


# The youth unemployment challenge in Africa: What are the drivers?

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## Abstract

Youth unemployment remains a major political and socioeconomic challenge in Africa despite the recent strong growth performance of many African countries. The study undertakes an empirical assessment of the main sources of youth unemployment in Africa. Based on panel data of 41 African countries covering the period 2000–2010, the study finds a demographic youth bulge and poor economic growth from both supply and demand sides of the market to be key drivers of youth unemployment in Africa. Employment-to-population ratio as a measure of country's job creation ability and vulnerable employment as a proxy for informality are observed to have had a decreasing effect on youth unemployment. The empirical findings also suggest higher youth employment rates among females than males and a higher concentration in urban than rural areas. Investment in the high labour absorption sectors of agriculture and manufacturing is advocated as job creation strategies, along with population control measures to slow the growing youth population in Africa. High growth in the low employment sectors of mining and extractive industries could serve as resource generating avenues to promote investment in education and skill training, along with infrastructure to facilitate growth in high labour absorption sectors.

**JEL Codes:** J 13, N37, N57, N67, O17, O55

## Keywords

Africa, economic growth, informal economy, labour markets, theories of unemployment, vulnerable workers, youth unemployment

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## Introduction

Africa's growth performance has been quite remarkable, particularly over the last one-and-half decades. Between 2000 and 2012, Sub-Saharan Africa (SSA) grew by more than 4.5% annually on average, compared to about 2% in the prior 20 years (World Bank, 2014). Nevertheless, although some jobs have been created, they have not been sufficient to meet the increasing number of young people in search of employment. Between 2000 and 2008, Africa created 73 million jobs, but of these, only 16 million, or 21.9%, went to youth (International Labour Office (ILO), 2008). Consequently, many young people on the continent find themselves unemployed or frequently in vulnerable or informal employment which is associated with low productivity and earnings (African Development Bank (AfDB) et al., 2012). Even though the youth employment challenge is seen as a global phenomenon, the youth population bulge in Africa makes the phenomenon more acute. Indeed, Africa's population is very young (see, for example, Population Reference Bureau, 2013) with more than half aged below 25 years, and it is estimated that there will be an annual increase of half a million in the number of 15-year-olds joining the labour market year by year over the period 2015–2035 (World Bank, 2014).

Alongside the rapid growth of Africa's youth population, is the fact that it is also becoming better educated. AfDB et al. (2012) estimate that the proportion of youth aged 20–24 years with secondary education will reach about 59% in 2030, compared to the current figure of 42%. Obviously, the growing numbers of educated youth constitute a potential resource for growth and development of the region, if the quality of education is improved to make them gainfully and productively employed. On the dark side, however, this reservoir of human capital could also be a source of civil conflict and social tension if the continent fails to create adequate economic opportunities to help educated young people obtain a decent living. Undoubtedly, large numbers of disaffected educated youth without prospects of a meaningful future could fuel future instability, migration, radicalisation and violent conflict.

This article seeks to ascertain the key drivers of youth unemployment in Africa. A macro-econometric panel analysis covering 41 African countries over a 3-year average period between 2000 and 2011 is undertaken to identify the main sources of youth unemployment in Africa. Data for estimation and analysis are sourced from the World Development Indicators (WDI), the International Labour Office's (ILO) Key Indicators of the Labour Market (KILM) and published national labour market indicators of countries covered in the study.

The article is structured into five sections. Following this brief introduction establishing the importance of the analysis, section 'Literature review' provides a survey of relevant theoretical and empirical literature. An overview of youth unemployment in Africa is carried out in Section 'Overview of youth unemployment in Africa'. Section 'Econometric analysis' focuses on econometric analysis followed by the conclusion and policy recommendation in Section 'Conclusion and policy recommendation', that job creation needs to be treated as a driver rather than a passive outcome of growth.

## Literature review

### *Definitions and concepts*

Unemployment is a phenomenon of job seeking arising out of joblessness. An unemployed person is one who has attained the minimum age of employment (e.g. 15 years), and in a reference week was ‘without work’, ‘available for work’ and ‘actively seeking work’ (ILO, 1982). This definition implies that a jobless individual who is available for work but fails to make the effort to seek work for various reasons cannot be classified as unemployed and can only be referred to as a discouraged worker. In addition, a full-time employed person who decides to seek (additional) work with another employer can only be termed as moonlighting (Baah-Boateng et al., 2013). The definition of unemployment based on job seeking, however, has come under scrutiny particularly in relation to its applicability to Africa. Indeed, it is increasingly seen as inadequate to characterise low-income countries’ labour markets (Cling et al., 2007; Fares et al., 2006; World Bank, 2006). In Africa, a considerable number of jobless people may be available for work but fail to look for work for various reasons including the perception of no job or, in some cases, seasonality of jobs, creating a high discouraged worker effect (Baah-Boateng, 2015).

In times of recession and associated unemployment problems, youth as a demographic group tends to be hugely affected. Curtain (2001) refers to youth as the demographic group who are at a separate stage in the life cycle between childhood and adulthood. In demographic analysis, the Commonwealth defines youth to cover 15–29 years compared with the African Youth Charter’s classification of youth as those aged 18–35 years (African Union (AU) Commission, 2006). In Ghana, Kenya and Tanzania, the African Union (AU) definition of 15–35 years for youth is adopted for policy purposes compared with 12–30 years in Nigeria, while South Africa’s National Youth Policy puts the youth into 14–35 years category (see Mkandawire, 2000).

