and 36.09 percent respectively Results of error correction analysis revealed that the exchange rate, export tax, the interest rate on the agricultural loan, and the inflation rate negatively affect the market share of palm oil. However, technological progress in agriculture positively affects the market share of palm oil.

Keywords: Competitiveness, Palm oil, Error correction model, Macro-economic variables

https://dx.doi.org/10.4314/jafs.v20i1.12

INTRODUCTION
Palm oil is an important agricultural commodity used globally for the manufacturing of a wide variety of products thereby creating a global market for its trade. Oil palm whose fruits are processed into palm oil is a native of the tropical rainforest region of West Africa. Its cultivation spread to Asia and South America in the 16th century. In the 1960s, the West Africa sub-region was the global leading producer and exporter of palm oil. However, in the 1970s and till date, Indonesia and Malaysia from the Asian continent became world powers in the production and exportation of palm oil, with both countries producing about 80% of the total world production of palm oil (International Trade Centre (ITC), 2012 and PricewaterhouseCoopers (Pwc), 2013 and 2019).

In the early part of the 1960s, Nigeria was the leading global producer of palm oil, with a share of 43% of the global market but, presently, Nigeria is ranked 5th in the global production of palm oil with an annual production of 74.08 million metric tonnes representing less than 2% of the global output. This represents a serious erosion of the competitiveness of Nigeria's palm oil in

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the global market (PricewaterhouseCoopers (Pwc), 2019).

Competitiveness in agricultural trade refers to the ability of an exporting country to deliver better valued agricultural commodities to the importing country than other countries exporting the same agricultural commodities in the global market. Competitiveness is a significant determinant of agricultural export earnings from agricultural trade. Countries with highly competitive agricultural commodities in the global market accrue higher revenues from agricultural trade relative to countries whose agricultural commodities are less competitive in the global market (International Trade Centre (ITC), 2018).

According to Oni (2020) improved agricultural competitiveness will impact positively on the welfare of a large population of smallholder farmers and other actors who are engaged in the agricultural export commodities value chain by generating income and employment opportunities for the rural populace. It will also stimulate export growth which will improve farm income and adoption of recent agricultural technology, thus creating jobs opportunities through agricultural processing and marketing, as well as providing raw materials for the sustenance of the local small and medium scale industries.

Among many development challenges facing Nigeria are that of reducing dependence on and diversification away from crude oil which is a central export as well as a key foreign exchange earner. In the past few years, this single commodity has constituted the lion's share of 96 percent of the total export earnings in Nigeria. (UNCTAD, 2002 and ITC, 2019). The continuous decline in the crude oil prices in the world market designates an impending doom for the Nigerian economy. There is thus the need to arrest this situation by diversifying the foreign exchange earnings capacity of the country away from crude oil. Agricultural exports, especially palm oil provide a viable option in this regard.

From the foregoing, it is imperative to evaluate the competitiveness of Nigeria's palm oil in the global market for significant agricultural trade policy reforms that will improve production, export supply, and earnings from palm oil exports. The objective of the study, therefore, is to examine competitiveness of Nigeria's palm oil in the global market using the econometric analysis approach. Specifically, the study examined the trend in the domestic production, the contribution of palm oil to agricultural exports, and competitiveness (market share) of Nigeria's palm oil in the world market.

MATERIALS AND METHODS

The study was conducted in Nigeria which is one of the largest countries in Africa and lies wholly within the tropics along the Gulf of Guinea on the West coast in the Sub-Saharan Africa. Nigeria lies between 40 and 140 North of the equator and between longitudes 30 and 150 east of the Greenwich. Nigeria has a total land area of 923, 768.622 km or about 98.3 million hectares, and a current population estimated at 215,175,364 million people by Worldometer elaboration from the United Nations database (Worldometer, 2022). Nigeria has a highly diversified conducive agro-ecological condition, which makes possible the production of a wide range of agricultural products. Smallholders and traditional farmers who use rudimentary production techniques, with resultant low yield and output cultivate most of this land (Manyong*et al*, 2004).

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The data for this research were in annual time series. The data set was obtained from secondary sources, mainly from Food and Agriculture Organization Statistics (FAOSTAT) databases. Specifically, data on domestic production of palmoil, an export supply of palm oil, exchange rates, producer prices, and export and world prices of Nigeria palm oil were collected. The analysis covered the period between 1980 and 2019.

