The Impact of Institutional Quality and Development of Human Resources on Exports in the West African Economic and Monetary Union (WAEMU) Countries

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Abstract
This study examined the relationship between export, institutional quality and human resources development in WAEMU countries.
Panel data specification were used over the period 1990-2005 and allowed the use of error correction modeling (VECM). The results reveal a long-term relationship between export, institutional quality and human resources development. In a short term perspective, they also show that human resources and institutional quality have positive significant impact for exports development in WAEMU area.
Therefore, these results show the need of policies to improve human resources development and strengthen institutional quality to impact exports flows of WAEMU countries, especially the rule of law of countries, governance stability and developed existing anti-corruption strategies.
Keywords*: Institutional quality – Human resources – Panel VECM - WAEMU

1. Introduction:
The majority of African countries have economies that are outward-looking. For most of them, they ae sufficient of raw materials, which they export to earn foreign exchange for development in certain domains of their economies. In this way, exports are an important tool of economic policy.

In West Africa, the first export products are raw materials with low human contribution of quality (gold in Burkina Faso, cocoa in Ivory Coast, etc). In most cases, foreign direct investment underpins production in sectors that are low in quality of human resources. The Human Development Index, which aggregate three (3) index as education level of the population aged 15+, remains relatively low in these countries. This is characteristic of a less qualified workforce for the production of goods and services so a weakness in exports flows.

Costinot (2009) shows that countries with skilled human resources and quality of institutions have comparative advantages that can positively impact their export performance.

Moreover, the quality of the institutions appears as a necessary condition to a better production and better returns of their exports. Credibility of institutions are guaranties of foreign investment in the economy that can lead to economic prosperity North D (1990). On the other hand, advanced exports can deteriorate institutions in countries considered as economically weak Levchenko A (2009). Several indicators measure the quality of institutions. However, stability in governance, clear rules of law over property rights, and minimal corruption can increase the productivity of economies and increase exports. If we consider that the quality of human resources as well as stable institutional frameworks can impact the level of production of economies, and hence indirectly boost export, then we can look for questions of link that can exist between them.

2. Methodology:
2.1 Data
Data use in our model are exports, human development index and institutional quality. Exports represents exports of good and services in % of GDP. Exports data from World Development Indicators. Human resources development comes from human development index database. Institutional quality data comes from ICRG international country risk guide presented by the PRS political risk service group. It is the medians of three (3) variables which are corruption, rule of law and governance stability.

2.2 Panel data specification
We use panel data specification for West African economic and Monetary Union (Waemu) gives by this specification**:**

$$Exports_{i,t} = \alpha_0 + \beta Human\ Ressources\ Development_{i,t} + \delta Institutional\ Quality_{i,t} + \eta_i + \lambda_t + \epsilon_{i,t}$$

Where η_i shows country specific effect and λ_t, temporal specific effect and $\epsilon_{i,t}$ terms of error.
The i and t represents respectively the country and time.

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The econometric model process follows three (3) steps. Firstly, the homogeneity test of HSIAO is made to prove evidence of nature to perform a panel treatment approach. Looking for the results of the test, P-value of $H^1 0$ is 4.818e-20 which is low than 0.05. This shows that alpha and beta are not identities. And then, P-value of $H^2 0$ is 0.11065515 which is higher than 0.05. So we cannot reject the beta coefficients of explicative variables are equal for different countries. The P-value of $H^3 0$ is very low than 0.05. This shows existence of specific effects.

Table 1: Hsiao test

Hypothesis	F-stat	P-value
$H^1 0$	13.434427	4.818e-20**
$H^2 0$	1.4558271	0.11065515
$H^3 0$	55.35322	9.440e-30**

Note: significance at 5%.

2.3 Unit root test

In other parts, we will discuss on stationarity of variables. The analysis of stationarity of exports, human resources development and institutional quality is necessary before econometric application, indeed, to avoid wrong regressions. The tests proposed by Levin-Lin-Chu (2002) and Im-Pesaran-Shin (2003) will be use to find the order of our series in panel.