### *Theoretical perspectives on unemployment*

The economic literature explains unemployment from different theoretical perspectives. Neoclassical economists view unemployment as voluntary because the labour market is deemed to be always in equilibrium based on the assumption of flexible wages and perfect market information. An example of voluntary unemployment within the neoclassical framework is structural unemployment created by a mismatch between demand for labour and the skills of jobseekers, made obsolete by slow response to technological advancements. Frictional unemployment is seen as being caused by lack of labour market information, increasing the time that jobseekers take to locate and move into a new job and the time and resources that employers take to identify and recruit suitable workers to fill vacancies – failure to obtain the relevant information too is seen as having a voluntary component (Phelps, 1970; Stigler, 1962).

Any intervention in the labour market that distorts wage flexibility causes involuntary unemployment. Involuntary unemployment arises if individuals cannot obtain work even

if they are prepared to accept lower real wages than similar qualified workers who are currently employed (Shackleton, 1985). At the microeconomic level, an enactment of minimum wage legislation that forces firms to pay wages above the ‘market-clearing wage’ is seen in neoclassical theory as having implications for involuntary unemployment, even though some argue that minimum wages have relatively minor employment and unemployment effects (Neumark and Wascher, 1995). Involuntary unemployment is also seen as arising from the actions of firms to pay higher wages above the equilibrium wage as an incentive to increase the efficiency of employees to avert workers’ shirking behaviour, reduce labour turnover, avoid adverse selection of job applicants or as a gift of exchange for high productivity from workers under the efficiency wage model (Akerlof, 1970, 1982; Salop, 1979; Shapiro and Stiglitz, 1984; Stiglitz, 1974). The phenomenon can also emanate from the behaviour of employees of firms to resist competition from jobseekers to prevent underbidding of their wages through lack of cooperation or harassment of newly engaged workers within the insider–outsider framework (see Lindbeck and Snower, 1988). Thus, unemployment is thought, within this framework, to arise if firms take into account only the interests of the employees (insiders) without regard to the interest of jobseekers (outsiders) in the firms’ wage determination process (Bentolila et al., 2011).

From a macroeconomic perspective under the Keynesian framework, by contrast, unemployment could occur as a result of deficiencies in aggregate demand over certain periods in the business cycle such that the jobs created are not enough for everyone who wants to work (Keynes, 1936). Contrary to the neoclassical argument that attributes involuntary unemployment to institutional factors, this type of demand-deficient unemployment is involuntary since the unemployed are constrained by limited job availability. A further factor, beyond individual control, is seasonal unemployment caused by predictable seasonal variation in demand – additionally, climatic conditions also create involuntary unemployment.

These theories of unemployment were formulated in more developed economies with wage-employment dominated labour markets and clear employer–employee relationships. They have only limited relevance in Africa, dominated by self-employment. The efficiency wage theory, insider–outsider model and labour market intervention through minimum wage imposition are applicable to formal wage employment, which accounts for quite a small proportion of employment in many African countries. It is not a market-clearing wage, but a high degree of informality, dominated by vulnerable employment comprising own account and contributing family jobs, that accounts for the apparently low unemployment rates in many African countries (Baah-Boateng, 2015). Countries such as South Africa, Namibia, Tunisia, Algeria and Morocco that have high levels of wage employment and bigger formal sectors more closely resembling developed labour market structures have to combat high rate of unemployment. Thus, while these theories may be applicable to the formal sector dominated labour markets in the developed world, they can only be used to explain joblessness in the formal sector, which constitutes a small segment of labour markets in Africa.

### *Drivers of youth unemployment: The literature*

Until recently, empirical research on youth unemployment in Africa was somewhat scanty, owing to the lack of regular availability of labour market data. Empirical literature on the

subject of unemployment has generally established a relatively higher unemployment rate among youth than adults (see, for example, AfDB et al., 2012; Baah-Boateng, 2013, 2015; Johnson and Layard, 1993; Sackey and Osei, 2006; United Nations Economic Commission for Africa (UNECA), 2005). In 2009, South Africa's youth unemployment rate was 48% compared to 19% for adults, while the youth unemployment rate in Egypt was more than six times higher than the rate for adults in 2007 (AfDB et al., 2012). Using age and age squared in estimating unemployment, Blackaby et al. (1999) show how this may reflect job shopping by younger workers and the lack of job opportunities as workers approach retirement age.

An assessment of the literature on the drivers of youth unemployment can be undertaken from both microeconomic and macroeconomic perspectives. At the microeconomic level, the demographic characteristics of youth including sex, race, education and skills and individual location have implications for their chances of securing a job. It is widely acknowledged that youth unemployment rates are higher in urban than in rural areas, while gender differences in the youth unemployment rate are mixed (AfDB et al., 2012; Baah-Boateng, 2014). Human capital endowment measured by education, skills and work experience is said to be the key determinant of the labour market success of individuals – better educated individuals with more professional experience in the world of work are more likely to be successful in finding jobs (Becker, 1975; Mincer, 1974). However, some studies have observed higher unemployment rates among individuals with at least a secondary school education, relative to the less educated, in developing countries (e.g. AfDB et al., 2012; Aryeetey et al., 2014; Baah-Boateng, 2013, 2014, 2015; Dickens and Lang, 1995). These authors attribute the phenomenon to the large informal sector's unattractiveness to the educated. This coupled with the slow growth of the formal sector leaves them with virtually no option than to battle with unemployment. The role of individual's family background has also been observed as a determinant of youth unemployment. Essentially, the education status or occupation of family members in the labour market can affect an individual's employment prospects, as a result of the professional networks that may arise from the jobs and acquaintances of family members (Vaerhaeghe et al., 2012; Zhang and Zhao, 2011).

