DOES THE DUTCH DISEASE SYNDROME MATTER IN AGRICULTURAL EXPORTS OF OIL-RICH ECOWAS MEMBER COUNTRIES?

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ABSTRACT

This study examined whether the resource curse hypothesis applies in the export of agricultural products of oil-rich ECOWAS member countries for the period 1986-2021 within a panel data framework. The study was anchored on the resources curse, export-led and growth-led hypotheses. Following the results of the relevant pre-estimation tests conducted, panel ARDL/PMG model and causality tests were employed. The study found that the direct effect of the resource curse hypothesis holds true for these economies in the short run but the indirect effect, which operates through the crowd out effect of exchange rate, holds true in the long run. The study therefore recommended, amongst others, that for these oil-rich ECOWAS countries to fully harness the potential of exports of agricultural products and escape both the direct and indirect effects of the resource curse hypothesis, diversification of agricultural exports and sound institutions should be promoted and sustained.

Keywords: Dutch Disease Syndrome, Agricultural Exports, Oil-rich, ECOWAS

JEL classification: C23, D73, O43, Q17

1. Introduction

Resource curse refers to a situation whereby a nation's natural resources exert negative effects on the economic, social or political well-being of the

citizenry (Ross, 2015). It is believed that economies that have a large supply of natural resources are likely to be more developed than those with fewer or no natural resources. Ideally, earnings from natural resources should stimulate economic growth. A situation where these natural resources fail to enhance economic growth because of its crowd out effect is termed resource curse or Dutch disease.

Methodologically, Richard Auty was the first to coin and use the term resource curse in 1993. However, Dutch disease is believed to have begun in the 60s from the Netherlands because of exploration and exploitation of newly-discovered gas reserves in the North Sea. The revenue earned was denominated in hard currencies causing the domestic Dutch guilder to sharply appreciate. Consequently, the non-oil sector (such as agricultural and manufacturing) was neglected, and the country's exports share in the world markets decreased, creating negative effects on the whole economy in the short run and crowding out the non-oil (agriculture and manufacturing) sector, as oil dominated the economy.

This syndrome seems to be at play in the oil-rich ECOWAS member nations (Nigeria, Ghana, Côte d'Ivoire and Benin Republic) with the backward state of these economies in the face of enormous natural resources. This reiterates the need to contribute to the existing debate on whether natural resource endowment is a blessing or a curse, but in this case, with regard to its influence on agricultural exports. Thus institutions, GDP, trade openness, exchange rate, and capital are identified as determinants of exports (Andohol & Ijuo, 2020; Omran et al., 2015). However, the influence of natural resource abundance on agricultural exports is excluded.

In this respect, several empirical studies (Rahim et al., 2021; Satti et al., 2013; Shabbir, 2021; Aljarallah & Angus, 2020; Ahmed et al., 2016; Badeeb et al., 2017; Cockx & Francken, 2016; Moradbeigi & Law, 2017; Shao & Yang, 2014) confirmed the existence of the natural resources curse hypothesis, while others (Hamdi & Sbia, 2013; James, 2015; Ji et al., 2014; Michaels, 2011; Yuxiang & Chen, 2011) rejected it, and some had mixed findings (Ampofo et al. (2020), Haseeb et al. (2021). Also, most of these studies focused on how natural resource rent directly influences economic growth without factoring out its indirect effect on agricultural exports. Hence, to the best of the knowledge of these researchers, no study has been carried out

along this line. Against this backdrop, this study seeks to provide an answer to the question: does the Dutch disease syndrome matter in oil-rich ECOWAS member countries?

The rest of the paper is organized into four sections: section 2 gives the literature review, section 3 presents the methodology, section 4 is the presentation and discussion of results, and lastly, section 5 which provides the conclusion and policy implications.

2. Literature Review

2.1 Theoretical review

This research work will be anchored on the Resource Curse Hypothesis, and Export-led Growth and Growth-led hypotheses. The resource curse hypothesis explains the paradox of poverty amid plenty in resource-rich economies such that natural resources, which are expected to be a blessing, turn out to be a curse due to the crowding-out effect on the other sectors of the economy (Corden, 1984; Corden & Neary, 1982). It establishes that an indirect link exists between exchange rates and non-oil (agricultural) exports, such that appreciation of real exchange rates, as a result of a booming resource sector (direct link), causes a decline in exports of non-oil (agricultural) exports.

