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Unlocking Factors Driving Import Demand in ECOWAS Countries: Evidence from a Heterogeneous Panel ARDL Analysis

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Abstract

This study examines the factors determining the demand for imports of the member countries of the Economic Community of West African States (ECOWAS) over the period from 1980 to 2017. As a modelling strategy, we employ the Common Correlated Effect Mean Group (CCEMG) estimator that accounts for both heterogeneity and cross-sectional dependence across countries. The study provides various pieces of evidence through whole-panel and country-level analyses. The results from the panel analysis indicate that income, relative price of imports, foreign direct investment and remittances are significant determinants of import demand in ECOWAS. Income, relative price and remittances have, on average, positive effect on import in the long run. In the short run, all explanatory variables are positively related to imports. Country-level results reveal, however, considerable heterogeneity across countries in the relationship between import demand and its determinants.

Keywords

Imports Demand, Economic Growth, CCEMG, ECOWAS

1. Introduction

Sub-Saharan African countries depend heavily on the outside world for the supply of most of their economic and social needs. This is because of the relatively weak productive capacity of their economies. Accordingly, imports of goods and materials are playing an important role in economic growth and development of these countries. They provide a regular supply of capital inputs as well as essential intermediate goods. However, increasing imports may have adverse effects

on external balance and create debt problems. Hence, it is useful to control imports when designing trade policies. Over the past few decades, a growing body of research has been devoted to estimating import demand functions. Various models with different specifications have been used to investigate the impact of some macroeconomic variables on imports in different countries. The majority of the estimated functions of import demand are derived from conventional theory of demand, according to which import demand is a function of real income and relative import price defined as the ratio of import price to domestic price (e.g., Mwega, 1993; Bahmani-Oskooee & Niroomand, 1998; Tang & Nair, 2002; Tang, 2003; Dutta & Ahmed, 2004; Tsionas & Christopoulos, 2004; Chang et al., 2005; Babatunde & Egwaikhide, 2010; Modeste, 2011; Nwogwugwu et al., 2015; Mugableh, 2017). Some attempts have been made to include others variables such as foreign reserves, exchange rate, remittances, financial development, and foreign direct investment (Khair-Uz & Nazakat, 2005; Karan & Sanjanya, 2013; Ahmed et al., 2014; Sayed, 2014; Dhungel, 2018). There are studies that considered different components of expenditure such as consumption, investment and exports as determinants of aggregate import demand (Giovannetti, 1989; Tang, 2003; Chani et al., 2011; Zhou & Dube, 2011; Chani & Chaudhary, 2012; Khan et al., 2013; Sulaiman & Saba, 2016; Chantha et al., 2018).

A major shortcoming in many of existing panel data studies is that they employed earlier regression approaches that impose cross-sectional homogeneity on coefficients and cross-sectional independence on error terms. The cross-sectional homogeneity assumption is likely to be violated given the heterogeneity of economies with respect to trade policies, economic conditions and institutional developments. Furthermore, cross-sectional dependence can arise due to unobserved common factors, externalities, regional and macroeconomic linkages.

The objective of this study is to estimate the aggregate import demand function for the member countries of the Economic Community of West African States (ECOWAS). We modify the standard import demand function by incorporating remittances and foreign direct investment (FDI) as potential determinants of imports. It is well-known that remittances and FDI are the largest sources of external financial flows to developing countries. Despite the increasing importance of these resources in recent years, the relationship between remittances, FDI and imports has not been studied. This study fills the gap and enriches the existing literature by investigating the determinants of import demand in the case of ECOWAS countries. At the econometric level, the study makes use of the Common Correlated Effect Mean Group (CCEMG) estimator that accommodates with both cross-sectional dependence and heterogeneity.

The remainder of the paper is organized as follows. Section 2 outlines the empirical model. Section 3 describes the data used in the study. Section 4 presents the econometric methodology employed for the empirical analysis. Section 5 reports and discusses the empirical findings of the study. Section 6 concludes the study and provides some policy recommendations.

