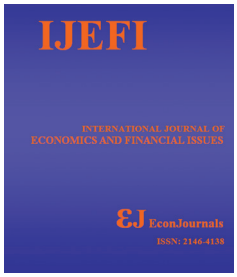

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Tourism, Financial Development and Sectoral Development in ECOWAS Countries: Empirical Evidence from the CS-ARDL Approach

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ABSTRACT

This study examines the role of financial development in the relationship between tourism and sectoral development in 12 ECOWAS countries over the period 2003-2020. Methodologically, it mobilized the Cross-sectional Augmented Autoregressive Distributed Lag (CS-ARDL) model developed by Chudik and Pesaran (2015), which takes cross-sectional dependence and heterogeneity into account. The results reveal that tourism hurts the development of the agricultural and industrial sectors in both the short and long term. Financial development harms the agricultural sector, while it improves the development of the industrial sector in both the short and long term. On the other hand, tourism associated with a developed financial sector improves the development of the agricultural sector and also the industrial sector. This result suggests that the contribution of tourism to sectoral development in ECOWAS countries depends on the level of financial development.

Keywords: Sector Development, Tourism, Financial Development, CS-ARDL, ECOWAS
JEL Classifications: C23, E22, O16, Z32

1. INTRODUCTION

Economic development is the set of transformations that enable a society to move from an underdeveloped to a developed universe (Lewis, 1954). According to Lewis (1954), any developing economy can be divided into two sectors: Traditional and modern. The former includes subsistence agriculture, handicrafts, and all other forms of informal work. The second is a modern capitalist sector, akin to the industrial sector. According to Lewis (1954), the modern capitalist sector will absorb the traditional sector through a transfer of labor between the traditional and modern sectors. Considering the current state of economic structures in developing countries, and Africa in particular, this theory may be called into question.

In the ECOWAS zone, for example, over the period 1996-2020, the service sector's share of GDP averaged 45.48%, compared with 24.42% for the agricultural sector and 21.514% for the industrial sector (World Bank, 2022). It appears that the industrial sector occupies a modest place in the contribution of sectors to economic growth. If we follow the development trajectory described by Rostow (1960) and the theoretical predictions of Lewis (1954), the stage of industrialization seems to have been missed.

Given the level reached by the service sector, wouldn't it be relevant to assess the development of the service sector in other sectors of our economies? This is undoubtedly what has motivated several researchers to take an interest in the effects of the service sector, and tourism in particular, because of the externalities it generates. Indeed, thanks to the multiplier effect, the development of tourism can stimulate the development of other sectors such as agriculture, transport, food, and accommodation, generating additional production, consumption, income, and tax revenues

that further contribute to the local economy (Tiwari, 2011; Nunkoo et al., 2020).

By increasing income and employment, tourism stimulates global demand for agricultural, industrial, and service products, thereby contributing to the development of the country's various sectors of activity (Telfer and Wall, 1996). Ashley et al. (2000) argue that tourism contributes to sectoral development and in particular, agricultural development by diversifying local agriculture. Kadiyali and Kosová (2013) point out that tourism development can boost the productivity of the industrial sector through industrial substitution and integration, leading to structural change up to and including sectoral development.

However, while the above authors emphasize the positive effects of tourism, others point out that tourism does not have only positive effects. Britton (1982) and Meyer (2006), for example, argue that the creation and expansion of tourist enclaves destroys local economies. Freitag (1994) argues that the tourist enclave model results in a socio-economic situation characterized by the over-exploitation of cheap labor by foreign companies and privileged locals.

On the other hand, another strand of literature argues that financial development can be a channel through which tourism contributes to sectoral development. In endogenous growth theory, finance occupies a prominent place through its positive effect on levels of capital accumulation and savings (Romer, 1986) or technological innovation (Romer, 1990). The financial sector mobilizes savings from surplus to deficit units (Levine, 1997). It provides financial resources to all sectors of the economy, including tourism-related businesses. A well-developed financial sector can channel tourism revenues into the agricultural and industrial sectors.

Over the past few decades, researchers, practitioners, and governments have become increasingly aware of the economic potential of tourism. Following suit, the ECOWAS states in particular have been preoccupied with promoting tourism development, and initiatives have been taken. In June 2019, they adopted the ECOTOUR strategy, a regional tourism policy with an action plan for 2019-2029.

More specifically, ECOWAS member countries such as Côte d'Ivoire, Senegal, and Burkina Faso have implemented policies to promote tourism. These include the International Tourism Fair (SITA), the territorial, and tourism development program for Saint-Louis and its region (in Senegal), and the protection of tourist sites against pollution, deforestation and gold washing. Recent decades have seen an unprecedented surge in the number of incoming tourists to the region.

Over the period 2003-2019, the number of incoming tourists to the ECOWAS region rose from 45,000 in 2003 to 1,180,000 in 2019 (World Bank, 2022). During this period, tourism revenues also rose sharply, reaching 485 million USD in 2019, compared with 115 million USD in 2003 (World Bank, 2022). Despite this increase in the number of incoming tourists and tourism revenues, the contribution of tourism to the development of the agricultural and industrial sectors in ECOWAS countries is difficult to assess.

