Characteristics and Macroeconomic Determinants of Youth Employment in Africa

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Characteristics and Macroeconomic Determinants of Youth Employment in Africa*

John C. Anyanwu**

***Abstract*:** The purpose of this paper is to present the characteristics of youth employment in Africa as well as investigate its macroeconomic determinants, with a view to proffering some solutions. Our empirical estimates, using available cross-sectional data over the period 1991–2009 show that a nation's domestic investment rate is found to be positively and significantly associated with youth employment in the overall Africa and sub-Saharan estimations. However, domestic investment rate is negatively and significantly associated with youth employment in North Africa. Government consumption expenditures negatively and significantly affect youth employment in sub-Saharan Africa. Rising inflation is negatively and significantly associated with youth employment in North Africa. The level of real GDP per capita has a negative and statistically significant effect in both the overall Africa and North Africa youth employment. The quadratic term of real GDP per capita is positive in sign and significant only in the youth employment estimation for the whole of Africa. We find that real GDP growth positively and significantly affects youth employment in the overall Africa, sub-Saharan and North Africa estimations. Other important variables considered are globalization indicators (FDI and trade openness), credit to the private sector, ICT infrastructure, education, demographic factors, institutionalized democracy, time trend, net oil-exporting/importing country, and regional dummies. Key policy implications include increased productive domestic investment; promoting government expenditure effectiveness; reforming the fiscal systems for consolidation by all levels of government; effective regulation of FDI for domestic job creation; improvements in the diversification, competitiveness and value addition of African export commodities; encouragement of entrepreneurship and access to financing for the youth; greater productive infrastructure development; up-skilling, better training and education for the low-skilled workforce; the promotion of effective democracy that will design policies friendly to youth job creation; and efficient management of oil and other natural resources throughout the value chain.

1. Introduction

Youth (aged 15–24) unemployment is currently one of the greatest development challenges facing countries globally, including those in Africa. In 2011, about 74.8 million youth globally were unemployed (an increase of more than four million since the start of the global financial and economic crisis in 2007), with nearly 20 per cent of them in Africa. The global youth unemployment rate, estimated at 12.5 per cent in 2011, remains a full percentage point higher than the pre-crisis level. In 2011, youth unemployment in sub-Saharan Africa (SSA) was slightly higher than the global average at 12.8 per cent but with North Africa averaging 27.1 per cent, the highest amongst the regions of the world. This gives an average of about 20 per cent youth unemployment in Africa in 2011. In addition, young people in Africa are about three times as likely as adults to be unemployed. Youth unemployment is also predominantly an issue for women in Africa, especially in North Africa. While the unemployment rate for young women in North Africa was 34.3 per cent in 2010 (compared to the global average of 13.1 per cent), the rate for young men stood at 18.5 per cent (compared to the global average of 12.5 per cent), both are the highest for any region (ILO, 2012a, 2012b).

The human misery and social exclusion of youth unemployment in Africa (especially in North Africa) is indeed a time-bomb, given that it was one of the main triggers of the Arab Spring ('revolution') in North Africa in January 2011, which led to the fall of

*The views expressed here are those of the author and in no way reflect those of the African Development Bank and its Executive Directors.

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the governments in Tunisia, Egypt and Libya. It also triggered a spate of socio-economic cum political reforms in the other countries in the sub-region and elsewhere in the world.

Thus, youth employment is currently a global policy issue: youth employment increases economic growth; promotes political and social stability; positively affects progress toward the Millennium Development Goals (MDGs) and poverty reduction generally. It also leads to better social equalities, especially among the youth, and results in efficient resource allocation, increased productive potential and a low dependency ratio (Anyanwu and Erhijakpor, 2012).

In addition to analysing the characteristics of youth employment and unemployment in Africa, this paper empirically studies the main macroeconomic determinants of youth employment (proxied by youth employment-to-population ratio for the age group 15–24 over the period, 1991 and 2009), using cross-sectional data. It also draws out important policy implications for African countries. The model is estimated by feasible generalized least squares (FGLS) method with sub-regional and oil fixed effects.

The next section of the paper summarizes the trend evidence on the characteristics of youth employment-to-population ratios (an indicator of how effective a country utilizes the productive potential of its youth). The third section reviews some relevant empirical literature. The fourth section presents the model and data while Section presents the cross-country regressions of the key macroeconomic determinants of youth employment in the entire continent, sub-Saharan Africa and North Africa. The last section concludes with policy recommendations, including suggestions on how to create more youth employment in African countries.

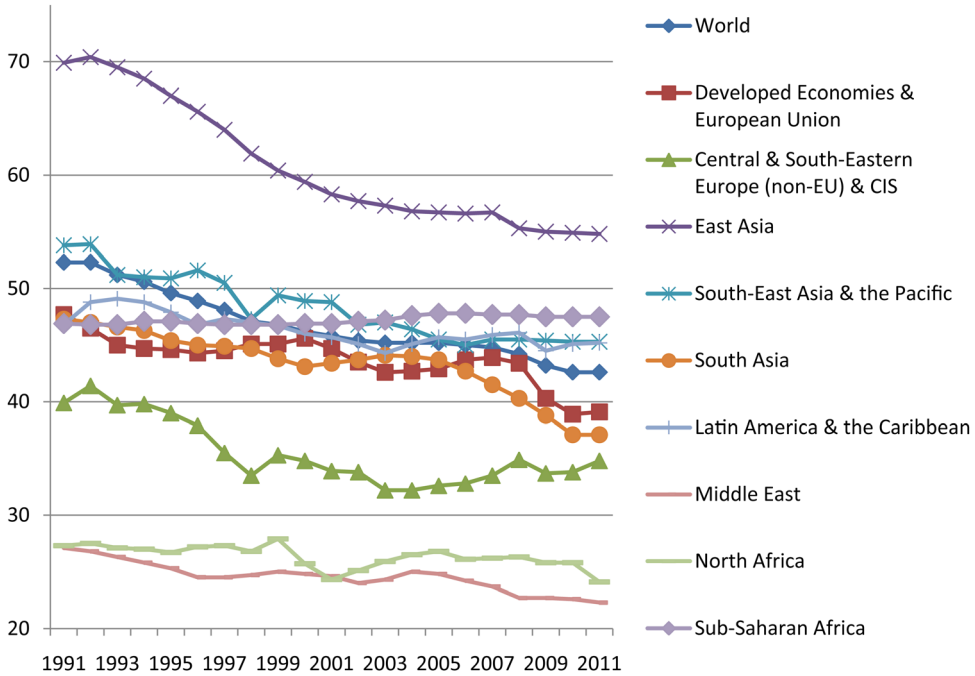
2. Youth Employment and Unemployment in Africa