2. Model, Data and Methodology

2.1. Model Specification

Our aim in this study is to investigate the determinants of aggregate imports in ECOWAS Countries. To do so, we extend the traditional import demand function to include other potential determinants of imports drawn from the empirical literature. Therefore, our empirical model is specified as follows:

$$\ln M_{it} = \beta_{0i} + \beta_{1i} \ln Y_{it} + \beta_{2i} \ln \mathrm{RP}_{it} + \beta_{3i} Z_{it} + \mu_{it} \quad (1)$$

where $\ln M_t$ is the natural logarithm of real imports of goods and services, $\ln Y_t$ is the natural logarithm of real income, $\ln \mathrm{RP}_t$ is the natural logarithm of the relative price of imports, Z_{it} is a vector of other determinants of imports. The term β_{0i} represents individual country heterogeneity and captures the unobserved and time-invariant effects which affect import demand. Such country-effect may include several factors such as geographic and cultural characteristics, as well as omitted economic variables. The term u_{it} represents the error term which is normally distributed with mean zero and constant variance. There are a large number of variables that have been regarded as potential determinants of imports. In this study, we include foreign direct investment (lnFDI) and remittances (lnREM). An important feature of our econometric model is that we do not impose a common coefficient on each explanatory variable. Accordingly, coefficients on explanatory variables are allowed to vary across countries.

Consistent with demand theory, imports are positively related to real income. An increase in domestic income will lead to a greater demand for foreign goods. Nevertheless, it is possible to observe a negative effect of income on imports, given that increases in real income may mean that the productive capacity of the country increases and the country relies less on imported goods (e.g., Ahad et al., 2017). On the other hand, a negative coefficient is expected on relative import price because consumers tend to substitute domestic goods for imports when import prices increase. A negative effect of import prices on import demand has been found by Tang (2004), Dutta and Ahmed (2004), Chani et al. (2011) for Japan, India, Pakistan and Turkey, respectively. With regard to the effect of FDI, it depends on the substitutability or complementarity existing between imports and FDI. A positive effect would be expected on FDI when the complementarity hypothesis holds, whereas a negative effect would appear when substitutability prevails. Under the import-substitution hypothesis, foreign investors are producing for the domestic market and thereby reducing the volume of goods imported into the country. Finally, foreign remittances play a potentially important role in the import demand, particularly for countries experiencing foreign exchange problems. Remittances are considered as a major source of foreign exchange for labor exporting countries used to pay import liabilities. As they can be used either for consumption or investment, remittances can increase the demand for goods including imported ones. Therefore, remittances are expected to have a positive effect on import demand (e.g., Zaman & Imrani, 2005; Sayed,

2014). It is worth mentioning that the elasticity of imports with respect to remittances may be lower or insignificant if remittances go to the subsistence of low income households. Durand and Massey (1992) found that most of income of migrant households from remittances is used for consumption rather than productive investments. In the case of Pakistan, Zaman and lmrani (2005) found that remittances have no impact on the demand for imported consumer goods whereas they have a positive impact on import of capital goods and raw materials.

2.2. Data Description

The study uses annual time series data for nine member countries of the Economic Community of West African States (ECOWAS), over the period from 1980 to 2017. The countries under study include: Benin, Burkina Faso, Cote d'Ivoire, Ghana, Mali, Niger, Nigeria, Senegal, and Togo. The coverage of countries and time period has been determined by the availability of data for at least T = 30 observations. The panel is balanced. The variables used are: real imports of goods and services (M), real GDP used as a proxy for total income, relative price of imports defined as the ratio of import price to domestic price, real inward FDI, and real foreign remittances (REM). Import unit value index was used as a proxy for import price whereas GDP deflator was used as a proxy for domestic price index. All data are in constant 2010 US dollar using the GDP deflator and converted into natural logarithm to derive the direct estimation of elasticities. Real data on imports, foreign direct investment, and remittances were obtained from their respective shares in GDP. In this study, we use inward FDI stocks because the influence of FDI on imports is not instantaneous. Furthermore, FDI stocks show smaller variations compared with FDI flows which are extremely volatiles, especially in period of crisis. The data were obtained from the electronic databank of the World Bank and the United Nations Conference on Trade and Development (UNCTAD).