The rise in tourism revenues has not translated into an improvement in agricultural value added, but rather a downward trend over this period, from 25.8% in 2003 to 22.1% in 2019 (World Bank, 2022). As for industrial value added, it fell between 2003 and 2009, from 21.2% in 2003 to 20.3% in 2009, before recovering to 23% in 2019 (World Bank, 2022). Based on this observation, this paper attempts to provide answers to the following questions: To what extent has tourism been able to contribute to sectoral development in ECOWAS countries? Wouldn't financial development be an essential factor to take into account when assessing the contribution of tourism to sectoral development in ECOWAS countries?

In this study, we examine the role of financial development in the relationship between tourism and sector development in ECOWAS countries. To our knowledge, no such study has been conducted in the region. The main contribution of this study is that it assesses the effect of tourism on the agricultural and industrial sectors through the channel of financial development. Our study thus differs from previous work (Ohlan, 2017; Shahbaz et al., 2018; Rasool et al., 2021), which has focused instead on analyzing the relationship between tourism and economic growth. Methodologically, it mobilizes the Cross-sectional Augmented Autoregressive Distributed Lag (CS-ARDL) model developed by Chudik and Pesaran (2015), which takes cross-sectional dependence and heterogeneity into account.

This paper is structured in six sections. The second section presents the literature review on the link between tourism, financial development, and sector development. The third section presents the methodology and a description of the variables used. The fourth section deals with data sources and descriptive analysis. The fifth section presents the estimation results and the sixth section is a conclusion.

2. LITERATURE REVIEW

This section reviews theoretical and empirical contributions to the relationship between tourism, financial development and sector development.

2.1. Theoretical Contributions

Tourism was originally seen as a non-productive sector with a negligible economic contribution (Vanhove, 2011). However, this view was quickly rejected. Practitioners, governments, and researchers became aware of tourism's economic potential, sparking debates on the relationship between tourism and economic growth. Originally proposed by Balaguer and Cantavella-Jordá (2002), the Tourism-Led Growth Hypothesis (TLGH) explains the contribution of tourism to the economic growth of host countries. The TLGH postulates a unidirectional relationship between tourism and economic growth. Thus, tourism expansion leads to increased foreign exchange, which stimulates local production, creates jobs and provides the financial resources needed to develop capital goods useful for economic growth (Copeland, 1991; De Vita and Kyaw, 2017; Nunkoo et al., 2012). Although the TLGH

postulates a positive relationship between tourism and economic growth, opinions differ in the literature on the link between tourism and sectoral development. On the one hand, thanks to the multiplier effect, tourism development stimulates the development of other sectors such as agriculture, transport, food, and accommodation, generating additional production, consumption, income and tax revenues that further contribute to the local economy (Nunkoo et al., 2020). As pointed out by Kadiyali and Kosová (2013), tourism development can boost the productivity of the industrial sector through substitution, and industrial integration, leading to structural change up to and including sectoral development. As for Ashley et al. (2000), they argue that tourism contributes to sectoral development, and in particular agricultural development through the diversification of local agriculture. In support of this idea, Saville (2001) points out that tourism revenues can be invested to improve local agriculture or lead to the development of vegetable and fruit businesses to supply tourism.

On the other hand, while tourism can stimulate economic growth and contribute to sectoral development, it can also contribute to the impoverishment of local development. It is in this sense that authors such as Britton (1982) and Meyer (2006) believe that the creation and extension of tourist enclaves destroys local economies. In the same vein, Freitag (1994) argues that the tourist enclave model leads to a socio-economic situation characterized by the over-exploitation of low-decent work by foreign companies and privileged locals. Thus, despite job creation, the population is affected by high inflation on foodstuffs, an exorbitant rise in land prices fuelled by speculation, and ultimately, an increase in the cost of living.

Another strand of literature stresses that tourism's contribution to sectoral development depends on the level of financial development. Endogenous growth theory teaches that finance plays an important role in the accumulation of capital and savings (Romer, 1986), and in technological innovation (Romer, 1990). It also can boost the various sectors of activity likely to generate assets and foreign direct investment (FDI), such as tourism. A well-developed financial system offers entrepreneurs better investment conditions, particularly in the tourism sector. Local entrepreneurs also have a better chance of investing in tourism and hospitality thanks to well-functioning banking and financial markets that finance projects and grant loans. In addition, tourists tend to choose destinations where macroeconomic conditions are sound and transaction and travel costs are favorable (Wang, 2009; Song and Lin, 2010).

The following section summarizes the empirical work on the link between tourism, financial development, and sector development.

2.2. Empirical Contributions

The empirical literature has focused on the link between tourism, financial development, and economic growth. Some researchers have focused on the link between tourism and economic growth. Among these, Maneejuk et al. (2022) looked at the case of Southeast Asian countries for the period 2004-2018. They find a positive effect of tourism on economic growth using the generalized maximum entropy (GME) estimator. Kumar et al. (2022) conducted a similar study in Papua New Guinea (PNG) over the period 1981-2018, using a different methodology. The results obtained from the NARDL model indicate that an expansion in tourism contributes to economic growth, while a decline in the level of tourism has no statistically significant effect on economic growth.

