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Structural Transformation and Poverty in the WAEMU

Saidou W. Roufaye, Malam M. Nafiou, and Idrissa M. Ouedraogo

ABSTRACT

Poverty is a major concern for West African Economic and Monetary Union (WAEMU) countries. If poverty is decreasing in the WAEMU, it's level remains high when compared to other developing countries. The low productivity of the agricultural sector, which represents the main activity of the poor in this area, explains the high level of the poverty. A structural transformation that would shift resources from low productivity sectors (notably agriculture) to high productivity sectors (manufacturing and services) would be conducive to poverty reduction. Indeed, evidence from both developed and emerging countries shows that structural change is associated with poverty reduction. In this context, this study analyses the relationship between structural transformation and poverty in the seven (7) WAEMU countries over the period 1996-2019. A simultaneous equation model was used to assess this relationship. The results show that structural transformation does not contribute to poverty reduction in the WEAMU. However, its effect becomes favourable when combined structural transformation with human capital development. In order to fight poverty, the study recommends that the structural transformation process must be accompanied by an improvement in human capital.

Keywords: Agricultural, Human Capital, Manufacturing, Poverty, Productivity, Services, Structural Transformation, WAEMU.

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S. W. Roufaye*
Abdou Moumouni University, Niamey, Niger
(e-mail: roufayrsw@gmail.com)
M. M. Nafiou
Abdou Moumouni University, Niamey, Niger
(e-mail: mnafiou@yahoo.fr)
O. M. Idrissa
Aube Nouvelle University, Ouagadougou, Burkina Faso
(e-mail: idriss_mo@yahoo.fr)

****Corresponding Author***

I. Introduction

Like other Sub-Saharan Africa (SSA) countries, poverty is a major concern for West African Economic and Monetary Union (WAEMU) economies. Although, the poverty rate is gradually declining in this area, her level is still high when compared to other developing countries. Furthermore, progress in poverty reduction remains relatively slow and doesn't allow for the achievement of the sustainable development goals by 2035.

Since the 1980s, WAEMU countries have multiplied several development plans and programs to fight poverty, the most important are the Structural Adjustment Programs, the Poverty Reduction Strategy, and, more recently, the accelerated growth policies. From the analysis of most of these development strategies, the agricultural sector has been placed at the heart of development policies. The interest given to this sector in the fight against poverty in this area, came from the fact that poverty is predominantly present in rural areas (BCEAO, 2012) and that agriculture is their main economic activity. Thus, the development of this sector is supposed to increase the labor productivity of farmers and consequently lead to a reduction of poverty. Development indicators apparently show that this sector has not been an effective instrument for fighting poverty (Noufe, 2018). Agriculture remains underdeveloped and is characterized by low productivity in the WAEMU. Thus, the agricultural sector in the WAEMU seems to face insuperable obstacles to reducing poverty. For Barbier and Hochard (2014), the limited impact of growth on poverty reduction in developing countries is explained by the fact that a larger share of the population lives on agricultural land that is less favorable to production.

Facing the failure of all these attempts to reduce poverty through the development of the agricultural sector, the hope is now placed in structural transformation, in which the non-agricultural sector is going to take over. Over the past decade, a large part of the literature has focused on structural transformation. It is important to move beyond this substantive agriculture to the more productive modern sectors. Structural transformation involves the shift of economic activity from the low-productivity sector (rural) to the high-productivity sector (modern) with labor-intensive (Lewis, 1954). It is seen by many authors as a way out of poverty in SSA countries (UNECA, 2011). So, what is the relationship between structural transformation and poverty in WAEMU? How does structural transformation affect poverty in WAEMU?

Is an economy dominated by the non-agricultural sector more likely to reduce poverty? We hypothesize that a transfer of resources from the agricultural sector to the non-agricultural sector would lead to a reduction of poverty in WAEMU countries. One of the main causes of poverty in Africa is the low productivity of the agricultural sector (Diego, 2014). A migration of resources from the traditional low productivity sector to the modern higher productivity sectors can be accompanied by a reduction of poverty (Cadot *et al*., 2016). Furthermore, modern sectors, such as manufacturing, for example, have a higher potential for job creation, which contributes to poverty reduction.

The main objective of this study is to verify the extent to which structural transformation measured by the reallocation of resources from the agricultural sector to the non-agricultural sector affects the probability of escaping from poverty in WAEMU countries.