The descriptive statistics of the logarithmic transformation of the variables are given in **Table 1**. Looking at Panel A of this Table, we note that there is a wide disparity among ECOWAS countries. For instance, the average real imports in log vary from 19.379 in Ghana to 25.140 in Nigeria. Similarly, the average real GDP varies from 21.237 in Togo to 26.863 in Nigeria. Over the sample period, real imports stood at an average of 21.836 with a standard deviation of 1.162. The correlation matrix indicates positive relationships between import and its determinants.

2.3. Econometric Methodology

In order to scrutinize the determinants of import demand in ECOWAS, we use the panel data framework, which exploits both the time series and cross sectional dimensions of data. However, when dealing with panel data, a number of econometric issues have to be addressed. The first issue is to control for the possible

Table 1. Descriptive statistics and correlation matrix.

	M	GDP	RP	FDI	REM
Panel A: *Summary Statistics*					
Mean	21.836	23.048	0.433	25.387	18.891
Std. Dev.	1.162	1.321	1.184	1.861	1.722
Minimum	19.379	21.237	−1.293	21.393	13.843
Maximum	25.140	26.863	6.057	30.113	24.017
Obs.	342	342	342	342	342
Panel B: *Correlation Matrix*					
M	1.000				
GDP	0.926*	1.000			
RP	0.038	0.229*	1.000		
FDI	0.891*	0.863*	0.043	1.000	
REM	0.663*	0.546*	−0.461*	0.573*	1.000

Notes: * and ** indicate significance at the 5% and 10% levels, respectively.

cross-sectional dependence across the members of panel. Cross-sectional dependence might be caused by unobserved common factors, interactions within socioeconomic networks, and spatial effects (Chudik & Pesaran, 2015). Ignoring cross-sectional dependence by employing standard panel estimation methods such as fixed or random effect methods may produce inconsistent and biased estimates (Pesaran, 2006; Sarafidis & Wansbeek, 2012; Kapetanios et al., 2011). We test cross-sectional dependence using the statistics proposed by Breusch and Pagan (1980) and Pesaran (2004).

The second issue to test is whether or not the slope coefficients are homogeneous among panel members. Even though ECOWAS countries belong to the same geographic area, they are not identical in terms of economic and trade structure. The assumption that the slope coefficients are homogeneous may mask the country specific characteristics. This study relies on the tests proposed by Swamy (1970) and Pesaran and Yamagata (2008).

To deal with both cross-section dependence and slope heterogeneity, this study employs the Common Correlated Effects Mean Group (CCEMG) estimator designed by Pesaran (2006). The CCEMG estimator assumes the following multifactor error structure:

$$X_{it} = \alpha_{1i} + \phi_i f_t + \gamma_i g_t + \eta_{it} \tag{2}$$

$$\mu_{it} = \alpha_{2i} + \omega_i f_t + e_{it} \tag{3}$$

where f_t and g_t are unobservable time variant common factors with country-specific factor loadings ϕ_i and γ_i; and η_{it} and e_{it} are individual country-specific idiosyncratic errors assumed to be distributed independently of the common factors and across panel units. The error term, μ_{it}, is allowed to be correlated with the regressors X_{it}, through the presence of the factors f_t and g_t. This implies

that if the factor loadings ϕ_i and ω_i are non-zero, estimating Equation (1) without accounting for this correlation will produce biased and inconsistent estimates of long-run effects. The CCEMG estimator solves the issue of cross-section dependence by augmenting the regression equation with the cross-sectional averages of the dependent variable as well as the observed regressors:

$$\ln M_{it} = \beta_{0i} + \beta_{1i} \ln Y_{it} + \beta_{2i} \ln \mathrm{RP}_{it} + \beta_{3i} Z_{it} + d_{1i} \overline{\ln M}_t + d_{2i} \overline{\ln Y}_t + d_{3i} \overline{\ln \mathrm{RP}}_t + d_{4i} \overline{Z}_t + e_{it} \quad (4)$$

Equation (4) is estimated by OLS for each cross-section. The consistent mean group estimator is derived as the simple average of the group-specific estimates. Simulations (Pesaran, 2006; Coakley et al., 2006; Kapetanios et al., 2011; Pesaran & Tosetti, 2011) have shown that this approach is robust to omitted variables bias and endogeneity of regressors and also performs well even when the cross-section dimension N is small, when variables are nonstationary, cointegrated or not, subject to structural breaks.

