THE IMPACT OF IMPORTS ON EXPORTS: EVIDENCE OF THE CEMAC ZONE

Ulrich Delve Fohoue[1], Wang Xin[2], Bola Momoh[3]

---ABSTRACT---

Even before their independence, the States of the CEMAC zone have always been led to exchange goods and services with other countries. CEMAC members countries have therefore been practicing international trade for decades. This paper investigates the link between import and export which are the two main components of international trade. This study based on countries in the CEMAC zone covering the period from 2005 to 2021 will use linear regression to determine how imports affect exports in Central Africa. From this empirical analysis, it emerges that imports have a positive and significant impact on exports for the countries of the CEMAC zone. This is surely by the mechanism that imports will boost economic growth which in turn will increase exports. The heteroskedasticity tests carried out after the regressions inform us about the absence of heteroskedasticity.---

INTRODUCTION

Over the past two decades, international trade has been a very significant factor in economic growth. International trade is just about buying and selling goods and services abroad. International trade therefore plays a crucial role for various economies. Indeed, the exchange and transfer of technologies, allow economies to increase the productivity of their production units. The relationship between international trade and economic growth has long been a major source of economic debates. Central Africa, an area where are located the countries of the CEMAC area (Economic and Monetary Community of Central Africa) is a very important area for the development of Sub-Saharan Africa. This is because, in addition to being full of important natural resources, it is a market of 61.25 million people spread over 3.02 million km^2 (source: World data info). The CEMAC zone is a free trade zone where member countries have adopted the use of a common currency, which is the CFA Franc. While it is true that international trade significantly impacts economic growth in Africa (Aderounmu et al., 2022), it is important to determine how the components of international trade interact with each other under the effect of certain control variables. The components of international trade, we can cite Import, Export, and Trade Volume as a component of international trade (Fornio Barusman et al., 2017) The aim here is, therefore, to determine how imports affect exports for countries in the CEMAC zone. This study will therefore be very important for African countries in General and Central Africa because it will allow them to determine how imports affect exports. With this regression, we will also observe the control variables and their impact on the model. This study is unique and innovative because it presents through a linear regression how exports are affected/by imports within the CEMAC zone during the period 2005-2021.

LITERATURE REVIEW

Several studies have investigated on the link between imports and exports.

Phaju, (2023) determined that there is a causal link between imports and exports. This means that imports have a positive impact on imports over the period from 2000 to 2020. In the same logic, Fannoun & Hassouneh, (2019) established the presence of a balanced long-term relationship between exports, imports, and economic growth in Palestine. The vector error correction technique was used to determine the long-term causality of exports, imports, and production growth in the Palestinian economy. Regarding the role of international trade in economic growth, Joshua et al., (2020) used autoregressive distributed lags (ARDL) to determine how globalization and trade openness

affect economic growth in Nigeria. It clearly appears that openness to international trade and globalization are important for economic growth through the GDP.

Sirgy et al., (2007) conducted a study on the impact of exports and imports on the quality of life in a country. It follows that exports can be a positive factor for social and health well-being while through imports, importers can obtain better product quality at lower prices.

Although it has been proven that international trade is considered a factor of growth, its components can act differently on economic growth. Gashti et al., (2012) studied the role of import and export. It follows that Exports have a positive impact on economic growth in the long run, while import has a significant and negative impact on economic growth in the long run.

In a study using a time series from 1980 to 2015 in Panama, Bakari, (2017) established that both export and import have a positive impact on economic growth.

Viroj (2013) asserts that imports increase the output of production units which will have a positive impact on exports to sell off production. In the same logic, Liu & Qiang, (2010) assert that imports can increase exports of manufactured products through the importation of advanced machines useful for production. Thus, there is often a link between imported products and those exported in return. Aristei et al., (2013) establishes that the import of raw materials favors the export of derived products. Lowering trade barriers can be a key strategy to increase domestic companies' global competitiveness, particularly when it comes to intermediate inputs. The liberalization of product imports, on the other hand, leads to a reduction in the value of exports (Fan et al., 2022).

There is therefore a link between exports and imports, hence the conclusion of Breinlich et al., (2022) who states that opening to imports reduces industrial exports by reducing national production due to the demand reduction. local products. This liberalization of imports can also lead to an increase in exports through lower raw material costs and increased productivity.

