

**STRUCTURAL CHANGES AND EMPLOYMENT GROWTH IN
SUB-SAHARAN AFRICA: DOES DEMOGRAPHIC STRUCTURE MATTER?**

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This study examines the effects of structural changes on employment growth in the sub-Saharan African (SSA) region using demographic structure as an intermediary factor. Data used covers 37 SSA countries for the period 2000 to 2018 and the Generalised Method of Moments (GMM) and decomposition techniques are employed to show the indirect and direct relationships respectively. Economic structure in the region is found to mainly promote total employment with services sector having a larger capacity for absorbing labour, especially in low-productivity activities. There is also evidence that demographic changes in SSA region, while acting as a strong base for drawing employment, has led to significant losses in productive employment yields. Countries with large labour force tend to produce highly vulnerable and less productive employment, especially for the youths. Demographic changes, rather than economic structure, have more long run implications for employment in the SSA region.

Keywords: Decomposition Analysis, Employment Rate, Employment Vulnerability, Labour Force Growth, Productivity Growth, Sectoral Shares

JEL Classification: J11, J21, J62, O14, O17

1. INTRODUCTION

Many African countries experienced rapid economic growth in the past few decades. For instance, six of the world's 10 fastest growing countries in the 2000s were in Sub-Saharan Africa: Mauritius at 11.1 percent, Nigeria 8.9 percent, Ethiopia 8.4 percent, Chad 7.9 percent, Kenya 7.9 percent, and Rwanda 7.6 percent (ACET, 2014). However,

these countries are also experiencing rapid expansions in population and other demographic indicators, thereby inflating the workforce and imposing further constraints on productive capacities. This has resulted in difficulty in translating the impressive growth prospects into significant improvement in living conditions in the region. For instance, absolute poverty in the region was 40.7 percent in 2018, compared to 12.2 percent in Asia and the Pacific. Although unemployment (at 7.7 percent in 2018) appears to be a less critical issue in SSA (except for youth unemployment which is 14.3 percent), the case of productive employment opportunities is critical. In this regard, Fields (2012, p.202) aptly noted that “what the developing countries have is an employment problem rather than an unemployment problem”.

In general, the dynamics of the growth-employment relationships in the SSA region has revealed deep and basic heterogeneity in terms of sectoral patterns, productivity dimensions, and demographic segmentations. Three basic employment challenges have been shown to exist in the SSA region (Adegboye et al., 2019); the need to get the young people into employment, reducing informality and vulnerability in employment, and getting more sectors to create more employment. This introduces structural and demographic dimensions to the employment problems in SSA countries. Structural changes embody the “sequential process through which the economic, industrial and institutional structure of an underdeveloped economy is transformed over time” (Todaro and Smith, 2009). However, the pattern of structural dynamics observed among SSA countries does not appear to align with theoretical models of development given that the manufacturing sector has played an insignificant role in the structural dynamics of many of the economies (Rodrik, 2016; Haraguchi et al., 2019). For instance, average share of manufacturing in total output was 10.9 percent in 1970 and 10.6 percent in 2018, indicating persistently low levels over the 48-year period. In addition to structural bottlenecks, population and its dynamics present another emphatic consideration in employment issues in SSA economies. The Malthusian theory on population growth suggests that a growing economy may yet experience downward welfare performance if population structure (which influence per capita outcomes) is not appropriately treated. Demographic characteristics have also contributed significantly to the deep segmentation in the region’s labour markets. For instance, the conditions of informal employment within the urban sectors in African economies have intensified in recent periods due to rising inflow of young job seekers (Martins, 2019; Coulibaly et al., 2019). Structural and demographic settings within African economies therefore provide a stimulating background for examining labour markets behaviour in the region. However, a combination of these factors has not been empirically examined for the SSA region.

This study aims at examining how structural changes and demographic factors affect employment in the SSA region. Employment is also considered in terms of economic and demographic distributions to observe varying outcomes of structural changes and demographic patterns. Investigating this pattern of effects implies the computation of both indirect and interaction relationships employing appropriate econometric methods. In the study, the impacts are explained using econometric analysis for 37 countries.

2. LITERATURE REVIEW

Employment concern, in the context of the dualistic models, results from the consideration that the rural sector discharges labour at a rate too rapid for the urban sector (which, according to Lewis (1954) is too highly capital intensive) to provide hiring opportunities. The theories generally oppose the traditional theories of employment and growth by arguing that the nature of production, prices and labour markets in developing economies do not permit the single market structure proposed in the traditional models. The Lewis model considers employment as both a cause and consequence of structural transformations in developing economies. The focus of employment in the model is in the modern sector which Lewis believes is the only sector capable of providing productive employment for developing economies. According to the model, “both the structure and size of labour demand should alter as sectoral transformation shifts production from primary to modern sectors”. Also, the model shows that capital accumulation in the modern sector is a basic requirement for producing sustainable employment associated with changes in the structure of an economy. For the Harris and Todaro (1970) model, there is strong implication that even with urban unemployment, labour inflows to the urban sector would occur provided expected urban wages are greater than expected rural wages. Thus, based on this model, employment changes in the economy are largely results of demographic and labour market factors. This is an explanation for why growth in the region is highly disengaged from employment generation.

Few studies have considered the role of structural transformation in employment for many African economies. For instance, Diao et al., (2017) noted that studies on structural change have only recently been given attention among African countries. Earlier, McMillan and Rodrik (2011) had concluded that structural transformation in SSA countries limited productivity growth and productive employment capacities. Page and Shimeles (2015) fully agreed with this conclusion in their study on SSA countries. Further, Gong (2015) conducted a comprehensive study on the structure of economies in Africa and found evidence of lesser role of structural transformation in Africa’s growth acceleration in recent years, resulting in significant lapses in intersectoral integration among the African economies. The study by Diao et al. (2017) using adequate and more recent data has also found that the agricultural sector in Africa is losing much more labour to the modern sector than Gong’s results have shown. Structural factors also affect the nature of labour markets participation in Africa. Like Page and Shimeles (2015) noted, “when African workers find a job, it is likely to be of low quality in terms of wages, benefits, and job security”. AfDB (2012) also found that apart from Botswana, Nigeria, and South Africa, less than 20 percent of entrants into the labour force for many SSA countries tend to find wage employment.

Data availability has proved a daunting challenge for estimating structural, productivity or employment changes in SSA. For most periods, data on employment

shares and the levels of productivity have been difficult to determine (Herrendorf et al., 2014). Recent studies have tended to use a combination of data and data sources to enrich the empirical results. For instance, Diao et al. (2017) used a combination of data from the Groningen Growth and Development Center's Africa Sector Database and the Demographic and Health Surveys to estimate structural changes and employment growth and consider demographic ramifications of employment growth within structural changes in the Africa. A particular issue that has often stimulated empirical studies on the effects of demographic changes on employment is the finding by (World Bank, 2012), using data for all developing countries, that the employment levels in a country indeed evolve in step with the different stages of their demographic transition. In this regard, Grant (2012) considered the effects of urban population growth on youth employment, with focus of different employment structures, including economic, formal, and informal. The study found that the structure of an economy during expansions largely influences the distribution of benefits and costs in relation to employment across urban populations.

Moreover, Lam and Leibbrandt (2014) formulated a model that demonstrated that a simple consideration of population cohorts and employment may not generate enough evidence on the demographic change-employment nexus. They rather found evidence that growth rate in the working-age population in developing countries had significant negative effect on youth employment. Thus, it is the rate of growth of entire population segments that has more relevance in terms of testing the effects on employment. Newhouse and Wolff (2014) found that among developing countries a 10 percent increase in population leads to a decline in employment rate by 0.7 percentage point. For Africa alone, Newhouse (2020) found that reducing a cohort population by 10 percent sharply increases the share of workers in non-agricultural sectors by 5 percentage points. Fox et al. (2016) showed that the persistently high fertility rates in many SSA countries has resulted in an unchanged employment structure in the region (low productivity, high informality) even when economic growth was impressive. For advanced economies, Boulhol (2009) found that the pattern of population structure significantly affects variations in labour utilisation and productivity, with larger structures limiting productivity.

A major issue not out rightly discussed in the literature is the interlinkages among structural changes, labour market input and outcomes, and employment. Though the studies in the review suggest that labour markets respond to the unique nature of dualistic systems in SSA countries, the demographic factors that drive such labour market conditions as well as the implications of these conditions on employment have not been explicitly examined. Moreover, the literature that include structural changes tend to assume rigid wages in the modern sector, but do not explain the reasons for these. A number of factors could result in such rigid wages which impair employment in the modern sector, especially for dual-sector economies of SSA. Although further studies have presented aspects of the economy that may generate such rigidities (e.g. Golub and Hayat, 2014), there was no direct attempt to integrate these into a model that explains

employment for SSA region. In particular, the special labour market characteristics and “employment problems” in the SSA region need to be taken into cognizance. The need to further understand the determination of these factors and their effects on employment is a major gap that the current study intends to fill.

3. METHODOLOGY

3.1. Theoretical Framework

In formulating the theoretical relationship between structural changes, demographic changes and employment, models that focus on both demand and supply sides are relevant. From the demand perspective (or structural change), the theory by Chenery et al. (1986) predicts that labour demand will shift from consumption-based activities to production-based activities and from government-based production to private-sector-based production as income increases over time. This is the process of structural transformation and it is made more effective if investment grows rapidly as income increased. With more capital accumulated in the manufacturing sector, labour demand would move away from the agricultural sector (which is less productive) towards the manufacturing sector.