From the macroeconomic angle, youth unemployment can be explained from the overall characteristics of the labour market in terms of the interaction between demand for and supply of youth labour. The direction of the effect of aggregate demand deficiency on youth unemployment is similar to its effect on overall unemployment, even though the degree of impact differs. Indeed, as a result of the limited labour market endowment such as lower skills and work experience, limited networking and the concentration of precarious employment contracts among the young, youth become more vulnerable to layoffs in times of economic recession (Baah-Boateng, 2013; Bell and Blanchflower, 2011). The tendency for most advertised jobs to require substantial work experience implies that most young people are locked up in an 'experience trap' through limited opportunities for work experience. Indeed, young people are highly vulnerable to aggregate demand fluctuations (Choudhry et al., 2012) suggesting the importance of demand-side causes of youth unemployment.

Empirically, Aryeetey et al. (2014) have established a strong demand-deficient effect of youth unemployment based on a model that shows that in times of economic recession, there is a higher probability of unemployment among young jobseekers who hold

strong preferences for specific jobs, instead of looking for any job, and among jobseekers pursuing full-time jobs as against part-time work. Using macroeconomic variables, Anyanwu (2013) established a significantly positive effect of domestic investment and real gross domestic product (GDP) on youth employment in Africa, confirming the importance of demand factors on youth unemployment. However, he found negative and significant effects of government consumption and real GDP per capita on youth employment. He thus argues for the promotion of government expenditure effectiveness and reform of the fiscal systems by all levels of government to address youth employment challenges.

From the supply side of the macroeconomic argument, the rising volume of the inflow of young people into the labour market relative to the number of jobs available is a major source of youth unemployment (Perugini and Signorelli, 2010). The ‘youth bulge’ explanation of youth unemployment has been stretched to account for the incidence of civil war in Africa: Collier et al. (2009) argue the urgent need to address the impact of the high and increasing youth population as a means to avert civil wars in Africa. There is however no clear consensus as to whether the ‘youth bulge’ argument could be isolated as a driver of youth unemployment without looking at aggregate demand-side issues. Some studies (e.g. Aryeetey et al., 2014; O’Higgins, 2012) found youth unemployment to be strongly linked to deficiency in aggregate demand. In their study, Korenman and Neumark (1997) affirm that the size of the youth population has no statistically significant effect on youth unemployment when controlling for demand factors.

Wage levels determined by the demand and supply interaction also have implications for youth unemployment. Increase in wages from institutional perspectives through minimum wage legislation, trade unions’ high-wage advocacy or firms’ own actions (efficiency wage and insider–outsider model) have the tendency of causing rising youth unemployment. The effect of high wages on firms’ cost of production and profits could influence their decision to reduce the employment of young people relative to their adult counterparts if the skills of the two groups are considered to be substitutes. Wage expectations of young people in their job-seeking decisions also affect their success in securing jobs. Thus, according to Aryeetey et al. (2014) and Baah-Boateng (2013), a high reservation wage has the effect of increasing youth and overall unemployment in Ghana.

## **Overview of youth unemployment in Africa**

Overall, as a global phenomenon, the higher unemployment rate among youth compared with adults is not in doubt. At the global level, youth unemployment is estimated to be about three times higher than the rate among adults (Table 1). There are, however, variations, both among and within countries. In 2012, Southeast Asia and the Pacific region recorded the highest relative youth–adult unemployment ratio of 5.8%, compared to the lowest, 1.98%, in SSA. In round figures, while youth in Southeast Asia and the Pacific region are about six times more prone to be unemployed, SSA youth are twice as likely to be unemployed compared to their adult counterparts. In North Africa, however, youth unemployment rates are about four times higher than the rate for adults.

When we focus on patterns of variation in youth unemployment rates, we find considerable divergence within regions, within and in some cases running counter to the broader

**Table 1.** Relative unemployment rates among youth and adults.

Region	2011			2012		
	Youth	Adults	Youth/adult	Youth	Adults	Youth/adult
World	12.7	4.5	2.82	12.9	4.5	2.87
Sub-Saharan Africa	11.9	6.0	1.98	11.9	6.0	1.98
North Africa	28.1	7.9	3.56	29.2	8.1	3.60
Middle East	26.0	7.4	3.51	26.6	7.5	3.55
Latin America and Caribbean	14.3	4.9	2.92	13.8	4.8	2.88
South Asia	9.7	2.4	4.04	10.1	2.4	4.21
Southeast Asia and the Pacific	12.9	2.4	5.38	12.7	2.2	5.77
East Asia	9.4	3.3	2.85	9.7	3.5	2.77
Central and South-Eastern Europe (non EU) and CIS	17.9	7.0	2.56	17.5	6.6	2.65
Developed economies and EU	17.6	7.2	2.44	18.0	7.4	2.43