2.1 Recent Trends in Youth Employment and Unemployment in Africa

Moderate Youth Employment Ratios in Sub-Saharan Africa — But Very Low Ratios in North Africa

The youth employment-to-population ratio (the proportion of the youth, aged 15 to 24 years, that is employed) by region is presented in Figure 1. While South Asia (with declining trend) had trumped other regions since 1991, those of sub-Saharan Africa

Figure 1: Youth employment ratios by region (%), 1991–2011



Source: Adapted from KILM ILO database.

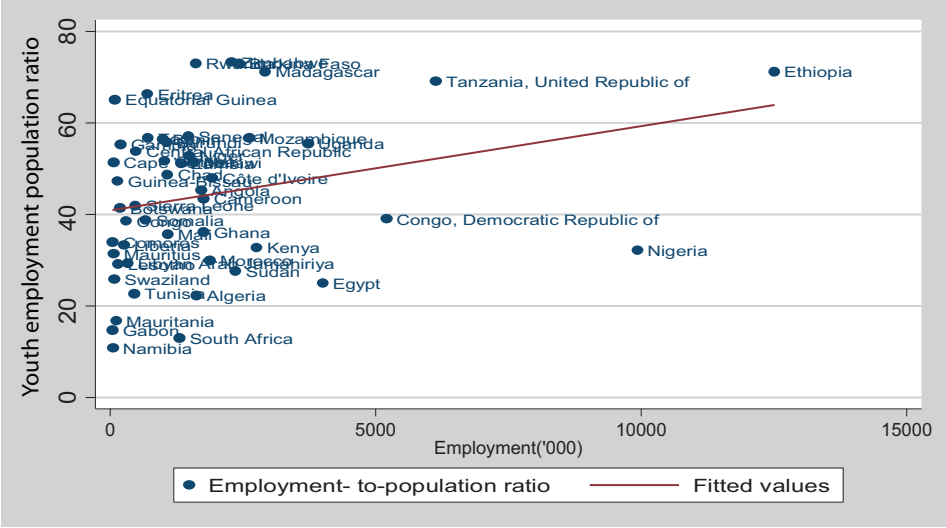
had remained at roughly 47 per cent while those of North Africa had fallen slightly from about 27 per cent in 1991 to 24 per cent in 2011. The overall African average between 1991 and 2011 stood at 36.8 per cent. However, these regional trends mask significant country differences. As Figure 2 shows, eight countries with employment ratios above 60 per cent in 2010 are in sub-Saharan Africa: Burkina Faso, Equatorial Guinea, Eritrea, Ethiopia, Madagascar, Rwanda, Togo, Tanzania and Zimbabwe.

On the other hand, mineral-rich and North African countries tend to dominate the lower end of the graph with low employment ratios. Also, as Figure 3 demonstrates, female youth employment-to-population ratio in North Africa is very low at an average of 13 per cent (against 39 per cent for males) – and indeed by far the lowest throughout the period, 1991 to 2011 of world regions. This huge gender gap in youth employment in North African countries largely explains the generally low levels of youth employment ratios in the sub-region. For the African continent as a whole, youth employment ratio averaged only 28.74 per cent for females against 44.65 per cent for the males between 1991 and 2011.

High Youth Unemployment Rates in North Africa

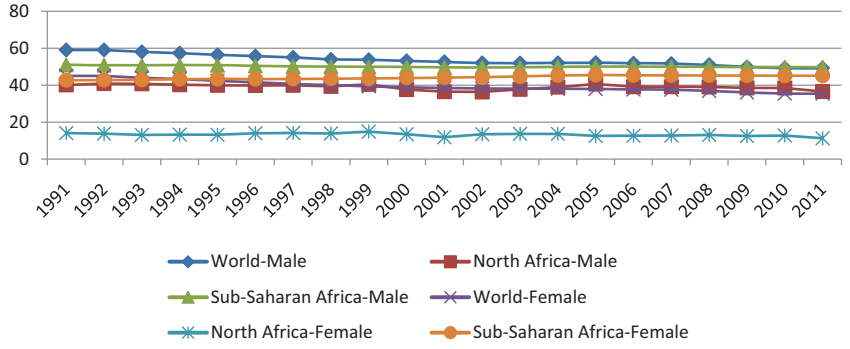
Figure 4 shows that North Africa (followed by the Middle East) has the highest (exceeding 25 per cent) youth unemployment in the world — significantly higher than the 17.3 per cent of the OECD area. Indeed, North Africa (with the Middle East) is the only