To test whether there is a long-run relationship among variables, we test for unit root in the residuals obtained from the CCEMG estimator. To this end, we apply the Cross-Sectionally Augmented Dickey-Fuller (CADF) panel unit root test proposed by Pesaran (2007), which takes into account both heterogeneity and cross-sectional dependency. This test follows the Common Correlated Effects approach by augmenting the ADF regressions carried out separately for each country with cross section averages. In presence of cointegration among the variables, we estimate the short-run dynamics of import demand function through a panel error-correction model given by:

$$\Delta \ln M_{it} = \gamma_{0i} + \gamma_{1i} \Delta \ln Y_{it} + \gamma_{2i} \Delta \ln \mathrm{RP}_{it} + \gamma_{3i} \Delta Z_{it} + \lambda_i ect_{it-1} + d_{1i} \overline{\Delta \ln M}_t + d_{2i} \overline{\Delta \ln Y}_t + d_{3i} \overline{\Delta \ln \mathrm{RP}}_t + d_{4i} \overline{\Delta Z}_t + d_{5i} \overline{\Delta ect_{t-1}} + \nu_{it} \quad (5)$$

where Δ is the first-difference operator and ect_{it-1} is the lagged error-correction term computed from Equation (1).

3. Empirical Results and Discussion

In order to choose the appropriate panel estimating method, we begin the empirical analysis by testing for cross-sectional dependency and slope homogeneity. Table 2 exhibits the results of the cross-section dependence and homogeneity tests. Both the Breusch-Pagan and Pesaran scaled LM tests indicate that Equation (1) is plagued by cross-section dependence in the error term. On the contrary, the Pesaran CD test fails to reject the null hypothesis of cross-section independence. Therefore, we can conclude that there are cross-section connections among countries. Furthermore, the null hypothesis of slope homogeneity is rejected in favor of the alternative hypothesis that heterogeneity exists in the relationship between imports and explanatory variables. This means that inconsistent estimates will be obtained if the constraints of cross-section independence and slope homogeneity are imposed. The results suggest that we should employ

Table 2. Results for cross-section dependence and homogeneity tests.

	Statistic	*p*-value
Cross-sectional dependence test		
Breusch-Pagan LM	152.952*	0.000
Pesaran CD	0.418	0.675
Pesaran scaled LM	13.783*	0.000
Homogeneity test		
Delta	194.302*	0.000
Delta adjusted	206.876*	0.000
Swamy test	403.72*	0.000

Note: * and ** indicate rejection of the null hypothesis at 5% and 10% significance levels, respectively.

estimation method that accounts for both cross-sectional dependence and slope heterogeneity.

To make sure that we do not run spurious regression, we test the order of integration of the series by means of unit root tests. We first apply the well-known IPS test developed by Im et al. (2003), which is less restrictive and more powerful compared to the other first generation panel unit root tests. The IPS test allows heterogeneity in the autoregressive coefficients, implying that some of the series may have unit roots individually. However, this test assumes cross-section independence across countries. Given the above results, we further employ the Cross-Sectional Augmented Dickey-Fuller (CADF) test proposed by Pesaran (2007). The results of these tests portrayed in **Table 3** indicate that the null hypothesis of unit root cannot be rejected for all variables. However, when applied to the first differences, the null hypothesis of unit root is rejected. Thus, we can regard the variables as being integrated of order one, which suggests that there might be a long-run relationship among them.

Next, we determine whether there is a long-run relationship among the variables. To this end, we first employ Pedroni (2004) residual-based test. This test allows for heterogeneity among cross-sectional units but it is limited by the assumption of cross-sectional independence. Results for the Pedroni tests are reported in **Table 4**. It reveals that majority of the seven within and between dimension tests suggest the existence of cointegration among the variables. However, Panel rho and Group rho-tests consistently accept the null of no cointegration. But this is not worrisome, since a Monte Carlo simulation by Pedroni (2004) shows that the two tests are inclined to underestimating the rejection of null hypothesis, when N and T are small, as is the case of this study. Therefore, we can conclude that cointegrating relationship exists among the variables.