From the supply side, the Harris-Todaro (1970) migration model provides a strong template for investigating labour market segmentation and demographic influences on employment in different sectors of the economy. The main thrust of the model is the possibility that even when the urban demand for labour curve shifts upwards, the size of urban unemployment might even rise because more workers from traditional sectors may seek more urban jobs (Fields, 2005). The model therefore implies that as long as structural change involves demographic changes that disproportionately increases the labour force, persistent unemployment will always hold, especially in the modern sectors. Given that the demographic structure in many SSA countries is skewed towards larger population of the working class along with dual economic sectors, the outcome of the Harris-Todaro model may be persistent in these economies. Thus, demographic changes may be considered as the “adjustment mechanism by which workers allocate themselves” within the two labour markets in the different sectors (Fields, 1975).

3.2. Model Specification and Data

In order to demonstrate the indirect effects of structural changes on employment along with demographic influences, a model that explains the determination of employment is specified. The empirical model specified follows the framework developed in Saget (2002) and Kamgnia (2005) which estimates changes employment rate (employment to working-age population) by the variations in structure of output composition, and demographic factors. An employment equation based on economic

structure inherently implies a system of structural equations containing at least one equation each for economic structure and overall employment. Thus, economic structure is endogenous in employment model. We therefore estimate a reduced form equation for employment generation with a general panel form given as:

$$lemplr_{it} = \alpha_0 + \beta_1 structure_{it} + \beta_2 demo_{it} + \beta X_{it} + \eta_i + \varepsilon_{it}, \quad (1)$$

where $lemplr_t$ is log of employment rate (note that in order to observe robust outcomes, employment rates are also disaggregated into youth employment and non-vulnerable employment in the model). Also, $structure$ represents structural factors including the shares of agriculture, manufacturing, and services in GDP respectively measured in value added, and $demo$ represents the demographic factors used in the study, including labour force growth (lbf), share of population in urban centres ($urbr$), and population density ($popden$). It is expected that growth in each sector would deliver positive employment effects which should make the φ_s in the model to be positive. On the other hand, demographic factors are expected to mostly have negative impacts on employment growth. For instance, rising urbanisation may limit employment levels in a country (Fields, 2012; Fuchs and Weyh, 2014).

Further, X is a vector of regressors that influence employment growth and also enhance robustness of the relationship in a country. It should be noted that these regressors were determined based on the theoretical framework presented in this study (the demand-side and supply-side theories). They include labour productivity (lpr), FDI-GDP ratio ($fdir$), and credit to private sector to GDP ratio (cre). Also, δ_t and ε_{it} are the country specific, and idiosyncratic error terms respectively. Since the public sector is critical in labour market implications of structural changes in SSA economies, the share of government expenditure in total GDP ($gsize$) is included in the model. The level of labour market rigidity (lmr) is also included in the model. For this variable, higher values are regarded as more flexibility in the market.

The relationship between employment and economic structure is however complementary with the variables reinforcing each other (Crivelli et al., 2012; Adegboye et al., 2019). This implies that $lrgdp$ variable on the right-hand side in (1) is endogenous in the model, suggesting a dynamic functional relationship. Thus, equation (1) is re-specified in a dynamic form as

$$lemplr_{it} = \alpha_0 + \phi lemplr_{t-1} + \beta_1 structure_{it} + \beta_2 demo_{it} + \beta X_{it} + \eta_i + \varepsilon_{it}. \quad (2)$$

There is a clear indication from literature that demographic structure may interact with structural changes and produce effects on employment that may not be similar to those of the direct effects (Blanchard and Wolfers, 2000; Fields, 2012; Adegboye et al., 2019). Thus, a non-linear version of Equation (2) with a model with interaction between structural changes and demographic structure is also estimated to consider the pattern of employment responses to varying demographic outcomes and shocks or

unilateral shifts. A second model is therefore specified to capture the non-linear impact of structural changes on employment (on the basis of different demographic settings among the countries). Again, a dynamic model is specified as:

$$\begin{aligned} lemplr_{it} = & \alpha_0 + \phi lemplr_{t-1} + \beta_1 structure_{it} + \beta_1 demo_{it} \\ & + \psi(structure \times demo)_{it} + \beta X_{it} + \eta_i + \varepsilon_{it}. \end{aligned} \quad (3)$$

In the model, the interaction between economic structure and demographic structure is captured by $(structure \times demo)$. The interaction variable is expected to produce a positive effect on employment among SSA countries.

In terms of estimation procedure, it should be noted that the inclusion of structural factors and productivity implies that the problem of endogeneity and obvious heterogeneity cannot be overlooked. Under the circumstances of endogeneity and obvious heterogeneity in employment equations, researchers (Kamgnia, 2005; McMillan and Rodrik, 2011) have either used an instrumental variable (IV) or system Generalised Method of Moments (GMM) estimators to consistently estimate the employment equations. Since country-specific factors have been included in the models, we avoid the use of direct IV techniques in this study. A consistent estimator that has been used by researchers to estimate cross-country growth regressions in a panel format is the Dynamic Panel Data (DPD) analysis which is a system GMM estimation technique developed by Arellano and Bond (1991) and Blundel and Bond (1998). The GMM estimator “not only controls for the bias that can arise from the correlation between the lagged dependent variable and the error term in a dynamic model, but also for endogeneity due to any of the other explanatory variables” (Hijzen and Swaim, 2010, p.1027). The system GMM estimator is computed by combining moment conditions for the equations in orthogonal forms using suitably lagged variables as instruments, with additional moment conditions for the equations in levels where the instruments are suitably lagged values provided the first-differences are uncorrelated with the within-sample effects (Roodman, 2009). Data used for regression analysis cover 37 SSA countries for the period 2000-2018. Data were obtained from World Development Indicators database and the ILO Key Indicators of the Labour Market database.

3.3. The Decomposition Analysis (Direct roles of Structural and Demographic Changes in Employment Growth)

The decomposition analysis is used to observe the direct roles of structural changes among sectors and productivity ranges on employment changes over time with given demographic implications (Fuchs and Weyh, 2014). The basic framework for the decomposition analysis involves decomposing employment within structural changes (using sectoral demand and productivity gains/losses) and demographic profiles. The “Job structure decomposition tool” highlighted in Haile (2018) is employed in systematically presenting the Shapley decomposition. The procedure involves the

decomposition of output per capita on the basis of the different shares of productivity, employment, and demographic conditions as follows:

$$\frac{Y}{N} = \frac{Y}{E} \times \frac{E}{W} \times \frac{W}{N}, \quad (4)$$

where Y is total output and N is total population, E is the total population in employment and W is total working-age population. These imply that $\frac{Y}{E}$ is the output (value added) per capita, $\frac{Y}{E}$ stands for output per worker or average productivity of labour, $\frac{E}{W}$ is proportion of working age population in employment (or the employment rate), and $\frac{W}{N}$ is proportion of the labour force in total population. Equation (4) can be rewritten as:

$$y = p \times r \times \omega. \quad (5)$$

This shows that y is value added per capita, p is average productivity, r is employment rate, and ω is age structure. Growth in output for a given period can then be decomposed into the marginal contribution of each of the per capita variables in Equation (5) as:

$$\frac{\Delta y}{y} = \underline{p} \frac{\Delta y}{y} + \underline{r} \frac{\Delta y}{y} + \underline{\omega} \frac{\Delta y}{y}, \quad (6)$$

where $\underline{p} \frac{\Delta y}{y}$, $\underline{r} \frac{\Delta y}{y}$, and $\underline{\omega} \frac{\Delta y}{y}$ each represents the marginal contribution of p , r and ω , respectively, to output growth. Each of the components on the right-hand side of Equation (6) indicates the share size of the contribution of each of productivity, employment rate, and share of labour force, to any proportional change in output per capita. Equation (6) indicates that the resulting size of a change in output per capita is linked to the size and direction of change in each of the marginal contributions. For instance, output per capita will rise in a given period as long as the (relatively constant) marginal contribution of labour force is positive and large enough, even though the marginal contribution of productivity is negative and that of employment rate is constant. Thus, output change is decomposed into a structural factor (productivity change) and demographic characteristics of population. The place of both structural and demographic factors in output decomposition thus suggests that as the working age population increases (for instance), the effect of structural factors on output reduce.

There are different levels of decomposition that can be derived from the baseline identity in (4). However, we focus on the decompositions related to employment changes. Employment changes are decomposed into changes in employment by sectors in order to observe the pattern of influences of sectoral output changes on changes in the employment rate:

$$\frac{E}{W} = \sum_{i=1}^n \frac{E^i}{W} \quad \text{or} \quad r = \sum_{i=1}^n r^i, \quad (7)$$

where E^i is employment in sector i , and r^i is employment rate in sector i . Equation (7) therefore shows the role of each sector on the direction of change of employment rate in the economy.

The decomposition analysis is performed for the five leading economies in sub-Saharan Africa (Nigeria, South Africa, Kenya, Ethiopia and Ghana) on the basis of GDP. The decomposition is performed for sets of periods between 1992-2000, 2001-2010 and 2011-2018. The reason for the selection of the pairs of years is the consideration that fundamental structural changes occurred in the SSA economies between the 1990s and 2018. For example, the IMF Structural Adjustment Programme (SAP) of the mid 1980s led to series of liberalisations that occurred in the 1990s. In particular, the structure of most of the economies (e.g., Nigeria, Ghana, Ethiopia, Kenya) moved away from large governments and into more private sector-led participation during the period. Hence, significant structural patterns could be observed during the period, with implications for the structure of employment. The decade following year 2000 marked the “golden years” of African economies when rising commodity prices and stronger institutions (emerging democracies in Nigeria, Ghana, Ethiopia, etc) stimulated strong macroeconomic performances (Jayne et al., 2018). For instance, “six of the world’s 10 fastest growing countries in the 2000s were in Sub-Saharan Africa (ACET, 2014). It was an ostensibly significant upgrade from the lost decade of 1990-1999 (Acemoglu et al., 2005). Data used for the decomposition analysis is based on the updated sectoral employment data from the World Development Indicators, and the UNCTADstat database.