The two (2) tests shows that we cannot reject the null hypothesis of a unit root for Exports (X), Human Resources Development (HDI) and Institutional Quality (IQ) at 5% level of significance. The P-values obtained are less than 5%. So these variables are not stationary at level.

Table 2: Unit root test (in level)

	Test Im-Pesaran-Shin		Test de Levin-Lin-Chu		
	Intercept	Intercept+trend	Intercept	Intercept+trend	None
X	0.0006*	0.0260*	0.0000*	0.0000*	0.3080
HDI	1.0000	0.4326	1.0000	0.9921	1.0000
IQ	0.0069*	0.9981	0.0009*	0.7702	0.3756

*Note : * means statistically significant at 5% level of significance.*
Source : Our construction on Eviews.

But, after differencing them at one time, the null hypothesis of existence of a unit root was rejected at 5% level of significance for both tests, and then we conclude at the stationarity of these variables at their first difference.

Table 3: Unit root test (in difference)

	Test Im-Pesaran-Shin		Test de Levin-Lin-Chu		
	Intercept	Intercept+trend	Intercept	Intercept+trend	None
X	0.0000*	0.0000*	0.0000*	0.0000*	0.0000*
HDI	0.0080*	0.1577	0.0000*	0.0000*	0.0202*
IQ	0.0005*	0.0000*	0.0000*	0.0000*	0.0000*

*Note : * means statistically significant at 5% level of significance.*
Source : Our construction on Eviews.

And then, they are integrated at order one I(1). And then, the variables are eligible to test the long run cointegration analysis between them.

2.4 Trace, max-eigen and Pedroni tests of cointegration
- **Trace and max-eigen tests**

According to Trace test, one (1) cointegrating equation at the level of 5% were accepted. The P-values from trace test and max-eigen statistic are significant at 5% level. This shows existence of a long-run relationship between X, HDI and IQ.

Table 4: Trace Test for cointegration

	Trace test	P value	Max-eigen test	P value
None	55.14	0.0000	62.48	0.0000
At most 1	9.906	0.7690	10.76	0.7049
At most 2	10.67	0.7120	10.67	0.7120

- **Predroni test**

Pedroni(2004) is used to test cointegration. And then, as results shows, four (4) of seven (7) statistics gives by Pedroni test concluded on existence of cointegration relation between exports, human ressources development and institutional quality. And then, according to Granger representation theorem, an vector error correction model (ECM) can be perform.

Table 5: Pedroni test for cointegration

Alternative hypothesis: common AR coefs. (within-dimension)				
	Statistic	P value	Weighted Statistic	P value
Panel v-Statistic	-1.079967	0.8599	-1.079967	0.8599
Panel rho-Statistic	-1.350867	0.0884	-1.350867	0.0884
Panel PP-Statistic	-2.428329	0.0076	-2.428329	0.0076
Panel ADF-Statistic	-1.908328	0.0282	-1.908328	0.0282
Alternative hypothesis: individual AR coefs. (between-dimension)				
	Statistic	P value		
Group rho-Statistic	-0.242182	0.4043		
Group PP-Statistic	-2.679863	0.0037		
Group ADF-Statistic	-1.873918	0.0305		

3. Result:

Cointegration equation

Cointegration equation is given by : $X = -39,073\,HDI + 2,011\,IQ$

On the long term, HDI have negative impact to X, exports and IQ have positive impact on X.