Figure 2: Youth employment ratios by country (%), 2010



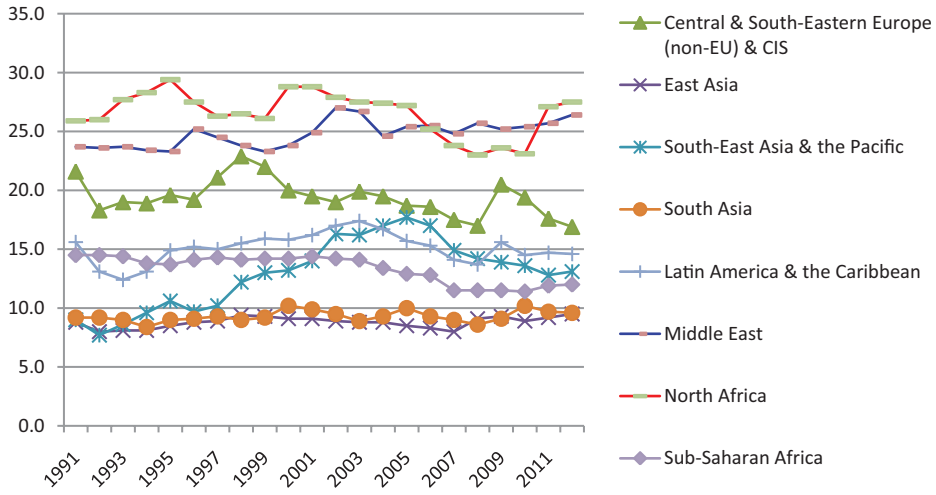
Source: Adapted from KILM ILO database.

Figure 3: Youth employment rates by gender (%), 1991–2011



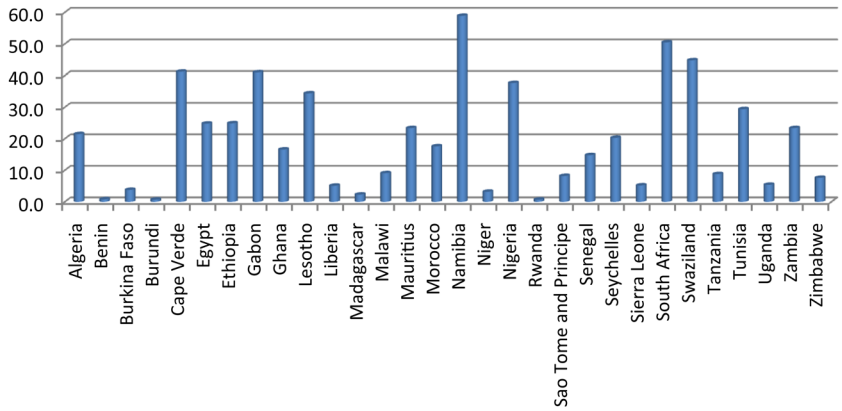
Source: Adapted from KILM ILO database.

Figure 4: Trend in regional youth unemployment rate, 1991–2012



Source: Adapted from KILM ILO database.

Figure 5: Youth unemployment rate (%) in African countries, latest data



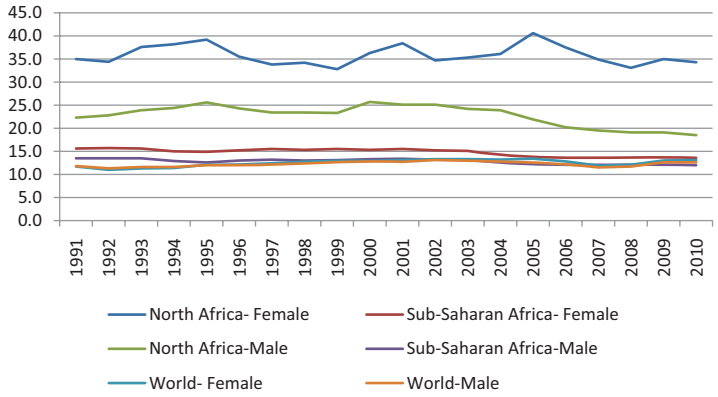
Source: Adapted from KILM ILO database.

region where youth unemployment exceeds 20 per cent globally, showing that unemployment is particularly acute among the youth (15–24 years). As seen in Figure 5, significant country differences exist in youth unemployment in Africa, with a number of the relatively high-income countries exhibiting high youth unemployment rates. Indeed, the issues of high unemployment (youth and overall) and regulations surrounding it were some of the main triggers of the self-immolation of Mohamed Bouazizi in Tunisia that eventually led to the Arab revolution.

Without doubt, Africa, with about 200 million young people between the ages of 15 and 24 (representing about 20 per cent of the continent's population — the 'youth bulge') urgently needs both gainful and dignified employment. Youth unemployment rates are also higher for women, but much more so in North Africa where female youth unemployment rate is almost double that of the male (Figure 6).

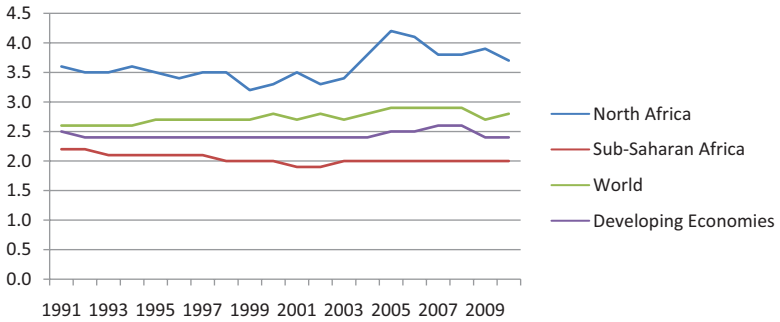
In addition, youth unemployment rates are generally more than twice the rates of adult unemployment in many countries on the continent. Indeed, while the ratio of youth to adult unemployment in sub-Saharan Africa is about 1:2, it is about 1:4 in North Africa (Figure 7).

Figure 6: Trend in youth unemployment rate by gender, 1991–2010



Source: Adapted from KILM ILO database.