This study employed a number of analytical methods based on the objectives of the study. These include; means, standard deviation, coefficients of variation, percentages, and average growth rate. These were used to describe the trend in the domestic production, international competitiveness of Nigeria's palm oil and to examine the stability of the exchange rate. The Augmented Dickey-Fuller statistics were used to examine the stationarity of time series data. The Johansen's cointegration method was used in verifying co-integration among the variables of the model.

Competitiveness in this study was measured by the market share of Nigeria's palm oil in the global market. At the agricultural commodities level, competitiveness in trade is broadly defined as the capacity of an industry to increase its share in international markets at the expense of its rivals. The competitiveness index is an indirect measure of international market power, evaluated through a country's share of world markets in selected export categories (Biswajit, 2008). The index is the share of total exports of a given product from the region under study in total world exports of the same product. This is known as market share and it is given as:

Market share index = $\sum idXisd/\sum wdXiwd$ x 100 … (1)

Where s is the country of interest, d and w are the set of all countries in the world, i is the sector of interest, and X is the commodity export flow. In other words, it is the share of countries' exports of goods i in the total world exports of goods i. (Biswajit, 2008).

The market share is a versatile aggregate index of competitiveness. Shifts in market share reflect changing competitiveness across countries. The market share is the only index that can be used to compare the competitiveness of a country's product with the rest of the world, other competitiveness indices such as unit labour cost can only be used for comparison between a country and two or more countries (Kagochi, 2007). The major limitation of this index is that distortion can arise as a result of market subsidy (Latruffe, 2010).

The Error Correction Mechanism (ECM) was used to determine the factors influencing the competitiveness of Nigeria's palm oil in the world market. Following, Tambi, 1999, Yusuf, 2007 and Yusuf and Akinlade, 2011). The implicit model used in this study is given as:

$Y = X_{1t-1} + X_{2t-1} + X_{3t-1} + X_{4t-1} + X_{5t-1} + X_{6t-1,} + ECM_t)$

Where;

Y = market share index for palm oil.
X_{1t-1} = world price of Nigeria palm oil in the United States dollars.
X_{2t-1} = currency exchange rate in Naira/United States Dollar.
X_{3t-1}= export tax levied on the agricultural export commodities (in percentage).
X_{4t-1} = interest rate on agricultural loans in percentage.
X_{5t-1} = rate of inflation in the economy in percentage.
X_{6t-1} = export supply of palm oil in tonnes.

ECMt = error correction factor

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RESULTS AND DISCUSSION

Trends in the domestic production of palm oil in Nigeria

Table 1 shows the trend in the domestic production of palm oil in Nigeria. As shown in the Table, there was an increasing trend in the domestic production of palm oil over the study period. The average domestic production of palm oil increased from 506,900 tonnes in the 1970-79 sub-period to 730,205 tonnes in the 2010-19 sub-period. The average domestic production of palm oil over the study period was 77,632.40 tonnes.

The highest annual growth rate (37.84%) in palm oil production was recorded in the 1990-99 sub-period which coincided with the Structural Adjustment Programme (SAP) era. The lowest annual growth rate (-17.01%) in palm oil production was recorded in the 2000-09 sub-period; after the Structural Adjustment Programme (SAP) era. The all-period annual growth rate in palm oil production was 5.05 percent.

The coefficient of variation ranged from lowest (4.05%) in the 2010-19 sub-period to highest (14.86 %) in the 1980-89 sub-period. This shows a high instability in the domestic production of palm oil in Nigeria over the study period.

Trends in the export supply of palm oil in Nigeria

Table 2 shows the trend in the export supply of palm oil in Nigeria. As shown in the Table, the export supply of palm oil fluctuated over the period of the study. The average export supply of palm oil declined from 6,647.60 tonnes in the 1970-79 sub-period to 727.90 tonnes in the 1980-89 sub-period. This decline can be attributed to the oil boom witnessed by Nigeria in the 1970-79 sub-period which led to significant neglect of the agricultural export sector, thus resulting in the reduction of agricultural export earnings.