Table 6: Estimation of VECM model

	D(X)	D(HDI)	D(IQ)
CointEq1	-1.573054	-4.39E-05	-0.053147
	(0.09191)	(0.00029)	(0.02070)
	[-17.1157]	[-0.14945]	[-2.56806]
D(X(-1))	0.269332	0.001165	-0.004773
	(0.06964)	(0.00022)	(0.01568)
	[3.86726]	[5.24060]	[-0.30436]
D(HDI(-1))	203.9609	0.187286	6.162952
	(32.5102)	(0.10381)	(7.32048)
	[6.27375]	[1.80403]	[0.84188]
D(IQ(-1))	5.053402	-0.006198	0.430450
	(0.47897)	(0.00153)	(0.10785)
	[10.5505]	[-4.05204]	[3.99110]
C	-1.120724	0.004708	-0.014155
	(0.19647)	(0.00063)	(0.04424)
	[-5.70437]	[7.50359]	[-0.31996]
R-squared	0.811807	0.344799	0.189686
Adj. R-squared	0.803713	0.316618	0.154834
Sum sq. resids	88.84066	0.000906	4.504555
S.E. equation	0.977382	0.003121	0.220082
F-statistic	100.2933	12.23530	5.442598
Log likelihood	-134.2479	428.9286	11.85806
Akaike AIC	2.841795	-8.651604	-0.139960
Schwarz SC	2.973681	-8.519718	-0.008074
Mean dependent	-0.050254	0.005714	0.017857
S.D. dependent	2.206064	0.003775	0.239394
Determinant resid covariance (dof adj.)	2.36E-07		
Determinant resid covariance	2.01E-07		
Log likelihood	338.3399		
Akaike information criterion	-6.537548		
Schwarz criterion	-6.062758		

3.1 The long run causality

The OLS (ordinary least squares) method were used to discuss about the significance of the model. We found that the error correction term C(1) which is -1.57 is negative and significant at the level of 5% because of -17.11 statistic which is low 0.09. So there is a long-run relationship between the three (3) variables. Then, it exists an impact in long-term between exports flows, human resources and institutional quality.

3.2 The short run causality

The wald test were conducted to determine the significance of coefficients.

- **Human resources development**

According to the short term causality results, the p value statistic associated to C(3) is lower than 0.05. So the coefficient is significant at the 5% level. We can consider human resources development explains exports flows in short term.

- **Institutional quality**

As we can see, the p value statistic associated to C(4) is lower than 0.05. So the coefficient is significant at the 5% level. We consider that institutional quality explains exports flows in short term in WAEMU countries.

Table 7 : Estimation of VECM model

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-1.573054	0.091907	-17.11567	0.0000
C(2)	0.269332	0.069644	3.867262	0.0002
C(3)	203.9609	32.51020	6.273751	0.0000
C(4)	5.053402	0.478971	10.55053	0.0000
C(5)	-1.120724	0.196468	-5.704366	0.0000
R-squared	0.811807	Mean dependent var		-0.050254
Adjusted R-squared	0.803713	S.D. dependent var		2.206064
S.E. of regression	0.977382	Akaike info criterion		2.841795
Sum squared resid	88.84066	Schwarz criterion		2.973681
Log likelihood	-134.2479	Hannan-Quinn criter.		2.895140
F-statistic	100.2933	Durbin-Watson stat		2.278503
Prob(F-statistic)	0.000000			

3.3 Granger causality

According to Granger causality test, we rejected that IQ does not Granger cause HDI. We also reject HDI does not Granger cause X and also X does not Granger cause HDI were rejected. So there is a relation of causality of IQ on HDI, HDI on X and X on HDI.

Table 9: Granger causality

Null Hypothesis:	Obs	F-Statistic	Prob.
X does not Granger Cause IQ	105	0.00144	0.9698
IQ does not Granger Cause X		0.01048	0.9187
HDI does not Granger Cause IQ	105	0.78679	0.3772
IQ does not Granger Cause HDI		4.71742	0.0322
HDI does not Granger Cause X	105	5.31028	0.0232
X does not Granger Cause HDI		6.71723	0.0109

4. Discussion and Conclusion:

The objective of this study was to analyze the impact of institutional quality and human ressources development on exports flows in WAEMU countries. Based on data from Human Development Index, World Development Indicators and PRS Group over the period 1990-2005, an vector error-correction were build and gives two (2) results. Firstly, there is a long-term relationship between exports flows, human ressources development and institutional quality. The institutional quality and human ressources have positive impact on short term on exports. Secondly, institutional quality implies a better human ressources development as exports too, and a qualified human ressources implies exports in WAEMU areas.

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