In contrast, a handful of studies have highlighted the link between tourism and the agricultural sector. To assess the effect of tourism on agriculture, Liu et al. (2008) focus their analysis on two villages in different locations in the Lake Lugu region. They conclude that tourism has had no obvious effect on agriculture in the village located near a tourism hotspot, as tourism administrators have put in place management measures to protect the culture so that this village retains its original agricultural processes and structure. In contrast, the village in the bangs of the tourist zone benefited from the greater effects of tourism on agriculture, despite being far from the tourist zone. Similarly, Lago (2017) contributes by focusing on the case of the agricultural sector. His work in Quezon province indicates relatively strong links between tourism and agriculture.

Other researchers have analyzed the link between tourism, financial development, and economic growth. They generally show a positive relationship between tourism, financial development, and economic growth. In India, for example, the work of Ohlan (2017) covering the period 1960-2014, reveals that tourism, and financial development stimulate economic growth in both the long and short term. Conducting a similar study in Malaysia over the period 1975-2016, Shahbaz et al. (2018) found a positive relationship between tourism, financial development, and economic growth.

In the BRICS countries, Rasool et al. (2021) use an ARDL model to show that tourism, financial development, and economic growth are cointegrated in the long term. Tourism and financial development contribute to economic growth in the 5 BRICS countries. In contrast to this work, Katircioglu et al. (2018) examined only the relationship between tourism and financial development in Turkey based on annual data covering the period 1960-2015. The results from the ARDL model estimates confirm a positive long-term association between tourism development and financial development. Using the Generalized Method of Moments (GMM), work by Cannonier and Burke (2017) shows a positive influence of tourism on financial development in Caribbean countries over the period 1980-2013.

Having reviewed the empirical literature, we note that the interactive effect of tourism and financial development on sectoral development has not been the subject of empirical investigation. Instead, researchers have focused, on the one hand, on the relationship between tourism and economic growth and, on the other, on the link between financial development and economic growth. Our contribution will therefore be to highlight the effects of tourism on the agricultural and industrial sectors through the channel of financial development. The following section presents the methodology used in this study.

3. METHODOLOGY

In this section, we present the empirical model used to assess the relationship between tourism, financial development and sector development. Firstly, the study model is specified, and secondly, the study variables are defined.

3.1. Empirical Model Specification and Variable Description

The objective of this work is to analyze the role of financial development in the relationship between tourism and sectoral development in ECOWAS countries. More specifically, we assess the role of financial development in the relationship between tourism and agricultural sector development. On the other hand, we examine the role of the financial sector in the relationship between tourism and the development of the industrial sector. The study is limited to these two sectors of activity since tourism and the financial sector are part of the service sector. Following the empirical literature, we consider the following two multiplicative interaction models:

$$AGRI_{it} = \beta_0 + \beta_1 TOURISM_{it} + \beta_2 DFIN_{it} + \beta_3 (TOURISM \times DFIN)_{it} + \beta_4 IDE_{it} + \beta_5 OUVCOM_{it} + \beta_6 INFL_{it} + \beta_7 INFRAST_{it} + \beta_8 Stabpo_{it} + \varepsilon_{it} \quad (1)$$

$$Indus_{it} = \beta_0 + \beta_1 TOURISM_{it} + \beta_2 DFIN_{it} + \beta_3 (TOURISM \times DFIN)_{it} + \beta_4 IDE_{it} + \beta_5 OUVCOM_{it} + \beta_6 INFL_{it} + \beta_7 INFRAST_{it} + \beta_8 Stabpo_{it} + \varepsilon_{it} \quad (2)$$

Where indices *i* and t denote country *i* and year t respectively. β_0 is the constant. β_1, β_2, β_3, β_4, β_5, β_6, $\beta_7$and β_8 are the respective coefficients of the explanatory variables to be estimated. ε_{it} is the error term. β_3 is the coefficient of the interactive term. It reflects the influence of financial development on the relationship between tourism and the development of the agricultural and industrial sectors.

The dependent variable *AGRI* is agricultural value added as a percentage of GDP, used as an indicator of the development of the agricultural sector. The second dependent variable *Indus* is industrial value added as a percentage of GDP, used as an indicator of the development of the industrial sector. The variable *TOURISM* represents tourism. In our case, we measure tourism by the logarithm of tourism receipts. International tourism receipts are the expenditures of incoming international visitors, including payments to domestic carriers for international transport. These receipts include any other prepayments made for goods or services received in the destination country. According to the economic literature, tourism accelerates sectoral development through multiplier effects (Kadiyali and Kosová, 2013). We therefore expect tourism to have a positive effect on the development of the agricultural and industrial sectors.

The variable *DFIN* is financial development, defined as the process by which the financial system gains in depth, accessibility and efficiency (Levine, 2005). It is measured by credit extended to the private sector by banks as a percentage of GDP. The financial system has the capacity to boost the various sectors of activity. Finance plays a key role in endogenous growth theory, through its positive impact on levels of capital accumulation and savings (Romer, 1986) and technological innovation (Romer, 1990).

We expect a positive effect of financial development on sector development. The variable *TOURISM* × *DFIN* is the interaction term between tourism and financial development. In theory, finance should enhance the effect of tourism on agricultural and industrial sector development. Since, in theory, the relationship between tourism and sectoral development is far from linear, we introduce this variable to take account of non-linearity.