The rest of this study is divided into four points. The first section is devoted to the descriptive analysis of data on structural transformation and poverty. The second section reviews the literature, both theoretical and empirical, on the subject. The third section presents the methodology used. The fourth section presents the results and their interpretation. Finally, we conclude with some policy recommendations.

II. Evolution of Structural Transformation and Poverty in the WAEMU Countries from 1996 to 2019

A. Poverty Situation in WAEMU Countries from 1996 to 2019

Fig. 1 shows the poverty situation in WAEMU countries over the periods 1996-2002, 2003-2010 and 2011-2019.

Fig. 1 that over the 1996-2002 period, poverty was very pronounced in three WAEMU countries. These are Mali, Niger and Senegal, with an average poverty rate of 67.3%, 62.6% and 57.5% respectively. Meanwhile, the poverty rate is lower in Benin, Côte d'Ivoire, Burkina Faso and Togo, with a level lower than that of WAEMU, which is 48.3%.

Over the period 2003-2010, poverty declined in most WAEMU countries, with the exception of Togo, Côte d'Ivoire and Benin, which experienced an increase in poverty. Over this period, Togo has the highest average poverty rate, at 51.2%, whereas it was only 48% in the WEAMU over the same period.

Over the last period (2011-2019), most of the countries in the area have made significant progress in the fight against poverty. In effect, the incidence of poverty fell between 2003-2010 and 2011-2019, from 52.3% to 41.1% in Senegal; from 60.4% to 45.3% in Niger; from 45.2% to 42.3% in Burkina Faso; and from 47% to 46.6% in Mali. However, poverty has increased in the other countries of the WAEMU over this period compared to the previous period.

At the WAEMU level, it should be noted that poverty has gradually declined over the three periods covered by our analysis. However, the progress recorded is slow and will not, at this rate, make it possible to achieve the Sustainable Development Goals (SDGs) by 2035.

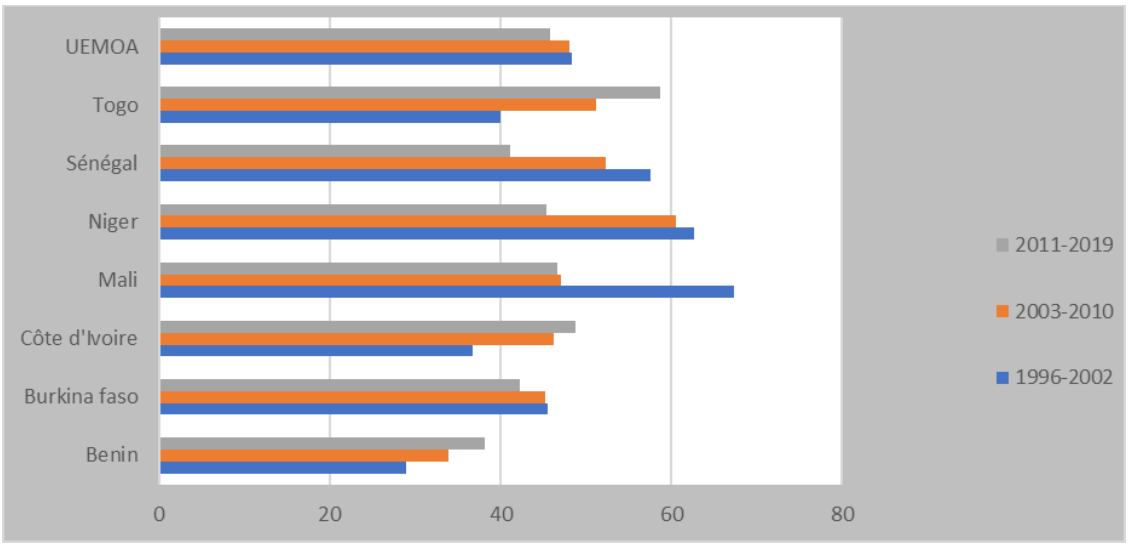

Fig. 1. Incidence of poverty at $1.25 in the WAEMU COUNTRIES from 1996 to 2019.
Source: authors based on national surveys; WAEMU and BCEAO.