However, the average export supply of palm oil rose from 727.90 tonnes in the 1980-89 sub-period to 1,229.10 tonnes in the 1990-99 sub-period. The significant increase recorded in the export supply of palm oil over this period can be attributed to the effect of the Structural Adjustment Programme (SAP) between 1985 and 1989, which reduced significantly the importation of food items, as well as a diversification from crude oil as the major export commodity; priority was given to the agricultural sector.

Thereafter, the export supply of palm oil plummeted from 10150 tonnes in the 2000-09 sub-period to 16500 tonnes in the 2010-19 sub-period. This situation according to Olubunmi and Adesoji (2020) can be attributed to the volatility of the exchange rate and the increasing inflation rate which retarded the growth of the agricultural export sector. The average export supply of palm oil for the period under study was 5,762.41 tonnes.

The highest annual growth rate (72.08%) of palm oil export supply was recorded in the 1990-99 sub-period, while the lowest growth rate (-89.05%) was recorded in the 1970-79 sub-period. The all-period growth rate of export supply of palm oil over the study period was 12.05 percent.

The coefficient of variation ranged from lowest (16.06%) in the 1970-79 sub-period to highest (59.92%) in the 2000-09 sub period showing a high instability in the export supply of palm oil over the period of the study.

Trends in the competitiveness (Market Share) of palm oil in Nigeria

Table 3 presents the results of the trend in the competitiveness of Nigeria's palm oil in the global market as represented by the market share index. Results in the Table reveal a declining trend in the competitiveness (market share) of palm oil in the world market over

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the study period, plummeting from 53-38 in the 1970 -1979 sub-period to 15.42 in the 2010 -2019 sub-period. A negative annual growth rate in the competitiveness of Nigeria's palm oil in the global market was recorded in the 1970 – 1979 sub period indicating serious decline in the competitiveness of palm oil during this period. However, positive annual growth rates in the competitiveness of palm oil were recorded between the 1990 and 2019 period. Trends in coefficients of variation reveal a high level of instability in the market share of palm oil during the period covered by the study. The steady decline in the competitiveness of Nigeria palm oil in the global market between the 1970 and 1989 sub-period according to Oyeyide (1986) and (Mayong*et al* (2004) may be attributed to the effects of the oil boom and price shocks between 1970 and 1975, leading to the high influx of foreign exchange earnings from oil exports which overvalued naira, causing prices distortions and a serious reduction in the price competitiveness of agricultural export commodities. The high inflationary rate Induced by the excess wage structure increased the costs of production of agricultural export commodities, reducing their price competitiveness in the global market. Also, flooding of the market with imported cheaper commodities reduced the competitiveness of their local substitutes, thereby rending them uncompetitive. According to Shenggen *et al.* (2008), other contributing factors included ineffective trade agricultural trade policies, such as import licensing which undermine the quest for the increased export of value added agricultural export commodities by unduly cheapening agricultural imports and increasing the production cost of agricultural export commodities, the activities of marketing boards of agricultural export commodities which resulted into lower producer prices for farmers, inefficiency of institutions saddled with promotion of agricultural exports and inadequate production and export incentives to encourage expansion in the production and export of agricultural export commodities.

Results of Co-integration tests

This section presents the results of unit root and co-integration tests for the model variables using Augmented Dickey-Fuller (ADF) and Johansen methods respectively. Unit root tests affirm the absence of a unit root or non-stationary in the model variables, implying that the variables are stationary at least in their first difference before proceeding to co-integration analysis to establish a long-run relationship among the model variables. The null hypothesis of the presence of unit root in a variable is rejected if the ADF statistic is greater than the critical values at 1%, 5%, and 10 significance levels respectively. Similarly, the null hypothesis of no co-integration among the variables is rejected if the likelihood ratio is less than the critical value at the 5% critical level.

Unit root test

The result of Augmented Dickey-Fuller (ADF) unit root tests for non-logged variables used in the study presented in Table 4. Market share index of palm oil (Y), world price of Nigeria palm oil in United States Dollar (X_1), exchange rate in United States Dollar(X_2), export tax levied on the agricultural export commodities (in percentage) (X_3), interest rate on agricultural loans in percentage (X_4), rate of inflation in the economy in percentage (X_5) and export supply of agricultural palm oil in tonnes (X_6)are not stationary at their original values but, stationary at first difference, showing that using their original values for regression analysis will give spurious results.