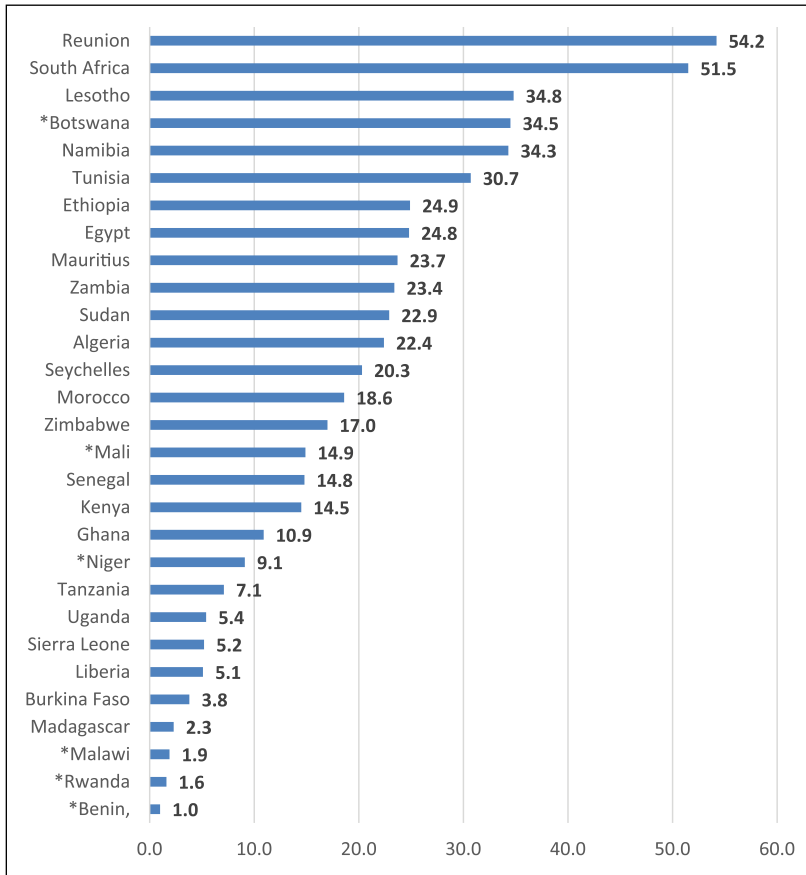
Source: Global Employment Trend 2014, Table A3, pp. 91 (ILO, 2014a).

EU: European Union; CIS: Commonwealth of Independence States.

trends. Thus, North Africa has the highest rate of 29.2%, and the lowest rate of 9.7% is recorded in East Asia in 2012. SSA recorded a rate of 11.9%, a 1% point lower than the world average. Generally, youth unemployment rates appear to be higher in relatively more developed than developing regions. While regions such as East and South Asia as well as SSA (considered to be less developed) had youth unemployment rates below the world average, developed regions such as the European Union (EU), non-EU and Commonwealth of Independence States (CIS) and Southeast Asia have rates far above the world average. The Middle East (which is generally endowed with oil resources and thus classified as a developed region based on per capita income) and North Africa have the highest youth unemployment rates. Essentially, a lower youth unemployment rate is not necessarily an indicator of the progress of development but could be viewed as a reflection of the quality of employment (see Tadjoeeddin, 2015). The low youth unemployment rate in the less developed regions is explained by the high level of informality, which masks the extent of unemployment (Baah-Boateng, 2015).

Youth unemployment rates differ across countries in Africa ranging from a low of 1.0% in Benin in 2010 to 54.2% in Réunion in 2012 (Figure 1). Six countries, most of which are located in the North and Southern Africa, recorded youth unemployment rates of between 30.7% (Tunisia) in 2005 and 54.2% (Réunion) in 2012. Similarly, seven countries, three of which are in Southern Africa and two each in the North and East Africa, recorded rates of between 20% and 30%. In contrast, 11 countries, all in SSA, recorded youth unemployment rates of less than 10% with Malawi, Rwanda, Congo Democratic Republic (DR) and Benin reporting rate of less than 2%. The relatively higher youth unemployment rates in these four North African countries compared with very low rates in many SSA countries largely explain the disparities in youth unemployment rates between North Africa and SSA. In addition, countries with low youth unemployment rates (mostly in West, Central and East





**Figure 1.** Youth unemployment rates – selected African countries 2005–2013.

**Source:** Key Indicators of the Labour Market 8th edition, International Labour Organisation (ILO, 2014b).

\*Computed by author from country's nationally representative household survey.

Africa) have a high proportion of employment in the informal sector and vice versa (AfDB et al., 2012).