B. Comparative Evolution between Structural Transformation and Poverty in the WAEMU Countries

Fig. 2 presents the average structural transformation index and the average incidence of poverty at the WAEMU over the periods 1996-2002; 2003-2010 and 2011-2019.

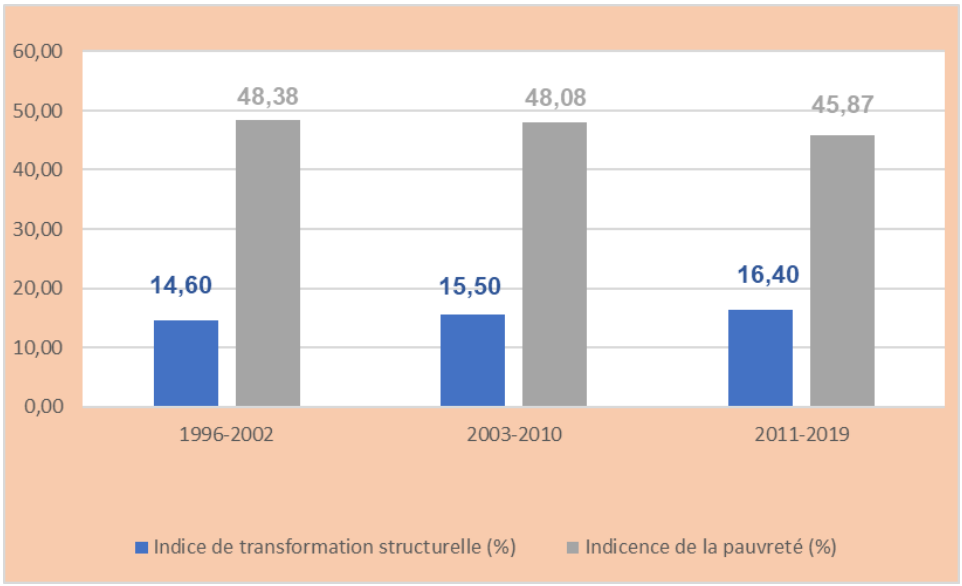

Fig. 2. Comparative evolution of the structural transformation and poverty in the WAEMU countries from 1996 to 2019.
Source: authors from WDI, 2021.

The analysis of the graph shows a correlation between structural transformation and poverty. An increase in the structural transformation index of the economy seems to lead to a decrease in poverty. For example, between the periods 1996-2002 and 2003-2010, an increase in the structural transformation index of 1.51 points led to a decrease in poverty of 0.30 points. Moreover, the same observation can be made for the last two periods. When the transformation index rose from 32.65% to 33.73%, the average incidence of poverty in the WEAMU fell by 2.21 points. However, the analysis can also be made in the opposite direction, i.e., the reduction in poverty could be the source of the structural transformation. Indeed, when poverty decreases, the structural transformation index increases.

C. Correlation between Structural Transformation and Poverty

Fig. 3 shows the structural transformation as measured by the structural transformation index and poverty as measured by the incidence of poverty over the period 1996-2019.

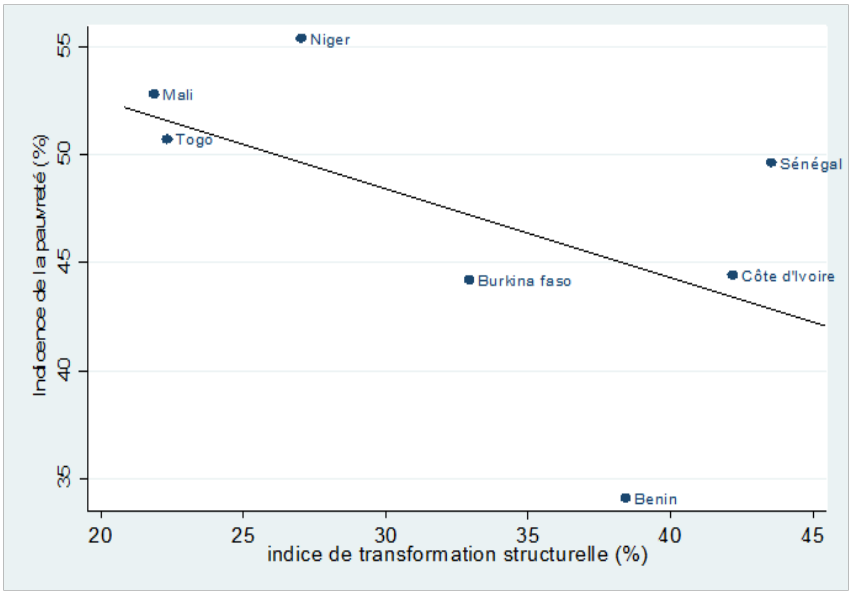

Fig. 1. Structural transformation and poverty 1996-2019.
Source: authors from WDI, 2021.