Similarly, the result of Augmented Dickey-Fuller (ADF) unit root tests for logged

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variables used in the study presented in Table 5 shows that market share index of palm oil (Y), world price of Nigeria palm oil in United States Dollar (X_1), exchange rate in Naira/United States Dollar (X_2), export tax levied on the agricultural export commodities (in percentage) (X_3), interest rate on agricultural loans in percentage (X_4), rate of inflation in the economy in percentage (X_5) and export supply of agricultural palm oil in tonnes (X_6)are not stationary at their original values but, stationary at first difference, showing that using their original values for regression analysis will give spurious results, implying that the results cannot be used for statistical inference and policy formulation.

Co-integration tests

Result of co-integration analysis for non-logged variable presented in Table 6 shows six co-integrating variables. The variables are market share index of palm oil (Y), world price of Nigeria palm oil in United States Dollar (X_1), exchange rate in Naira/United States Dollar (X_2), export tax levied on the agricultural export commodities (in percentage) (X_3), interest rate on agricultural loans in percentage (X_4), rate of inflation in the economy in percentage (X_5) and export supply of agricultural palm oil in tonnes (X_6).The value (50.441) of the maximum likelihood ratio is greater than the critical values of 54.460 and 47.210 at 1% and 5% respectively. This shows that there are 2 co-integration equations among the variables of the model. This confirms a long run relationship among the variables of the model.

Similarly, the result of co-integration analysis for regression equation used in the study for logged variable presented in Table 7 shows six co-integrating variables. The variables are market share index of palm oil (Y), world price of Nigeria palm oil in United States Dollar (X_1), exchange rate in Naira/United States Dollar (X_2), export tax levied on the agricultural export commodities (in percentage) (X_3), interest rate on agricultural loans in percentage (X_4), rate of inflation in the economy in percentage (X_5) and export supply of agricultural palm oil in tonnes (X_6).The value (50.441) of the maximum likelihood ratio is greater the critical values of 54.460 and 47.210 at 1% and 5% respectively. This shows that there are 2 co-integration equations among the variables of interest. This confirms a long run relationship among the variables of the model. This imply that the variables have significant influence on each other in the long run.

Result of error correction model (ECM) analysis.

Table 8 presents the results of the ECM analysis. The coefficient of multiple determinations (R^2) is 0.520. The F- value is statistically significant at 1 percent level showing that the models fitted the data well. The error correction coefficient is negative and statistically significant at 5 percent level. The significance of the error correction term supports co-integration and suggests the existence of long run equilibrium steady state equilibrium between market share of palm oil and its selected determinants specified in the model. The coefficients of the ECM indicate that the speed of adjustment from disequilibrium to long run equilibrium is 50.02 percent.

The coefficient of exchange rate (X_2) is statistically significant at 5 percent level. The sign on the coefficient conform to *a priori* expectation. The result shows that the exchange rate has an inverse effect on the market share of palm oil. This result is in line with the postulation of Edwards (1987 and 1993), Oyejide (1986), and Azu *et al* (2021) that an increase in exchange rate will increase domestic cost of production of agricultural export commodities, thus reducing their price competitiveness in the international market.

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Results in Table 8 also reveal that the coefficient of export tax on agricultural export commodities (X_3) is negative and statistically significant at 5 percent level. The results show a negative relationship between export tax on palm oil and its market share. This implies that an increase in export tax on agricultural export commodities might induce a decline in domestic production of agricultural export commodities due to reduced farmer's income from the production of such commodities; consequently, there would be a high tendency for farmers to shift to the production of more profitable non-export crops (Shenggen *et al.*, 2008).

The coefficient of interest rate on agricultural loan (X_4) is statistically significant at 5 percent level. The sign on the coefficient conform to a*priori* expectation. The result shows that increase in agricultural loan interest rate significantly reduce the market share of palm oil. The result is indicative of the fact that higher interest rate on agricultural loan would tend to limit the capacity of the farmers to access agricultural loans to increase their output and supply of these commodities, their access to improved technology required to reduce their cost of production might also be hampered.