Since in the economic literature, sectoral development is not fully explained by tourism and financial development, we have added other variables to the specification, notably control variables. The variable *IDE* represents inward foreign direct investment as a percentage of GDP. Foreign direct investment is the international movement of capital to create, develop or maintain a subsidiary abroad, or exercise control over the management of a foreign enterprise (OECD, 2002). They are made up of equity capital, reinvested earnings, and other short-and long-term capital. FDI in a country generates economic growth (Kurtishi-Kastrati, 2013). A positive sign is therefore expected for the coefficient of the FDI variable.

The variable *OUVCOM* is the degree of trade openness. It measures the degree to which a country's economy is open to international trade. It is the share of trade in a country's GD and is obtained by dividing the sum of exports and imports by 2 times GDP. This openness can contribute to growth and the development of sectors of activity. The inflation rate (*INFL*) is included in the specification to take account of macroeconomic conditions. It is measured by the GDP deflator, which is a measure of all price levels for all goods and services in an economy. It is not based on a fixed basket of goods or services.

Economic theory shows that inflation has a negative influence on growth and therefore on the development of industries, in the sense that a rise in prices leads to a reduction in demand and therefore in supply. A negative sign for the coefficient of this variable is therefore expected. The variable *INFRAST* is transport infrastructure development, measured by the transport infrastructure development index. Good transport infrastructures can contribute to the development of sectors of activity.

In addition to these variables, we add an institutional variable, namely political stability (*Stabpo*). This is measured by the political stability index, which ranges from −2.5 to 2.5. Political instability is detrimental to economic growth, negatively influencing the main decisions of economic agents, notably savings and investment (Wang and Swain, 1997). Political stability, on the other hand, promotes growth and economic activity. We expect political stability to have a positive effect on sectoral development.

Once the coefficients are estimated, we examine how financial development affects the relationship between tourism and the development of the agricultural and industrial sectors. Using

equation (2), we calculate the marginal effects of tourism on the agricultural and industrial sectors as follows:

$$\frac{\partial AGRI}{\partial TOURISM} = \beta_1 + \beta_3 DFIN \quad (3)$$

$$\frac{\partial Indus}{\partial TOURISM} = \beta_1 + \beta_3 DFIN \quad (4)$$

Equations 3 and 4 show that the marginal effects of tourism on the development of the agricultural and industrial sectors depend on financial development. The development of the financial system is expected to improve the marginal effects of tourism on the development of the agricultural and industrial sectors, which should be reflected by a coefficient $\beta_3 \rangle 0$.

The common approach in empirical studies to testing the existence of a non-linear effect is simply to examine the sign and statistical significance of the interaction coefficient β_3 (Keho, 2012). Thus, if β_1 and β_3 are all positive (negative), then tourism has a positive (negative) effect on the agricultural and industrial sectors, and financial development enhances (worsens) this effect. If $\beta_1 \rangle 0$ and $\beta_3 \langle 0$, then tourism has a positive effect on the development of the agricultural and industrial sectors, but the development of the financial sector reduces this positive effect. If $\beta_1 \langle 0$ and $\beta_3 \rangle 0$, then tourism hurts the development of the agricultural and industrial sectors, and financial development mitigates this negative effect.

3.2. Estimation Method

To highlight the relationship between tourism, financial development, and the development of the agricultural and industrial sectors in the ECOWAS region, the study adopts the Cross-sectional Augmented Autoregressive Distributed Lag (CS-ARDL) model developed by Chudik and Pesaran (2015). The choice of this approach is justified by the fact that it is superior to others in terms of efficiency and reliability, including MG, PMG, Common Correlated Effect Mean Group (CCEMG) &and Augmented Mean Group (AMG). Indeed, PMG estimators, for example, are consistent under the assumption of long-term slope homogeneity in the model. However, if the data set exhibits cross-sectional dependence and slope heterogeneity, results based on ARDL, or PMG would be biased (Ullah et al., 2023). In addition, the problem of biased results can be observed in the presence of cross-sectional dependence in the residuals (Phillips and Sul, 2003). In the ECOWAS zone, economic integration and the reduction of trade barriers between states are factors, among others, that may justify a high dependence in our sample. Biased, inconsistent and misleading results can result from failing to take cross-sectional dependency into account, and from assuming that cross-sections are independent of each other (Westerlund and Edgerton, 2007; Chudik and Pesaran, 2013). Adopting the CS-ARDL approach solves these problems of cross-sectional dependence and heterogeneity in the data, as opposed to MG, PMG and AMG (Adebayo and Rjoub, 2021). It allows mean group estimates when slope coefficients are heterogeneous. The mean group (MG) version of the CS-ARDL model is based on augmenting the ARDL estimates of each cross-section with cross-sectional means that are approximations of the unobserved common factors, and their lags (Chudik et al., 2017). Chudik and Pesaran (2015) argue that adding lagged cross-sectional means to the model mainly avoids the endogeneity problem. This method also performs well in the case of the weak exogeneity problem that arises when the lagged dependent variable is added to the model. It also makes it possible to process both short- and long-term coefficients simultaneously.