In general, the trend shows that countries with a high structural transformation index also have a lower incidence of poverty. Niger, Mali and Togo, which have low structural transformation indices, also have a high incidence of poverty. In contrast, Côte d'Ivoire and Senegal, which have a more appreciable level of structural transformation in the area, also have lower poverty rates. Overall, the stylized facts reveal a wide disparity in the incidence of poverty within WAEMU countries. Moreover, the data show that despite the significant progress made in the fight against poverty, its incidence remains high when compared to other developing countries.

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III. Literature Review

After the last decade, African economic growth has increased since the beginning of the 21st century. However, this recovery has not significantly impacted job creation and poverty reduction. As a result, many studies have attempted to provide plausible explanations for this situation. The absence of a substantial transformation of the economy is one of the reasons for the limited impact of growth on poverty levels. Indeed, the recovery has been observed in capital-intensive sectors with low hiring capacity (ECA, 2011). For growth to contribute to poverty reduction, it must be in sectors with high productivity and strong job creation. This implies a significant transformation of the economy, particularly the growth of the manufacturing sector (UNIDO, 2011). The results of Kahya (2012) confirm this idea. Using Pooled OLS regression, he shows that the structural transformation of the ASEAN economies, which occurred over the past three decades has given positive and significant effects on poverty reduction. However, the effects of such structural transformation on income distribution differ from country to country. Similar results are obtained by Achmad and Listiono (2021) on a panel of 38 cities in Indonesia over the 2012-2015 period. Indeed, these authors find that the structural transformation observed in these cities has contributed to poverty reduction. Moreover, their results clearly show that the service sector played a crucial role in reducing poverty.

On the other hand, the urbanization seen in Brazil, Russia, India, China, South Africa (BRICS) over the past three decades, reflecting a structural transformation of the economy, has been accompanied by a reduction in poverty (UNIDO, 2012). This structural transformation has taken place through the movement of labor from rural areas (agriculture sector) to urban areas (in the manufacturing sector). For structural transformation to contribute effectively to poverty reduction, the state must implement appropriate public policies (Timmer & Akkos, 2008).

However, the argument in which the structural transformation plays an active role in the decline of poverty is contested in the economic literature. In fact, structural transformation is not associated in the long run with poverty decline. Using an error correction model for the period 1980-2017, Fitria *et al.* (2020) show that the structural transformation of the Indonesian economy has not had a significant long-term effect on poverty reduction. On this basis, they suggested that the Indonesian government should focus on the agricultural sector to reduce poverty. In this country, most of the poor population is engaged in agricultural activity; the development of this sector will have more impact on poverty reduction. The research results of Doroch (2018) corroborate the conclusion of Fitria *et al.* (2020). He demonstrates from the general equilibrium model that public investments oriented in the rural economy, thus agricultural activity, tend to be more pro-poor than those made in the cities. Then, he considers that the State has more interest in directing its investment in the agricultural sector than in the industrial or service sectors. Similar results are obtained by Aradhna (2016). Indeed, using the Ordinary Least Squares (OLS) method over the period 1951-2012, he finds that the structural transformation of the Indian economy has not contributed to poverty reduction. Structural transformation has occurred in this country without a shift in employment from the agricultural sector to the industrial sector. Thus, the failure of structural transformation to reduce poverty is due to the fact that the industrialization process in India has left the vast majority of the population in the low-productivity agricultural sector.

