

**Foreign Direct Investment and Economic size as drivers of Intra-regional exports of manufactured goods in West Africa: The case of West African Economic and Monetary Union.**

Paper prepared for Joint ASSA/NEA meetings, 5-7 January 2018 in Philadelphia, PA  
Session: African Development: Regional Economic Integration (O1)

By

Toussaint Houeninvo and Philippe Sèdédji\*

\*Houeninvo: African Development Bank, Senegal Country Office, Route de Ngor, Zone 12, Almadies, BP 50544-CP 18524 RP Dakar (email: [t.houeninvo@afdb.org](mailto:t.houeninvo@afdb.org)); Sededji: Ministry of State in charge of Planning and Development, BP 342 Cotonou (email: [sphilos@yahoo.fr](mailto:sphilos@yahoo.fr)). We thank WAEMU Commission for providing trade statistics by category and Makhtar Gueye for excellent Research Assistance. This paper reflects the opinions of the authors and not those of the institutions the authors are affiliated with.

Corresponding Author: [t.houeninvo@afdb.org](mailto:t.houeninvo@afdb.org)



# Foreign Direct Investment and Economic size as drivers of Intra-regional export of manufactured goods in West Africa: The case of West African Economic and Monetary Union

By TOUSSAINT HOUENINVO AND PHILIPPE SÈDÉDJI\*

## Abstract

*Africa exports mainly crude product to its main partner countries outside the continent, a trade pattern that exacerbates the vulnerability of its economies as shown by the recent sharp decline in commodity price. The paper investigates on the role of Foreign Direct Investment and Economic size of West African Economic and Monetary Union member countries on intra exports of manufactured goods. The results of random effects of panel data over 1996-2012 indicate that GDP as well as FDI have the positive expected sign and significant at 1% while population has a negative impact at 1% (Lindert Hypothesis).*

**Key words:** Intra regional manufactured exports, Foreign Direct Investment, Panel data, Gravity model, West Africa

**JEL Classification:** F13 ; F14 ; F15 ; F21 ; L69

\* Houeninvo: African Development Bank, Senegal Country Office, Route de Ngor, Zone 12, Almadies, BP 50544-CP 18524 RP Dakar (email: [t.houeninvo@afdb.org](mailto:t.houeninvo@afdb.org)); Sededji: Ministry of State in charge of Planning and Development, BP 342 Cotonou (email: [sphilos@yahoo.fr](mailto:sphilos@yahoo.fr)). We thank WAEMU Commission for providing trade statistics by category and Makhtar Gueye for excellent Research Assistance. This paper reflects the opinions of the authors and not those of the institutions the authors are affiliated with

Corresponding Author: [t.houeninvo@afdb.org](mailto:t.houeninvo@afdb.org)

## I. Introduction

Export of manufactured goods<sup>1</sup> plays a resilient role to external shocks and has a greater potential of generating a large number of jobs. (Rodrik 2011a,b AfDB/OECD/UNDP 2013).

And yet, manufacturing sector is still weak representing only 11percent of Africa's GDP in 2014-2015 as compared to East Asia and Pacific (23 percent), South Asia (16 percent) and Latin America and the Caribbean (14percent) (AfDB/OECD/UNDP 2017). For West African Economic and Monetary Union (WAEMU), it is estimated at 9 percent of GDP over 1995-2012 (Ameganvi 2015). Obstacles to a successful upgrading in manufacturing value chain include lack of large internal market, transport and logistics, Foreign Direct Investment (FDI) that can support the processed goods. While there have been some investigations on intra-African trade in general, there is less on intra-African export of manufactured goods and in WAEMU in particular.

The paper aim at contributing to fill that gap by addressing the following research question. How determinant are country economic size (GDP) and FDI to intra-regional export of

manufactured goods in WAEMU region. The econometric analysis uses panel data for the period 1996-2012 covering WAEMU Countries in an extended gravity model. The random effects model indicates that GDP as well as FDI (with two lags) have the positive expected sign and significant at 1% while population has a negative impact at 1% (Linder Hypothesis).

## II. Stylized facts

WAEMU<sup>2</sup> member countries have a common monetary policy conducted at central level by the Central Bank of West African States (BCEAO). They also have a Common External Tariff (CET) implemented since January 1<sup>st</sup> 2000.