4. EMPIRICAL ANALYSIS

In Table 1, the descriptive statistics of the variables for the empirical analysis is presented. Average total employment rate is 62.58 percent which is much larger than the average youth employment rate. This clearly shows that younger labour market participants have had lesser access to employment in many SSA countries. The situation is worse for non-vulnerable employment (or productive employment) which has an average of 22.09 percent, indicating that only 22 percent of all individuals in employment have seemingly good jobs. The standard deviation also shows that the lower proportion of productive or sustainable jobs is common in most of the countries in the study. In line with theoretical expectations, the share of agriculture in total value-added output had negative growth rate of -1.24 percent on average over the period, while industry has grown by 3.24 percent. Surprisingly, the services sector (which is largest in most of the economies) has grown slowly on average in the economies.

Average labour productivity growth is less than labour force growth, which implies that growth in output per labour has been less than growth in labour force for the economies. This is expected to have negative implications for per capita benefits from output growth as well as employment in general.

Table 1. Descriptive Statistics

Variable	Mean	Maximum	Minimum	Std. Dev.
<i>emplr</i>	62.574	85.786	38.601	11.685
<i>emplry</i>	43.785	74.898	12.495	14.828
<i>emplrv</i>	22.090	4.111	92.256	7.386
<i>agricshg</i>	-1.236	35.094	-41.560	7.419
<i>indusg</i>	3.241	36.285	-36.731	5.310
<i>servshg</i>	0.563	25.071	-20.879	4.375
<i>pgr</i>	2.564	4.767	0.161	0.868
<i>lbfgr</i>	2.888	12.752	-1.902	1.300
<i>popden</i>	89.245	621.145	2.376	130.261
<i>urbr</i>	38.691	86.923	8.680	15.246
<i>fdir</i>	5.080	84.954	-5.981	8.013
<i>cre</i>	20.301	160.120	0.485	25.587
<i>gsiz</i>	15.044	39.580	2.740	6.221
<i>lmr</i>	6.018	9.236	2.377	1.576

Table 2 shows the results for the estimated equations from the previous section with a linear relationship and no labour market rigidity indicator. The results are presented for the three employment categories (total, youth and non-vulnerable). The estimations are also performed in recursive forms using each of the sectoral shares in order to avoid dummy variable trap that may occur when all shares are included in a single equation. Both the Hansen J-test and the two AR tests show that the instruments are valid estimates are free of inadequate lags specification. The autoregressive coefficient is positive and significant in each of the estimates, with those of total employment lesser than those of the disaggregated employment rates. From the results, the share of agriculture is positive in the total and youth employment Equations, suggesting that growth in agricultural sector essentially improves youth employment.

Table 2. Linear Results without Labour Market Rigidity Indicator

Variable	Total employment rate			Youth employment rate			Non-vulnerable employment rate		
	1	2	3	1	2	3	1	2	3
<i>emplr_{t-1}</i>	0.543** (0.000)	0.561** (0.000)	0.560** (0.00)	0.648** (0.000)	0.661** (0.000)	0.642** (0.000)	0.616** (0.013)	0.642** (0.021)	0.631** (0.048)
<i>agricsh</i>	0.024** (0.000)	0.049** (0.000)					-0.056** (0.000)		
<i>indsh</i>		-0.011** (0.000)			0.031** (0.000)			0.016* (0.012)	
<i>servsh</i>			0.001** (0.000)			-0.083** (0.000)			0.057** (0.000)
<i>prdg</i>	0.004** (0.000)	0.005** (0.000)	0.004** (0.000)	0.006** (0.000)	0.008** (0.000)	0.007** (0.000)	0.002** (0.000)	0.006** (0.000)	0.004** (0.000)
<i>lbfg</i>	0.001** (0.000)	0.001** (0.000)	0.001** (0.000)	0.006** (0.000)	0.006** (0.000)	0.006** (0.000)	-0.012** (0.000)	-0.013** (0.000)	-0.012** (0.000)
<i>popden</i>	0.051** (0.000)	0.038** (0.011)	0.037** (0.000)	0.042** (0.012)	0.019** (0.012)	0.035* (0.021)	-0.076** (0.012)	-0.115** (0.021)	-0.115** (0.010)
<i>urbr</i>	-0.03** (0.000)	-0.022* (0.011)	-0.03** (0.000)	-0.06** (0.011)	-0.08** (0.011)	-0.074** (0.021)	-0.036 (0.030)	0.015* (0.063)	-0.029 (0.016)
Hansen J-stat	0.431	0.601	0.377	0.290	0.485	0.473	0.488	0.094	0.383
AR(1) p-value	-0.042	-0.050	-0.038	-0.046	-0.065	-0.048	-0.030	-0.026	-0.044
AR(2) p-value	0.814	0.785	0.840	0.673	0.671	0.704	0.807	0.781	0.806
No. of observations	703	703	703	703	703	703	703	703	703

Notes: Standard errors in parenthesis; ** p < 0.01, * p < 0.05; standard errors in parentheses.

Table 3. Results for Non-linear Relationship

Variable	Total employment rate			Youth employment rate			Non-vulnerable employment rate		
	1	2	3	1	2	3	1	2	3
<i>emplr_{t-1}</i>	0.461** (0.000)	0.473** (0.000)	0.469** (0.000)	0.428** (0.000)	0.443** (0.000)	0.417** (0.000)	0.636** (0.000)	0.627** (0.000)	0.627** (0.000)
<i>agricsh</i>	0.005** (0.000)			0.041** (0.000)			0.018** (0.000)		
<i>agric × lbf_g</i>	-0.003** (0.000)			-0.005** (0.000)			-0.007** (0.000)		
<i>indsh</i>		-0.020** (0.000)			0.005* (0.000)			0.037** (0.000)	
<i>indsh × lbf_g</i>		0.003** (0.000)			-0.001 (0.011)			-0.022** (0.000)	
<i>servsh</i>			-0.027** (0.000)			-0.128** (0.012)			0.106** (0.000)
<i>servsh × lbf_g</i>			0.003** (0.000)			0.016** (0.000)			-0.058** (0.000)
<i>prdg</i>	-0.005** (0.000)	-0.006** (0.000)	-0.003 (0.011)	-0.017** (0.000)	-0.024** (0.000)	-0.013** (0.000)	-0.086** (0.000)	-0.06** (0.000)	-0.104** (0.000)
<i>lbf_g</i>	0.006** (0.000)	-0.012** (0.000)	-0.013** (0.000)	0.013** (0.000)	0.003 (0.014)	-0.062** (0.000)	-0.032** (0.000)	-0.091** (0.000)	0.21** (0.000)
<i>popden</i>	0.012** (0.000)	0.009** (0.000)	0.013** (0.000)	-0.004 (0.013)	-0.011 (0.011)	0.006 (0.013)	-0.028** (0.000)	-0.051** (0.000)	-0.018 (0.014)
<i>ur-br</i>	0.055** (0.001)	0.062** (0.000)	0.061** (0.000)	-0.001 (0.014)	-0.008 (0.011)	0.001 (0.011)	-0.071** (0.000)	-0.10** (0.000)	-0.080** (0.010)
Hansen J-stat	0.801	0.574	0.367	0.415	0.750	0.459	0.727	0.316	0.656
AR(1) p-value	-0.031	-0.053	-0.046	-0.039	-0.048	-0.041	-0.022	-0.027	-0.046
AR(2) p-value	0.770	0.614	0.791	0.661	0.658	0.683	0.887	0.804	0.811
No. of observations	703	703	703	703	703	703	703	703	703

Notes: Standard errors in parenthesis; ** p < 0.01, * p < 0.05; standard errors in parentheses.

However, the coefficient of agriculture is negative in the non-vulnerable employment equation which shows that expansion of agricultural sector dampens productive employment growth in Nigeria. Industrial sector growth significantly improves both youth and non-vulnerable employment, while growth in services sector only improves youth employment. This suggests that both industrial and services sector growth tend to generate better employment in the economy. Moreover, the result suggests that growth in any of the sectors leads to expansion in youth employment. Productivity growth has significant positive impacts in each of the equations, indicating that productivity growth leads to employment growth in Nigeria.

For the demographic factors, the coefficients of labour force growth and population density are significant and positive in the total and youth employment rate Equations, but negative in the non-vulnerable employment rate Equation. This shows that larger demographic setting tend to improve total employment in SSA countries. On the other hand, increasing demographic factors reduce productive employment in the region. This result suggests that the labour market has strong capacity of retaining increases in labour force, although the type of employment generated is highly vulnerable. This result confirms previous outcomes in the region about the employment problem (Fields, 2012; Page and Shimeles, 2015; Adegboye et al., 2019).