Several works have highlighted the fundamental role that the industrial sector plays in an economy (Ghani & O'Connell, 2016; Baumol, 1967; Kaldor, 1966; McMillan and Rodrik, 2011; De-Vries *et al*. 2013). Like other Sub-Saharan African countries, industrialization remains a critical issue for West African authorities. There are several reasons why leaders in the region are interested in industrial development. First, West African economies are heavily dependent on primary products, mining, and agriculture. Primary products account for at least 50% of exports in three-quarters of West African countries and 90% in one-third. This type of specialization does not produce enough value added and exposes countries to commodity price shocks. Diversification of West African economies through industrialization would improve incomes, household consumption, and demand for intermediate goods (Fleming, 1955) and limit the volatility of growth. All of which would help reduce poverty in these countries. Second, Africa faces a huge challenge in terms of job creation and poverty reduction. West Africa's working-age population is expected to grow from 702 million in 2019 to nearly one billion in 2030. The intensifying pressure on the labor market, coupled with the goal of eradicating poverty by 2030, requires a substantial transformation of the economy towards high productivity sectors. To create jobs in high-productivity sectors, Africa needs to learn from the past and revive its industrial sector.

Third, several scholars agree that economic growth is intimately linked to manufacturing (Ghani & O'Connell, 2016; Baumol, 1967; Kaldor, 1966; McMillan & Rodrik, 2011; De-Vries *et al*. 2013). The primary and service sectors in Africa are characterized by low productivity. Due to a lack of industrialization, Ghani and O'Connell (2016) fear that the growth spurt in Africa in recent years may be running out of steam.

From an empirical perspective, several works have analyzed the role of the industrial sector in poverty reduction (Cadot *et al*., 2016; Habito, 2009). According to Cadot *et al*. (2016), industrial growth is more effective in reducing poverty than the agricultural and service sectors. In a sample of 35 countries in sub-Saharan Africa, these authors find a higher elasticity of industrial value added to reduce poverty than agriculture and services. Thus, only the industrial sector has significant enough induced effects on growth to significantly reduce poverty. In the same perspective, some authors argue that the development of the industrial sector is favorable to the fight against poverty. The experience of Asian and American countries sufficiently demonstrates the role that industrialization has played in reducing poverty in these countries. Indeed, Habito (2009), in his work on a sample of 15 representative Asian countries between 1990 and 2006, shows that the industrial sector has contributed more to job creation and poverty reduction than other sectors. However, Ghani and O'Connell (2016) provide counter-arguments to this view. Indeed, they show that the service sector has a higher job creation dynamic than the industrial sector at an early level of development.

From these ideas, strong arguments have emerged for the important role of the industrial sector in poverty eradication. The main channels identified through which industrialization influences poverty relate to levels of job creation and income. According to the ECA (2011), the lack of job creation is one of the main causes of persistent poverty in Africa. In line with this, it is accepted in the literature that the industrial sector absorbs more employment than the agricultural and service sectors. The second channel is related to the increase in income due essentially to the higher level of productivity in the industrial sector.

However, the argument that the industrial sector plays a dominant role in poverty reduction is being challenged by some authors. There is now evidence that services contribute as much as, if not more than, the industrial sector to job creation and poverty reduction in developing countries. This argument is supported by Ghani and O'Connell (2016) who find that the contribution of services to growth and employment is greater than that of manufacturing, whether in developed or developing countries. In the same vein, Ravallion and Chen (2007), using an econometric regression over the period 1980-2001 in China, show that the primary sector has a higher impact on poverty reduction than the secondary and tertiary sectors.

IV. Methodology

This section presents the methodology used to analyze the relationship between structural transformation and poverty. It is structured around three points: the first point explains the model, the second presents the variables and the data sources, and the third shows the estimation method.

A. Model

To analyze the effects of the structural transformation on poverty, the simultaneous equation model was used.

The models usually used to explain the poverty level from the structural transformation consider the latter as exogenous (Lee, 2018; Achmad & Listiono, 2021). According to this view, the structural transformation acts on poverty without being influenced by the poverty level of this economy. Such an understanding of the relationship between transformation and poverty is limited because in the long run it cannot be argued that structural transformation is stable or only influenced by purely random phenomena. Despite the fact that we are interested in explaining the level of poverty from structural transformation, ignoring the endogenous nature of the structural transformation, in the long run, leads to results that can be strongly biased.

Methodologically, empirical studies on the relationship between a country's structural transformation and poverty may suffer from simultaneity bias and endogeneity bias. Seen from this perspective, in the long run, structural transformation explains the level of poverty in line with the theses defended by empirical studies on the subject (Lee, 2018; Achmad & Listiono, 2021). However, drawing on the lessons of the ECA (2020) analyses, there are few arguments to justify the inertia of structural transformation and, therefore, their exogeneity. Yet, most of the research work relies on one-way relationship from structural transformation to poverty.

