

STRUCTURAL TRANSFORMATION AND LABOUR FORCE REALLOCATION EFFECTS: Evidence from West African Economic and Monetary Union (WAEMU)

**Kwami Ossadzifo WONRYA¹, Honoré TENAKOUA²,
Yacobou SANOUSSI³ & Kossi Edem BAITA⁴**

¹Laboratory for Research in Applied Economics and Management (LAREAG), FaSEG- University of Kara;
BP: 404, Kara (Togo), E-mail: wonrya.ossa@gmail.com

²Head of the department for the management of medium-sized enterprises in the III/Ouagadougou,
Directorate General of Taxes (Burkina Faso), E-mail: tenakouah@yahoo.fr

³Laboratory for Research in Applied Economics and Management (LAREAG), FaSEG-
University of Kara; BP: 404, Kara (Togo), E-mail: syacobou@gmail.com

⁴Afrider Research and Consulting (ARC), Kofi Annan University of Guinea (Guinea)
E-mail: baita.edem@gmail.com

Article History

Received : 11 March 2021

Revised : 18 March 2021

Accepted : 13 April 2021

Published : 3 May 2021

Key words

Structural transformation,
sectoral employment, sectoral
labour productivity, WAEMU.

JEL: N17, E24, J24

ABSTRACT: This research analyses the effects of structural transformation on sectoral employment and sectoral labour productivity in WAEMU countries. To achieve this, the methodological approach adopted consists of decomposing the economy into three sectors, namely agriculture, industry and services. The results show that the agricultural sector employs 70% of the available labour force as against 10% and 20% respectively for the industrial and service sectors. In terms of value-added, the agricultural (rural) sector and the service sector contribute 40% each against 20% for the industrial sector to the Gross Domestic Product (GDP) for the Sahelian countries. For all WAEMU countries as a whole, the agricultural sector accounts for 30%, industry for 20% and services for 50%. Reallocation effects show that the service sector is the sector benefiting from a better reallocation of the labour factor. This reallocation effect is very pronounced in Burkina Faso compared to all Sahelian countries and all WAEMU countries.

1. INTRODUCTION

By 2050, the population of Sub-Saharan Africa (SSA) will account for 21% of the world's population, while its youth aged 15 to 24 will account for 30% of the world's

youth. This rapid population growth will impact the labour market. Indeed, in the next fifteen years, nearly 375 million young people will be of working age. These young people will be looking for income-generating activities. (Losch, 2016). The challenge of youth employment is unique and persistent in African countries. The challenge relates to the capacity of African economies to cope with unproductive, temporary, insecure or unpaid employment. Africa's youth continues to grow, creating an ever-increasing demand for multi-sectoral strategies to ensure a better transition to a labour market with decent jobs. (ILO, 2016).

To face this important employment challenge, Sub-Saharan African countries have potential assets to feed their development trajectory. The demographic dividend is complemented by the breadth of the geographical space, the diversity of ecosystems, the endowments of natural resources and the rapid growth of domestic markets offering opportunities to meet the needs of domestic demand without overlooking the potential for regional integration and the capacity of these economies to integrate into the global market. The Sahelian countries, by their geographical characteristics and the security instability they have been facing over the past decade, must, therefore, put in place public policies aimed at ensuring greater integration of young people into the labour market, especially in rural areas, to make this segment of the population less vulnerable.

The structural transformation of economies remains an adequate trajectory for addressing employment challenges in African economies, particularly in SSA. Sahelian countries all those in SSA in general experience low economic diversity, high levels of poverty and low levels of human capital and infrastructure. The primary sector, especially agriculture, accounts for a substantial share of the economy, with the industrial sector making little progress. In light of this, structural transformation of these economies is emerging as a solution to the employment challenges of youth, women and men (ILO, 2016).

Many countries in Sub-Saharan Africa have adopted industrial policies aimed at boosting economic growth. Indeed, the majority of African countries' industrialization strategies target specific economic sectors. Currently, in SSA, out of twenty-six identified industrialization strategies, nineteen target light manufacturing industry as a key sector for development, including agro-industry, wood, clothing, textiles, leather and footwear; sixteen strategies address aspects of sustainable development, such as the use of renewable energy and water protection; 15 strategies focus on agriculture, in particular, livestock farming, forestry and fisheries products; 13 strategies deal with tourism and high-tech services; 11 strategies focus on mining and the extraction of resources such as copper, oil and natural gas; 8 strategies make the energy sector a priority, and 5 do the same with construction.