The results for the non-linear effects of structural change and demographic factors are also estimated in order to observe the second-round effects that these factors have on employment. The results in Table 3 show that with the non-linear effects, the autoregressive coefficients are smaller for youth employment compared with non-vulnerable employment, suggesting that productive employment is more persistent with changes in sectoral shares and demographic factors. For the youth employment model, the coefficient of agricultural share is positive while the interaction variable with labour force growth is negative. This result shows that effect of agricultural sector growth on youth employment is negative for countries with larger labour force growth. The results are similar for the other employment types, which show that countries with larger labour force growth tend to experience lesser employment effects when sectoral shares increase. As also noted in Fox et al. (2016) and Newhouse (2020), determining the debilitating effects of demographic patterns on employment in developing countries require more technical examination such as the use of non-linear variables. The only interaction of labour force growth with services sector (in the youth employment model) has a positive coefficient, suggesting that the services sector tends to exhibit a highly elastic capacity in absorbing youth labour force among the economies. With the non-linear estimates, the coefficients of productivity growth become negative, indicating that larger influences of demographic factors tend to dampen the effect of productivity on employment among the economies.

From the results, it is seen that when non-linear effects are estimated, the coefficients of labour force growth become mainly negative. This result suggests that the debilitating effect of labour force on employment are more established for countries with larger population increases. In the results also, the coefficient of urban population share is

mainly positive in contradiction to the initial linear estimate. Thus, it is shown that the nature of economy-wide labour force contributes significantly to the pattern of urban influences on employment. This seems to in line with theoretical postulations by Harris and Todaro (1970) and Fields (1975).

Table 4. Results for Non-linear Relationship with Labour Market Rigidity

Variable	Total	Youth	Non-vulnerable
<i>emplr_{t-1}</i>	0.428** (0.021)	0.411** (0.000)	0.622** (0.012)
<i>agricsh</i>	0.042** (0.000)	0.101** (0.000)	0.070** (0.000)
<i>agric × lbf_g</i>	-0.0014** (0.000)	-0.001* (0.000)	-0.001** (0.000)
<i>pgr</i>	0.021** (0.000)	-0.009** (0.000)	-0.121** (0.000)
<i>lbf_g</i>	0.007** (0.000)	0.006** (0.000)	-0.034** (0.000)
<i>popden</i>	0.019* (0.013)	-0.044** (0.000)	-0.128** (0.000)
<i>urbr</i>	0.084** (0.000)	0.102** (0.000)	-0.015 (0.011)
<i>fdir</i>	0.008* (0.000)	0.005 (0.012)	0.001** (0.000)
<i>gsize</i>	0.007** (0.000)	0.015** (0.000)	0.036** (0.000)
<i>lmr</i>	0.024 (0.000)	0.009** (0.000)	0.031** (0.000)
Hassen J-stat	0.313	0.471	0.397
AR(1) p-value	-0.066	-0.073	-0.051
AR(2) p-value	0.863	0.819	0.855
No. of observations	703	703	703

Notes: Standard errors in parenthesis; ** p < 0.01, * p < 0.05; standard errors in parentheses.

Finally, on the indirect relationship between structural change and employment with demographic influences, we report the results for the non-linear estimates while including the indicator of labour market rigidity and other variables in Table 4. Note that this result only includes agricultural share which is used relative to other sectors. The results are similar to the previous estimates, with agricultural sector growth having lesser

(and negative) impacts on employment for countries with larger labour force growth. There is therefore significant evidence that though labour force growth may stimulate total employment at all level, countries with very large surges in labour force inflow will experience negative employment rate growth even when the sectors are expanding. The coefficients of labour force growth, population density, and urban population ratio are all negative in the non-vulnerable employment equation, further strengthening the argument that demographic changes among SSA countries tend to hinder productive employment (see Grant, 2012; Martins, 2012; Lam and Leibbrandt, 2014).

In the result, FDI to GDP ratio has significant positive impact on employment at all level, although the coefficient fails the significance test for the youth employment Equation. This outcome is rather surprising since it shows that even though FDI improves employment in the productive sector, it does not significantly improve youth employment. Perhaps, the patterns of FDI inflows into the country may have contributed this outcome (Inekwe, 2013; Adegboye et al., 2019). Government size also significantly improves employment at all levels among the SSA countries. The coefficient of labour market rigidity is positive and significant for each equation, suggesting that more flexible labour markets (where adjustment to output changes can be easily facilitated) is important for boosting employment in the region.

Decomposition of Employment and Output in Selected SSA Countries

Table 5 shows changes in employment rates in each country for the sectors which is used to present a more proper reflection of the combined roles of output changes and demographic transition on employment. Agriculture has consistently lost its share of employment the 1990s for the SSA countries given the negative changes the sectoral employment shares for all the countries, except Kenya. This is to be expected and has been generally reported in studies on structural transformation in the region (de Vries et al., 2013; Gong, 2015; Diao et al., 2017), suggesting a significant movement of people out of agriculture to other sectors with higher productivity and hence, higher wages. The decline in employment shares in agriculture is however less than the decline in output share of the sector, posing significant risks to productivity and sustainability of employment in the sector. For instance, Martins (2012) noted that the weight of agriculture in total GDP among SSA countries declined to uncharacteristically low levels in the 2000s when compared to countries with similar income levels with profound negative impacts on employment and productivity.

Manufacturing sector employment also experienced declines over the years (-24.2 percent for Nigeria in 2001-2010) and (-0.8 percent for South Africa in 2011-2018). In contrast, results in Table 6 shows that the services sector (consisting of trade services, transport, and communication) has received more employment share than any of the other sectors over the period. It is seen that changes in economic structure in terms of employment has favoured the services sector over the 27 years period under consideration, leading to the dominance of the sector in employment for many SSA countries. Considering that agricultural sector led employment in the 1970s and 1980s

(Gong, 2015), 27 years is a relatively short period for structural transition to transcend the standard pattern - namely from traditional primary sector to secondary sector, and then to the tertiary sector. Rapid de-industrialisation of the SSA region during the intervening period between 1990s and the 2018 is conspicuously highlighted by these results. In this case, the industrial sector (especially manufacturing) has been left behind in the transformation process resulting in “premature de-industrialisation” as indicated by Rodrik (2016). Rodrik, McMillan and Sepúlveda (2016) also reaffirmed this outcome and noted that the process of structural change involving employment and output shares in SSA countries has not “following the standard patterns that we are familiar with from the historical literature or from widely used models of structural change” (p.31).

The contribution of each sector to overall changes in employment rate (shown in Table 6) demonstrates the relevance of each sector (and its evolution) to employment growth. Once again, the agricultural sector contributed negatively to changes in employment rates for each of the countries. The rate of decline in agricultural sector contribution to total employment rate appears to be similar across the countries, although South Africa had a very large decline of -69.9 percent in 2001-2010, while the forecast contribution for Ghana in 2018-2015 is also high at 22.1 percent. The negative contribution of agricultural sector could be a result of structural transition, or sheer neglect of the sector (as noted by Martins, 2012). This has made the sector unable to provide more productive employment opportunities in the labour market. The contribution of the manufacturing sector to total employment growth was negative for four of the countries in the recent decade, suggesting that less and less people are getting manufacturing sector jobs. Given that this sector leads in productivity growth among the countries, the result indicates that productivity growth does not translate to employment growth for the SSA countries.

The services sector had the most potent contribution to changes in overall employment rate across the countries. In the sector, transport and communication as well as trade services dominated the contribution. Given that the services sector exhibits low productivity among SSA countries (Diao et al., 2017; Adegboye et al., 2019), the results suggest that most of the employment growth has occurred in the sector with little productivity growth and lesser prospects of rapid efficiency growth. This implies that most of the jobs being created in many SSA economies are low productivity and therefore low wage jobs that are often vulnerable (as shown in Page and Shimeles, 2015; Adegboye et al., 2019). This explains some of the results obtained in the regression analysis where labour force growth appeared to have positive effect on employment rates across that SSA countries. As noted by Field (1975, 2012), the traditional services sector, which is largely informal, creates a form of dual production and labour markets in the urban sector as found in the Lewis traditional versus modern sectors. The informal markets in the urban sector then demonstrates the characteristics of the traditional sector, namely, low productivity and large capacity to absorb labour supply.

Table 5. Changes in Employment Rate by Sectors of Economic Activity

Sector	Ethiopia					Ghana					Kenya				
	1992-2000	2001-2010	2011-2018	2018-2025 (p)	2018-2025 (p)	1992-2000	2001-2010	2011-2018	2018-2025 (p)	2018-2025 (p)	1992-2000	2001-2010	2011-2018	2018-2025 (p)	
Agriculture	23.402	35.816	20.165	18.190	12.202	22.011	-4.562	-0.850	25.279	24.042	25.861	20.603			
Mining and Utilities	37.311	120.418	123.277	97.305	61.850	76.473	104.232	61.350	21.118	35.902	28.039	26.023			
Manufacturing	39.417	69.382	20.302	17.381	84.118	2.319	10.313	2.101	26.323	39.811	14.162	16.154			
Construction	59.483	251.355	76.499	60.890	69.882	93.522	93.270	65.092	39.372	71.253	47.493	44.310			
Wholesale and Retail	39.891	62.187	32.710	27.910	27.672	47.290	50.581	38.110	27.309	47.100	34.301	31.691			
Transport and Communications	44.302	130.700	90.110	66.333	20.050	88.617	80.600	57.563	23.313	58.515	41.515	38.900			
Other Activities etc.	43.418	94.117	113.182	84.182	33.040	62.703	91.117	65.300	20.020	48.719	37.150	34.851			
<i>Aggregate</i>															
Agriculture	23.423	35.641	20.190	18.188	12.155	22.004	-4.454	-0.861	25.325	24.001	25.875	20.555			
Industry	41.608	97.590	42.218	40.697	80.782	17.298	34.603	27.350	29.491	49.582	28.200	29.415			
Services	42.016	82.601	83.295	68.802	29.003	56.410	69.322	52.111	21.029	49.850	37.482	35.203			
Total Employment	26.271	44.773	31.766	30.910	23.709	31.003	25.472	27.192	24.516	31.851	29.190	25.522			

Source: Author's computations.