METHODOLOGY

To analyze the impact of Imports on exports, a linear regression will be used following the model:

$Imp_{i;t} = \beta_0 + \alpha Exp_{i;t} + \lambda X_{i;t} + \mathcal{E}_{i;t}$

Where Imp represents imports (Dependent Variable)

Exp represents Exports (Independent variable)

$X_{i;t}$ represents the matrix associated with the control variables (Unemployment of women, Unemployment of men, Unemployment Total; Population growth; Inflation)

$\mathcal{E}_{i;t}$ represents the error term

B0, α, λ represent the slope of the coefficient associated with the different variables

Sources: Variables are taken from Data World Bank,

RESULTS AND DISCUSSIONS

4- 1 Descriptive statistic

Summarize	Exp	Imp	UnempM	UnempT	PopG	Inf
Variable	**Obs**	**Mean**	**Std.Dev**	**Min**	**Max**	
UnempT	102	9.879353	7.731983	0.856	22.517	
Exp	102	43.10474	22.14019	9.84165	89.22435	
Imp	102	36.44355	13.38464	16.5856	85.77826	
UnempM	102	8.534843	6.509695	1.134	21.408	
UnempF	102	11.73389	9.839217	0.491	29.697	
UnempT	102	9.879353	7.731983	0.856	22.517	
Popg	102	2.967806	0.8934399	-0.076949	4.780037	
Inf	102	4.466355	11.77831	-21.16523	59.32905	

Table 1 presents the descriptive statistics. We can observe the minimum values, maximum the standard deviation of the different observed variables. The average of exports over the period is 43.10 and the average of imports is 36.44 in the Cemac zone.

Table 2 presents the correlation table between the variables. Only the variables related to unemployment present a strong correlation. This is acceptable in the model because it seems logical that there is a strong correlation between the unemployment of men and unemployment of women. the same is true between the male unemployment rate and the total unemployment rate.

4-2 Correlation Matrice

	Exp	Imp	UnempM	UnempF	UnempT	PopG	Inf
Exp	1						
Imp	0.5207	1					
UnempM	0.5961	0.3785	1				
UnempF	0.5352	0.1338	0.929	1			
UnempT	0.5756	0.2654	0.9838	0.9803	1		
PopG	0.6628	0.3375	-0.0032	-0.011	-0.0086	1	
Inf	0.326	-0.0104	0.0858	0.0603	0.0751	0.1249	1

4-3: Model 1
- Regress Exp Imp UnempM PopG Inf

Number of obs	102
F (4, 97)	132.27
Prob > F	0.000
R-Squared	0.88451
Adj R-squared	0.8387
Root MSE	8.8926

Source	SS	df	MS			
Model	4183.4185	4	10459.6046			
Residual	7670.56664	97	79.0780066			
Total	49508.9851	101	490.187971			
Exp	coef.	Std.Err.	t	P > |t|	[95% Conf. Interval]	
Imp	0.1950507	0.077134	2.53	0.013	.0419611	.3481404
UnempM	1.821921	0.1496207	12.18	0.000	1.524966	2.118877
PopG	14.8432	1.076958	13.78	0.000	12.70574	16.98066
Inf	0.3881193	0.0763895	5.08	0.000	.2365073	.5397314
Cons	-25.33863	3.472685	-7.3	0.000	-32.23095	-18.44631

- **Breusch-pagan / Cook-Weisberg test for heteroscedasticity**
    H0: Constant Variance

Chi 2(1)	0.14
Prob > chi 2	0.7048

Table 3 presents the linear regression considering the male unemployment rate as one of the control variables in our model. It appears that imports positively and significantly affect exports. Regarding the control variables, they are all significantly significant for the export. This liberalization of imports can also lead to an increase in exports through lower raw material costs and increased productivity.

The heteroskedasticity test is carried out to validate our regression. As a reminder, it is possible to validate the regression if the variance of the model errors is constant, hence the hypothesis H0: Constant Variance. Here the P-value is 0.7048 hence the confirmation of H0 and the validation of the linear regression model.