The choice of the simultaneous equations model is justified by the fact that structural transformation can explain the level of poverty, but also by the fact that the decrease of poverty contributes to the structural transformation (ECA, 2020). Hence, estimating a structural model with simultaneous equations allows us to take into consideration this interdependence and addresses to solve the problem of inverse causality of some variables.

In order to take into account all the interrelationships described above and, consequently, to control for possible correlations between the variables, a simultaneous equation model was specified.

The structural model for the analysis of "structural transformation and poverty" interactions is formalized as (1) and (2).

$$sti_{it} = \alpha_i + \alpha_t + \alpha_1 pov_{it} + \phi X_{it} + \varepsilon_{it} \quad (1)$$

$$pov_{it} = \beta_i + \beta_t + \beta_1 sti_{it} + \gamma W_{it} + \varepsilon_{it} \quad (2)$$

Equation (1) of this model is based on the empirical model of Lee (2018). However, we have made some small modifications to this model.
sti_{it}: The index of the structural transformation of the economy of a country i at time t.
pov_{it} : The poverty incidence of country i at time t.
X_{it} : The vector of control variables of the structural transformation.
W_{it} : The vector of poverty control variables.
α_i and α_t denote individual and time fixed effects, respectively; and ε_{it} the error term.
$\emptyset$ et γ are vectors of parameters of the control variables to be estimated.

B. Variables and Data Sources

The explanatory variables selected are those commonly used in the empirical literature on structural transformation and poverty, including Lee (2018), Fitria *et al*. (2020), Achmad and Listiono (2021), etc.

Table I presents the different variables of the model and the sources from which they are extracted.

TABLE I: DESCRIPTION OF VARIABLES AND DATA SOURCES

Name of variable	Description	Data Source
sti	Index of structural transformation of the economy is measured by $STi_i = \alpha X + \beta Y + \mu Z$ with: - economic index (X), based on the value-added shares of the non-agricultural sector; - urbanization index (Y), based on the percentage of the population living in urban areas in the total population; - demographic transition index (Z), based on birth and infant mortality rates. α the weight of the economic index; β the weight of the urbanization index and μ the weight of the population transition index	WDI, Banque Mondiale
pov	Incidence of poverty	National surveys, BCEAO, WEAMU
trade	degree of commercial openness as measured by (X+M)/PIB	WDI
infla	Annual inflation rate	WDI
pib	Gross domestic product per capita	WDI
cct	Short term credit	EDEN/BCEAO
clt	Long term credit	EDEN/BCEAO
dpp	Index of protection of private property rights	Heritage Foundation
vaa	Agricultural value added	WDI
txsco	Primary school enrollment	UNESCO Data
educsti	Primary school enrollment x structural transformation index	WDI; UNESCO Data

Source: authors.

C. Estimation Method

The appropriate estimation method depends on the model identification criterion. When the model is under-identified, there is no estimation possible. If the model is just identifiable, indirect least squares or double least squares should be used. On the other hand, if the model is over identifiable, the appropriate estimation method is double least squares.

D. Model Identification Conditions

To estimate a simultaneous equation model, we must first study the conditions for identifying the model (Doucouré, 2016). To do so, three cases can arise:

- the model is under-identified when one equation of the model is under-identifiable (i.e., there are fewer equations than parameters to identify in the structural form. Then the system is impossible to solve);
- the model is just identified if all equations are just identifiable;
- the model is overidentified if the equations of the model are over identifiable.

It should be noted that if the model is under-identified, there is no solution for estimating the model parameters. We must then re-specify the model.

Let:

f : number of endogenous variables in the model or the number of equations in the model;
h : number of exogenous variables in the model including the constant;
F : number of endogenous variables contained in the equation to be identified;

H : number of exogenous variables contained in the equation to be identified.

The identification conditions are determined for each equation.

Thus:

If $(f - F) + (h - H) < f - 1$ then the equation is sub-identified.

In the event that $(f - F) + (h - H) = F - 1$ then the equation is just identified.

However, if $(f - F) + (h - H) > F - 1$ then the equation is overidentified.