5. CONCLUSION

For a long time, economists considered employment generation as only an indirect outcome of long run growth. This has led to growth-focused policies that have struggled to create widespread good jobs. This study set out to establish the effects of structural changes and demography on employment as well as basic channels through which employment growth have been achieved over time for SSA countries. Econometric analyses show that growth in each sector's share in the economy stimulates employment growth, especially, the services sector. However, the distributional effects indicate that expansion in the share of industry is more relevant for boosting productive and non-vulnerable employment among SSA countries. Moreover, countries with bigger working age population are shown to have significant challenges in promoting productive employment even when structural changes favour the modern sectors. This outcome was further clarified in the decomposition analysis where employment was decomposed between pairs of periods (years) in a system whereby the roles of economic structure and demographic changes could be observed.

A broad highlight from the study indicated that though structural change is a potential component for employment-enhancing growth in an economy, demographic transitions could also provide strong background for analyzing how growth affects employment. Demographic ramifications have effectively distorted the pattern of employment as well as the responses of labour markets to structural changes in the SSA region. Also, the study suggests that the dynamics of growth in relation to economic structure in SSA is rather precarious. This is because the growing sector, and one towards which the SSA economies appear to be transiting into (services sector), does not appear to possess the capacity of generating the much needed productive (non-vulnerable) employment over time in the continent. In the same vein, the structure of economies in SSA have been shown to have a unique character in terms of employment outcomes in its adjustments. It was demonstrated that, though some sectors are more employment-elastic than others, the strength of such employment generation resulting from output growth does not vary with sectoral changes. Thus, the role of economic structure on employment appears to be stable and rather dormant in SSA region.

REFERENCES

- Acemoglu, D., S. Johnson and J.A. Robinson (2005), "Institutions as the Fundamental Cause of Long-Run Growth," *Handbook of Economic Growth*, 1A, 386-472.
- ACET (2014), *2014 African Transformation Report: Growth with Depth*, Accra: African

- Centre for Economic Transformation.
- Adegboye, A.C., M.I. Egharevba and J. Edafe (2019), "Economic regulation and employment intensity of output growth in sub-Saharan Africa," in Elhiraika, A., G. Ibrahim and W. Davis (eds.), *Governance for Structural Transformation in Africa*, London: Palgrave Macmillan, 101-143.
- African Development Bank (AfDB) (2012), *African Economic Outlook, 2012: Promoting Youth Employment*, Tunis: African Development Bank.
- Arellano, M. and S.R. Bond (1991), "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations," *Review of Economic Studies*, 58, 277-297.
- Blanchard, O. and J. Wolfers (2000), "The Role of Shocks and Institutions in the Rise of European Unemployment: The Aggregate Evidence," *Economic Journal*, 110(462), 1-33.
- Blundell, R. and S.R. Bond (1998), "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models," *Journal of Econometrics*, 87, 115-143.
- Boulhol, H. (2009), "The Effects of Population Structure on Employment and Productivity," OECD Economics Department Working Papers No. 684.
- Chenery, H., S. Robinson and M. Syrquin (1986), *Industrialization and Growth: A Comparative Study*, Oxford: Oxford University Press.
- Coulibaly, B.S., D. Gandhi and A.A. Mbaye (2019), "Job Creation for Youth in Africa: Assessing the Potential of Industries Without Smokestacks," Brookings Institute AGI Working Paper No.22.
- Crivelli, E., D. Furceri and J. Toujas-Bernat  (2012), "Can policies affect employment intensity of growth? A Cross-Country Analysis," IMF Working Paper No. WP/12/218.
- de Vries, G.J., M.P. Timmer and K. de Vries (2013), "Structural Transformation in Africa: Static Gains, Dynamic Losses," *Journal of Development Studies*, 51(6), 674-688.
- Diao, X., K. Harttgen and M. McMillan (2017), "The Changing Structure of Africa's Economies," *World Bank Economic Review*, 30(2), 412-433.
- Fields, G.S. (1975), "Rural-urban Migration, Urban Unemployment and Under-Development, and Job-search Security in LDCs," *Journal of Development Economics*, 2(2), 165-187.
- Fields, G.S. (2012), *Working Hard, Working Poor*, New York: Oxford University Press.
- Fields, G.S. (2005), "A Welfare Economic Analysis of Labor Market Policies in the Harris-Todaro Model", *Journal of Development Economics*, 76(1), 127-146.
- Fox, L., L.W. Senbet and W. Simbanegavi (2016), "Youth Employment in sub-Saharan Africa: Challenges, Constraints and Opportunities," *Journal of African Economies*, 25(s1), i3-i15.
- Fuchs, M. and A. Weyh (2014), "Demography and Unemployment in East Germany: How Close are the Ties?" IAB-Discussion Paper 26/2014.
- Golub, S. and F. Hayat (2014), "Employment, Unemployment, and Underemployment

- in Africa,” in Monga C. and J.Y. Lin (Eds.), *The Oxford Handbook of Africa and Economics: Volume 1: Context and Concepts*, Oxford: Oxford University Press, 136-153.
- Gong, X. (2015), “African Economic Structural Transformation: A Diagnostic Analysis,” *Journal of African Transformation*, 1(1), 1-22.
- Grant, U. (2012), “Urbanization and the Employment Opportunities of Youth in Developing Countries,” Background paper prepared for the Education for All Global Monitoring Report 2012 Youth and skills: Putting education to work, UNESCO.
- Haile, F. (2018), “Structural Change in West Africa: A Tale of Gain and Loss”, World Bank Policy Research Working Paper No. 8336.
- Haraguchi, N., B. Martorano, M. Sanfilippo and A. Shingal (2019), “Manufacturing Growth Accelerations in Developing Countries,” *Review of Development Economics*, 23(4), 1696-1724.
- Harris, J. and M. Todaro (1970), “Migration, Unemployment, and Development: A Two Sector Analysis,” *American Economic Review*, 40, 126-142.
- Herrendorf, B., R. Rogerson, and A. Valentini (2014), “Growth and Structural Transformation,” *Handbook of Economic Growth*, 2, 855-941.
- Hijzen, A. and P. Swaim (2010), “Offshoring, Labour Market Institutions and the Elasticity of Labour Demand,” *European Economic Review*, 54(8), 1016-1034.
- Inekwe, J.N. (2013), “FDI, Employment and Economic Growth in Nigeria,” *African Development Review*, 25(4), 421-433.
- Kamgnia, B.D. (2005), “Growth-Employment Nexus: The Specificities in Africa,” in Kasekende L. and O. Ajakaiye (Eds.), *Accelerating Africa’s Development Five Years into the 21st Century*, Nairobi: African Economic Research Consortium, 40-78.
- Jayne, T.S., J. Chamberlin and R. Benfica (2018), “Africa’s Unfolding Economic Transformation,” *Journal of Development Studies*, 54(5), 777-787.
- Lam, D. and M. Leibbrandt (2014), “Youth Bulges and Youth Unemployment”, Paper presented at the Population Association of America Annual Meeting Boston MA, May 1-3.
- Lewis, W.A. (1954), “Economic Development with Unlimited Supply of Labour,” *Manchester School*, 22, 139-191.
- Martins, P. (2012), “Growth, Employment and Poverty in Africa: Tales of Lions and Cheetahs,” Background paper prepared for the World Development Report 2013, Washington: World Bank.
- Martins, P.M.G. (2019), “Structural Change Rediscovered: The role of Human and Physical Capital,” World Bank Research and Policy Briefs No. 24.
- McMillan, M.S. and D. Rodrik (2011), “Globalization, Structural Change, and Productivity Growth,” in Bachetta, M. and M. Jansen (Eds.), *Making Globalization Socially Sustainable*, Geneva: International Labour Organization and World Trade Organization, 36-70.
- Newhouse, D.L. (2020), “How Does Population Growth Affect African Jobs?” <https://www.weforum.org/agenda/2015/12/how-does-population-growth-affect-afric>

- an-jobs/, assessed on 31 October 2020.
- Newhouse, D.L. and C. Wolff (2014), "Cohort Size and Youth Employment Outcomes," World Bank Policy Research Working Paper No. 6848.
- Page, J. and A. Shimeles (2015), "Aid, Employment, and Poverty Reduction in Africa," *African Development Review*, 7(S1), 17-30.
- Rodrik, D. (2016), "Premature deindustrialization," *Journal of Economic Growth*, 21(1), 1-33.
- Rodrik, D., M. McMillan and C. Sepúlveda (2016), "Structural Change, Fundamentals, and Growth," in McMillan, M., D. Rodrik and C. Sepúlveda (Eds.), *Structural Change, Fundamentals, and Growth: A Framework and Case Studies*, Accra: International Food Policy Research Institute, 1-38.
- Roodman, D. (2009), "How to Do xtabond2: An Introduction to Difference and System GMM in Stata," *Stata Journal*, 9(1), 86-136.
- Saget, C. (2000), "Can the Level of Employment be Explained by GDP Growth in Transition Countries? Theory Versus the Quality of Data," *Labour*, 14(4), 623-644.
- Todaro, M.P. and S.C. Smith (2009), *Economic Development. 10th Edition*, London: Pearson Education Limited.
- World Bank (2012), *World Development Report 2013: Jobs*, Washington DC: World Bank.