The mere finding of cointegration relationship between the variables is not sufficient to conclude that imports are positively related to each of the explanatory variables. We have to estimate the long-run coefficients on the explanatory

Table 3. Panel unit root test results.

	Level		First difference	
	IPS test	CADF test	IPS test	CADF test
M	4.014 [1.000]	0.874 [0.421]	−14.594* [0.000]	−5.084* [0.000]
GDP	8.745 [1.000]	0.563 [0.713]	−10.340* [0.000]	−4.324* [0.000]
RP	−2.898* [0.001]	0.280 [0.610]	−11.949* [0.000]	−4.834* [0.000]
FDI	2.950 [0.998]	−0.033 [0.487]	−12.745* [0.000]	−3.528* [0.000]
REM	3.506 [0.999]	0.410 [0.659]	−13.809* [0.000]	−3.049* [0.001]

Notes: The IPS test provides W-t-bar statistic, whereas the CADF test provides z-t-bar statistic of Pesaran's CADF test. Tests are conducted for model with intercept and *p*-values are given in brackets. Optimal lag length was determined using AIC with a maximum of 5. * and ** denote rejection of the null hypothesis of unit root at the 5% and 10% significant levels, respectively.

Table 4. Results of Pedroni panel cointegration tests.

Tests	Statistic	Prob.
	Common AR Coefficients (within dimension)	
Panel v-Statistic	−0.407	0.658
Panel rho-Statistic	−0.439	0.330
Panel PP-Statistic	−2.245*	0.012
Panel ADF-Statistic	−2.552*	0.005
	Individual AR Coefficients (between dimension)	
Group rho-Statistic	0.404	0.657
Group PP-Statistic	−2.471*	0.006
Group ADF-Statistic	−2.642*	0.004

Note: The asterisks * denotes significance at the 5% level.

variables. As indicated in the methodology, we apply the CCEMG estimator. For comparison purposes, we first apply the Mean Group (MG) estimator proposed by Pesaran and Smith (1995), the Fully Modified OLS (FMOLS) developed by Pedroni (2000) and the Dynamic OLS estimator suggested by Kao and Chiang (2000). Chen et al. (1999) analyzed the properties of the OLS estimator and showed that FMOLS and DOLS estimators may be more promising in cointegrated panel regressions. However, Kao and Chiang (2000) showed that both the OLS and FMOLS have small bias and that the DOLS estimator outperforms both estimators. Results are reported in **Table 5**. As expected, income is robustly and significantly positively related to import demand in ECOWAS. Relative price of imported goods is negatively and significantly related to imports only in the FMOLS regression. Further, the coefficient associated with foreign domestic investment is positive and significant both in DOLS and FMOLS regressions. This suggests that FDI increases the demand for imports in ECOWAS. As expected,

Table 5. Panel long-run estimates from MG, DOLS and FMOLS.

	MG	DOLS	FMOLS
GDP	0.762* (2.82)	0.427* (3.157)	0.662* (6.11)
RP	0.053 (0.57)	−0.065 (−0.856)	−0.118* (−2.931)
FDI	0.028 (0.29)	0.118* (2.662)	0.097* (2.568)
REM	0.147* (2.03)	0.186* (3.783)	0.105* (3.718)
Obs.	330	267	321
CD test	2.59 [0.010]	2.265 [0.023]	11.771 [0.000]

Note: Figures in parentheses are t-statistics. The asterisks ** and * denote significance at the 10% and 5% levels, respectively.

remittances have positive effect on imports. The three estimators allow for coefficient heterogeneity but do not deal with cross-sectional dependence. As can be seen from the bottom rows of Table 5, they exhibit cross-section dependence in the residuals. Therefore, estimator that can accommodate both slope heterogeneity and cross-section dependence is required so as to provide a more adequate analysis of determinants of imports in ECOWAS.