However, it should also be noted that Africa's industrialization will not be like that of other regions of the world - if only because of the different profiles of the 54 African countries, which will, therefore, follow different trajectories. Secondly, this industrialization will not be based solely on the manufacturing sector, which, at 11 per cent of the continent's GDP, remains small. Industrial policies for the 21st century can target sectors with high growth potential, such as agribusiness and value-added services (African Economic Outlook, 2017).

In this context, what is the effect of structural transformation on employment and labour productivity in Sahelian countries? The general objective of this paper is to analyse the effect of structural transformation on employment and labour productivity. Specifically, it is a question of (i) analysing the dynamics of structural transformation in the WAEMU countries (i) analysing the effect of structural transformation on employment and labour productivity according to the different sectors of activity (ii).

The relevance of this research lies in highlighting the effects of a structural transformation of economies on poverty reduction. Today, one of the social problems facing governments, especially in low-income countries, is unemployment, which makes the various segments of the population vulnerable. It is, therefore, no less relevant to consider the effects of structural transformation on the employment problem following a sectoral approach in the Sahelian countries.

The methodological approach adopted consists of breaking down the economy into three sectors, namely agriculture, industry and services. For these different sectors, we have highlighted the intra-sectoral effects (effect within), the inter-sectoral effects (effects between) and the effects of the terms of trade between different sectors. The Divisia index is used to capture the total effect. The results show that the agricultural sector employs 70% of the available labour force against 10% and 20% respectively for the industrial and service sectors. In terms of value-added, the agricultural (rural) sector and the service sector contribute 40% each against 20% for the industrial sector to the Gross Domestic Product (GDP) for the Sahelian countries. For all WAEMU countries as a whole, the agricultural sector accounts for 30%, industry for 20% and services for 50%. Reallocation effects show that the service sector is the sector benefiting from a better reallocation of the labour factor. This reallocation effect is very pronounced in Burkina Faso compared to all WAEMU countries.

The rest of the article is organized as follows. Section 2 presents an overview of the theoretical and empirical work; Section 3 is devoted to the analytical methodology and data; results and interpretations are presented in Section 4. Section 5 concludes.

2. LITERATURE REVIEW

The Economic Commission for Africa understands “structural transformation” to mean all fundamental changes in economic and social structures that promote equitable and sustainable development. Structural transformation can be accelerated through three intrinsic dimensions: employment, production and society. Thus, employment plays a key role in creating a two-way link between economic growth (production) and social development (society). To this end, it then focuses on increasing labour productivity, promoting decent employment and improving education and skills.

2.1. Review of theoretical work

2.1.1. Structural transformation and its influence on economic performance

Early models of economic growth ignored structural changes, as they focused on a single production sector. However, models proposed over the past decade have attempted to replicate the structural changes observed, by modifying assumptions of standard growth models (Acemoglu, 2008, Syrquin, 2010, Jiang, 2011). Lewis (1954) hypothesized that structural transformations are an important source of economic growth. Then the work of de Chenery, Robinson and Syrquin (1986) and Syrquin (1995), have their part analyzed the effect of structural change and allocation of production factors in development economics. These authors show that structural change is an important factor in explaining countries’ economic performance. Most recent studies manage to show that the effects of technological change and factor allocation on economic performance are significant (Akkemik, 2005; Berthelemy, 2001; Nelson and Pack, 1999; Ngai and Pissarides, 2007).

Recent work focuses on the role of structural changes in productivity growth in the nonagricultural and manufacturing sectors in developed and emerging countries. For example, Timmer and Szirmai (2000) find a positive effect of the allocation of factors across sectors on industrial growth in four industrialized and emerging Asian countries, namely South Korea, Taiwan, India and Indonesia.

2.1.2. The vectors of structural transformation

According to McMillan and Rodrik (2011), a structural transformation has two elements: (i) the rise of new, more productive activities, and (ii) the shift of resources from traditional activities to these new activities, which raises overall productivity. In the absence of the first element, there are insufficient means for the economy to take off. In the absence of the second, productivity gains in the growth sectors do not spread to the rest of the economy. It emerges that the main vectors of structural transformation are innovation and the reallocation of factors in favour of high value-added sectors.

(a) *Innovation as a driving force for structural transformations*: Schumpeter is the first author to analyse the primordial role of innovations in explaining the evolution of economies. Innovation and technical progress through the phenomenon of “creative destruction” is a source of productivity gains. Innovative activities concern as much the production of new goods and services as the development of new production methods, the opening of new markets, access to new sources of raw materials and the creation of new organisational modes.

Recent studies on the innovation-productivity relationship generally identify four types of innovation: (i) product innovation (new product or significant improvement of existing goods and services), (ii) process innovation (change in production or distribution methods), (iii) organizational innovation (change in managerial strategies, work organization or external relations) and (iv) marketing innovation (change in product design, packaging, placement or pricing policy).