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Table 2. Linear Results without Labour Market Rigidity Indicator

Variable	<i>Total employment rate</i>			<i>Youth employment rate</i>			<i>Non-vulnerable employment rate</i>		
	1	2	3	1	2	3	1	2	3
<i>emplr_{t-1}</i>	0.543** (0.000)	0.561** (0.000)	0.560** (0.00)	0.648** (0.000)	0.661** (0.000)	0.642** (0.000)	0.616** (0.013)	0.642** (0.021)	0.631** (0.048)
<i>agricsh</i>	0.024** (0.000)			0.049** (0.000)			-0.056** (0.000)		
<i>indsh</i>		-0.011** (0.000)			0.031** (0.000)			0.016* (0.012)	
<i>servsh</i>			0.001** (0.000)			-0.083** (0.000)			0.057** (0.000)
<i>prdg</i>	0.004** (0.000)	0.005** (0.000)	0.004** (0.000)	0.006** (0.000)	0.008** (0.000)	0.007** (0.000)	0.002** (0.000)	0.006** (0.000)	0.004** (0.000)
<i>lbfg</i>	0.001** (0.000)	0.001** (0.000)	0.001** (0.000)	0.006** (0.000)	0.006** (0.000)	0.006** (0.000)	-0.012** (0.000)	-0.013** (0.000)	-0.012** (0.000)
<i>popden</i>	0.051** (0.000)	0.038** (0.011)	0.037** (0.000)	0.042** (0.012)	0.019** (0.012)	0.035* (0.021)	-0.076** (0.012)	-0.115** (0.021)	-0.115** (0.010)
<i>urbr</i>	-0.03** (0.000)	-0.022* (0.011)	-0.03** (0.000)	-0.06** (0.011)	-0.08** (0.011)	-0.074** (0.021)	-0.036 (0.030)	0.015* (0.063)	-0.029 (0.016)
Hansen J-stat	0.431	0.601	0.377	0.290	0.485	0.473	0.488	0.094	0.383
AR(1) p-value	-0.042	-0.050	-0.038	-0.046	-0.065	-0.048	-0.030	-0.026	-0.044
AR(2) p-value	0.814	0.785	0.840	0.673	0.671	0.704	0.807	0.781	0.806
No. of observations	703	703	703	703	703	703	703	703	703

Notes: Standard errors in parenthesis; ** $p < 0.01$, * $p < 0.05$; standard errors in parentheses.

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Table 3. Results for Non-linear Relationship

Variable	<i>Total employment rate</i>			<i>Youth employment rate</i>			<i>Non-vulnerable</i>
	1	2	3	1	2	3	1
<i>emplr_{t-1}</i>	0.461** (0.000)	0.473** (0.000)	0.469** (0.000)	0.428** (0.000)	0.443** (0.000)	0.417** (0.000)	0.636** (0.000)
<i>agricsh</i>				0.041** (0.000)			0.018** (0.000)
<i>agric</i> × <i>lbf</i>				-0.005** (0.000)			-0.007** (0.000)
<i>indsh</i>		-0.020** (0.000)			0.005* (0.000)		
<i>indsh</i> × <i>lbf</i>		0.003** (0.000)			-0.001 (0.011)		
<i>servsh</i>			-0.027** (0.000)			-0.128** (0.012)	
<i>servsh</i> × <i>lbf</i>			0.003** (0.000)			0.016** (0.000)	
<i>prd</i>	-0.005** (0.000)	-0.006** (0.000)	-0.003 (0.011)	-0.017** (0.000)	-0.024** (0.000)	-0.013** (0.000)	-0.086** (0.000)
<i>lbf</i>	0.006** (0.000)	-0.012** (0.000)	-0.013** (0.000)	0.013** (0.000)	0.003 (0.014)	-0.062** (0.000)	-0.032** (0.000)
<i>popden</i>	0.012** (0.000)	0.009** (0.000)	0.013** (0.000)	-0.004 (0.013)	-0.011 (0.011)	0.006 (0.013)	-0.028** (0.000)
<i>urbr</i>	0.055** (0.001)	0.062** (0.000)	0.061** (0.000)	-0.001 (0.014)	-0.008 (0.011)	0.001 (0.011)	-0.071** (0.000)
Hansen J-stat	0.801	0.574	0.367	0.415	0.750	0.459	0.727
AR(1) p-value	-0.031	-0.053	-0.046	-0.039	-0.048	-0.041	-0.022
AR(2) p-value	0.770	0.614	0.791	0.661	0.658	0.683	0.887
No. of observations	703	703	703	703	703	703	703

Notes: Standard errors in parenthesis; ** p < 0.01, * p < 0.05; standard errors in parentheses.

However, the coefficient of agriculture is negative in the non-vulnerable employment equation which shows that expansion of agricultural sector dampens productive employment growth in Nigeria. Industrial sector growth significantly improves both youth and non-vulnerable employment, while growth in services sector only improves youth employment. This suggests that both industrial and services sector growth tend to generate better employment in the economy. Moreover, the result suggests that growth in any of the sectors leads to expansion in youth employment. Productivity growth has significant positive impacts in each of the equations, indicating that productivity growth leads to employment growth in Nigeria.

For the demographic factors, the coefficients of labour force growth and population density are significant and positive in the total and youth employment rate Equations, but negative in the non-vulnerable employment rate Equation. This shows that larger demographic setting tend to improve total employment in SSA countries. On the other hand, increasing demographic factors reduce productive employment in the region. This result suggests that the labour market has strong capacity of retaining increases in labour force, although the type of employment generated is highly vulnerable. This result confirms previous outcomes in the region about the employment problem (Fields, 2012; Page and Shimeles, 2015; Adegboye et al., 2019).

The results for the non-linear effects of structural change and demographic factors are also estimated in order to observe the second-round effects that these factors have on employment. The results in Table 3 show that with the non-linear effects, the autoregressive coefficients are smaller for youth employment compared with non-vulnerable employment, suggesting that productive employment is more persistent with changes in sectoral shares and demographic factors. For the youth employment model, the coefficient of agricultural share is positive while the interaction variable with labour force growth is negative. This result shows that effect of agricultural sector growth on youth employment is negative for countries with larger labour force growth. The results are similar for the other employment types, which show that countries with larger labour force growth tend to experience lesser employment effects when sectoral shares increase. As also noted in Fox et al. (2016) and Newhouse (2020), determining the debilitating effects of demographic patterns on employment in developing countries require more technical examination such as the use of non-linear variables. The only interaction of labour force growth with services sector (in the youth employment model) has a positive coefficient, suggesting that the services sector tends to exhibit a highly elastic capacity in absorbing youth labour force among the economies. With the non-linear estimates, the coefficients of productivity growth become negative, indicating that larger influences of demographic factors tend to dampen the effect of productivity on employment among the economies.

From the results, it is seen that when non-linear effects are estimated, the coefficients of labour force growth become mainly negative. This result suggests that the debilitating effect of labour force on employment are more established for countries with larger population increases. In the results also, the coefficient of urban population share is

mainly positive in contradiction to the initial linear estimate. Thus, it is shown that the nature of economy-wide labour force contributes significantly to the pattern of urban influences on employment. This seems to in line with theoretical postulations by Harris and Todaro (1970) and Fields (1975).

Table 4. Results for Non-linear Relationship with Labour Market Rigidity

Variable	Total	Youth	Non-vulnerable
<i>emplr_{t-1}</i>	0.428** (0.021)	0.411** (0.000)	0.622** (0.012)
<i>agricsh</i>	0.042** (0.000)	0.101** (0.000)	0.070** (0.000)
<i>agric × lbfg</i>	-0.0014** (0.000)	-0.001* (0.000)	-0.001** (0.000)
<i>pgr</i>	0.021** (0.000)	-0.009** (0.000)	-0.121** (0.000)
<i>lbfg</i>	0.007** (0.000)	0.006** (0.000)	-0.034** (0.000)
<i>popden</i>	0.019* (0.013)	-0.044** (0.000)	-0.128** (0.000)
<i>urbr</i>	0.084** (0.000)	0.102** (0.000)	-0.015 (0.011)
<i>fdir</i>	0.008* (0.000)	0.005 (0.012)	0.001** (0.000)
<i>gsize</i>	0.007** (0.000)	0.015** (0.000)	0.036** (0.000)
<i>lmr</i>	0.024 (0.000)	0.009** (0.000)	0.031** (0.000)
Hassen J-stat	0.313	0.471	0.397
AR(1) p-value	-0.066	-0.073	-0.051
AR(2) p-value	0.863	0.819	0.855
No. of observations	703	703	703

Notes: Standard errors in parenthesis; ** p < 0.01, * p < 0.05; standard errors in parentheses.

Finally, on the indirect relationship between structural change and employment with demographic influences, we report the results for the non-linear estimates while including the indicator of labour market rigidity and other variables in Table 4. Note that this result only includes agricultural share which is used relative to other sectors. The results are similar to the previous estimates, with agricultural sector growth having lesser

(and negative) impacts on employment for countries with larger labour force growth. There is therefore significant evidence that though labour force growth may stimulate total employment at all level, countries with very large surges in labour force inflow will experience negative employment rate growth even when the sectors are expanding. The coefficients of labour force growth, population density, and urban population ratio are all negative in the non-vulnerable employment equation, further strengthening the argument that demographic changes among SSA countries tend to hinder productive employment (see Grant, 2012; Martins, 2012; Lam and Leibbrandt, 2014).