The CS-ARDL estimate is based on the following regression.

$$y_{i,t} = \alpha_i + \sum_{l=1}^{p} \lambda_{l,i} y_{i,t-l} + \sum_{l=0}^{q} \beta_{l,i} x_{i,t-l} + \sum_{l=0}^{r} \gamma'_{i,l} \bar{z}_{t-l} + \varepsilon_{i,t} \quad (5)$$

Where $\bar{z}_{t-l} = (\bar{y}_{i,t-l}, \bar{x}_{i,t-l})$ refers to lagged cross-sectional averages. P and q indicate the lags for each variable and r is the number of lags of the cross-sectional means to be included. The long-run coefficients in the CS-ARDL approach can be calculated as follows:

$\hat{\theta}_{CS-ARDL,i} = \dfrac{\sum_{l=0}^{p_x} \hat{\beta}_{l,i}}{1 - \sum_{l=1}^{p_y} \hat{\lambda}_{l,i}}$ and mean group (MG) estimates can be obtained as follows

: $\hat{\bar{\theta}}_{MG} = \dfrac{1}{N} \sum_{i=1}^{N} \hat{\theta}_i$

According to equation 5, the specifications of the study models to be estimated are as follows:

$$AGRI_{i,t} = \alpha_i + \sum_{l=1}^{p} \lambda_{l,i} AGRI_{i,t-l} + \sum_{l=0}^{q} \beta_{l,i} X_{i,t-l} + \sum_{l=0}^{r} \gamma'_{i,l} \bar{Z}_{t-l} + \varepsilon_{i,t} \quad (6)$$

$$Indus_{i,t} = \alpha_i + \sum_{l=1}^{p} \lambda_{l,i} Indus_{i,t-l} + \sum_{l=0}^{q} \beta_{l,i} X_{i,t-l} + \sum_{l=0}^{r} \gamma'_{i,l} \bar{Z}_{t-l} + \varepsilon_{i,t} \quad (7)$$

With

$X_{i,t} = (TOURISM_{i,t}, DFIN_{i,t}, TOURISM \times DFIN_{i,t}, IDE_{i,t}, OUVCOM_{i,t}, INFL_{i,t}, INFRAST_{i,t}, Stabpo_{i,t})'$ and

$\bar{Z}_t = (\overline{\Delta TOURISM_t}, \overline{\Delta DFIN_t}, \overline{\Delta TOURISM \times DFIN_t}, \overline{\Delta IDE_t}, \overline{\Delta OUVCOM_t}, \overline{\Delta INFL_t}, \overline{\Delta INFRAST_t}, \overline{\Delta Stabpo_t})'$

The application of the CS-ARDL model requires several econometric tests. First, the slope homogeneity assumption must be verified. Standard panel data methods assume that slope coefficients are homogeneous. However, the estimated coefficients may differ from one cross-sectional unit to another. In panel data econometrics, slope heterogeneity is therefore crucial (Okumus et al., 2021). Initial slope heterogeneity is analyzed in this study using the test developed by Pesaran et al. (2008). This test is based

on how the weighted slope of all countries is distributed. The following equations provide the statistics for this test:

$$\tilde{\Delta} = \sqrt{N}\left(\frac{N^{-1}\tilde{S} - k}{\sqrt{2k}}\right) \quad (8)$$

$$\tilde{\Delta}_{adj} = \sqrt{N}\left(\frac{N^{-1}\tilde{S} - E(\tilde{z}_{i,t})}{\sqrt{\text{var}(\tilde{z}_{i,t})}}\right) \quad (9)$$

Where $\tilde{S}$ is the Swamy test statistic and k is the number of explanatory variables. $\tilde{\Delta}_{adj}$ is the bias-corrected version of de $\tilde{\Delta}$. Secondly, the study examines cross-sectional dependence through Pesaran's (2015) cross-sectional dependence test. The equation for this test is as follows:

$$CSD = \sqrt{\frac{2T}{\text{N}(N-1)N}\left(\sum_{i=1}^{N-1}\sum_{k=i+1}^{N} C\hat{o}rr_{i,t}\right)} \quad (10)$$

The test consists of testing the null hypothesis of the absence of cross-sectional dependency against the alternative hypothesis of the presence of cross-sectional dependency.

4. DATA SOURCES AND DESCRIPTIVE ANALYSES

This section presents, firstly, the data sources and, secondly, the descriptive statistics.

4.1. Data Sources and Descriptive Analysis

The study uses annual data from 12 ECOWAS countries covering the period from 2003 to 2020. The choice of this period and the number of countries is linked to data availability. The data come mainly from the World Bank (2022), except transport infrastructure development and political stability, which come respectively from the AFDB (2022) and Worldwide Governance Indicators (WGI, 2022). Table 1 describes the variables, their symbols, units of measurement, and data sources.

4.2. Descriptive Analysis

Table 2 presents the descriptive statistics of the data. It shows the mean values and respective standard deviations, as well as the minimum and maximum values of the variables used. The mean value essentially indicates the average value of the variable, while the standard deviation shows the extent of deviation from the mean value.

Table 2 shows that, over the period from 2003 to 2020, average agricultural and industrial added values are 23,627 and 21,533 respectively, with respective standard deviations of 8,567 and 5,269, below the average. This reflects low dispersion and concentration around the mean. The various added values observed during this period vary between 4,632 and 42,523 for the agricultural sector and 9,828 and 34,275 for the industrial sector. Tourism receipts over this period in the ECOWAS zone averaged 293,000,000, with a standard deviation of 345,000,000 around the mean. The minimum value of tourism receipts over this period is 289999.8 and the maximum is 262 000 0000. The mean and standard deviation for financial development are 17.661 and 12.228 respectively. The minimum value is 2,627 and the maximum is 65,821. FDI received by ECOWAS countries averages 3,338, with a dispersion of 3,207. The average degree of trade openness is 43,404. The inflation rate observed over the study period is 6.396, with a high dispersion around the mean, and a standard deviation (12.410) above the mean. The average level of transport infrastructure development is 7,981. The political situation remains unstable in the region, with an average political stability index of −0.537. The results of the correlation matrix for the respective variables are also presented in the Table 3.