Table 8 reveals that the coefficient of technological progress in agriculture (X_5) is positive and statistically significant at 5 percent level. This shows that there is a positive relationship between technological progress in agriculture and market share of palm oil. This result is in accordance with the findings of Henry *et al* (2006) that the generation and diffusion of key technologies is important to reducing production cost, increasing productivity, enhancing the quality of products, adding value to products and meeting consumers' needs, thus improving their competitiveness. The market share of palm oil is negatively influenced by inflation rate (X_6) as shown in Table 8. This result conform to the findings of Sheggen *et al.* (2008) that a rising inflation is associated with higher nominal interest rates which would eventually lead to a fall in the competitiveness of agricultural commodities in the international market.

CONCLUSION AND RECOMMENDATION

In line with current drive of the Federal Government of Nigeria to diversify the economy away from oil as the dominant foreign exchange earner, the agricultural export sector provides a viable option. However, the agricultural sector has manifested low rate of output growth. From the general findings from this study, it is concluded that macro-economic variables such as exchange rate, export tax, interest rate on agricultural loan and inflation rate have significant effects on the competitiveness of palm oil in the global market. Based on the findings of this study, the following recommendations are made; there is need for effective and efficient monetary policies, especially on the currency exchange rate and inflation rate in the economy. This would go a long way in improving the competitiveness of agricultural export commodities in the world market thereby increasing agricultural export earnings. There is also the need to encourage farmers to take advantage of available improved agricultural technology, especially improved varieties of oil palm which gives optimum output and high quality palm oil that will command a premium price as well as a fair share of the world market. This will go a long way in increasing agricultural export earnings from palm oil exports.

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APPENDICES

Table 1: Trends in the domestic production (tonnes) of palm oil in Nigeria

Sub-period	Average volume ('000 tonnes) per annum	Annual Percent change	Coefficient of variation
1970-79	509600	18.91	11.47
1980-89	606000	34.17	14.86
1990-99	813100	37.84	6.13
2000-09	1120805	-17.01	15.00
2010-19	730205	-15.03	4.05
All Period	**77633.40**	**+5.05**	**25.86**

Source: Computed from FAOSTAT, 2021

Table 2: Trends in the export supply (tonnes) of palm oil in Nigeria

Sub-period	Average volume ('000 tonnes) per annum	Annual Percent change	Coefficient of variation
1970-79	6647.60	-89.05	16.06
1980-89	727.90	68.86	16.67
1990-99	1229.10	72.08	17.04
2000-09	10150.00	-63.35	59.92
2010-19	16500.00	25.00	30.70
All Period	**5762.41**	**+6.07**	**21.76**

Source: Computed from FAOSTAT, 2021

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Table 3: Trends in the competitiveness (Market Share Index) of palm oil in Nigeria

Sub period	Average market share index	Annual Percent Change	Coefficient of variation
1970-79	53.38	-4.21	18.86
1980-89	43.36	-5.28	22.07
1990-99	27.26	4.28	18.00
2000-09	17.46	3.36	42.81
2010-19	15.42	4.42	33.48
All period	**36.09**	**+2.65**	**38.00**

Source: Computed from FAOSTAT, 2021

Table 4: Results of ADF unit root test for non-logged variables

Variables	Augmented Dickey Fuller (ADF) Values (Original values)	Augmented Dickey Fuller (ADF) Values (First difference)	Order of integration
Market Share (Y_1)	-1.871	-4.307	1
World price of Nigeria palm oil (X_1)	-2.364	-4.311	1
Exchange rate (X_2)	-2.376	-3.862	1
Export tax (X_3)	-1.508	-3.900	1
Interest rate (X_4)	-1.598	-4.647	1
Inflation rate (X_5)	-2.313	-3.992	1
Export supply of palm oil (X_6)	-2.120	-3.776	1
Critical values			
1%	-4.265	-2.373*	
5%	-2.953	-3.568**	
10%	-2.613	-3.723***	

***significant at 1% level; **significant at 5% level; ***significant at 10% level**

Source: Author Computation, 2021

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Table 5: Results of ADF unit root test for logged variables

Variables	Augmented Dickey Fuller (ADF) Values (Level)	Augmented Dickey Fuller (ADF) Values (First difference)	Order of integration
Ln Market Share (Y_1)	-1.771	-4.317	1
Ln World price of Nigeria palm oil (X_1)	-2.354	-4.311	1
Ln Exchange rate (X_2)	-2.366	-3.862	1
Ln Export tax (X_3)	-1.518	-3.900	1
Ln Interest rate (X_4)	-1.578	-4.647	1
Ln Inflation rate (X_5)	-2.312	-3.981	1
Ln Export supply of palm oil (X_6)	-21.33	-3.721	1
1%	-4.265*	-2.373*	
5%	-2.953**	-3.568**	
10%	-2.613***	-3.723***	