In the result, FDI to GDP ratio has significant positive impact on employment at all level, although the coefficient fails the significance test for the youth employment Equation. This outcome is rather surprising since it shows that even though FDI improves employment in the productive sector, it does not significantly improve youth employment. Perhaps, the patterns of FDI inflows into the country may have contributed this outcome (Inekwe, 2013; Adegboye et al., 2019). Government size also significantly improves employment at all levels among the SSA countries. The coefficient of labour market rigidity is positive and significant for each equation, suggesting that more flexible labour markets (where adjustment to output changes can be easily facilitated) is important for boosting employment in the region.

Decomposition of Employment and Output in Selected SSA Countries

Table 5 shows changes in employment rates in each country for the sectors which is used to present a more proper reflection of the combined roles of output changes and demographic transition on employment. Agriculture has consistently lost its share of employment the 1990s for the SSA countries given the negative changes the sectoral employment shares for all the countries, except Kenya. This is to be expected and has been generally reported in studies on structural transformation in the region (de Vries et al., 2013; Gong, 2015; Diao et al., 2017), suggesting a significant movement of people out of agriculture to other sectors with higher productivity and hence, higher wages. The decline in employment shares in agriculture is however less than the decline in output share of the sector, posing significant risks to productivity and sustainability of employment in the sector. For instance, Martins (2012) noted that the weight of agriculture in total GDP among SSA countries declined to uncharacteristically low levels in the 2000s when compared to countries with similar income levels with profound negative impacts on employment and productivity.

Manufacturing sector employment also experienced declines over the years (-24.2 percent for Nigeria in 2001-2010) and (-0.8 percent for South Africa in 2011-2018). In contrast, results in Table 6 shows that the services sector (consisting of trade services, transport, and communication) has received more employment share than any of the other sectors over the period. It is seen that changes in economic structure in terms of employment has favoured the services sector over the 27 years period under consideration, leading to the dominance of the sector in employment for many SSA countries. Considering that agricultural sector led employment in the 1970s and 1980s

(Gong, 2015), 27 years is a relatively short period for structural transition to transcend the standard pattern - namely from traditional primary sector to secondary sector, and then to the tertiary sector. Rapid de-industrialisation of the SSA region during the intervening period between 1990s and the 2018 is conspicuously highlighted by these results. In this case, the industrial sector (especially manufacturing) has been left behind in the transformation process resulting in “premature de-industrialisation” as indicated by Rodrik (2016). Rodrik, McMillan and Sepúlveda (2016) also reaffirmed this outcome and noted that the process of structural change involving employment and output shares in SSA countries has not “following the standard patterns that we are familiar with from the historical literature or from widely used models of structural change” (p.31).

The contribution of each sector to overall changes in employment rate (shown in Table 6) demonstrates the relevance of each sector (and its evolution) to employment growth. Once again, the agricultural sector contributed negatively to changes in employment rates for each of the countries. The rate of decline in agricultural sector contribution to total employment rate appears to be similar across the countries, although South Africa had a very large decline of -69.9 percent in 2001-2010, while the forecast contribution for Ghana in 2018-2015 is also high at 22.1 percent. The negative contribution of agricultural sector could be a result of structural transition, or sheer neglect of the sector (as noted by Martins, 2012). This has made the sector unable to provide more productive employment opportunities in the labour market. The contribution of the manufacturing sector to total employment growth was negative for four of the countries in the recent decade, suggesting that less and less people are getting manufacturing sector jobs. Given that this sector leads in productivity growth among the countries, the result indicates that productivity growth does not translate to employment growth for the SSA countries.

The services sector had the most potent contribution to changes in overall employment rate across the countries. In the sector, transport and communication as well as trade services dominated the contribution. Given that the services sector exhibits low productivity among SSA countries (Diao et al., 2017; Adegboye et al., 2019), the results suggest that most of the employment growth has occurred in the sector with little productivity growth and lesser prospects of rapid efficiency growth. This implies that most of the jobs being created in many SSA economies are low productivity and therefore low wage jobs that are often vulnerable (as shown in Page and Shimeles, 2015; Adegboye et al., 2019). This explains some of the results obtained in the regression analysis where labour force growth appeared to have positive effect on employment rates across that SSA countries. As noted by Field (1975, 2012), the traditional services sector, which is largely informal, creates a form of dual production and labour markets in the urban sector as found in the Lewis traditional versus modern sectors. The informal markets in the urban sector then demonstrates the characteristics of the traditional sector, namely, low productivity and large capacity to absorb labour supply.

Table 5. Changes in Employment Rate by Sectors of Economic Activity

Sector	Ethiopia				Ghana				Kenya			
	1992-2000	2001-2010	2011-2018	2018-2025 (p)	1992-2000	2001-2010	2011-2018	2018-2025 (p)	1992-2000	2001-2010	2011-2018	2018-2025 (p)
Agriculture	23.402	35.816	20.165	18.190	12.202	22.011	-4.562	-0.850	25.279	24.042	25.861	20.603
Mining and Utilities	37.311	120.418	123.277	97.305	61.850	76.473	104.232	61.350	21.118	35.902	28.039	26.023
Manufacturing	39.417	69.382	20.302	17.381	84.118	2.319	10.313	2.101	26.323	39.811	14.162	16.154
Construction	59.483	251.355	76.499	60.890	69.882	93.522	93.270	65.092	39.372	71.253	47.493	44.310
Wholesale and Retail	39.891	62.187	32.710	27.910	27.672	47.290	50.581	38.110	27.309	47.100	34.301	31.691
Transport and Communications	44.302	130.700	90.110	66.333	20.050	88.617	80.600	57.563	23.313	58.515	41.515	38.900
Other Activities etc.	43.418	94.117	113.182	84.182	33.040	62.703	91.117	65.300	20.020	48.719	37.150	34.851
<i>Aggregate</i>												
Agriculture	23.423	35.641	20.190	18.188	12.155	22.004	-4.454	-0.861	25.325	24.001	25.875	20.555
Industry	41.608	97.590	42.218	40.697	80.782	17.298	34.603	27.350	29.491	49.582	28.200	29.415
Services	42.016	82.601	83.295	68.802	29.003	56.410	69.322	52.111	21.029	49.850	37.482	35.203
Total Employment	26.271	44.773	31.766	30.910	23.709	31.003	25.472	27.192	24.516	31.851	29.190	25.522

Source: Author's computations.

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Table 5. Changes in Employment Rate by Sectors of Economic Activity (con't)

Sector	Nigeria				South Af	
	1992-1999	2000-2010	2011-2018	2018-2025 (p)	1992-2000	2001-2010
Agriculture	21.802	12.809	-0.661	-0.217	16.655	-66.280
Mining and Utilities	19.468	292.517	42.309	35.606	19.759	-42.864
Manufacturing	12.110	-24.200	61.355	51.211	11.701	10.901
Construction	21.680	97.872	40.949	34.107	47.762	55.891
Wholesale and Retail	19.653	48.001	37.473	30.855	30.510	19.316
Transport and Communications	21.026	122.421	51.900	43.206	33.000	32.708
Other Activities etc.	17.701	87.750	53.751	45.511	30.358	32.272
<i>Aggregate</i>						
Agriculture	21.752	12.822	-0.700	-0.200	16.716	-66.317
Industry	13.102	-2.716	55.218	46.488	20.408	8.603
Services	18.864	67.798	45.633	38.552	30.577	28.761
Total Employment	19.663	30.854	26.350	26.200	26.281	11.750

Source: Author's computations.

Table 6. Contribution of Sectoral Employment Changes to Overall Change in Employment

	Ethiopia				Ghana				1992-2000	2001-2010
	1992-2000	2001-2010	2011-2018	2018-2025 (p)	1992-2000	2001-2010	2011-2018	2018-2025 (p)		
Agriculture	-2.271	-6.216	-8.663	-9.652	-9.294	-6.877	-23.827	-22.072	0.559	-0.559
Mining and Utilities	8.705	52.200	69.582	50.679	30.851	34.782	62.652	26.655	-2.783	3.283
Manufacturing	10.446	17.082	-8.592	-10.301	48.810	-21.917	-12.090	-19.887	1.397	6.397
Construction	26.319	142.593	34.001	22.917	37.303	47.803	54.101	29.910	12.001	29.910
Wholesale and Retail	10.839	12.015	0.839	-2.322	3.163	12.482	20.028	8.615	2.181	1.181
Transport and Communications	14.297	59.273	44.362	27.049	-2.858	44.000	44.000	24.032	-0.879	2.121
Other Activities etc.	13.472	34.017	62.039	40.656	7.555	24.211	52.317	30.032	-3.603	1.397
Agriculture	-2.311	-6.155	-8.696	-9.683	-9.319	-6.901	-23.851	-22.072	0.582	-0.582
Industry	12.117	36.473	8.011	7.500	46.202	-10.391	7.305	0.201	4.110	1.110
Services	12.409	26.110	39.220	28.918	4.349	19.363	34.864	19.599	-2.807	1.193

Source: Author's computations.

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Table 6. Contribution of Sectoral Employment Changes to Overall Change in Employment R

	Nigeria				South A	
	1992-1999	2000-2010	2011-2018	2018-2025 (p)	1992-2000	2001-2010 2
Agriculture	1.792	-13.785	-21.359	-20.918	-7.616	-69.911
Mining and Utilities	0.003	199.832	12.582	7.382	-5.203	-49.022
Manufacturing	-6.317	-42.131	27.810	19.793	-11.593	-0.753
Construction	1.674	51.211	11.544	6.268	16.980	39.472
Wholesale and Retail	0.133	13.042	8.810	3.710	3.288	6.692
Transport and Communications	1.218	69.839	20.249	13.404	5.305	18.700
Other Activities etc.	-1.607	43.392	21.703	15.211	3.217	18.401
Agriculture	1.816	-13.753	-21.380	-20.933	-7.593	-69.925
Industry	-5.438	-25.738	22.817	16.092	-4.690	-2.807
Services	-0.497	28.201	15.277	9.800	3.425	15.316

Source: Author's computations.