TABLE II: ANALYSIS OF THE IDENTIFIABILITY OF THE MODEL

Equation	Characteristics	Identification procedure	Results	Decision
(1)	$f = 2; F = 2; h = 8; H = 10$	$(10 - 8) > (2 - 1)$	$2 > 1$	overidentified
(2)	$f = 2; F = 2; h = 5; H = 10$	$(10 - 5) > (2 - 1)$	$5 > 1$	overidentified

Source: authors.

As shown in Table II, all two equations in our model are overidentified. Thus, the appropriate estimation method is double least squares.

E. Instrument Validity Test

Before validating the results of the simultaneous equation model, it is necessary to verify that the instruments used are not correlated with the error term. The choice of instrument validity test depends on the estimator used in the model. Since we have used double least squares in our model, it is appropriate to use the Sargan-Hansan test. The Sargan-Hansan overidentification test simultaneously tests two things: first, it ensures that the instruments used are not correlated with the error term, and second, that the equation is not misspecified and that the excluded exogenous variables should be included in the structural equation (Sargan test, 1958). Therefore, this test validates the instruments used in the regression. Thus, if the probability associated with the test is below the 5% threshold, then the instruments used are invalid. Otherwise, the instruments are validated. As shown in Table III, the p-values associated with the Sargan-Hansan test for each of the equations are above the 5% threshold. We conclude that the instruments used in our model are valid.

TABLE III: OVER-IDENTIFICATION TEST RESULTS

Sargan-Hansen statistic	sti	pov
Chi-sq(n-k)	1,93121	2,78461
P-value (Prob>chi2)	0,5868	0,4260

Source: authors

F. Endogeneity Test

The endogeneity test allows us to confirm or deny the exogeneity of the variables assumed to be endogenous in the simultaneous equation model. Thus, when the explanatory variables supposed to be endogenous are found to be exogenous thanks to the endogeneity test, then the ordinary least square is more efficient than the double least square. On the other hand, if the basic hypothesis about the endogeneity of the explanatory variables is confirmed, then the double least square is the most appropriate estimator. The Hausman test is used to question the endogeneity of the explanatory variables. The null hypothesis of this test considers that the variable is exogenous against the alternative hypothesis that the variable is endogenous. Thus, if the critical probability is below the 10% threshold, we reject Ho and accept the alternative hypothesis H1.

The results in Table IV show that the p-values are lower than the 10% threshold. Consequently, we accept the hypothesis of endogeneity of the exogenous variables assumed to be endogenous.

TABLE IV: RESULTS OF THE ENDOGENEITY TESTS

Statistique de Hausman	sti	pov
Chi-sq(n-k)	3,33622	48,2067
P-value (Prob>chi2)	0,0678	0,0000

Source: authors

All post-estimation tests confirm the relevance of the choice of the simultaneous equations model.

G. Davidson-Mackinnon Exogeneity Test

To demonstrate the relevance of the instrumentation, we used the Davidson-Mackinnon (1993) exogeneity test. The Davidson-Mackinnon exogeneity test is based on the following assumptions:

Ho: instruments are weak

H1: instruments are strong

If the p-value is below the 5% threshold, we reject H0 and accept the relevance of the instruments.

TABLE V: RESULTS OF THE EXOGENEITY TESTS OF THE EXPLANATORY VARIABLES OF INTEREST

Variables suspected of being endogenous	Davidson-Mackinnon statistic (F)	P-value
sti	F (4,151) = 509,765	0,0000
pov	F (4,149) = 15,9693	0,0000

Source: authors

The test results show that the instruments used are necessary and sufficient.

Thus, the results of the preliminary tests confirm the relevance of the simultaneous equations modeling. Moreover, the results of the model identification conditions lead to the choice of the double ordinary least squares method. The following section is then devoted to the presentation and discussion of the results.

V. RESULTS OF THE BASIC STRUCTURAL MODEL

Table VI below presents the results of the econometric estimations of the interrelation between structural transformation and poverty model.