Table 1: Description of variables, measurements, sources, and expected signs

Variables	Description of variables and measures	Data sources	Expected signs
TOURISM	Tourism is measured by the logarithm of tourism receipts.	World Bank (2022)	+
DFIN	Financial development is measured by credit to the private sector as a % of GDP.	World Bank (2022)	+
IDE	FDI inflows as % of GDP	World Bank (2022)	+
OUVCOM	Trade openness is measured by the sum of exports and imports divided by GDP.	World Bank (2022)	+
INFL	Inflation rate is measured by the GDP deflator	World Bank (2022)	-
INFRAST	Transportation infrastructure is measured by the transportation infrastructure development index.	AFDB (2022)	+
STABPO	Political stability is measured by the political stability index.	WGI (2022)	+

Source: Authors, based on economic literature

Table 2: Descriptive statistics

Variables	Mean	SD	Min	Max	Observations
AGRI	23.627	8.567	4.632	42.523	n=216
INDUS	21.533	5.269	9.828	34.275	n=216
TOURISM	293000000	345000000	289999.8	2620000000	n=216
DFIN	17.661	12.228	2.627	65.821	n=216
IDE	3.338	3.207	−2.544	18.828	n=216
OUVCOM	43.404	12.028	16.514	89.280	n=216
INFL	6.396	12.410	−7.594	100.607	n=216
INFRAST	7.981	6.516	1.212	28.428	n=216
STABPO	−0.537	0.872	−2.400	1.0385	n=216

Source: Authors, based on World Bank data (2022), AFDB (2022) and WGI (2022).

The first column of Table 3 shows that the explanatory variables are negatively correlated with agricultural value added, except for financial development and the inflation rate, which are positively correlated. Tourism, FDI, trade openness and inflation are positively correlated with industrial value added. The other variables are negatively correlated with industrial value added. Overall, the correlations between the explanatory variables are relatively weak, except for that between transport infrastructure and financial development, which is high (0.7). This high correlation between these two variables led us to perform the multicollinearity test, namely the VIF test. The results are shown in Table 4. According to Guijarati et al. (2009), if the VIF value is greater than 10, then there is strong multicollinearity. The results in Table 4 indicate that none of the VIF values is greater than 10, implying that multicollinearity is not a problem in this study if we use all the variables from the regression.

Following the analysis of descriptive statistics and correlation, in the next section we present the results.

5. ESTIMATION RESULTS

This section first presents the results of the econometric tests, before moving on to the estimation results.

5.1. Econometric Tests

In the first stage of empirical analysis, we need to examine the assumptions of slope homogeneity, cross-sectional dependence, and variable stationarity to select more robust estimates. On this basis, we first use the slope homogeneity test of Pesaran et al. (2008), the Breusch and Pagan (1980), and Pesaran (2015) tests for cross-sectional dependence before moving on to unit root and cointegration tests. The results of the slope homogeneity and cross-sectional dependence tests are reported in Tables 5 and 6 respectively.

The results of the homogeneity test show that the null hypothesis that the slopes of the estimates are homogeneous is rejected at the 5% level, as both the delta and adjusted delta statistics are statistically significant at the 5% level. The results confirm the presence of slope heterogeneity in the sample for both models.

With p-values below the 5% threshold, Breusch and Pagan's (1980) Lagrange multiplier (LM) test and Pesaran's (2015) cross-sectional dependence (CD) test fail to reject the null hypothesis of no cross-sectional dependence. The results of these tests confirm the presence of a cross-sectional dependency. This leads us to carry out only the second-generation unit root tests, namely those of Pesaran (2003) and Pesaran (2007). The results summarized in Table 7 reveal that the variables present a mixed order of integration. Some variables are stationary in level, while others are stationary in first difference. There is therefore a presumption of a long-term relationship between the variables. To verify this, we use the Pedroni (1999) cointegration test, the results of which are presented in Table 8.

The results of Pedroni's (1999) cointegration test reject the null hypothesis of no cointegration. We can therefore conclude that there is a long-term relationship between the variables.

Since slope heterogeneity, cross-sectional dependence and cointegration are verified, the CS-ARDL method is suitable for this study, since it allows for cross-sectional dependence and slope heterogeneity.

5.2. Estimation Results and Discussion

Estimates of the CS-ARDL model are presented in Tables 9 and 10. Long-term parameter estimates are reported in Table 9 and short-term parameter estimates in Table 10.

The result shows that the coefficients of the adjustment term are statistically significant at the 1% threshold in both regressions. This result indicates that the system returns to equilibrium in the event of an imbalance-inducing shock. It also reveals stable long-term cointegration between the variables.