Data obtained from WAEMU Commission indicate that intra exports represent 14 percent of total export of WAEMU over 1996-2012. During the same period, intra exports of manufactured goods is estimated at 42 percent representing CFAF 5760.1 billion out of CFAF 13682.4 billion overall intra exports. It increased from 44 percent during 1996-1999 to 47 percent over 2010-2012 with the lowest share estimated at 38 percent during 2005-2009.

<sup>1</sup> Manufactured goods are products of Sections 5, 6, 7, 8 except for Division 68 and Group 891 of the Standard International Trade Classification (SITC), rev 4.

<sup>2</sup> WAEMU member countries are Benin, Burkina Faso, Côte d'Ivoire, Guinea Bissau, Mali, Niger, Senegal and Togo

Côte d'Ivoire, the largest WAEMU Country, share of manufactured goods in intra-WAEMU exports went from 77.3 percent during 1996-1999 to 56.5 percent during 2000-2005 and 28.7 percent over 2010-2012, a 62 percent drop as compared to its 1996-1999 level. The decrease has benefited mainly Senegal and Togo whose share increased from 18 percent to 23.8 percent for Senegal and 1.0 percent to 18.2 percent for Togo, almost 1700 percent.

### III. Literature review

Exports of sophisticated goods (manufactured) generate greater economic development outcome than those of raw materials or less technology intensive ones. [Hausmann, Hwang and Rodrik (2005); Lall 2000; Rodrik (2011a,b) Thorbecke and Pai (2013)]

Yameogo et al (2014) found that African Countries exports are weakly diversified and sophisticated. Anyanwu and Kponnou (2017) found that key positive drivers of Food beverage and Tobacco manufacturing for Africa include government consumption, household consumption and renewable electricity.

Effobi and Osabuohien (2016) found that poor infrastructure have been detrimental to manufacturing exports and competitiveness of Economic Community of West African States (ECOWAS) Countries.

## IV. Theoretical model

### A. The gravity model

Following several authors [Tinbergen (1962); Linnemann (1966); Hummels (2001); Houeninvo and Sededji (2016); Seck (2017)], we used the gravity model to address the research question. The basic model can be written as follows:

$$(1) \quad X_{mg_{ij}} = B \frac{Y_i^{a1} Y_j^{a2}}{DIST_{ij}^{a3}}$$

with  $a1, a2 > 0$  and  $a3 < 0$

where  $X_{mg_{ij}}$  is the value of Exports from country i to country j.

B is an intercept;

t is the period

$Y_{it}$  is the GDP of Country i during the period

$Y_{jt}$  is the GDP of Country j during the period

$D_{ij}$  is the distance between country i and country j ( $i \neq j$ ). Usually, it is the distance between the major capitals and ports of the two countries.

Taking the logarithm of equation (1) gives:

$$(2) \quad \log(X_{mg_{ij}}) = \log[B] + a1 \log(Y_i) + a2 \log(Y_j) + a3 \log(D_{ij})$$

where  $a1$  and  $a2$  are  $> 0$  and  $a3 < 0$

By adding other potential determinants as control variables in equation (2), the extended model with partner's country features can be written as follow:

(3)

$$\log(X_{mg_{ijt}}) = \log(B) + \sum_{k=1}^{ki} a_{1k} \log(F_{ki}) + \sum_{k=1}^{kj} a_{2k} \log(F_{kj}) + \varepsilon_{ijt}$$

where  $F_{ki}$  and  $F_{kj}$  represent respectively the features of trade partner countries. Therefore equation (3) can be written as:

(4)

$$\log(X_{mg_{ijt}}) = \log(B) + a_1 \log(GDP_{it}) + a_2 \log(D_{ij}) + a_3 \log(POP_{it}) + a_4 \log(FDI_{it-2}) + a_5 Z_{it} + a_6 PS_{it} + \varepsilon_{it}$$

where  $X_{mg_{ijt}}$  is the total intra manufactured goods exports from country i to other member countries of WAEMU (block j)<sup>3</sup> during year t  
 $GDP_{it}$  is the GDP of country i in the year t  
 $D_{ij}$  is the distance from country i to the other member countries of WAEMU (block j)  
 $POP_{it}$  is the population of country i in year t  
 $FDI_{it-2}$  is the Foreign Direct Investment of year t-2 in country i.