The export-led growth hypothesis indicates that exports bring about growth of the economy via associated positive externalities (like technological spillover, specialization, large-scale production, increased access to market/efficient allocation of resources) (Cosmas, 2015; Verdoorn, 1993). Conversely, the growth-led hypothesis argues that it is rather the growth of the economy that leads to the expansion of exports (Vernon, 1996; Krugman, 1984; Giles & Williams, 2000).

2.2 Empirical review

Rahim et al. (2021) conducted a panel study on the effect of natural resources and financial development on the growth of economies of the Next Eleven countries between 1990 and 2019, using the dynamic ARDL within the endogenous growth model to test the resource curse hypothesis. The study supported the projection of the resource curse hypothesis among these

resource-rich economies, causing negative effects on economic growth. Also, investigating the relationship between natural resources abundance and economic growth in Venezuela, Satti et al. (2013) confirm that abundant natural resources inhibit economic growth. The study used ARDL bounds testing on time series data covering 1971-2011.

In a related study, Shabbir (2021), while using VECM for the period 1972-2016, found a negetive associationship between natural resource endowment and growth of the Pakistani economy. Ampofo et al. (2020) found mixed results when they investigated the relationship between natural resources and GDP in a study conducted on top resource-rich nations, using nonlinear and asymmetric analysis. The study confirmed the resource curse hypothesis for Australia, DRC, and India, while the hypothesis did not hold for Brazil, Canada, Saudi Arabia, and the USA.

Similarly, in a study to examine the efficacy of the resource curse hypothesis in 5 top Asian economies (China, India, Thailand, Indonesia and Malaysia), Haseeb et al. (2021) found no evidence in support of the hypothesis in these economies, except for India which showed that natural resource abundance is a curse for the nation. The study adopted quantile-on-quantile regression on time series data covering 1970 to 2018. Aljarallah and Angus (2020) confirmed that natural resource abundance is a curse rather than a blessing in Kuwait using ARDL and ECM to analyse time series data covering 1984-2014.

Eregha and Mesagan (2016) verified the potency of the resource curse hypothesis on economic growth by interacting institutional quality and oil-resource endowment with GDP per capital in African oil-rich countries and found that institutional quality, though insignificant, stimulated per-capita income growth. The study also revealed that oil export per capita and net oil export variables had negative effects on GDP per capita growth, resulting in the conclusion that the quality of institutions in these nations would not be able to alter the resource curse and turn it into a blessing. In a variant study, Onwioduokit and Effiong (2024) employed the fully modified ordinary least squares (FMOLS) method to investigate the role of institutional quality in facilitating economic recovery in selected West African countries between 2010 and 2020. Their findings indicate that institutional quality, encompassing factors such as government effectiveness, rule of law, and

control of corruption, has a significantly positive impact on economic growth. The study recommends strengthening institutions as a crucial step towards efficient and effective policy implementation, ultimately driving economic development.

Also, Andohol and Ijuo (2020) investigated whether there was causality between exports of agricultural products and GDP growth in oil-rich West African states for the period 1982-2016 with the view to confirm if panel homogenous causality assumption holds for the economies. They found a unidirectional causality running from exports of agricultural products to economic growth in the panel analysis, but had mixed results in the cross-sectional analysis, therefore rejecting the assumption of panel causal homogeneity.

Several other empirical studies (including Ahmed et al., 2016; Badeeb et al., 2017; Cockx & Francken, 2016; Moradbeigi & Law, 2017; Shao & Yang, 2014) supported the existence of the natural resources curse hypothesis while others (Hamdi & Sbia, 2013; James, 2015; Ji et al., 2014; Michaels, 2011;Yuxiang & Chen, 2011) found contrary evidence.

3. Methodology

This study basically understudies the theoretical basis of natural resource rent to investigate the link between natural resources and agricultural exports in ECOWAS resource-rich nations, analysed within panel framework.

3.1 Variable description and data sources

The description of the variables and data sources are presented in table 1.