The estimates show that tourism and financial development have a negative and statistically significant effect on the agricultural sector

Table 3: Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) AGRI	1							
(2) TOURISM	−0.218*	1						
(3) DFIN	0.518*	0.175*	1					
(4) IDE	−0.122	0.050	0.233*	1				
(5) OUVCOM	−0.054	−0.012	0.146*	0.226*	1			
(6) INFL	0.053	0.163*	−0.234*	0.064	0.060	1		
(7) INFRAST	−0.625*	0.116	0.719*	0.332*	−0.011	−0.049	1	
(8) STABPO	−0.228*	−0.021	0.415*	0.245*	0.041	−0.063	0.496*	1
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) INDUS	1							
(2) TOURISM	0.197*	1						
(3) DFIN	−0.155*	0.175*	1					
(4) IDE	0.001	0.050	0.233*	1				
(5) OUVCOM	0.159*	−0.012	0.146*	0.226*	1			
(6) INFL	0.252*	0.163*	−0.234*	0.064	0.060	1		
(7) INFRAST	−0.091	0.116	0.719*	0.332*	−0.011	−0.049	1	
(8) STABPO	−0.292*	−0.021	0.415*	0.245*	0.041	−0.063	0.496*	1

Note: *represents the correlation between variables at the 10% threshold. Source: Authors, based on data from the World Bank (2022), AFDB (2022) and WGI (2022)

in both the short and long term in the ECOWAS zone. On the other hand, the interaction coefficient between tourism and financial development is positive and statistically significant in the short and long term at the 10% and 5% thresholds. This suggests that tourism and financial development are complementary in boosting the development of the agricultural sector in the ECOWAS zone. They are mutually supportive of strategies to develop the agricultural sector in the ECOWAS zone. A well-developed financial sector can channel tourism revenues into the agricultural sector through agricultural credit. Our results stand out from those of previous work (Rasool et al., 2021; Shahbaz et al., 2018) that highlighted a positive effect of tourism and finance on economic growth, in that they reveal the complementarity between tourism and the financial sector in the development of the agricultural sector.

In terms of the industrial sector, the results show that the effect of tourism is negative and statistically significant in both the short and long term, at the 5% and 1% thresholds respectively. Tourism therefore has a negative influence on the development of the industrial sector in the ECOWAS zone. As for financial development, it has a positive and statistically significant effect on industrial development in the short and long term at the 5% and 10% thresholds respectively. In addition, the coefficient of the interaction between tourism and financial development is positive and statistically significant in the short and long term at the 5% and 1% thresholds respectively. As the coefficient for tourism is negative and that for financial development positive, the positive sign of the interaction coefficient implies that the development of the financial sector mitigates the negative effect of tourism on the industrial sector in the ECOWAS zone. One possible explanation for this result is that financial development favors the channeling of resources toward the most productive sectors, including industry. Indeed, for tourism to contribute to the development of the industrial sector, tourism revenues would have to pass through the financial system. A well-developed financial system absorbs the revenues generated by tourism and allocates them efficiently to the industrial sector, thereby contributing to its development. This result, contrary to previous work, shows the importance of the financial sector in the contribution of tourism to the development of the industrial sector.

As for the other variables, inflation, transport infrastructure, and political stability have positive and significant effects on

Table 4: Multicollinearity test (VIF)

Variable	VIF	1/VIF
DFIN	3.09	0.323
INFRAST	2.77	0.360
STABPO	1.37	0.731
TOURISM	1.34	0.747
IDE	1.22	0.820
OUVCOM	1.16	0.860
INFL	1.14	0.8764
Mean VIF	1.73	

Source: Authors, based on data from the World Bank (2022), AFDB (2022) and WGI (2022)

Table 5: Slope homogeneity test by Pesaran et al. (2008)

	Delta	Delta adjusted	Decision
AGRI	0.394*** (0.004)	0.643** (0.020)	Heterogeneity
INDUS	0.369*** (0.002)	0.602*** (0,007)	Heterogeneity

Note: *** and ** indicate significance at 1% and 5%, respectively. P-values are in brackets. Source: Authors, based on data from the World Bank (2022), AFDB (2022) and WGI (2022)

Table 6: Breusch and Pagan (1980) and Pesaran (2015) cross-sectional dependency test

	Breusch and Pagan LM	Pesaran CD	Decision
AGRI	242.384*** (0.000)	3.953*** (0.000)	Dependence
INDUS	220.760*** (0.000)	0.648*** (0.000)	Dependence

Note: *** indicates significance at 1% and 5%. P-values are in brackets.
Source: Authors, based on data from the World Bank (2022), AFDB (2022) and WGI (2022)

Table 7: Unit Root Tests by Pesaran (2007) and Pesaran (2003)

Variables	CIPS		CADF		Decision
	Level	in Difference	Level	in Difference	
AGRI	−0.407	−7.221***	−0.407	−7.221***	I (1)
	(0.342)	(0.000)	(0.342)	(0.000)	
INDUS	−0.214	−6.702***	−0.214	−6.702***	I (1)
	(0.415)	(0.000)	(0.415)	(0.000)	
TOURISM	−1.446*	-	−1.446*	-	I (0)
	(0.074)		(0.074)		
DFIN	−1.718**	-	−1.718**	-	I (0)
	(0.043)		(0.043)		
IDE	−0.838	−8.667***	−0.838	−8.667***	I (1)
	(0.201)	(0.000)	(0.201)	(0.000)	
OUVCOM	0.493	−7.445***	0.493	−7.445***	I (1)
	(0.689)	(0.000)	(0.689)	(0.000)	
INFL	−6.054***	-	−6.054***	-	I (0)
	(0.000)		(0.000)		
INFRAST	1.122	−7.837***	1.122	−7.837***	I (1)
	(0.869)	(0.000)	(0.869)	(0.000)	
STABPO	−1.901**	-	−1.901**	-	I (0)
	(0.029)		(0.029)		