Figure 7: Ratio of youth unemployment rate to adult unemployment rate, 1991–2010



Source: Adapted from KILM ILO database.

2.2 Characteristics of Youth Employment and Unemployment in Africa

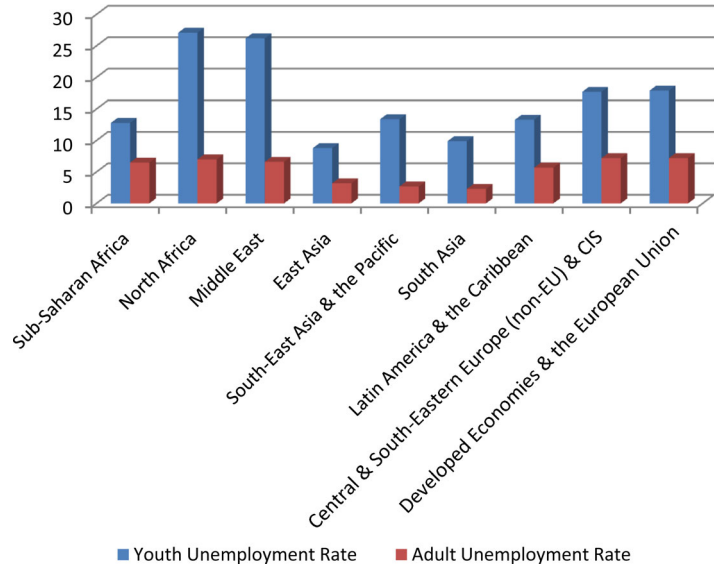
Youth Unemployment Is Higher than Adult Unemployment

In Africa, as in other regions, youth unemployment rates are higher than those of adults, aged 25 years and over (see Figure 8). A number of reasons have been advanced for the labour market bias against young people: the younger workers tend to be easier and less expensive to dismiss than older ones; employers lay off young workers first because the cost to establishments of releasing young people is generally perceived as lower than for older workers; employment protection legislation usually requires a minimum period of employment before it applies, and compensation for redundancy usually increases with tenure; since they make up a disproportionate share of new jobseekers, the youth suffer most from freezes in hiring by establishments or economically induced (such as the current financial crisis) reductions; and young people tend to 'shop around' for jobs while easily entering and exiting the labour force as they move between employment, school enrolment and unemployment.

Youth Unemployment in Africa Is Deep

Figure 9 illustrates the depth of the youth employment challenge by region. Using latest available data, the share of unemployed youth in the youth population in sub-Saharan Africa, at 9.6 per cent, is the highest among the world's regions, indicating that the

Figure 8: Youth and adult unemployment rates by region, 2011



Source: Adapted from KILM ILO database.

sub-region is clearly having a problem in utilizing its potential youth labour force. Moreover, unlike in East Asia, central and South Eastern Europe as well as developed economies and the European Union, the share of unemployed youth in total unemployment in Africa (sub-Saharan and North) is high, showing that the unemployment problem is more of a youth one on the continent. In these two sub-regions, more than 45 per cent of jobseekers are young and they face barriers in fierce competition for the limited numbers of existing vacancies.

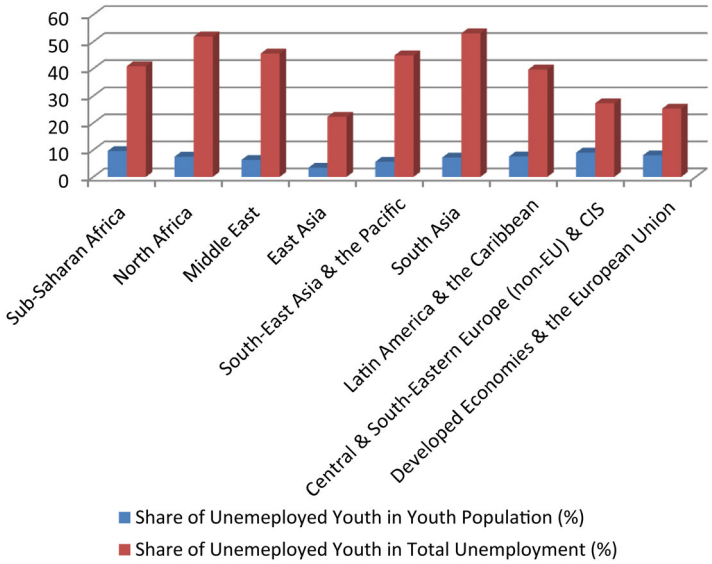
High Level of Informal Youth Employment in African Countries – And Associated High Working Poor

Existing data indicate that youth informal employment represents a very high percentage of all non-agricultural employment in many African countries (Figure 10). This is over 40 per cent in 11 countries for which data are available, reaching over 70 per cent in countries such as Kenya, Rwanda and Mali. While the informal sector plays a major role in employment creation, production and income generation in these countries, it acts as a 'fallback' job, offering a necessary survival strategy in the absence of social safety nets (such as unemployment insurance), pensions and decent and livable wages. This explains the positive relationship between the share of the employed in the informal sector and youth employment ratio (Figure 11). In addition, those employed in the informal sector are mostly casual, short-term and seasonal workers, lacking rights and freedom of association, legal status, social protection, and health benefits — but working mostly in self-employment or in unregistered and/or small-scale private unincorporated enterprises. It is not therefore surprising that youth employment is associated with a high level of poverty (Figure 12).