We now apply the CCEMG estimator to estimate both the long and short-run relationships among the variables. The results are reported in Table 6. The point estimate on the error-correction term (ECT) is negative and statistically significant. This provides evidence in support of the existence of a long-run relationship between the variables. Furthermore, the IPS and CADF test results suggest rejection of the null hypothesis of unit root in the residuals. Therefore, there is a long-run relationship among the variables over the period under study.

The results indicate that there is a positive and significant relationship between imports and current income. An increase of one percent in income causes imports to rise by about 1.6 percent, by keeping other things constant. The coefficient on real total income is greater than those on other explanatory variables, indicating that imports strongly depend on current income or economic growth. This finding is consistent with those of Dutta and Ahmed (2004) and Chani et al. (2011) who reported a positive impact of economic growth on import demand for India and Pakistan, respectively. Furthermore, the long-run income elasticity is in line with the Goldstein-Khan (1985) ranges of (1.0, 2.0) for typical income elasticity, suggesting that there is a degree of trade-off between economic growth and the trade balance. As the result, the trade balance of ECOWAS countries is likely to worsen with economic growth if it is not compelled through increasing exports.

Unexpectedly the sign of relative import price shows a positive relationship between imports and import prices both in the long and short-run. Keeping

Table 6. CCEMG long and short-run estimates.

Variables	Long run coefficient			Short run coefficient		
	Coef.	Std. Err.	z-stat.	Coef.	Std. Err.	z-stat.
GDP	1.690*	0.873	1.94	1.560*	0.278	5.62
RP	0.345*	0.143	2.42	0.318*	0.143	2.21
FDI	0.051	0.126	0.41	0.092**	0.054	1.70
REM	0.135*	0.053	2.55	0.072*	0.027	2.58
ECT				−0.732*	0.097	−7.53
Obs.	330			321		
IPS	−11.768* [0.000]			−12.459* [0.000]		
CADF	−4.785* [0.000]			−1.898* [0.029]		
CD test	−1.25 [0.213]			−2.18 [0.029]		

Note: IPS unit root test provides W-t-bar statistic, whereas the CADF test provides z-t-bar statistic with *p*-values in parentheses. Optimal lag length was determined using AIC with a maximum of 5. IPS and CADF tests are conducted in the case of an intercept only. The asterisks * and ** indicate significance at the 5% and 10% levels, respectively.

other things constant, a one percent rise in relative price of imports increases import demand by 0.3 percent. The positive elasticity of relative price may be due to lack of import substitutes. We note that FDI is positively but insignificantly related to imports in the long-run while in the short-run it increases import demand. This finding is consistent with Sulaiman and Saba (2016) and Chantha et al. (2018) found insignificant impact of FDI on imports in Pakistan and Cambodia, respectively.

Consistent with theoretical expectations and empirical studies (e.g., Khair-Uz & Nazakat, 2005; Zaman & Imrani, 2005; Sayed, 2014; Dhungel, 2018), remittances have a positive and significant effect on import demand in ECOWAS. This finding contradicts with those of Mukit et al. (2013) and Ahmed et al. (2014) who found that remittances have no significant impact on the demand for imported goods in Bangladesh and Pakistan, respectively. The elasticity coefficient of imports with respect to remittances is 0.135 and 0.072 in the long and short-run, respectively. This suggests that a one percent increase in remittances will increase imports by 0.135 percent in the long-run and 0.072 percent in the short-run.

We report the country-level results in **Table 7**. As expected, the results show considerable heterogeneity in the relationship import demand and its determinants. A significant positive long-run effect of income is found for six countries (Burkina Faso, Cote d'Ivoire, Ghana, Niger, Nigeria and Togo) whereas a negative effect is reported for Senegal. The effect of income is insignificant for the remaining countries. In the long-run, foreign direct investment increases imports in Cote d'Ivoire, Nigeria, Senegal and Togo while it reduces imports in Ghana. In the short-run, foreign direct investment increases imports only in

Table 7. CCEMG individual country results.