$Z_{it}$  is a dummy variable for the Common External Tariff during the period t

$PS_{it}$  stands for political stability/absence of terrorism

$\varepsilon_{ijt}$  is the error term  
 Except for distance where a negative effect is expected a positive effect is expected from all other variables. However population could have either a positive sign (Hechscher-Ohlin hypothesis) or negative sign (Linder hypothesis).

#### B. The variables, sampling and sources of data

The variables and sources of data are:

GDP and POP: WDI/World Bank

FDI: UNCTAD

Xmg and Z: WAEMU Commission

PS: [www.govindicators.org](http://www.govindicators.org)

D: [www.levoyageur.net/distances](http://www.levoyageur.net/distances)

Sample: Seven WAEMU member countries over 1996-2012 leading to 126 observations of panel data. Guinea Bissau has been excluded due to missing data on variables such as FDI.

<sup>3</sup> Since the data available are not bilateral intra manufactured goods from country i to country j but total intra manufactured goods from country i to other WAEMU countries. Then j became the entire WAEMU and common to all countries.. In line with this and to be more

realistic  $D_{ij}$  is a total critical trajectory by road from country i to the other WAEMU countries (block j). e.g distance from Senegal to other WAEMU countries including coastal ones follows Dakar-Bamako-Ouagadougou axis.

## V. Estimation method and Results

We run fixed effect and random effect of the model under STATA. The General Least Squared random effect yields a better quality with an  $R^2$  “between” coefficient of determination of 0.84 as opposed to the within  $R^2$  “within” coefficient of determination of 0.43 in fixed effect model.

After performing the required econometric tests (e.g: Hausman, Breusch and Pagan Lagrangian Multiplier test and correcting for heteroscedasticity), the result is summarized in table 1.

All the variables except the Common External Tariff are significant at 1 percent. The negative sign of population variable suggests that Linder hypothesis applies. Surprisingly however, political stability and distance have the non-expected and significant signs. It could be either due to a “measurement bias” or that FDI and GDP positive effects outweighed the negative effect of distance and insecurity.

## VI. Concluding remarks

Overall, a 1percent increase in GDP leads to 1.9 percent increase in intra-regional export of manufactured goods within WAEMU while a 1 percent increase in FDI leads to 0.34 percent

increase in intra-regional export of manufactured goods.

This calls for genuine economic reforms for greater FDI inflows in manufacturing sector and greater growth of GDP that can support the development and exports of manufactured goods within the zone for greater Jobs.

## REFERENCES

- AfDB, OECD, UNDP and UNECA.** 2013. “*Structural Transformation and Natural Resources*”. OECD Publishing, Paris.
- AfDB, OECD, UNDP and UNECA.** 2017. “*Entrepreneurship and Industrialisation*”. OECD Publishing, Paris.
- Ameganvi Komi.** 2015. “Impact économique du développement du secteur minier dans l’UEMOA”. Document d’Etude et de Recherche n° DER/14/04, Janvier.
- Anyanwu John C. and Mawuko Kponnou.** 2017. “Accelerating Agro-Manufacturing to feed Africa”. *African Development Review* 29 (S2): 78-95.
- Effobi Uchenna R. and Evans S Osabuohien.** 2016. “Manufacturing Exports, Infrastructure and Institutions in Africa: Reflections from ECOWAS”, in D. Seck. (Ed). *Accelerated Economic Growth in West Africa*. Geneva: Springer International Publishing.
- Hausmann Ricardo, Jason Hwang and**