The Economic Commission for Latin America and the Caribbean (ECLAC) observes that innovation is mainly motivated by the search for technological rents in industrialized countries, while in less developed countries it is generally limited to the incorporation of productive branches, goods or processes that have already reached a certain degree of maturity in more advanced economies. This limitation may be explained by the dynamism of entrepreneurs.

(b) *Reallocation of production factors: a catalyst for factor productivity growth*: The movement of labour from low-productivity semi-subsistence agriculture to more productive manufacturing and services in both urban and rural areas is necessary to fuel increases in overall productivity and improved living standards that can reduce poverty.

Kuznets’ analysis shows that economic dynamics revolve around manufacturing industry, whose share of activity has taken the form of an inverted U-shaped curve: it increases during the low stages of development, as capital accumulates, and then declines during the high stages of development when improved incomes drive demand for services and rising labour costs to weigh on manufacturing output. This transition to manufacturing and then to services takes place partly within rural areas. However, it involves, to a large extent, migration to urban centres, motivated by the search for formal employment opportunities. In general, urban workers tend to have higher labour productivity, partly as a result of greater specialization, better access to capital and internal and external economies of scale. To these two vectors should be added the constraints of the structural transformation process. For the process to take place, the relevant productive branches must have access to the factors of production. If these are rationed or immobile, structural change will be impossible. The required elasticity of factors can be ensured by the prior existence of idle or under-utilized resources and regional or international factor mobility.

2.2. Review of empirical work

2.2.1. Structural transformation - youth employment in Africa

Many people refer to the youth employment problem as a “youth unemployment problem”, while actual unemployment in low-income Africa is only 3 per cent; even in middle-income countries outside Southern Africa, unemployment is not high (Fox and Thomas, 2013). This low rate in Africa is simple: most people of working age in sub-Saharan Africa cannot afford to be unemployed. Many families cannot fully support a young graduate looking for work, and many young people have not completed high school, so they would not be eligible for formal employment (Filmer and Fox, 2014). They will have to earn a living either by obtaining land and farming or by starting a non-farm business.

Considering the low overall youth unemployment rate in low-income countries, there is a high unemployment rate among urban graduates. It is no coincidence that these graduates come mainly from the top of the income distribution; only the wealthiest parents can afford to help young people in a thorough job search.

Alfani *et al.* (2012) showed that Mozambique, for example, is a poor country where more than half of the population is considered extremely poor. Youth unemployment in rural areas is almost non-existent; the rate is 1.7%. But in urban areas, 20% of young people meet the strict definition of unemployment given by the ILO. People with secondary or higher education are over-represented in the unemployed group. Two-thirds of the urban unemployed reported having been unemployed for more than a year. In high-income countries with broader safety nets, high unemployment persists, including among young people.

South Africa is known for its high unemployment rate. Overall, South Africa's Quarterly Labour Force Surveys for 2014 show that 25% of the population was unemployed during the survey month and the unemployment rate for young people aged 15-29 was 42% (Bhorat *et al.*, 2016). Other resource-rich and middle-income countries show similar rates; in Gabon, for example, the youth unemployment rate was 35% in 2013, while in Namibia it was 34% in the same year.

Magruder (2012) indicates that wage rigidities account for only one percentage point of unemployment in South Africa, so the problem is lack of demand. Alternatives to wage employment are not widely available in South Africa. Partly because of urban zoning and other regulations that create high barriers to entry, the informal sector does not absorb many of the least educated young people compared to poor countries in Africa and even middle-income countries outside Africa.

In the same vein, (Fox, 2014) Fox highlights the “aspirations gap”, i.e. the expectations of young people and their parents regarding employment, compared to the opportunities available, especially in the informal sector. Ismail highlights one of the main reasons why politicians cannot find solutions: they take a top-down approach and ignore policies and programmes that could channel the energies and resources of their youth into productive activities. South Africa is particularly cautious, especially for resource-rich countries in sub-Saharan Africa, a group that is growing as a result of new mining explorations and recent discoveries in countries such as Kenya, Uganda and Ghana. Safety nets for the unemployed are better than nothing, but economic growth would be even better, creating many low-skilled jobs.

3. ANALYSIS METHOD, VARIABLES AND DATA

The analytical approach adopted in this article consists of a sectoral analysis of the distribution of employment and output or value-added. This is done by calculating the respective shares of employment and value-added in each sector of the economy. The level of disaggregation considered is three. These are agriculture, industry and services. This is justified by the fact that this research aims to analyse the sectoral effects of structural transformation on the level of sectoral employment and productivity by controlling for the specificity of each sector. The data used are from ILO statistics and UNCTAD statistics.