High Youth Inactivity Rate, Especially for Females

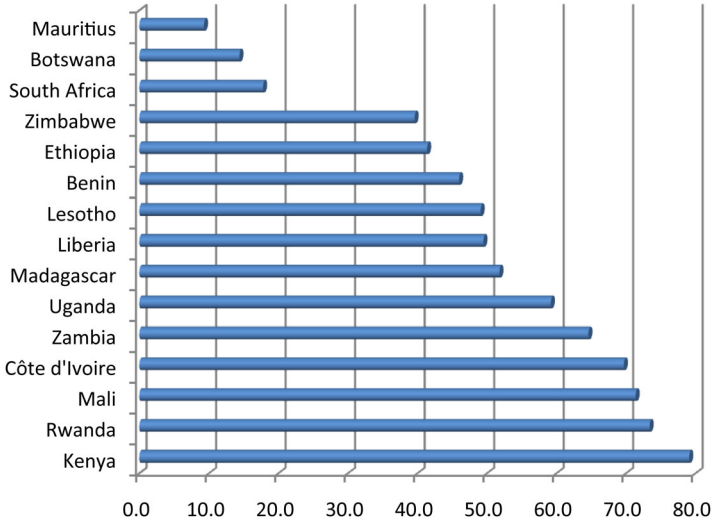
Youth inactivity rate — the proportion of the working-age population that is not in the labour force — is high in Africa, reaching an average of 48 per cent in 2011 and averaging 47 per cent between 1990 and 2011. But it is more overwhelming for females, reaching 53 per cent in 2011 against 43 per cent for males. Such a high proportion of the youth working-age population being economically inactive means that these potential workers are underutilized. It also reflects increased discouragement and more so that more youth are enrolling and staying longer in educational institutions as an alternative to entering the labour force.

Figure 9: Share of youth unemployed in total unemployment and in youth population, regional averages of latest year data



Source: Adapted from KILM ILO database.

Figure 10: Share of youth employed in the informal sector in total non-agricultural employment (%) in selected countries, latest data

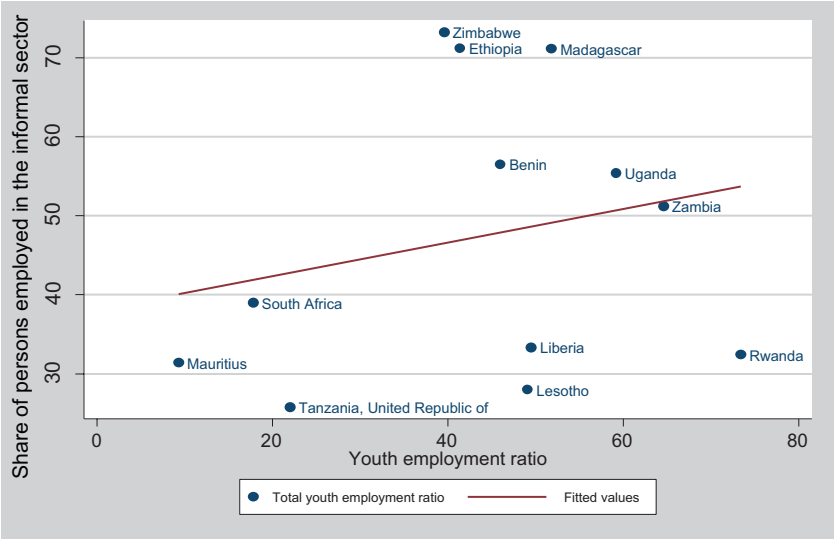


Source: Adapted from KILM ILO database.

High Percentage of Youth Not in Education, Employment or Training (NEET), Especially for Females — And Associated High Poverty Rates

It is a matter of serious policy concern that a large proportion of African youth is not in education, employment or training ('NEET') (Figure 13). The share of the female youth not in employment or education/training as a percentage of the youth population (the NEET rate) is even more alarming as Figure 13 shows for all the selected countries. For example, in Niger, NEET

Figure 11: Informality and youth employment ratio, latest data

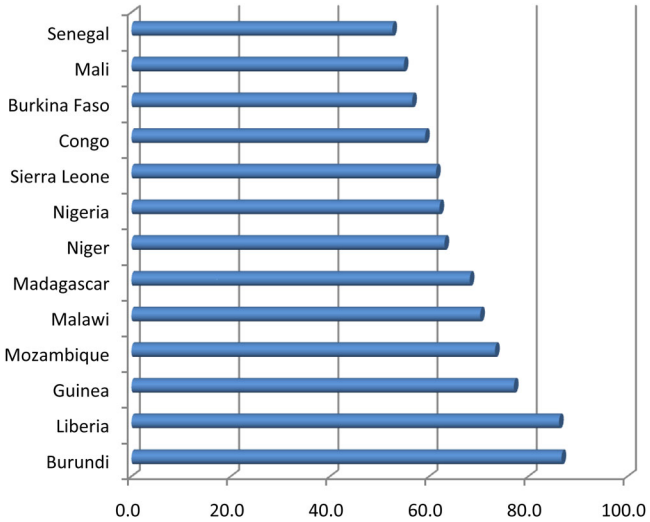


Source: Adapted from KILM ILO database.

rate for females reached 68 per cent against 21 per cent for the males. A key result of this is the associated high poverty rates (at the US$1.25 a day level).