Note: ***, ** and * indicate the level of significance at 1%, 5% and 10%, respectively. P-values are in brackets. Source: Authors, based on data from the World Bank (2022), AFDB (2022) and WGI (2022)

Table 8: Pedroni (1999) cointegration tests

	AGRI	INDUS
Modified Phillips-Perron t	4.814***	5.282***
	(0.000)	(0.000)
Phillips-Perron t	−1.498*	−0.651***
	(0.067)	(0.007)
Augmented Dickey-Fuller t	−0.6960**	−1.206***
	(0.043)	(0.003)

Note: ***, ** and * indicate the level of significance at 1%, 5% and 10%, respectively. P-values are in brackets. Source: Authors, based on data from the World Bank (2022), AFDB (2022 and WGI (2022)

Table 9: CS-ARDL estimates

Long run estimation	AGRI	INDUS
lr_TOURISM	−3.228**	−13.927***
	(0.012)	(0.004)
lr_DFIN	−11.877*	15.188*
	(0.062)	(0.051)
lr_TOURISMxDFIN	14.579**	1.251***
	(0.020)	(0.003)
lr_IDE	−0.311	0.160
	(0.213)	(0.641)
lr_OUVCOM	0.006	0.071*
	(0.940)	(0.086)
lr_INFL	0.061**	0.100
	(0.025)	(0.520)
lr_INFRAST	2.174***	1.803***
	(0.008)	(0.009)
lr_STABPO	2.869**	−0.039
	(0.044)	(0.991)

Note: ***, ** and * indicate the level of significance at 1%, 5% and 10%, respectively. P-values are in brackets. Source: Authors, based on data from the World Bank (2022), AFDB (2022) and WGI (2022)

Table 10: CS-ARDL estimates

Short run estimation		
Adjust. Term	AGRI−0.917*** (0.000)	INDUS−0.942*** (0.000)
L.AGRI	−0.377**	-
	(0.033)	
L.INDUS	-	0.992**
		(0.015)
ΔTOURISM	−2.962**	−8.527**
	(0.027)	(0.025)
ΔDFIN	−0.653***	15.560**
	(0.000)	(0.012)
ΔTOURISMxDFIN	13,856*	0.791**
	(0.093)	(0,013)
ΔIDE	−0.536	0.097
	(0.109)	(0.742)
ΔOUVCOM	−0.053	0.119*
	(0.716)	(0.065)
ΔINFL	0.058**	−0.022
	(0.042)	(0.723)
ΔINFRAST	2.845**	1.927**
	(0.010)	(0.015)
ΔSTABPO	3.053**	5,483**
	(0.039)	(0,031)

Note: ***, ** and * indicate the level of significance at 1%, 5% and 10%, respectively. P-values are in brackets. Source: Authors, based on data from the World Bank (2022), AFDB (2022 and WGI (2022).

the agricultural sector in both the short and long term. Trade openness and transport infrastructure have positive and statistically significant effects on the industrial sector in both the short and long term. Transport infrastructure and political stability have positive and significant effects on the industrial sector in the short term only. The positive effects of transport infrastructure and political stability on the agricultural and industrial sectors can be explained by the fact that good transport infrastructure and a stable political environment encourage private investment in all sectors of activity (Khadaroo and Seetanah, 2008).

6. CONCLUSION AND IMPLICATIONS

This study aimed to examine the role of financial development in the relationship between tourism and sector development in ECOWAS countries. It covered 12 countries and spanned the period from 2003 to 2020. Methodologically, it mobilized the Cross-sectional Augmented Autoregressive Distributed Lag (CS-ARDL) model developed by Chudik and Pesaran (2015), which takes cross-sectional dependence and heterogeneity into account.

The results reveal that tourism hurts the development of the agricultural and industrial sectors in both the short and long term. Financial development also has a negative effect on the agricultural sector, while it improves the development of the industrial sector in both the short and long term. On the other hand, tourism combined with financial development improves the development of the agricultural sector and also the industrial sector. This suggests that the contribution of tourism to sectoral development in ECOWAS countries depends on financial development. In light of these results, the main lesson to be drawn is that in the case of the agricultural sector, tourism and financial development are inextricably linked to the development of this sector in the ECOWAS zone. In the case of the industrial sector, financial development not only enhances the development of this sector but also mitigates the negative effect of tourism. Financial development is therefore imperative for ECOWAS countries if they are to benefit from the spillover effects of tourism on their agricultural and industrial sectors. To achieve this, they need to strengthen their financial development policies. ECOWAS countries also need to strengthen national tourism policies and their implementation. The development of tourism infrastructures is also recommended. Furthermore, the results indicate that inflation, transport infrastructure, and political stability exert positive and significant effects on the agricultural sector in both the short and long term. Trade openness and transport infrastructure have positive and statistically significant effects on the industrial sector in both the short and long term. Transport infrastructure and political stability have positive and significant effects on the industrial sector in the short term only.

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