Structural transformation, sectoral employment and value-added

Considering the n levels of disaggregation, total employment and total output can be calculated by adding up the number of workers in each sector. Thus, by formalizing, we can write total employment, L , and total value-added, X , like:

$L = \sum_{i=1}^n L_i$ and $X = \sum_{i=1}^n X_i$ where L_i is the employment or number of workers in the sector i and X_i the nominal value added of the sector i .

The distribution of employment and value-added across sectors is obtained by the ratio of sectoral employment and sectoral value added to total employment and value-added. We can therefore write:

$$\sum_{i=1}^n \frac{L_i}{L} = \frac{L_1}{L} + \frac{L_2}{L} + \dots + \frac{L_i}{L} = \sum_{i=1}^n \lambda_i \quad (1)$$

$$\sum_{i=1}^n \frac{X_i}{X} = \frac{X_1}{X} + \frac{X_2}{X} + \dots + \frac{X_i}{X} = \sum_{i=1}^n \theta_i \quad (2)$$

λ_i and θ_i are the shares of each sector in total employment and total value-added, respectively.

Quantification of the effect of structural transformation on labour productivity

The economic literature indicates that labour productivity can be determined in three ways. Within each sector, productivity can grow through the accumulation of human capital, the exploitation of economies of scale, technological change, or through learning. This is known as the direct productivity effect or the within effect. Moreover, during the process of structural transformation, labour moves across sectors. This is the movement of labour from low productivity sectors to high-productivity sectors making the latter larger. In this context, we speak of structural change or the reallocation effect (the effect between). Finally, changes in productivity can occur as a result of the difference in relative prices between the different sectors. This change is called the terms-of-trade effect. The latter effect is not considered in this article since it is only marginally observed.

Let us decompose aggregate labour productivity as follows:

$$\Delta PT_t = \sum_{i=1}^n \theta_{i,t-k} \Delta PT_{i,t} + \sum_{i=1}^n PT_{i,t} \Delta \theta_{i,t} \quad (3)$$

PT_t and $PT_{i,t}$ represent economy-wide and sectoral labour productivity, respectively. $\theta_{i,t}$ is the share of employment in sector i at time t . Δ captures the change in labour productivity (ΔPT) or the change in the workforce $PT\Delta_{i,t}$ between the period $t-k$ and t . The first component of equation 3 represents intra-sectoral labour productivity growth weighted by the employment share of the sector. This is the intra-sector component of productivity growth. Intuitively, this component captures the idea that “the larger the sector with labour productivity growth above the economy-wide average labour productivity growth, the greater the aggregate economy-wide labour productivity growth. The second component captures the impact of the movement of labour across sectors of the economy over any period (De Vries *et al*, 2015; Mc-Millan and Rodrik, 2011; Timmer and de Vries, 2009; Timmer *et al*, 2014b).

Method of decomposing productivity and employment growth: Divisia index

This method consists of decomposing aggregate labour productivity and the employment-to-population size ratio through effects in a sectoral contribution approach based on the Divisia index (Sato, 1976). The index division method is a weighting of the sum of the logarithms of growth rates in which the weights are components of shares in total values (Ang, 2004). The first step in this decomposition analysis is to define the aggregates to be decomposed. In the case of this research, we consider

labour productivity in an aggregate form calculated as the ratio of real total value-added and total employment. Aggregate labour productivity reflects intra- and inter-sectoral dynamics.

Suppose a saving to n sectors. Each sector i produces real added value X_i (i.e. the value of output at constant prices) and employs L_i workers. Total employment is $L = \sum_{i=1}^n L_i$. Because prices differ between sectors, it is not possible to calculate the sum of sectoral value-added. Thus, real value added is calculated as the sum of the nominal value added of each sector deflated by the overall price index. Aggregate labour productivity is written as follows:

$$\beta = \frac{X}{L} = \frac{\sum_{i=1}^n P_i X_i}{\sum_{i=1}^n P L_i} \quad (4)$$

Let's move on to the transformation of equation 4 by multiplying it by the ratio $\frac{L_i}{L}$. This allows aggregate labour productivity to be defined as the product of factors.

$$\beta = \sum_{i=1}^n \frac{P_i X_i}{P L_i} \frac{L_i}{\sum_{i=1}^n L_i} = \sum_{i=1}^n v_i \beta_i \gamma_i \quad (5)$$

$\beta = \frac{X_i}{L_i}$ refers to sectoral labour productivity; $\gamma_i = \frac{L_i}{L}$ is the share of sectoral

employment, and $v_i = \frac{P_i}{P}$ is the term of the exchange. Labour productivity growth can be decomposed into different contributing factors. Observed changes in sectoral productivity are referred to as intraproductivity effects; changes in the structure of the economy are measured by the labour shares that led to the structural change effects; the terms of trade reflect the effects of market structure.