TABLE VI: RESULTS OF THE STRUCTURAL MODEL

Variables	***sti***	***pov***
sti	-	0,4551651*** (0,006)
pov	-0,5411053*** (0,000)	-
trade	0,2425384* (0,092)	0,3587167*** (0,001)
infla	-	-0,0642341 (0,510)
*edu*csti*	-	-0,9825823*** (0,000)
vas	-	0,3609483*** (0,001)
pib	0,0003123** (0,014)	-
cct	-0,1738529*** (0,002)	-
clt	0,0840588 (0,401)	-
dpp	0,0017705*** (0,000)	-
vaa	-0,7456881*** (0,000)	-
txsco	0,115798 (0,370)	-
c	0,7450748*** (0,000)	-

Source: authors

The second column of Table VI presents the results of the determinants of the structural transformation in WAEMU countries. These results show that poverty has a negative and significant impact on structural transformation. Thus, a 1% decrease in poverty is accompanied by an increase in the structural transformation index of 0.54%. This result is consistent with the theoretical prediction.

The control variables introduced into the structural transformation equation also have the coefficients indicated in the theoretical predictions. As expected, education, openness, the index of protection of private property rights, GDP, and long-term credit to the economy emerge with a positive and significant sign. However, education and openness have more important effects on structural change. The coefficients associated with agricultural value added and short-term credit to the economy have a negative influence on structural transformation.

The third column of the table above shows the determinants of poverty in WAEMU countries. The coefficient associated with the structural transformation index is positive and significant, indicating that an increase in the structural transformation index leads to a deepening of poverty. This result is contrary to our working hypothesis. It also contradicts the work of Mustafa (2012) and Achmad and Listiono (2020) who conclude that structural transformation rhymes with poverty reduction. However, this counterintuitive result can be explained by WAEMU economies. In fact, in these countries, despite the collapse of the weight of the agricultural sector, which is synonymous with structural transformation, employment is still high in this sector. In fact, the shift in value added from the agricultural sector to the non-agricultural sector has not led to a similar shift in employment from the agricultural sector to the non-agricultural sector, which has led to an increase in poverty. Thus, the data show that almost half of the employment still remains in the agricultural sector, while its contribution to the GDP value added is barely 25%. Diego *et al*. (2008) explains this paradox in Africa through technological and labor market barriers.

However, when the structural transformation is crossed with education, the sign of poverty becomes negative and significant. This result is all the more appreciable in that it emerges with this sign and is significant. Consequently, structural transformation can lead to a decline in poverty in the WAEMU, provided that human capital is improved.

All the coefficients of our control variables in the poverty equation are significant. However, some variables emerge with a sign opposite to what is expected. For example, inflation does not follow the expected sign. On the other hand, trade openness and value-added services are consistent with theoretical predictions.

VI. Conclusion

The objective of this study is to analyze the relationship between structural transformation and poverty in the WAEMU over the period 1996-2019. We used a simultaneous equation model to analyze this interrelationship.

The stylized facts reveal a wide disparity in the poverty level within WAEMU countries. Moreover, the data show that despite the significant progress made in the fight against poverty, the poverty level remains high when compared to other developing countries. Furthermore, other indicators, such as the human development index, the rate of access to electricity, the mortality rate, and the school enrollment rate, were mobilized to assess poverty in the WEAMU. These indicators show that poverty is multidimensional and covers several aspects.

The literature provides mixed results on the relationship between structural transformation and poverty. The results certainly depend on the estimation technique but also on the specificity of the economies. Furthermore, the literature review clearly shows that there is a relationship between the different sectors of the economy and poverty. Finally, structural transformation forms a virtuous circle with poverty. Given the contingent nature of the results of the empirical literature, we assess this relationship by taking into account the specificity of WAEMU countries.

The use of simultaneous equations to analyze the link between transformation and poverty is an important innovation in our work. We used the double least squares technique to estimate this model. The results show that structural transformation does not systematically lead to poverty reduction in the WAEMU. For structural transformation to be favorable to poverty reduction in this area, it is necessary that the structural transformation process be accompanied by an improvement in human capital. It follows from these results that the structural transformation process in WAEMU can only contribute to poverty reduction when it is accompanied by a reallocation of workers from traditional activities to new more productive activities. This is not evident in the WAEMU region, as workers are not qualified to be hired in the industrial and service sectors. Thus, the structural transformation process in most African countries has left workers in the agricultural sector. In the WAEMU, the structural transformation has been reallocating value added from the agricultural sector to the service sector, without an equivalent migration of labor. Hence the need to accompany the structural transformation process by improving human capital.

These results provide several indications for economic policy to fight poverty, but also to support structural transformation in WAEMU countries. To fight poverty, the study recommends that the structural transformation process should be accompanied by an improvement in human capital.

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