Table 1: Variable Description and Data Source

Variable	Acronym	Description	Measurement/Proxies	Data Source
Agricultural Exports	AXP	Agricultural Exports	Agricultural raw materials exports (% of merchandise exports)	WDI
Natural Resource	NAR	Total Natural Resources Rent	Total natural resources rents (% of GDP)	WDI
Trade Openness	OPE	Trade Openness	The sum of exports and imports divided by GDP	WDI

Variable	Acronym	Description	Measurement/Proxies	Data Source
Exchange Rates	EXR	Exchange Rates	Real effective exchange rate index (2010 = 100)	WDI
Institutions	INS	Institutions	Rule of Law/Corruption index	WGI
Gross Domestic Product	GDP	Gross Domestic Product	GDP (constant 2015 US$)	WDI

Notes: Dataset covers 1986 to 2021. WDI and WGI represent World Development Indicators and World Governance Indicators respectively.

3.2 Model specification

Drawing from the theoretical review, the reduced form of the model is specified as:

$$AXP = f(NAR, GDP, EXR, OPENS, INS) \quad (1)$$

'*t*' in the model represents time (from 1986-2021) and *i*, the cross-section (ECOWAS oil-rich nations). All the variables (except trade openness which is a constructed index and institution which is an index) are transformed to natural log to rule-out the differences in the units of measurements of the variables, correct for heteroscedasticity and, as well, enable interpretation of the estimated coefficients as elasticity. The model therefore becomes:

$$\ln AXP = f(\ln NAR, \ln GDP, \ln EXR, OPENS, INS) \quad (2)$$

The econometric form of the model is specified as:

$$\ln AXP_{i,t} = \beta_0 + \beta_1 \ln NAR_{i,t} + \beta_2 \ln GDP_{i,t} + \beta_3 \ln EXR_{i,t} + \beta_4 \ln OPENS_{i,t} + \beta_5 INS_{i,t} + \varepsilon_{i,t} \quad (3)$$

Economic a priori requires that β is >0 except for β_3 and β_5 which could be > or < 0.

3.3 Econometric procedure

The Levin, Lin and Chu (LLC), Im, Pesaran and Shin (IPS) (Im et al., 2003), and ADF-Fisher chi-square unit root tests were employed. The LLC test suggests that individual unit root tests have limited power against alternative

hypothesis, especially in small samples. A multicollinearity diagnostic test was conducted to check if the variables are highly correlated, hence whether multicollinearity exists or not. Also, a cross-sectional dependence test (CDT) was conducted to ascertain if linkages or dependence exist among cross sections (Pesaran, 2015). Since the study used Panel ARDL, the cointegration test was excluded, given that the model already accounts for long-run relationship. The Dumitrescu and Hurlin (2012) causality method was then employed. The empirical results found from conducting these stated tests are presented in the subsequent section.

4. Results and Discussion

4.1 Multicollinearity diagnostic

The results of the multicollinearity diagnostic test are reported in Table 2. The findings show negative correlation between agricultural exports and natural resource rent as well as with GDP. However, a positive connection exists between it (agricultural exports) and the rest of the variables. By the rule of thumb, given that the coefficient of the relationship between all the variables is less than 0.5, it can be concluded that there is no problem of multicollinearity in the model.

Table 2: Correlation Matrix

	LNAXP	LNGDP	OPENS	LNEXR	INS	LNNAR
LNAXP	1.000000	-0.425919	0.030679	0.159661	0.034290	-0.062666
LNGDP	-0.425919	1.000000	0.030997	0.056094	0.053420	0.015992
OPENS	0.030679	0.030997	1.000000	-0.026119	0.024108	0.004933
LNEXR	0.159661	0.056094	-0.026119	1.000000	0.008539	-0.289817
INS	0.034290	0.053420	0.024108	0.008539	1.000000	0.090117
LNNAR	-0.062666	0.015992	0.004933	-0.289817	0.090117	1.000000

4.2 Cross-sectional dependence test (CDT)

The results of the CD test are presented in Table 3. Since the p-values of the majority of the variables (except for OPENS) are less than 5%, the H_0 of no

cross-sectional dependence is rejected. In other words, the cross-sections are interdependent. This indicates that any shock to a cross-sectional unit (country) may exert effect on the parameters of other nations except for the case of OPENS. Increasing level of globalization and trade liberalization may be responsible for this finding.