Assuming that the variables are continuous, the differentiation of equation 5 concerning time and dividing the two members of the equation by productivity. We get:

$$\frac{d \ln(\beta)}{dt} = \sum \theta_i \left[\frac{d \ln(v_i)}{dt} + \frac{d \ln(\beta_i)}{dt} + \frac{d \ln(\gamma_i)}{dt} \right] \quad (6)$$

The weighting coefficient θ_i is the share of the sector i in the total nominal value-added. By integrating the equation ... over the time interval $[0, T]$, we obtain the division decomposition of labour productivity growth.

$$L_n \frac{\beta_T}{\beta_0} = \int_0^T \Sigma \theta_i [d \ln(v_i) / dt] + \int_0^T \Sigma \theta_i [d \ln(\beta_i) / dt] + \int_0^T \Sigma \theta_i [d \ln(\gamma_i) / dt] \quad (7)$$

The exponential form of equation 7 gives:

$$D_{ag} = D_{prod} D_{str} D_{prix} \quad (8)$$

Where the components are:

$$D_{prod} = \exp \left[\int_0^T \theta_i [d \ln(\beta_i) / dt] dt \right] \quad (9)$$

$$D_{str} = \exp \left[\int_0^T \theta_i [d \ln(\gamma_i) / dt] dt \right] \quad (10)$$

$$D_{prix} = \exp \left[\int_0^T \theta_i [d \ln(v_i) / dt] dt \right] \quad (11)$$

Applying this decomposition to the discrete variables, we obtain:

$$D_{prod} = \exp \left[\int_0^T [\ln(\beta_i) (\theta_{i,0} + \theta_{i,T}) / 2] \right] \quad (12)$$

$$D_{str} = \exp \left[\int_0^T [\ln(\gamma_i) (\theta_{i,0} + \theta_{i,T}) / 2] \right] \quad (13)$$

$$D_{prix} = \exp \left[\int_0^T [\ln(v_i) (\theta_{i,0} + \theta_{i,T}) / 2] \right] \quad (14)$$

From a job creation perspective, a fundamental observation to note is that a sector creates a lot of jobs if its output per capita grows faster than its labour productivity (Ocampo *et al.*, 2009). In more detail, we start from this identity $\varphi = L/P$ is the size of

the population. The labour productivity of sector i is $\beta_i = \frac{X_i}{L_i}$ and the per capita output of the sector is defined by $\beta_i = \frac{X_i}{P}$. An algebraic transformation gives the following employment-to-population ratio:

$$\varphi = \Sigma \left(\frac{\pi_i}{\beta_i} \right). \quad (15)$$

We can decompose the ratio as follows:

$$\ln \frac{\varphi_T}{\varphi_0} = \sum_{i=1}^n [\ln \ln(\pi_i) - \ln \ln(\beta_i)] (\gamma_{i,0} + \gamma_{i,T}) / 2 \quad (16)$$

The γ_i are the sectoral employment shares. In a multiplicative form, the Divisia index decomposition of the employment-to-population size ratio relative to the growth rate gives:

$$D_{empl} = \frac{D_{inc}}{D_{prod}} \quad (17)$$

D_{inc} is the per capita income index and D_{prod} is the productivity index.

Shift-share decomposition method

This is a method of decomposing the change recorded within a business segment or from one segment to another. Shift-share decomposition is a descriptive accounting technique that helps to break down the change in aggregate into structural components, i.e. changes in the composition of the aggregate, and captures the changes within individual units that cause the change in the aggregate. Fagerberg (2000: 400).

Either P , the productivity of the labour force; Q , value-added; N , labour input in terms of work years; i , industry ($i = 1, \dots, m$). The decomposition of labour productivity can be written as follows:

$$P = \frac{Q}{N} = \frac{\sum_i Q_i}{\sum_i N_i} = \sum_i \left[\frac{Q_i}{N_i} \frac{N_i}{\sum_i N_i} \right] = \sum_i P_i S_i \quad (18)$$

$P_i = \frac{Q_i}{N_i}$ is labour productivity in the industry i and S_i is the industry's share of total employment. To capture the effects of variation, we differentiate equation 18. In doing so, we obtain:

$$\frac{\Delta P}{P} = \sum_i \left[\frac{P_{i0} \Delta S_i}{P_0} + \frac{\Delta P_i \Delta S_i}{P_0} + \frac{S_{i0} \Delta P_i}{P_0} \right] \quad (19)$$

In equation 19, the first term captures the contribution to productivity growth of changes in reallocation across industries. It is positive if the share of high-productivity

industries in total employment increases. The second term measures the interactions between the changes observed in each industry and the changes observed in employment shares (the inter-component). This component is positive if industries with high labour productivity growth increase their employment shares. The last term measures the contribution of productivity growth within the industry weighted by the employment share of those industries (intra component).