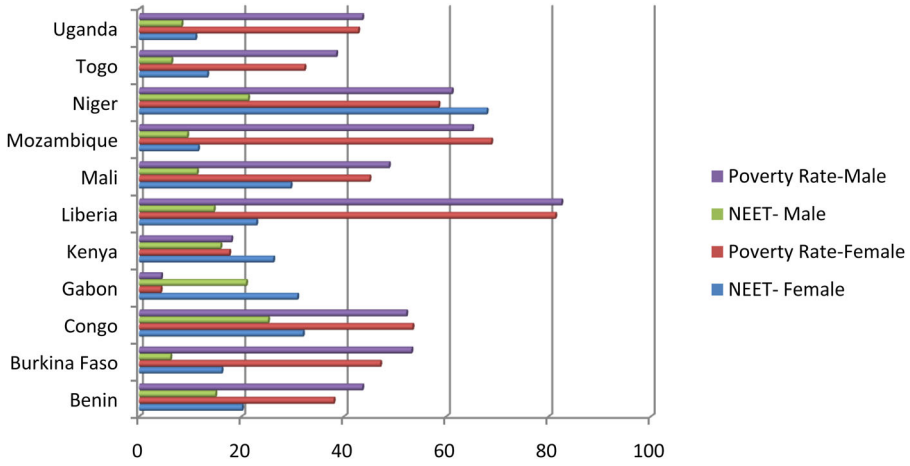
As with many developing regions of the world, Africa is characterized by persistent skills mismatches as confirmed by the World Bank's Enterprise Surveys. The skills mismatch occurs in various areas, including entrepreneurial and managerial skills, analytical capabilities, language acquisition, and other technical skills. The mismatch between available skills and the job market's needs in most African countries hinders employment growth.

Figure 12: Share of youth working poor at US$2 a day in total employment (%) in selected countries, latest data



Source: Adapted from KILM ILO database.

Figure 13: Youth not in education, employment or training (NEET) and poverty rates in some African countries, by sex (%)



Source: Adapted from KILM ILO database.

3. Literature Review

The literature suggests that the key factors affecting youth employment relate to macroeconomic factors, globalization, access to credit by the private sector, infrastructure availability, education, demographic factors, cultural and social norms, perceptions and expectations, political systems and the level/stage of economic development. These conform roughly to what Spierings, Smits and Verloo (2008) refer to as opportunities, needs and values in their framework of factors affecting women employment.

The first macroeconomic variable is domestic investment. Domestic investment is a key source of employment, wealth creation and innovation. Increasing domestic investment levels is also fundamental to poverty reduction. Without it, countries are unable to spur the growth of their economies or to sustain the reduction of poverty over the long term. Where domestic investment is low, the productive capacity of the economy fails to increase. This results in lower rates of economic growth, fewer opportunities for the poor to improve their livelihoods, and lower rates of job creation. As the International Labour Organization (ILO, 2011) shows, investment growth has a strong and positive effect on employment creation. The results show that a one percentage point increase in the investment growth rate would produce a 0.12 percentage point increase in employment growth. In addition, results from ILO (2012c) show that both private and public investment rates positively and strongly affect employment.

The second macroeconomic variable influencing youth employment is government consumption expenditure. The literature on the relationship between government consumption expenditure and youth employment focuses on the transmission mechanisms and the results of policy actions. According to the real business cycle (RBC) model, an increase in government consumption expenditure (financed by current or future lump-sum taxes) has a negative wealth effect which should lead to a decline in consumption and hence a rise in labour supply. The rise in labour supply leads, in equilibrium, to a lower real wage, higher employment and higher output (Ramey, 2011a, 2011b; Wilson, 2012). However, the New Keynesian models differ in that they generally assume some degree of stickiness, that is, that wages and prices do not adjust instantly to economic shocks (Christiano *et al*., 2011). Earlier, the Keynesian IS-LM model had asserted that consumption rises in response to an increase in government consumption expenditure. According to the proponents of this position, consumers exhibit non-Ricardian behaviour in the IS-LM model and consumption is a function of current disposable income. Thus, the impact of an increase in government consumption expenditure depends on how the government consumption expenditure is financed with the fiscal multiplier increasing with the extent of deficit financing (see Wilson, 2012). Indeed, Wilson (2012) concludes that though the impact depends on the environment in which expenditures are made, the effects of government investment are potentially greater than other types of government expenditure, a type of result found by Kehoe and Serra-Puche (1982). Aiyagari *et al*. (1990) also find that persistent changes in government consumption have contemporaneous employment and output effects which are larger than those due to transitory changes. Fatás and Mihov (2002) find that increases in government consumption lead to increases in employment.

Also, ILO (2012c) finds that government expenditures on public wages and salaries, social benefits, and social transfers positively and significantly affect employment while government expenditures on interest payments significantly reduce employment.

The third macroeconomic variable is inflation rate. According to the findings of Niemi and Lloyd (1981), inflation has an independent, positive impact on female labour force participation. As a result of women's lower cash holdings relative to men, it is posited that it possible that women are less adversely affected than men are by increases in inflation (Cardoso, 1992). In a recent cross-sectional study, Choudhry *et al*. (2012) find that inflation has a negative and significant effect on youth unemployment.

There is evidence that, as countries develop, female labour force participation, for example, displays a U-shaped trajectory. A number of hypotheses have been put forward as to why female labour force participation first falls before rising with economic development levels. Boserup (1970) suggests that men's greater access to education and technologies implies that they displace women from the labour force during the early stages of a country's development. As development continues and women gain more access to education and technologies, female labour force participation increases. Another well-established hypothesis for this phenomenon focuses on income and substitution effects. As development occurs, households' unearned incomes rise, reducing the incentive of women to work outside the home. The negative impact of rising incomes on women's labour force participation is termed the 'income effect', since greater household income implies that households are able to afford more female leisure time. On the other hand, the substitution effect works in the opposite direction — as youth wages rise, more youth have the incentive to enter the labour market (Goldin, 1995; Mammen and Paxson, 2000; Bloom *et al*., 2009; Chaudhuri, 2009; Tam, 2011). The stylized U-shaped curve holds for African countries as demonstrated in the empirical results section. This holds for both men and women. Countries like Namibia, Tunisia, Equatorial Guinea and the Seychelles have substantially higher levels of youth employment ratios than the continental average relative to their per capita GDP levels, while the employment ratio is near the continental average in countries such as Nigeria, Côte d'Ivoire and Angola.