5. CONCLUSION

For a long time, economists considered employment generation as only an indirect outcome of long run growth. This has led to growth-focused policies that have struggled to create widespread good jobs. This study set out to establish the effects of structural changes and demography on employment as well as basic channels through which employment growth have been achieved over time for SSA countries. Econometric analyses show that growth in each sector's share in the economy stimulates employment growth, especially, the services sector. However, the distributional effects indicate that expansion in the share of industry is more relevant for boosting productive and non-vulnerable employment among SSA countries. Moreover, countries with bigger working age population are shown to have significant challenges in promoting productive employment even when structural changes favour the modern sectors. This outcome was further clarified in the decomposition analysis where employment was decomposed between pairs of periods (years) in a system whereby the roles of economic structure and demographic changes could be observed.

A broad highlight from the study indicated that though structural change is a potential component for employment-enhancing growth in an economy, demographic transitions could also provide strong background for analyzing how growth affects employment. Demographic ramifications have effectively distorted the pattern of employment as well as the responses of labour markets to structural changes in the SSA region. Also, the study suggests that the dynamics of growth in relation to economic structure in SSA is rather precarious. This is because the growing sector, and one towards which the SSA economies appear to be transiting into (services sector), does not appear to possess the capacity of generating the much needed productive (non-vulnerable) employment over time in the continent. In the same vein, the structure of economies in SSA have been shown to have a unique character in terms of employment outcomes in its adjustments. It was demonstrated that, though some sectors are more employment-elastic than others, the strength of such employment generation resulting from output growth does not vary with sectoral changes. Thus, the role of economic structure on employment appears to be stable and rather dormant in SSA region.

REFERENCES

- Acemoglu, D., S. Johnson and J.A. Robinson (2005), "Institutions as the Fundamental Cause of Long-Run Growth," *Handbook of Economic Growth*, 1A, 386-472.
- ACET (2014), *2014 African Transformation Report: Growth with Depth*, Accra: African

- Centre for Economic Transformation.
- Adegboye, A.C., M.I. Egharevba and J. Edafe (2019), "Economic regulation and employment intensity of output growth in sub-Saharan Africa," in Elhiraika, A., G. Ibrahim and W. Davis (eds.), *Governance for Structural Transformation in Africa*, London: Palgrave Macmillan, 101-143.
- African Development Bank (AfDB) (2012), *African Economic Outlook, 2012: Promoting Youth Employment*, Tunis: African Development Bank.
- Arellano, M. and S.R. Bond (1991), "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations," *Review of Economic Studies*, 58, 277-297.
- Blanchard, O. and J. Wolfers (2000), "The Role of Shocks and Institutions in the Rise of European Unemployment: The Aggregate Evidence," *Economic Journal*, 110(462), 1-33.
- Blundell, R. and S.R. Bond (1998), "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models," *Journal of Econometrics*, 87, 115-143.
- Boulhol, H. (2009), "The Effects of Population Structure on Employment and Productivity," OECD Economics Department Working Papers No. 684.
- Chenery, H., S. Robinson and M. Syrquin (1986), *Industrialization and Growth: A Comparative Study*, Oxford: Oxford University Press.
- Coulibaly, B.S., D. Gandhi and A.A. Mbaye (2019), "Job Creation for Youth in Africa: Assessing the Potential of Industries Without Smokestacks," Brookings Institute AGI Working Paper No.22.
- Crivelli, E., D. Furceri and J. Toujas-Bernat  (2012), "Can policies affect employment intensity of growth? A Cross-Country Analysis," IMF Working Paper No. WP/12/218.
- de Vries, G.J., M.P. Timmer and K. de Vries (2013), "Structural Transformation in Africa: Static Gains, Dynamic Losses," *Journal of Development Studies*, 51(6), 674-688.
- Diao, X., K. Harttgen and M. McMillan (2017), "The Changing Structure of Africa's Economies," *World Bank Economic Review*, 30(2), 412-433.
- Fields, G.S. (1975), "Rural-urban Migration, Urban Unemployment and Under-Development, and Job-search Security in LDCs," *Journal of Development Economics*, 2(2), 165-187.
- Fields, G.S. (2012), *Working Hard, Working Poor*, New York: Oxford University Press.
- Fields, G.S. (2005), "A Welfare Economic Analysis of Labor Market Policies in the Harris-Todaro Model", *Journal of Development Economics*, 76(1), 127-146.
- Fox, L., L.W. Senbet and W. Simbanegavi (2016), "Youth Employment in sub-Saharan Africa: Challenges, Constraints and Opportunities," *Journal of African Economies*, 25(s1), i3-i15.
- Fuchs, M. and A. Weyh (2014), "Demography and Unemployment in East Germany: How Close are the Ties?" IAB-Discussion Paper 26/2014.
- Golub, S. and F. Hayat (2014), "Employment, Unemployment, and Underemployment

- in Africa,” in Monga C. and J.Y. Lin (Eds.), *The Oxford Handbook of Africa and Economics: Volume 1: Context and Concepts*, Oxford: Oxford University Press, 136-153.
- Gong, X. (2015), “African Economic Structural Transformation: A Diagnostic Analysis,” *Journal of African Transformation*, 1(1), 1-22.
- Grant, U. (2012), “Urbanization and the Employment Opportunities of Youth in Developing Countries,” Background paper prepared for the Education for All Global Monitoring Report 2012 Youth and skills: Putting education to work, UNESCO.
- Haile, F. (2018), “Structural Change in West Africa: A Tale of Gain and Loss”, World Bank Policy Research Working Paper No. 8336.
- Haraguchi, N., B. Martorano, M. Sanfilippo and A. Shingal (2019), “Manufacturing Growth Accelerations in Developing Countries,” *Review of Development Economics*, 23(4), 1696-1724.
- Harris, J. and M. Todaro (1970), “Migration, Unemployment, and Development: A Two Sector Analysis,” *American Economic Review*, 40, 126-142.
- Herrendorf, B., R. Rogerson, and A. Valentini (2014), “Growth and Structural Transformation,” *Handbook of Economic Growth*, 2, 855-941.
- Hijzen, A. and P. Swaim (2010), “Offshoring, Labour Market Institutions and the Elasticity of Labour Demand,” *European Economic Review*, 54(8), 1016-1034.
- Inekwe, J.N. (2013), “FDI, Employment and Economic Growth in Nigeria,” *African Development Review*, 25(4), 421-433.
- Kamgnia, B.D. (2005), “Growth-Employment Nexus: The Specificities in Africa,” in Kasekende L. and O. Ajakaiye (Eds.), *Accelerating Africa’s Development Five Years into the 21st Century*, Nairobi: African Economic Research Consortium, 40-78.
- Jayne, T.S., J. Chamberlin and R. Benfica (2018), “Africa’s Unfolding Economic Transformation,” *Journal of Development Studies*, 54(5), 777-787.
- Lam, D. and M. Leibbrandt (2014), “Youth Bulges and Youth Unemployment”, Paper presented at the Population Association of America Annual Meeting Boston MA, May 1-3.
- Lewis, W.A. (1954), “Economic Development with Unlimited Supply of Labour,” *Manchester School*, 22, 139-191.
- Martins, P. (2012), “Growth, Employment and Poverty in Africa: Tales of Lions and Cheetahs,” Background paper prepared for the World Development Report 2013, Washington: World Bank.
- Martins, P.M.G. (2019), “Structural Change Rediscovered: The role of Human and Physical Capital,” World Bank Research and Policy Briefs No. 24.
- McMillan, M.S. and D. Rodrik (2011), “Globalization, Structural Change, and Productivity Growth,” in Bachetta, M. and M. Jansen (Eds.), *Making Globalization Socially Sustainable*, Geneva: International Labour Organization and World Trade Organization, 36-70.
- Newhouse, D.L. (2020), “How Does Population Growth Affect African Jobs?” <https://www.weforum.org/agenda/2015/12/how-does-population-growth-affect-afric>

- an-jobs/, assessed on 31 October 2020.
- Newhouse, D.L. and C. Wolff (2014), "Cohort Size and Youth Employment Outcomes," World Bank Policy Research Working Paper No. 6848.
- Page, J. and A. Shimeles (2015), "Aid, Employment, and Poverty Reduction in Africa," *African Development Review*, 7(S1), 17-30.
- Rodrik, D. (2016), "Premature deindustrialization," *Journal of Economic Growth*, 21(1), 1-33.
- Rodrik, D., M. McMillan and C. Sepúlveda (2016), "Structural Change, Fundamentals, and Growth," in McMillan, M., D. Rodrik and C. Sepúlveda (Eds.), *Structural Change, Fundamentals, and Growth: A Framework and Case Studies*, Accra: International Food Policy Research Institute, 1-38.
- Roodman, D. (2009), "How to Do xtabond2: An Introduction to Difference and System GMM in Stata," *Stata Journal*, 9(1), 86-136.
- Saget, C. (2000), "Can the Level of Employment be Explained by GDP Growth in Transition Countries? Theory Versus the Quality of Data," *Labour*, 14(4), 623-644.
- Todaro, M.P. and S.C. Smith (2009), *Economic Development. 10th Edition*, London: Pearson Education Limited.
- World Bank (2012), *World Development Report 2013: Jobs*, Washington DC: World Bank.

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