3. RESULTS AND INTERPRETATION

The results of this research are presented through a three-level sectoral approach, namely the agricultural sector (rural aspects), industry and services. This categorisation is justified by the nomenclature adopted by the available data sources. Thus, we present in turn, employment by sector (i), value-added and labour productivity by sector (ii), direct effects, reallocation effects and term of trade effects chained to the Divisia index (iii).

3.1. Evolution of employment by sector from 2010 to 2017

The results in Table 1 show the change in the share of sectoral employment between 2010 and 2017. The analysis shows that between 2010 and 2017, the change in the sectoral employment rate is almost nil. This shows that the structure of the Sahelian and WAEMU economies as a whole did not change during this period. The agricultural sector employs 70% of the available labour force against 10% and 20% respectively for the industrial and service sectors.

Table 1: Share of employment by sector

Country	Share of employment by sector					
	2010			2017		
	<i>agr</i>	<i>ind</i>	<i>serv</i>	<i>agr</i>	<i>ind</i>	<i>serv</i>
Benin	0,5	0,1	0,4	0,4	0,1	0,5
Burkina Faso	0,8	0,1	0,1	0,8	0,0	0,1
Ivory Coast	0,6	0,1	0,3	0,6	0,1	0,4
Guinea Bissau	0,6	0,1	0,3	0,7	0,0	0,3
Mali	0,7	0,1	0,2	0,7	0,1	0,3
Niger	0,6	0,1	0,3	0,6	0,1	0,3
Senegal	0,5	0,1	0,3	0,5	0,2	0,3
Togo	0,5	0,1	0,4	0,5	0,1	0,4
UEMOA	0,6	0,1	0,3	0,6	0,1	0,3

Source: Author's calculations

3.2. Sectoral contribution to wealth creation and labour productivity in the Sahel

In the light of the results in Table 2, on average, the agricultural (rural) sector and the service sector contribute 40% each, compared to 20% for the industrial sector, to the Gross Domestic Product (GDP) for the Sahelian countries. For the WAEMU countries as a whole, the agricultural sector accounts for 30%, industry for 20% and services for 50%. This result indicates that WAEMU countries as a whole have a smaller share of the agricultural sector than the Sahel countries. This is justified by the economic geography of these countries. Countries such as Togo, Benin, Côte d'Ivoire, Guinea Bissau have access to the sea against Senegal; the only Sahelian country in WAEMU with access to the sea.

Table 2: Sectoral value-added and labour productivity

Country	Shares of nominal value-added						Sectoral labour productivity					
	2010			2017			2010			2017		
	<i>agr</i>	<i>ind</i>	<i>serv</i>	<i>agr</i>	<i>ind</i>	<i>serv</i>	<i>agr</i>	<i>ind</i>	<i>serv</i>	<i>agr</i>	<i>ind</i>	<i>serv</i>
Benin	0,4	0,1	0,5	0,4	0,1	0,5	787	1 537	1 300	1 036	2 135	1 343
Burkina Faso	0,3	0,2	0,5	0,3	0,2	0,5	218	3 890	4 022	559	7 191	3 741
Ivory Coast	0,3	0,2	0,5	0,3	0,3	0,4	1 317	4 840	3 851	981	6 079	3 975
Guinea-Bissau	0,4	0,2	0,4	0,5	0,1	0,4	820	3 665	2 687	659	3 108	1 578
Mali	0,5	0,1	0,4	0,4	0,2	0,4	866	2 658	2 235	922	5 005	1 789
Niger	0,4	0,2	0,5	0,4	0,2	0,4	653	1 172	1 289	725	1 232	1 053
Senegal	0,2	0,2	0,6	0,2	0,2	0,6	604	2 996	2 853	739	2 421	4 333
Togo	0,4	0,3	0,4	0,5	0,2	0,3	718	2 186	1 231	573	2 572	955
SAHEL	0,4	0,2	0,4	0,4	0,2	0,4	579	2 573	2 515	735	4 476	2 194
UEMOA	0,3	0,2	0,5	0,4	0,2	0,4	748	2 868	2 434	774	3 718	2 346

Source: Author's calculations

3.3. Divisia Index Calculation Result: Direct and Reallocation Effect Analysis

On average, the structural transformation has led to higher productivity in the agricultural sector compared to the industrial and service sectors in Sahelian countries. Looking at WAEMU countries, it is the industrial sector that has benefited from direct productivity. As a result of the reallocation effect of structural transformation, the service sector is the sector that has benefited from a reallocation of labour in the Sahelian countries as in the WAEMU as a whole. Burkina Faso is the country with the highest reallocation score in favour of the services sector.