Country	Long-run estimates				Short-run estimates				
	GDP	RP	FDI	REM	ΔGDP	ΔRP	ΔFDI	ΔREM	ECT
Benin	0.305	0.902*	0.191	0.151	2.671*	0.245	0.064	0.142**	−0.996*
	(0.20)	(2.17)	(1.41)	(1.57)	(2.16)	(0.82)	(0.73)	(1.87)	(−4.76)
Burkina Faso	1.416*	0.447	−0.081	0.003	2.104*	0.368**	−0.060	−0.024	−0.492*
	(2.64)	(1.53)	(−1.15)	(0.05)	(3.07)	(1.88)	(−1.05)	(−0.31)	(−2.53)
Cote d'Ivoire	1.008*	0.129	0.529*	−0.033	1.466*	0.115	0.247*	0.054	−0.492*
	(2.52)	(0.82)	(2.57)	(−0.27)	(2.88)	(1.19)	(2.03)	(0.70)	(−3.65)
Ghana	7.852*	0.749*	−0.789*	0.018	2.407*	0.770*	−0.138	−0.004	−0.337*
	(5.23)	(3.40)	(−4.24)	(0.24)	(1.59)	(3.75)	(−0.62)	(−0.08)	(−2.33)
Mali	0.141	0.008	0.019	0.269*	0.753**	0.344	−0.052	0.184*	−1.037*
	(0.26)	(0.03)	(0.33)	(2.09)	(1.81)	(1.50)	(−0.88)	(2.24)	(−6.32)
Niger	1.858*	−0.489**	−0.156	0.186**	0.931	−0.304	0.087	−0.004	−0.652*
	(3.18)	(−1.69)	(−1.47)	(1.78)	(1.48)	(−1.18)	(0.87)	(−0.06)	(−3.21)
Nigeria	2.521*	0.451**	0.332*	0.186*	1.768**	0.167	0.321	0.162*	−0.916*
	(3.16)	(1.92)	(4.13)	(2.82)	(1.65)	(0.64)	(1.40)	(2.59)	(−4.54)
Senegal	−1.686*	0.672*	0.207*	0.448*	0.100	1.162*	0.077	0.001	−0.527*
	(−2.15)	(2.27)	(1.99)	(2.93)	(0.16)	(4.45)	(0.77)	(0.01)	(−2.92)
Togo	1.798*	0.238	0.211**	−0.011	1.840*	−0.012	0.284*	0.133	−1.136*
	(2.78)	(1.60)	(1.70)	(−0.13)	(2.99)	(−0.08)	(2.61)	(1.35)	(−5.53)

Note: Figures in parentheses are t-statistics. * (**) indicates significance at the 5% (10%) level.

Cote d'Ivoire and Togo. For instance, estimates for Cote d'Ivoire suggest that a one percentage point increase in foreign direct investment stock is associated with a short-run increase in import growth of approximately 0.247 percentage point and a long-run increase in real imports of 0.529 percent.

The results for remittances show a positive effect in the long-run for Mali, Niger, Nigeria and Senegal and a positive effect in the short-run for Benin, Mali and Nigeria.

4. Conclusion

The aim of this study was to shed light on the determinants of aggregate import demand in nine ECOWAS countries over the period from 1980 to 2017. Contrary to previous studies which are typically based on standard panel estimators, we have made use of a more flexible and efficient panel estimation framework which controls for a number of important issues in panel data analysis. Among these, parameter heterogeneity and cross-section dependence among the panel groups are of particular importance. Our estimation method deals with these issues relying on the Common Correlated Effects Mean Group estimator developed by Pesaran (2006). The panel estimates show that the demand for imports of ECOWAS countries is in a significant way positively associated with econom-

ic growth, relative price, foreign direct investment and remittances. Country-level results reveal, however, considerable heterogeneity across countries.

From a policy perspective, our findings suggest that economic growth will impact trade balance of ECOWAS adversely if it is not compelled through exports earning. Another implication of this study is that policy makers should consider foreign direct investment as an instrument in controlling import demand via encouraging investment in import substitution sectors. Promoting import substitution policies will not only reduce the heavy dependence on imports but also improve the foreign exchange reserves that can be used to strengthen the economies of the zone.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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