Gender differences in youth unemployment rates across countries are mixed. Of 12 African countries, 10 experienced a higher rate for females than males, with only Mali and Niger recording higher male youth unemployment rates compared to females. Generally, the higher unemployment rate among young females could underscore the difficulties faced by young females in securing employment that tend to undermine the effort towards women's empowerment and gender equality. High youth unemployment rates are also estimated to be an urban phenomenon, with all the 12 countries represented in Table 2 having higher urban youth unemployment rates than in rural areas. This is explained by the dominance of agriculture activities in rural areas; this tends to maintain under-utilisation of the labour force, masking the true face of unemployment. In addition, youth are often attracted to the cities in search for non-existent jobs, as they find life



**Table 2.** Youth unemployment rate by sex, location and education (percentage).

Country	Year	Female–male ratio**	Urban	Rural	No education	Basic	Secondary	Tertiary
Botswana	2006	1.26	40.5	26.2	24.4	33.7	37.8	33.0
Egypt	2010	3.68	9.4	6.8	4.9	9.7	51.2	34.2
Ethiopia	2005	1.37	25.0	0.9	1.9	6.9	37.0	13.5
Ghana	2013	1.15	16.3	7.1	3.8	6.6	14.0	26.4
Malawi*	2004	1.11	11.5	1.0	–	8.0	11.5	9.4
Mali	2005	0.84	33.6	8.1	10.2	18.5	54.1	85.3
Niger	2007	0.47	9.8	8.8	7.9	16.9	–	–
Liberia*	2010	1.94	–	–	–	13.1	26.3	21.4
Senegal	2006	1.69	19.5	10.7	14.1	25.2	30.2	6.8
South Africa	2011	1.21	–	–	31.4	54.9	54.3	34.9
Tanzania*	2006	1.35	19.2	1.6	–	10.8	28.5	30.8
Uganda*	2009	1.38	14.0	1.8	–	4.9	7.1	8.6

Sources: Computed from nationally representative household surveys and African Dev. Bank 2012, pp. 117.

\*Figures for unemployment by education were sourced from Global Employment Trend for Youth 2012 (ILO, 2015: 85). Table A.9.

\*\*Computed from Key Indicators of the Labour Market, 8th Edition (ILO, 2014b).

in the rural areas unattractive considering the low earnings in agriculture, the main economic activity.

Youth unemployment rates are higher among the educated than the less educated or uneducated in Africa, and similar observations have been made in Indonesia (see Chowdhury et al., 2012). Higher youth unemployment rates are reported among those with secondary school education or better, apart from South Africa that showed a marginally higher rate among those with basic education than those with secondary or tertiary education (Table 2). Higher rate among secondary school leavers than other levels is reported in five countries (i.e. Botswana, Egypt, Ethiopia, Senegal and Tanzania), with five other countries (Ghana, Mali, Malawi, Nigeria and Uganda) showing higher youth unemployment rate among university graduates than all other levels. This development is not necessarily bad since the educated can afford to be unemployed because the informal sector does not seem attractive to many of them as an option. Thus, with secondary school education or better, most of these youth do not find the informal sector attractive enough. Coupled with limited job opportunities in the formal sector, they have no choice than to wallow in joblessness. On the other hand, youth with basic or no education have the lowest unemployment rate because they have limited or no access to formal employment that often requires at least secondary school education and clearly can only seek refuge in the informal sector which does not require any education.

## Econometric analysis

### *Model specification and data sources*

In this analysis, the ILO definition of unemployment based on job seeking out of joblessness and readiness to work is adopted, and the target group is the youth aged 15–24 years

based on the United Nations (UN) definition. Different countries and organisations define youth in different ways. The adoption of the UN definition of 15–24 years for the study seeks to ensure consistency and uniformity across countries against the backdrop of varied definition and measurement of youth as demographic group.

Unemployment is a consequence of disparities between demand for, and supply of, labour. From a Keynesian economics point of view, unemployment arises from aggregate demand deficiencies over certain periods in the business cycle, creating a shortage of jobs for an increasing number of jobseekers (Keynes, 1936). Several empirical studies have identified limited job creation opportunities through slow growth of the employment-friendly sectors of agriculture and manufacturing (Aryeetey et al., 2014; Baah-Boateng, 2013). On the supply side, rapid growth of the population and low quality of education relative to skills requirements in the labour market also help explain the employment generation challenges of many African countries (AfDB et al., 2012; Sackey and Osei, 2006).

Following Osberg et al. (1986), we specify the incidence of youth unemployment from demand and supply perspectives as

$$YUR_i = f(S_i) + g(D_j) \quad (1)$$

where  $YUR_i$  is the youth unemployment rate,  $S_i$  refers to the incentives faced by young people to become or remain employed and  $D_j$  measures the incentives to firms to employ young people. In a panel framework involving a sample of African countries over a period of time and accounting for labour market conditions and other controls, youth unemployment in Africa is formulated as

$$YUR_{it} = S_{it}\beta_k + D_{it}\delta_k + X_{it}\theta_k + U_i + \varepsilon_{it} \quad (2)$$

where  $YUR$  is youth unemployment rate,  $S$  denotes a vector of supply factors,  $D$  represents a vector of demand factors while  $X$  is a vector of labour market-related and other controls,  $U$  is a vector of time invariant variables that vary only over countries and  $\varepsilon$  is random disturbance term. The subscript  $i$  represents countries and  $t$  denotes time of 3-year average (i.e. 2000–2002; 2003–2005; 2006–2008; 2009–2011).