Table 3: Cross-sectional Dependence Test (CDT)

Variable	CDT	p-value
NAR	-1.638402	0.0000
INS	2.053015	0.0000
EXR	-4.182396	0.0000
OPENS	0.006284	0.1882
GDP	1.573922	0.0000

4.3 Unit root tests

The results of the unit root tests conducted are presented in Table 4. The variables OPENS, EXR and TEK were stationary at levels while NAR and INS became stationary at first difference. This means that the trend deviations of these variables are not stable. The economic implication of these results is that the effect of policy change on OPENS, EXR and TEK is permanent while that of NAR and INS changes from time to time. With this mixed order of integration, the cointegration test should have been employed, but since the study set out to use the ARDL model, this will not be necessary as the model provides both the long and short-run estimates. However, before then, the result of the lag structure selection criteria is presented in table 5.

Table 4: Results of Unit Root Tests

Variables	Levels				First Difference				Order of Integration
	LLC	IPS	ADF-F	PP-F	LLC	IPS	ADF-F	PP-F	
AXP	-10.3925	-9.3168	82.0077	141.223					I(0)
P-value	0.0000	0.0000	0.0000	0.0000					
NAR	-0.37269	-1.23451	12.5151	15.2748	-5.76620	-6.84850	57.4620	100.182	I(1)
P-value	0.3547	0.1085	0.1297	0.0540	0.0000	0.0000	0.0000	0.0000	
EXR	-8.39488	-6.5084	47.0921	47.4317					I(0)
P-value	0.0000	0.0000	0.0000	0.0000					
GDP	-9.31681	82.0077	1.34237	141.223					I(0)
P-value	0.0000	0.0000	0.0000	0.0000					
OPENS	-9.67290	-9.70033	86.0397	123.763					I(0)
P-value	0.0000	0.0000	0.0000	0.0000					
INS	-1.06426	-0.11201	7.05210	7.43369	-5.47951	-5.76182	48.0263	96.9741	I(1)
P-value	0.1436	0.4554	0.5310	0.4906	0.0000	0.0000	0.0000	0.0000	

Table 5: Lag Structure Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
1	-790.0262	1079.220	0.114329	14.85761	15.87705*	15.27123
2	-731.1855	104.0218	0.076443*	14.44974*	16.34298	15.21789*
3	-702.6869	47.32817	0.088594	14.58369	17.35074	15.70637
4	-679.0183	36.77084	0.113325	14.80390	18.44474	16.28111
5	-639.4604	57.21769*	0.111030	14.74036	19.25501	16.57210
6	-611.0222	38.08679	0.135687	14.87540	20.26385	17.06166
7	-586.7318	29.92932	0.183783	15.08450	21.34675	17.62529
8	-566.5543	22.69970	0.277869	15.36704	22.50310	18.26237

*Note:** indicates lag order selected by the criterion

Also, LR, FPE, AIC, SC and HQ represent sequential modified LR test statistic (each test at 5% level), final prediction error, Akaike information criterion, Schwarz information criterion, and Hannan-Quinn information criterion respectively.

The findings from this result suggest that lag 2 is the optimal lag order as indicated by majority of the criteria (see FPE, AIC and HQ carrying asterisk at lag 2). The ARDL test is therefore employed at lag 2.

4.4 ARDL/PMG result

The results of the autoregressive distributed lag–pooled mean group (ARDL/PMG) are presented in Table 6.

The findings show relative differences in the size, direction, and significance of coefficients throughout the sample. From the long-run results, the estimates of all the variables (EXR, INS, GDP, OPENS) negatively affect AXP, except NAR which has a positive effect. EXR, INS and GDP are statistically significant while NAR and OPENS are not. Also, the result shows that a 1% increase in EXR, INS, GDP, and OPENS will bring about a 2.18%, 1.73%, 6.89% and 0.05% decrease respectively in AXP, while a 1% increase in NAR will bring about a 1.02% increase in AXP. This implies that, in the

long run, the resource curse hypothesis does not have direct effect on AXP, however, it has indirect effect on AXP with EXR decreasing the returns on AXP. Hence, volatility in natural resource rent does not exert negative effect on AXP in the long run, but indirectly does via its effect on EXR.