Table 3: Direct effects, reallocation effects, terms of trade and Divisia index

Country	Direct Productivity			Reallocation effect			Terms of trade			Divisia index			Total
	Agr	Ind	Ser	Agr	Ind	Ser	Agr	Ind	Ser	Direct	Réalloc	TDE	
Benin	0,10	0,04	0,02	-0,03	-0,03	0,08	-0,01	0,03	-0,02	1,17	1,01	1,00	1,18
Burkina Faso	0,30	0,12	-0,04	-0,02	-0,04	0,35	-0,02	0,07	-0,04	1,46	1,32	1,01	1,96
Ivory Coast	-0,09	0,06	0,01	0,01	-0,13	0,02	0,04	0,09	-0,10	0,98	0,91	1,04	0,93
Guinea-Bissau	-0,10	-0,02	-0,21	0,02	-0,12	0,03	-0,11	0,04	0,03	0,72	0,94	0,96	0,65
Mali	0,03	0,11	-0,09	-0,04	-0,03	0,10	0,00	0,02	-0,03	1,05	1,04	0,99	1,08
Niger	0,04	0,01	-0,09	0,02	-0,03	-0,01	-0,03	0,06	-0,02	0,96	0,98	1,01	0,96
Senegal	0,04	-0,05	0,25	-0,03	0,13	0,00	0,04	0,01	-0,05	1,26	1,11	1,00	1,40
Togo	-0,09	0,04	-0,09	-0,01	-0,09	0,03	0,12	-0,06	-0,05	0,87	0,94	1,01	0,82
UEMOA	0,03	0,04	-0,03	-0,01	-0,04	0,08	0,00	0,03	-0,04	1,06	1,03	1,00	1,12

Source: Author's calculations

4. FINAL REMARKS

African countries are adopting many strategies to achieve better economic performance and reduce poverty. The last decade has been marked by a new dimension in the search for growth, that of structural transformation of economies. It is a process of transition from low productivity sectors to high productivity sectors generating effects on the structure of employment and generating effects on labour productivity. This research aims to analyse the effects of structural transformation on sectoral employment and sectoral labour productivity in Sahelian WAEMU member countries. To achieve this, the methodological approach adopted consists of breaking down the economy into three sectors, namely agriculture, industry and services. For these different sectors, we have highlighted the intra-sectoral effects (effect within), the inter-sectoral effects (effects between) and the effects of the terms of trade between different sectors. The Divisia index is used to capture the total effect. The results show that the agricultural sector employs 70% of the available labour force against 10% and 20% respectively for the industrial and service sectors. In terms of value-added, the agricultural (rural) sector and the service sector contribute 40% each against 20% for the industrial sector to the Gross Domestic Product (GDP) for the Sahelian countries. For all WAEMU countries as a whole, the agricultural sector accounts for 30%, industry for 20% and services for 50%. Reallocation effects show that the service sector is the sector benefiting from a better reallocation of the labour factor. This reallocation effect is very pronounced in Burkina Faso compared to all WAEMU countries. It emerges that special attention should be paid to the services sector, which benefits more from the reallocation of factors, especially labour.

REFERENCES

- Akkemik, K. A. (2005). Labor Productivity and Inter-Sectoral Reallocation of Labor in Singapore (1965-2002) [GE, Growth, Math methods]. Consulté à l'adresse University Library of Munich, Germany website: <https://econpapers.repec.org/paper/wpawunwpg/0510005.htm>
- Alfani, F., Azzarri, C., d'Errico, M., & Molini, V. (2012). *Poverty in Mozambique: new evidence from recent household surveys* (Policy Research Working Paper Series N° 6217). Consulté à l'adresse The World Bank website: <https://econpapers.repec.org/paper/wbkwbrnps/6217.htm>
- Ang, B. W. (2004). Decomposition analysis for policymaking in energy: which is the preferred method? *Energy Policy*, 32(9), 1131-1139.
- AfDB, OECD, & UNDP. (2017). *Economic Outlook at Afrique/ : Entrepreneurship and Industrialization*. Retrieved from <http://dx.doi.org/10.1787/aeo-2017-fr>
- Bagchi, A. K. (1991). *Industrialization and growth: A comparative study*: Edited by Hollis Chenery, Sherman Robinson and Moshe Syrquin (New York: Oxford University Press,