The supply-side variables in the model are youth as a share of total population to capture the ‘youth bulge’ effect on youth unemployment and gross enrolment rate as a proxy for education. The growth rate of real GDP and the share of agriculture and manufacturing in GDP (as a measure of the job creation effect of growth) are used to explain the demand side of youth unemployment. Labour market-related variables such as employment-to-population ratio are used to account for a country’s job creation ability (see ILO, 2009), and the vulnerable employment rate is used to link the degree of informality to the incidence of youth unemployment (Baah-Boateng, 2015). The effect of the reservation wage on youth unemployment could not be addressed in the study due to the non-availability of data on wages across countries on the continent. Other control variables include degree of urbanisation to measure urban–rural differences of youth unemployment, female–male ratio of youth labour force participation rate to capture the effect of gender, the country’s total population as a proxy for country size and country’s per

**Table 3.** Description of variables and expected signs of parameters.

Variable	Label name	Measure	A priori sign
YUR	Youth unemployment rate	Unemployment rate for 15–24 years	Dependent variable
yp	Youth population	Youth share in total adult population	–
ed	Level of education of the youth	Gross enrolment rate of secondary education	–
gr	Economic growth	Real GDP growth rate	–
qgr	Quality of economic growth	Agriculture and manufacturing of GDP	–
emp	Employment creation ability	Employment-to-population ratio	–
vul	Vulnerable employment	Share of own account and contributing family work in total employment	–
urb	Urbanisation	Share of urban working age population in total working age population	+
fem	Female	Female–male ratio of labour force participation rate	±
size	Size of population	Total population	+
dev	Level of development	Per capita real GDP	–

GDP: gross domestic product.

capita GDP to account for country’s level of development. The model for estimation is specified as

$$\begin{aligned}
 YUR_{it} = & \beta_0 + \beta_1 yp_{it} + \beta_2 ed_{it} + \beta_3 gr_{it} + \beta_4 qgr_{it} + \beta_5 emp_{it} + \\
 & \beta_5 vul_{it} + \beta_6 urb_{it} + \beta_7 fem_{it} + \beta_8 size_{it} + \beta_9 dev_{it} + U_i + \varepsilon_{it}
 \end{aligned}
 \tag{3}$$

where the description of the variables in the model is as reported in Table 3. The apparent problem of endogeneity between youth and employment-to-population ratio is avoided, because YUR is calculated as the share of the labour force aged 15-24, whereas emp is the ratio of total employment-to-working age population aged 15+. Data for estimation are drawn from two main sources – KILM, 8th edition (ILO, 2014b), and WDI, World Bank (2015). Data on youth unemployment, youth population, employment-to-population ratio, vulnerable employment, female–male labour force participation rate and total population were sourced from KILM, while data on youth education, GDP growth rates, quality of growth, urban population and per capita GDP were derived from WDI.

Descriptive statistics for the variables in the estimated models are shown in Appendix 1 Table 5 and indicate that the panel identifier, country, does not vary within the panels or it is time invariant. A total of 41 of 54 African countries where data for all the variables could be obtained were covered in the analysis and are listed in Appendix 1 Table 6.

**Table 4.** Random-effects GLS regression of 41 countries over 3-year average period of 2000–2011: *Dependent Variable: Youth unemployment rate.*

Explanatory variables	Coefficient	Standard error	z	$p >  z $
Youth population	0.717**	0.367	1.95	0.050
Education of youth	0.004	0.044	0.10	0.923
Real GDP growth rates	0.007	0.072	0.10	0.921
Quality of growth	-0.118**	0.059	-2.01	0.045
Employment creation	-0.730***	0.086	-8.46	0.000
Vulnerable employment	-0.253***	0.050	-5.05	0.000
Urbanisation	0.212***	0.075	2.83	0.005
Female	17.62***	4.246	4.15	0.000
Size of country's population	-0.00005*	0.00003	-1.68	0.092
Per capita GDP	-0.00003	0.0003	-0.10	0.919
Constant	42.100***	10.381	4.06	0.000
$\sigma_u$	5.604			
$\sigma_e$	2.749			
$\rho$	0.806 (fraction of variance due to $u_i$ )			
$R^2$ : within = 0.2927	Number of observation = 164		Wald chi-square (10) = 229.40	
Between = 0.8166	Number of groups = 41		Probability > chi-square = 0.0000	
Overall = 0.7964	Observations per group = 4			

GLS: generalized least squares; GDP: gross domestic product.

\*\*\* $p < 0.01$ , \*\* $0.01 < p < 0.05$ , \* $0.05 < p < 0.10$ .

### Estimation strategy and analysis of results

The estimation process begins with a test of the appropriate estimation technique (fixed effect vs. random effect). The fixed effect approach is necessary in analysing the effect of variables that vary over time by controlling for all time-invariant differences between countries. In contrast, the rationale behind the random effect technique is that the variation across countries is assumed to be random and uncorrelated with the regressors included in the model. In choosing the suitable method of estimation, the Hausman test for fixed versus random effect was carried out and the results (Appendix 1 Table 7) indicate that a random effect technique is appropriate in estimating equation (3) based on probability greater than that represented by the chi-square value of 0.8034. Mindful of the potential multicollinearity problem with the inclusion of per capita GDP to proxy level of development and vulnerable employment rate (which also largely reflects the level of a country's labour market) were introduced separately in the estimation but no significant change was noticed.

Table 4 presents the estimation results for a youth unemployment panel regression model based on the random effect approach. The result of a Breusch and Pagan Lagrangian multiplier test of random effect (see Appendix 1 Table 8) confirms the appropriateness of the random effect estimation technique. In all, the model performed quite well with overall  $R^2$  of about 0.796 to suggest that about 80% of variation in youth

unemployment rate was related to the regressors included in the model. The Wald chi-square and associated probability value imply that the regressors in the model significantly and jointly explain youth unemployment in Africa.