In a study on the Euro Area, Gomez-Salvador and Leiner-Killinger (2008) find that economic conditions, represented by economic growth, are negatively correlated with the youth unemployment rate, that is, the youth unemployment rate increases when the economic situation worsens in the zone. Choudhry *et al*. (2012) find similar results in a recent cross-sectional study.

However, economic integration can solidify gendered occupational segregation, which forces women into poorly paid jobs. At the same time, policies designed to increase trade and FDI inflows reduce state revenue, and therefore reduce the government's capacity to provide social services. Because women are often the key beneficiaries of these services, economic integration can undermine female employment in many dimensions.

Recent empirical work finds that globalization can improve employment because foreign direct investment (FDI) and international trade can generate employment opportunities, especially for women (Richards and Gelleny, 2007). As Javorcik (2013) notes, one of the reasons why policy-makers in developing and developed countries strive to attract foreign direct investment (FDI) is to create new jobs in their economies. According to Oostendorp (2009), inflows of foreign capital to local markets are held to have positive effects on female employment as multinational corporations (MNCs) frequently provide women with employment outside of the home — often in countries where these opportunities would not have existed in its absence. However, in the long term, FDI may make women more likely to either lose their jobs to men or be pushed down the production chain into subcontracting work. Furthermore, FDI may further widen the gender gap as technical training is mostly offered primarily to men, thereby 'improving male technical knowledge and reducing women's access to technology and employment' (Parpart *et al*., 2000). Also, foreign investment could have a disproportional adverse effect on women if it serves to reinforce existing gender inequalities (Ward, 1984; see also Ernesto, 2011). In their study, Choudhry *et al*. (2012) find that both openness and FDI have a negative and significant effect on youth unemployment. Using both aggregate and sub-industry level manufacturing data, Orbeta (2002) shows that the impact of openness on the proportion of women workers is not significant in the aggregate but at the manufacturing sub-industry level, the increase in the propensity to export is a boon for women workers.

The banking sector is the key conduit for financial intermediation in an economy. It has also been argued that financial constraints induced by information asymmetries make firms' labour demand dependent on their balance-sheet position. Thus, employment fluctuates according to financial pressures faced by firms (see Gatti *et al*., 2011). Other works also show that financial factors affect employment through their impact on firms' creation. As Acemoglu (2001) notes, financial constraint is harmful to employment because it hinders the emergence of new innovating firms, which are particularly job-creating.

Thus, access to credit by the private sector enhances the productive capacity of businesses. Businesses and enterprises with adequate credit access have greater potential to grow in terms of sales, revenues and operations; expand investments; and to create more employment. Indeed, greater access to credit by the private sector fosters growth because the greater the access to credit by the private sector, the fewer firms will be financially constrained and the larger the number of investment projects undertaken. This in turn should foster employment and economic growth. Financial development also contributes to building and improving

productivity of assets held by poor people, create opportunities for entrepreneurship and new investments, improve efficiencies in product and factor markets, and stimulate private sector development, and job creation (see Gandelman and Rasteletti, 2012). Also, as the International Finance Corporation (IFC, 2012) notes, improving access to finance helps firms expand their operations, which can have a positive effect on the quality and number of jobs created. The effects tend to be greatest for smaller firms. In a recent review of seven evaluations that focused on the provision of loans and advisory services to MSMEs and households, carried out by the IFC (2012), the finding is that private sector access to credit has mainly positive effects on job creation. The report concludes that increasing access to loans helped firms expand, facilitating the hiring of more workers.

Chen (2004) shows that increases in the level of ICT infrastructure tend to improve labour activity rates. In addition, the author shows that education among the general population, gender equality in education, and economic development are important for improving labor market activity. In a study of the determinants of employment of affiliates of US MNEs in Africa, Asiedu (2004) finds that infrastructure, proxied by phones per 1,000 population, has positively and significant effect on employment. Also, Lin (2012), in a study of the Japanese case, finds that the combined effects of structural changes and the business cycle play the main roles in explaining the employment changes in Japan. Industry ICT intensity has increased the share of male regular employment in sectors that hire a larger proportion of professional workers but the opposite story is found in the case of women. This suggests that there is a gender bias in ICT usage within specialist/managerial occupations, with a larger share of women possibly involved in less complex computer tasks relative to men and those tasks are more likely to be substituted by computer and irregular workers.

In a multinational corporation context, Asiedu (2004) show that education, proxied by literacy rate, increases employment. As Sakellariou (2011) had explained, changes in educational attainment, demographic profile of the population, explain changes in the female-male gap in labour force participation, especially in rural communities. Changes in education and literacy contribute to the explanation of variation in female labour force participation within a country (Ogawa and Akter, 2007; World Bank, 2010; Gallaway and Bernasek, 2004). Recent findings by Cipollone *et al*. (2012) show that increasing (positive) effect of the level of education plays an important role in explaining women's participation to the labour market, with important differences across EU countries characterized by different institutional and welfare settings.

Gomez-Salvador and Leiner-Killinger (2008) find that there is a positive relationship between the share of young people in the total population and the youth unemployment rate in the Euro Area, that is, the smaller the share of young people in the population, the lower the risk of them being unemployed in the Euro Area. In a recent study, Tseloni *et al*. (2011) find that a relatively greater participation of women in paid employment is evidenced in more populous countries, with a greater share of women in their populations, more equal income distribution, and higher growth rates, but lower level of economic development, democracy ratings or international capital mobility (i.e., current account surplus or deficit/GDP).

With respect to urbanization, it has been posited that cities have the advantage of matching the skills of the workforce to local jobs (Helsley and Strange, 1990; Kim, 1987, 1990; Sato, 2001; Wheeler, 2001; Finney and Kohlhase, 2008). Urban areas place a large number of people in close proximity to a large number of potential employers as urbanization decreases the cost of making market transactions.