***significant at 1% level; **significant at 5% level; ***significant at 10% level**
Source: Author Computation, 2021

Table 6: Result of co-integration analysis of non-logged variables for regression equation

Co-integrating Variables	Hypothesized No. of CE(s)	Eigen Value	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value
Y_1	None**	0.659	128.380	94.150	103.180
X_1	At most 1**	0.623	87.527	68.520	76.070
X_2	At most 2*	0.449	50.441	47.210	54.460
X_3	At most 3	0.315	27.825	29.680	35.650
X_4	At most 4	0.231	13.465	15.410	20.040
X_5	At most 5	0.087	3.479	3.760	6.650
X_6	At most 6	0.067	3.574	3.564	6.640

CE(s) means Co-integration equation (s), * and** denote rejection of hypothesis of no co-integration at 1% and 5% significance level respectively. * and ** denote1% and 5% significance level respectively. This shows more than 2 Co-integration equations at 1% significance level.

Source: Author Computation, 2021.

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Table 7: Result of co-integration analysis of logged variables for regression equation

Co-integrating Variables	Hypothesized No. of CE(s)	Eigen Value	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value
Y_1	None**	0.659	128.380	94.150	103.180
X_1	At most 1**	0.623	87.527	68.520	76.070
X_2	At most 2*	0.449	50.441	47.210	54.460
X_3	At most 3	0.315	27.825	29.680	35.650
X_4	At most 4	0.231	13.465	15.410	20.040
X_5	At most 5	0.087	3.479	3.760	6.650
X_6	At most 6	0.067	3.574	3.564	6.640

CE(s) means Co-integration equation (s)* and** denote rejection of hypothesis of no co-integration at 1% and 5% significance level respectively. * and** denote1% and 5% significance level respectively. This shows more than 2 Co-integration equations at 1% significance level.

Source: Author Computation, 2021.

Table 8: Result of error correction (ECM) analysis (Dependent variable = ΔLn Y_1)

Variables	Coefficients	Standard error	t-statistics	Probability
ECM_t (-1)	-0.502	0.247	-2.033	0.013*
ΔLn X_1	-0.032	0.131	-0.245	0.168
ΔLn X_1 (-1)	-0.599	0.460	-1.303	0.164
ΔLn X_1 (-2)	-0.048	0.160	-0.300	0.342
ΔLn X_2	-3.136	1.131	-2.772	0.042**
ΔLn X_2 (-1)	-0.531	6.247	0.085	0.453
ΔLn X_2 (-2)	-0.433	0.958	-0.452	0.354
ΔLn X_3	-11.494	4.143	2.774	0.044**
ΔLn X_3 (-1)	-0.453	1.049	-0.432	0.167
ΔLn X_3 (-2)	-0.132	1.714	0.077	0.452
ΔLn X_4	-3.433	1.252	-2.742	0.032**
ΔLn X_4 (-1)	-0.423	1.027	-0.412	0.282
ΔLn X_4 (-2)	-0.412	0.930	0.44 3	0.198
ΔLn X_5	11.543	4.014	2.876	0.031

ΔLn X_5 (-1)	0.064	0.111	0.574	0.341
ΔLn X_5 (-2)	0.796	8.559	0.093	0.741
ΔLn X_6	-3.089	1.175	2.630	0.043**
ΔLn X_6 (-1)	-2.332	34.294	0.068	0.453
ΔLn X_6 (-2)	-2.432	24.816	0.098	0.467
C	-10.822	14.146	-0.765	0.456
R^2	0.628			
Adj. R^2	0.512			
Sum sq .res.	7.964			
S.E. equation	0.631			
F-statistic	5.988*			
Log likelihood	-24.228			
Durbin Wat.	1.81			
Akaike AIC	10.431			
Schwarz SC	2.998			
Mean Dep.	-0.047			
S.D. Dep.	0.761			

* Coefficient significant at 1% level, ** Coefficient significant at 5% level

Source: Author's Computation, 2021.