On the supply side, the youth population share was found to significantly explain youth unemployment in Africa. A 1% point increase in the share of youth population in total population implied a 0.72% point rise in the youth unemployment rate, indicating that the 'youth bulge' is a major driver of youth unemployment in Africa. The study, however, found no significant effect of education on youth unemployment in Africa.

On the demand side, the quality of economic growth, measured by the share of agriculture and manufacturing value added in total national output, was found to have a significantly negative effect on youth unemployment, while real GDP growth showed no significant effect on youth unemployment. Thus, an average increase by 1% point in the share of agriculture and manufacturing in total national output by 1% point was found to have a reducing effect of 0.12% points on the youth unemployment rate. This may explain why youth unemployment remains a challenge on the continent against the backdrop of strong growth performance. The recent remarkable growth in Africa has been driven largely by extraction of natural resources such as oil, gold and diamonds (among others), which are known to have weak employment-generating effect. Indeed, high growth driven by mining and oil extraction in countries like Nigeria, Gabon, Angola, Ghana, Botswana, Zambia and so on at the expense of agriculture and manufacturing does not promote the creation of sufficient job opportunities to meet the increasing youth population. Baah-Boateng (2013) argues that the high economic growth driven largely by low labour absorption economic activities of mining and oil extraction in particular as against the slow growth of high employment elasticity sectors of agriculture and manufacturing underscores the strong demand-deficient unemployment in Ghana.

As expected, the ability of countries to generate employment measured by employment-to-population ratio contributes significantly to a decline in youth unemployment. Thus, increasing employment-to-population ratio does not only imply declining inactivity in the labour market but also has the effect of reducing youth unemployment and vice versa. In addition, however, the structure of the labour market has implications for youth unemployment in Africa such that a high rate of vulnerable employment has also contributes to a decrease in youth unemployment and vice versa. Thus, a 1-percentage point higher vulnerable employment rate suggests a 0.25 percentage point lower youth unemployment rate (Table 4). Indeed, in countries where the structure of the labour market provides a platform for informality (dominated by vulnerable employment) to flourish with no social benefit for the unemployed, youth tend to seek refuge in the informal sector for survival rather than remaining unemployed. On the other hand, in a well-structured and regulated labour market with some social protection programmes for the unemployed and limited or no avenues for informality to develop, youth have no choice but to register as unemployed to enjoy social benefits, resulting in reported high open unemployment (AfDB, 2012; Baah-Boateng, 2015). Indeed, in countries such as Benin, Burkina Faso, Malawi and Rwanda where informality is estimated to be over 90%, unemployment rates are very low at less than 5%, while in South Africa, Namibia, Botswana, Tunisia and Algeria, where informal sector constitutes less than 25%, youth unemployment rates are high at over 25%.

The empirical results also contribute to the evidence for higher urban youth unemployment rates relative to rural rates (Anyanwu, 2013; Baah-Boateng, 2013; Dickens and Lang, 1995; Sackey and Osei, 2006). Thus, the significantly positive coefficient of the urban dummy variable suggests that a 1-percentage point rise in the degree of urbanisation measured by urban share in total population has a 0.2percentage point increasing effect on youth unemployment rates. The attraction of urban life vis-à-vis low income from rural agriculture draws many people – particularly youth – into the cities in search for better-paid jobs that are however often not readily available. This phenomenon helps account for the higher incidence of youth unemployment in urban than rural areas (Baah-Boateng, 2013).

The gender dimension of youth unemployment in Africa appears to suggest stronger labour market challenges for young females than young males. The ratio of female-to-male labour force participation rates indicates that greater participation of females relative to males has an increasing effect on youth unemployment in Africa. People participate in the labour market as either employed or unemployed, and this observation implies that a higher proportion of young females than young males participate in the labour market as unemployed. The size of a country is observed to have a decreasing effect on youth unemployment even though the statistical significance of the coefficient is weak. The level of a country's development measured by per capita real GDP is observed to have no statistically significant effect on youth unemployment in Africa, contrary to findings by Anyanwu (2013) that per capita real GDP has negative and statistically significant effects on youth employment, indicating a positive effect of per capita GDP on youth unemployment in Africa.

## **Conclusion and policy recommendation**

The empirical analysis of the study provides some policy thoughts in addressing youth unemployment challenges in Africa. From the supply side, the strong effect of the 'youth bulge' on youth unemployment calls for measures to address the increasing youth population. The adoption of population control measures such as promotion of female education beyond secondary level as a fertility-reducing strategy could slow down population growth and address the increasing youth population challenge. It should, however, be done by accounting for each country's specific features and characteristics, since the problem of high population growth and the youth 'population bulge' may not be the same across countries. In addition, even though there is no evidence of a link between education and youth unemployment, investment in youth education and skill development would make the youth more productive and useful in the labour market.

From the demand side, youth unemployment in Africa cannot be addressed by just focusing on the level and rate of economic growth but rather the quality of growth, which is directly linked to the source of economic growth. This is based on the evidence of statistically significant effects of the share of agriculture and manufacturing value added on youth unemployment, and no link between economic growth and youth unemployment. This suggests that job creation policies need to go beyond a focus on the rate of economic growth to addressing the source of growth. High economic growth stimulated

by agriculture and manufacturing, considered as high employment elasticity sectors in Africa, rather than low labour absorption sectors of mining and oil extraction, is more likely to create more and better employment opportunities for the increasing youth labour force. This does not imply a call for a neglect of mining and extractive sectors that have low employment elasticity of output. Resources generated from activities in these sectors could be invested in education and skill training and infrastructural development to facilitate the growth of employment-oriented sectors of the economy. Indeed, it is important for Africa to treat job creation as a priority in its development agenda rather than regard it as a passive outcome of economic policies.