- for the World Bank, 1986. £27.50 hardback. Pp. x + 387). *Structural Change and Economic Dynamics*, 2(1), 247-249. [https://doi.org/10.1016/0954-349X\(91\)90016-L](https://doi.org/10.1016/0954-349X(91)90016-L)
- Berthélemy, J.-C. (2005). *International Trade and Economic Diversification* [Université Paris1 Panthéon-Sorbonne (Post-Print and Working Papers)]. Retrieved from the HAL website: <https://econpapers.repec.org/paper/halcesptp/balsbs-00305513.htm>
- Chenery, H. B. (1982). *Industrialization and growth/ : the experience of large countries* (N° SWP539; p. 1). Consulté à l'adresse The World Bank website: <http://documents.worldbank.org/curated/en/943471468741380757/Industrialization-and-growth-the-experience-of-large-countries>
- Diewert, W., & Fox, K. (2014). *Sunk Costs and the Measurement of Commercial Property Depreciation* (Discussion Paper N° 2014-28). Consulté à l'adresse School of Economics, The University of New South Wales website: <https://econpapers.repec.org/paper/svenpaper/2014-28.htm>
- Filmer, D., & Fox, L. (2014). *Youth Employment in Sub-Saharan Africa* [World Bank Publications]. Consulté à l'adresse The World Bank website: <https://econpapers.repec.org/bookchap/wbkwbpubs/16608.htm>
- Fox, L., Haines, C., Munoz, J. H., & Thomas, A. H. (2013). *Africa's Got Work to Do; Employment Prospects in the New Century* (IMF Working Paper N° 13/201). Consulté à l'adresse International Monetary Fund website: https://econpapers.repec.org/paper/imfjwpa/13_2/201.htm
- Griffith-Jones, S., & Ocampo, J. A. (2009). *The Financial Crisis and Its Impact on Developing Countries* (Working Paper N° 53). Consulté à l'adresse International Policy Centre for Inclusive Growth website: <https://econpapers.repec.org/paper/ipcpaper/53.htm>
- ILO. (2016). *Women at work. Trends 2016 - Summary*. 13.
- Jiang, Y. (2011). Understanding openness and productivity growth in China: An empirical study of the Chinese provinces. *China Economic Review*, 22(3), 290-298. <https://doi.org/10.1016/j.chieco.2011.03.001>
- Lewis, W. A. (1954). Economic Development with Unlimited Supplies of Labour. *The Manchester School*, 22(2), 139-191. <https://doi.org/10.1111/j.1467-9957.1954.tb00021.x>
- Losch, B. (2016). *Youth employment: A challenge for the continent*. 18-19.
- Magruder, J. R. (2012). High Unemployment Yet Few Small Firms: The Role of Centralized Bargaining in South Africa. *American Economic Journal: Applied Economics*, 4(3), 138-166. <https://doi.org/10.1257/app.4.3.138>
- McMillan, M. S., & Rodrik, D. (2011). *Globalization, Structural Change and Productivity Growth* (Working Paper N° 17143). <https://doi.org/10.3386/w17143>
- Nelson, R., & Pack, H. (1999). The Asian Miracle and Modern Growth Theory. *Economic Journal*, 109(457), 416-436.
- Ngai, L. R., & Pissarides, C. A. (2007). Structural Change in a Multisector Model of Growth. *American Economic Review*, 97(1), 429-443. <https://doi.org/10.1257/aer.97.1.429>

- Reddy, V., Bhorat, H., Powell, M., Visser, M. M., & Arends, F. (2016). *Skills supply and demand in South Africa*.
- Sato, K. (1976). The Ideal Log-Change Index Number. *The Review of Economics and Statistics*, 58(2), 223-228.
- Syrquin, M. (2010). Kuznets and Pasinetti on the study of structural transformation: Never the Twain shall meet? *Structural Change and Economic Dynamics*, 21(4), 248-257. <https://doi.org/10.1016/j.strueco.2010.08.002>
- Timmer, M. P., & de Vries, G. J. (2009). Structural change and growth accelerations in Asia and Latin America: a new sectoral data set. *Cliometrica*, 3(2), 165-190. <https://doi.org/10.1007/s11698008-0029-5>
- Timmer, M. P., & Szirmai, A. (2000). Productivity growth in Asian manufacturing: the structural bonus hypothesis examined. *Structural Change and Economic Dynamics*, 11(4), 371-392. [https://doi.org/10.1016/S0954-349X\(00\)00023-0](https://doi.org/10.1016/S0954-349X(00)00023-0)

To cite this article:

Kwami Ossadzifo Wonyra & *et al.* (2021). Structural Transformation and Labour Force Reallocation Effects: Evidence from West African Economic and Monetary Union (WAEMU). *International Journal of Economics and Financial Issues*, Vol. 2, Nos. 1-2, pp. 93-109.