Table 6: Results of ARDL/PMG

Variable	Coefficients	t-statistics	p-value
Long-run Results			
NAR	1.020498	1.094151	0.2769
INS	-1.739251	-2.864955	0.0052
EXR	-2.187436	-2.398675	0.0186
OPENS	-0.046701	-0.380669	0.7044
GDP	-6.887571	-10.57197	0.0000
Short-run Results			
ECM	-0.176315	-1.988089	0.0499
NAR	-0.210138	-0.279026	0.7809
INS	3.091311	1.701702	0.0924
EXR	0.871988	1.447904	0.1512
OPENS	40.0711	2.114578	0.0373
GDP	-1.171685	-0.862284	0.3909

From the short-run results, the value of the lagged ECT [ECT(-1)] is correctly signed and significantly demonstrates that there is short-run dynamics and long-run relationships. The speed of adjustment from the short to long run equilibrium is 0.18. The value shows that about 18% of the errors are corrected each time. The short-run estimates show that NAR and GDP have a negative effect on AXP, while the estimates of the rest of the variables (EXR, INS and OPENS) have positive effects with only OPENS being statistically significant. This indicates that, in the short run, a 1% rise in NAR and GDP will bring about a 0.21% and 1.17% decrease respectively in AXP, whereas a 1% increase in EXR, INS and OPENS will bring about 0.87%, 3.09% and 40.07% increase respectively in AXP. In other words, the direct

implication of the resource curse hypothesis holds for these economies in the short run.

The failure of the resource curse hypothesis to hold in the long run may point to the significant measures implemented to ensure that natural resource abundance does not crowd out export of agricultural products via the non-oil export diversification programmes of these economies. To further confirm the potency of export-led growth and growth-led hypotheses, D-H panel causality test is conducted in Table 7. The result indicates that a bi-directional causality holds for AXP and GDP, meaning that export-led growth and growth-led hypotheses hold for these economies.

Table 7: Dumitrescu Hurlin (D-H) Panel Causality Test

Variable	Null Hyp.	W-Stat.	Zbar-Stat.	p-value	Remarks
NAR	H_0	3.76271	1.39570	0.1628	✚
AXP	H_0	1.02900	-0.96744	0.3333	✚
INS	H_0	2.88916	0.64057	0.5218	✚
AXP	H_0	7.88989	4.96341	7.E-07	✚
EXR	H_0	1.05588	-0.94420	0.3451	✚
AXP	H_0	2.02993	-0.10219	0.9186	✚
OPENS	H_0	5.84697	3.19742	0.0014	→
AXP	H_0	3.20123	0.91033	0.3626	✚
GDP	H_0	96.4365	81.5070	0.0000	→
AXP	H_0	71.6293	60.0626	0.0000	→

Note: Ho: Each variable does not homogenously cause the corresponding variable.

Each arrow indicates the direction of causation from one variable to another while a cross indicates absence of causation between variables. From the results above, it can be summarized that trade openness and economic growth lead to the growth of agricultural exports and as well, agricultural export leads to growth of the economies of these countries, indicating a bi-directional causation between AXP and GDP. The findings reinforce the efficacy of the growth-led and export-led growth hypotheses.

5. Findings and Policy Recommendations

This empirical analysis conducted in this study revealed that the direct effect of the resource curse hypothesis holds for the oil-rich ECOWAS economies in the short run, while its indirect effect, which operates through the crowd-out effect of exchange rate, holds in the long run. These findings underscore the need for concerted efforts to harness the potential of agricultural exports and mitigate the adverse effects of the resource curse hypothesis in these economies. The study provides evidence supporting both the export-led and the growth-led hypotheses, highlighting the interdependence between agricultural exports and economic growth. To capitalize on this relationship, policymakers are advised to:

1. *Diversify agricultural exports:* Strengthening the diversification of agricultural exports can unlock their potential impact on economic growth.
2. *Foster sound institutions:* Building robust institutions is crucial for escaping the resource curse hypothesis and promoting sustainable economic development.
3. *Implement an agricultural export strategy:* Adopting a targeted agricultural export strategy can stimulate economic growth and ensure that economic expansion, in turn, drives agricultural export growth.

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