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## Appendix I

**Table 5.** Descriptive statistics for variables in the panel estimation.

Variable		Mean	Standard deviation	Minimum	Maximum	Observations
<i>Youth unemployment rate</i>	Overall	17.71	14.21	0.70	58.90	N= 164
	Between		14.06	0.70	51.98	n=41
	Within		2.79	6.68	32.78	T=4
<i>Youth population</i>	Overall	20.31	1.62	15.70	24.70	N= 164
	Between		1.55	16.35	24.00	n=41
	Within		0.49	18.48	21.56	T=4
<i>Education of youth</i>	Overall	44.12	23.64	7.00	94.90	N= 164
	Between		23.12	10.20	90.55	n=41
	Within		5.88	32.35	61.85	T=4
<i>Real GDP growth rate</i>	Overall	4.77	3.93	-9.50	26.6	N= 164
	Between		2.50	-2.89	10.18	n=41
	Within		3.05	-14.82	21.27	T=4
<i>Quality of growth</i>	Overall	34.71	14.26	4.40	81.70	N= 164
	Between		14.00	8.08	70.63	n=41
	Within		3.30	17.19	45.94	T=4
<i>Employment creation</i>	Overall	61.9	14.47	31.50	86.90	N= 164
	Between		14.55	35.55	86.28	n=41
	Within		1.35	56.05	69.60	T=4
<i>Vulnerable employment</i>	Overall	65.70	25.08	10.10	95.70	N= 164
	Between		25.15	13.68	94.64	n=41
	Within		2.87	50.10	73.08	T=4
<i>Urbanisation</i>	Overall	62.04	16.18	14.30	91.50	N= 164
	Between		16.24	16.58	90.48	n=41
	Within		1.71	57.67	66.27	T=4
<i>Female</i>	Overall	0.84	0.24	0.18	1.36	N= 164
	Between		0.24	0.19	1.29	n=41
	Within		0.03	0.75	1.00	T=4
<i>Country’s population size</i>	Overall	21,370	26,798	451.0	159,761	N= 164
	Between		26,892	474.0	142,270	n=41
	Within		2878	5136.0	38,861	T=4
<i>Per capita GDP</i>	Overall	1594.4	1936.5	119.4	9691.1	N= 164
	Between		1800.4	159.9	6861.7	n=41
	Within		753.9	-1358.4	4423.9	T=4

GDP: gross domestic product.

**Table 6.** List of African countries used in the analysis.

Algeria	Cabo Verde	Ghana	Mali	Rwanda	Tanzania
Angola	Cote d'Ivoire	Guinea	Mauritius	Reunion	Togo
Benin	Congo DR	Kenya	Morocco	Senegal	Tunisia
Botswana	Congo Republic	Lesotho	Mozambique	Sierra Leone	Uganda
Burkina Faso	Egypt	Liberia	Namibia	South Africa	Zambia
Burundi	Ethiopia	Madagascar	Niger	Sudan	Zimbabwe
Cameroon	Gabon	Malawi	Nigeria	Swaziland	

**Table 7.** Hausman fixed versus random effect.

Variable	Coefficients		(b - B) difference	sqrt(diag(V_b_B)) standard error
	(b) Fixed	(B) Random		
Youth population	0.115	0.717	-0.602	0.261
Education of youth	0.002	0.004	-0.002	0.043
Real GDP growth rate	0.047	0.007	0.040	-
Quality of growth	-0.055	-0.118	0.063	0.046
Employment creation	-0.920	-0.730	-0.190	0.156
Vulnerable employment	-0.233	-0.253	0.020	0.061
Urbanisation	0.075	0.212	0.137	0.215
Female	11.15	17.62	-6.466	5.915
Country's population size	-0.000049	-0.000034	-0.000015	0.0001
Per capita GDP	-0.00025	-0.00003	-0.00021	0.0001

*b* = consistent under  $H_0$  and  $H_a$  – obtained from xreg  
*B* = inconsistent under  $H_a$ , efficient under  $H_0$  – obtained from xreg  
 Test:  $H_0$ : difference in coefficients not systematic  
 $\chi^2(B) = (b - B)' [V_b - V_B]^{-1} (b - B)$   
 = 4.56  
 Probability > Chi-square = 0.8034  
 ( $V_b - V_B$ ) is not positive definite

GDP: gross domestic product.

**Table 8.** Lagrangian multiplier test for random effect.

Breusch and Pagan Lagrangian multiplier test for random effects

Youth unemployment rate [code, t] =  $Xb + u[\text{code}] + e[\text{code}, t]$

Estimated results:

$\sqrt{\text{Var sd}} = \sqrt{\text{Var}}$

Youth unemployment rate |201.9391|4.21053

e|7.5567672.748957

u|26.946845.191034

Test:  $\text{Var}(u) = 0$

$\text{chibar}^2(01) = 109.09$

Probability >  $\text{chibar}^2 = 0.0000$