4-4 Model 2
- **Regress Exp Imp UnempF PopG Inf**

					Prob > F	0.000
					R-Squared	0.8427
					Adj R-squared	0.8362
					Root MSE	8.9596

Source	SS	df	MS			
Model	41722.3196	4	10430.5799			
Residual	7786.66547	97	80.2749017			
Total	49508.9851	101	490.187971			
Exp	coef.	Std.Err.	t	P > |t|	[95% Conf. Interval]	
Imp	0.4510825	0.0716833	6.29	0.000	.30811	.593354
UnempF	1.10433	0.0918298	12.03	0.000	.9220729	1.286586
PopG	13.56417	1.072693	12.65	0.000	11.43528	15.69306
Inf	0.434017	0.0766047	5.67	0.000	.2819778	.5860562
Cons	-28.48669	3.555169	-8.01	0.000	-35.54272	-21.43067

- **Breusch-pagan / Cook-Weisberg test for heteroscedasticity**
  H0: Constant Variance

Chi 2(1)	3.78
Prob > chi 2	0.0518

In model 2 we only consider the unemployment rate of women. All coefficients are significant and positive. R2 is 0.84 so 84% of the variations in the dependent variable are observed in the model.

The P-value of the heteroskedasticity test is 0.0518 so we do not reject H0. The same is true for the model 3 containing the total unemployment rate. This regression presents a heteroskedasticity test with a P-value of 0.25. So acceptable regression results

.4-5 Model 3
- **Regress Exp Imp UnempF PopG Inf**

					Number of obs	102
					F (4, 97)	135.01
					Prob > F	0.000
					R-Squared	0.8477
					Adj R-squared	0.8415
					Root MSE	8.8158

Source	SS	df	MS			
Model	41970.2952	4	10492.5738			
Residual	7538.68995	97	77.7184531			
Total	49508.9851	101	490.187971			
Exp	coef.	Std.Err.	t	P > |t|	[95% Conf. Interval]	
Imp	0.3187541	0.0728815	4.37	0.000	.1741044	.4634038
UnempT	1.4689885	0.1189283	12.35	0.000	1.232945	1.705025
PopG	14.24988	1.060631	13.44	0.000	12.14482	16.35494
Inf	0.4091942	0.0755394	5.42	0.000	.2592694	.5591191
Cons	-27.14289	3.470721	-7.82	0.000	-34.03131	-20.25447

- **Breusch-pagan / Cook-Weisberg test for heteroscedasticity**
  H0: Constant Variance

Chi 2(1)	1.31
Prob > chi 2	0.2521

4-6 Model
- **Regress Exp Imp UnempM UnempF PoPG Inf**

Number of obs	102
F (4, 97)	107.56
Prob > F	0.000
R-Squared	0.8485
Adj R-squared	0.8406
Root MSE	8.8381

Source	SS	df	MS			
Model	42010.2193	5	8402.04386			
Residual	7498.7658	96	78.1121437			
Total	49508.9851	101	490.187971			
Exp	coef.	Std.Err.	t	P > |t|	[95% Conf. Interval]	
Imp	0.3017345	0.1051272	2.87	0.005	.0930585	.5104104
UnempM	1.04521	0.5444304	1.92	0.058	-.0354755	2.125896
UnempF	0.491842	0.3316441	1.48	0.141	-.1664663	1.15015
PopG	14.31501	1.128058	12.69	0.000	12.07583	16.55419
Inf	0.4064345	0.0769194	5.28	0.000	.2537506	.5591184
Cons	-26.88292	3.603073	-7.46	0.000	-34.003893	-19.72691

- **Breusch-pagan / Cook-Weisberg test for heteroscedasticity**

H0: Constant Variance

Chi 2(1)	1.08
Prob > chi 2	0.2977

In table 5, we combine the unemployment rate for women and men. The coefficient of UnempF and UnempM are positive and not significant. So, if we take into account the differences between men and women, the unemployment rate of women and the unemployment rate of men have no significant effect on exports of central African countries. The heteroskedasticity test presents a P-value of 0.297 so H0 is accepted hence the constant of the error variance therefore the absence of heteroskedasticity.

5. CONCLUSION
At the end of this study, it clearly appears that Import has a positive and significant impact on Export for the Cemac zone during the period 2005-2021. Thus, the reduction of import barriers will lead to an increase in exports. All The control variables have a positive impact on exports. Only, when UnempF is associated with UnempM, these two control variables appear with non-significant coefficients for export (our dependent variable). The different heteroskedasticity tests reassure us about the acceptance of the model because of the absence of heteroskedasticity. This study provides tools to CEMAC governments to increase their exports, a real factor of economic growth.

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