- Dani Rodrik.** 2005. "What you export matters". National Bureau of Economic Research Working paper 11905. <http://www.nber.org/papers/w11905>
- Houeninvo and Sededji (2016),** "Driving factors of Intra-regional trade in agricultural goods: The case of West African Economic and Monetary Union". Paper presented at the Seventh Annual Conference on Regional Integration in Africa (ACRIA 7) on the theme: External Sector and Inclusive Development in West Africa ,7-9 July in Cotonou, Benin.
- Hummels David. (2001),** "Toward a Geography of Trade Costs" <http://www.krannert.purdue.edu/faculty/hummelsd/research/toward/tgct>.
- Lall Sanjaya.** 2000. "The Technological Structure and Performance of Developing Country manufactured Exports, 1985-1998". Queen Elizabeth House Working Paper 44, University of Oxford.
- Linnemann Hans.** 1966. "*An Econometric Study of International Trade Flows*". Amsterdam: North Holland Publishing.
- Rodrik Dani.** 2011a. "Unconditional Convergence". National Bureau of Economic Research Working Paper 17546.
- Rodrik Dani.** 2011b. "The Manufacturing Imperative". Project syndicate, [www.project-syndicate.org/Commentary](http://www.project-syndicate.org/Commentary).
- Seck Abdoulaye.** 2017. "How Facilitating Trade would Benefit Trade in Sub-Saharan Africa". *Journal of African Development* 19 (1):1-26.
- Tinbergen Jan.** 1962 *Shaping the World Economy: Suggestions for an International World Economic Policy*, New York, Twentieth Century Fund.
- Thorbecke Willem.** 2013."The Sophistication of east Asian Exports". The research Institute of Economy, Trade and Industry Discussion Paper Series 13-E-092.
- Yameogo Nadège Désirée, Tiguéné Nabassaga, Bassirou Amadou Diallo and Abebe Shimeles.** 2014. "Diversification and Sophistication as drivers of structural transformation for Africa. Paper presented at the Eastern Economic Association 40<sup>th</sup> Annual Conference in Boston, 6-9 March.



TABLE 1— SUMMARY OF THE RANDOM EFFECT RESULTS, 1996-2012

	(1)	(2)
	Log (Xmg)	Log (Xmg)
Intercept	30.58 (9.04)	29.23 (0.34)
Log (GDP)	1.99 (0.35)	1.91 (0.34)
Log (D)	0.78 (0.32)	0.83 (0.32)
Log (FDI-2)	0.34 (0.09)	0.35 (0.09)
Lop (POP)	-3.38 (0.54)	-3.30 (0.54)
PS	-0.65 (0.12)	-0.65 (0.12)
Z	0.20 (0.21)	-
Observations	111	111
Wald chi2 (6)	382.18	385.10
Prob>chi2	0.00	0.00

Notes: Standard errors are in parenthesis. The final model is in Column 2.

Table 2- Intra-regional WAEMU exports of manufactured goods by country CFAF billion, 1996-2012

	Benin	Burkina Faso	Côte d'Ivoire	Guinea Bissau	Mali	Niger	Senegal	Togo	Overall WAEMU
1996-1999	6.3	12.7	638.2	3.3	6.4	1.5	148.8	8.9	826.0
2000-2004	27.8	32.8	792.1	2.3	24.1	5.7	290.4	225.5	1400.6
2005-2009	37.9	43.6	819.0	1.6	54.0	14.7	491.6	399.3	1861.7
2010-2012	27.9	45.5	483.0	0.5	139.9	128.3	440.9	416.9	1682.9
1996-2012	99.9	134.5	2732.2	7.7	224.4	150.2	1371.7	1050.6	5771.2

Source: Authors' computation based on WAEMU Commission data

Table 3- Intra-regional WAEMU exports of manufactured goods by country, 1996-2012 in %

	Benin	Burkina Faso	Côte d'Ivoire	Guinea Bissau	Mali	Niger	Senegal	Togo
1996-1999	0.7	1.5	77.3	0.4	0.8	0.2	18.0	1.0
2000-2004	2.0	2.3	56.5	0.2	1.7	0.4	20.7	16.1
2005-2009	2.0	2.3	44.0	0.0	2.9	0.8	26.4	21.4
2010-2012	1.7	2.7	28.7	0.0	8.3	7.6	26.2	24.8
1996-2012	1.7	2.3	47.3	0.1	3.9	2.6	23.8	18.2

Source: Authors' computation based on WAEMU Commission data

Table 4- Intra-regional WAEMU exports by big categories, 1996-2012, CFAF Billion and in %

Years	Big categories								
	Agricultural goods		Extractive Industry goods		Manufactured goods		Other goods		Total
	Value	%	Value	%	Value	%	Value	%	
1996-1999	558.0	29.7	469.1	25.0	826.0	44.0	25.6	1.4	1878.7
2000-2004	1096.4	33.1	626.5	18.9	1400.6	42.2	192.2	5.8	3315.6
2005-2009	1623.6	33.0	120.7	2.4	1850.7	37.6	1331.1	27.0	4926.1
2010-2012	1195.2	30.7	60.1	1.5	1682.9	43.3	921.4	23.7	3887.3
1996-2012	4473.1	31.9	1276.4	9.1	5760.2	41.1	2470.3	17.6	14007.7

Source: Authors' computation based on WAEMU Commission data