Campa *et al*. (2011) analyse the extent culture affects the gender gap in employment. They show that the index of culture based on firms' attitudes as well as female literacy and education are significant in explaining gender gap in employment in Italian provinces. As Forsythe *et al*. (2000) have noted, with respect to the effect of culture, 'rapid development is particularly likely to be accompanied by greater gender rigidity in a country with a tradition of patriarchal institutional arrangements'. Indeed, Boserup (1970), Moghadam (1994), Shukri (1996), Psacharopoulos and Tzannatos (1989) find that Muslim and Latin American countries — countries with strong socio-religious views about women's role in the public sphere and the workplace — are more likely to be characterized by entrenched patriarchal institutions (see also Antecol, 2000; Fernández, 2010; Fernández and Fogli, 2005; Fernández *et al*., 2004).

In addition, the seminal work by Hegre *et al*. (2001) supports a quadratic relationship between democracy and employment. Democracy could unleash labour market potential and open up the decision-making process to the less privileged, resulting in redistributive policies benefitting these groups. Democracy could also increase employment by increasing expenditures on social programmes. We therefore expect that democracy will have a significant positive effect on youth employment.

The pattern of youth employment ratio in Africa partly reflects natural resource endowment structure, whereby the youth employment ratio is lowest in fossil fuel- and mineral-rich economies. For example, between 1991 and 2010, Sudan, Mauritania, Gabon, Niger, Algeria, Egypt, Libya and Tanzania had very low employment ratios relative to their income levels. This pattern tends to conform with the often analysed 'cultural effect' in Muslim-dominated countries where female employment, for example, is considered socially and culturally acceptable as long as it does not interfere with women's primary role as wives and mothers

given the notion, belief and persistent stereotypes that motherhood and child care represent a 'woman's true vocation' (Blackburn, 2004; Stivens, 2006). As the case of Tunisia, however, demonstrates, legislation can codify social norms and 'gendered beliefs' into gender-equalizing labour practices.

4. The Model and Data

This section focuses on the econometric analyses of the determinants of youth employment in Africa. We use the cross-sectional time series data covering 48 African countries to empirically study the key drivers of youth employment in the continent, during the period 1991–2009. The variable that proxies youth employment (youth employment-to-population ratio for the age group 15–24 over the period) was used as the dependent variable. Macroeconomic factors, along with other control variables, acted as independent variables.

4.1 Independent Variables

Macroeconomic Factors

Five indicators are used to measure macroeconomic conditions: domestic investment rate, government consumption expenditure relative to GDP, the inflation rate (percentage change in CPI), real per capita GDP, and real GDP growth.

The first indicator of macroeconomic condition is a nation's domestic investment measured as a percentage of GDP. The higher the value of investment rate, the more resources a government and the private sector ostensibly have at their disposal to spend on economic and social programmes, including investments for employment creation.

The second macroeconomic condition is government consumption expenditure measured as a percentage of GDP. The higher the value of government consumption expenditure, the lesser the resources the government has at its disposal to spend on economic and social programmes, including investments for employment creation for both men and women.

With respect to inflation's effect on employment, the current literature is inconclusive. Some experts contend that inflation will hurt women more than men since women are disproportionately represented among the poor and thus unable to protect their consumption levels in the presence of rising inflation. However, others assert that inflation will not harm women as much as men due to their lower cash holdings; further still, others contend that inflation may actually benefit women by increasing labour force participation. We expect inflation to have a positive effect on women's employment.

To control for the level of economic development, we include a nation's real gross domestic product (GDP) per capita measured in terms of constant 2000 dollars. We also include the square of real GDP per capita in order to determine whether a non-monotonic relationship exists between development and male employment. The quadratic term tests Boserup's (1970) assertion that the gap between men and women increases at intermediate levels of economic development but subsequently narrows after a nation has achieved a certain level of economic development.

We also include economic growth (real GDP growth rate) separately to control for the possibility that an economic decline or slowdown might have adverse effects on female employment independent of the level of development. Dropping this variable in the estimations did not affect the other results.

Globalization

In order to control for the effect of globalization on youth employment, trade openness of the economy and foreign direct investment (FDI) are included as explanatory variables and they are measured as a percentage of GDP.

A nation's openness to trade is defined as the sum of net exports of goods and services as a percentage of GDP. An increase in openness is hypothesized to augment female youth labour force participation thereby increasing male youth employment. In addition, if the export sector is primarily capital intensive, then female youth employment is expected to decrease as a result of differential access to productive resources.

As authors like Oostendorp (2009) have argued, FDI is assumed to be positively associated with higher employment, especially for women. On the other hand, other authors have argued that FDI can have a negative effect on female employment by serving to reinforce existing gender inequalities in the access to the labour market and the gender division of labour. Indeed, in

predominantly agricultural nations of Africa, males have a greater advantage in producing export crops, compared with women who predominately produce crops for subsistence and local consumption hence the greater the access to export channels through FDI would further widen the gender gap. Many African countries are today blessed with abundant natural resources, which have been attracting huge FDI. However, most natural resources sectors such as minerals, are enclave and capital-intensive sectors, and operate to the advantage of males, thus widening the gender gap in employment.

Credit to the Private Sector

As noted earlier, access to credit by the private sector enhances the productive capacity of businesses, leading to greater potential to grow in terms of sales, revenues and operations; expand investments; and create more employment. We therefore include banking system's credit to the private sector as a percentage of GDP. The higher the value of credit to the private sector, the more resources firms have at their disposal for investment, expansion and entrepreneurship, all of which increase employment.

Infrastructure

It is recognized that reducing time on family chores is likely to increase family members' ability to engage in market-based income-earning opportunities. A good example is investment and provision of requisite infrastructure. These include access to affordable child care centres, energy, transport and ICT infrastructure. It has been shown that new and emerging technologies, when accessible, can help people by opening new economic (including employment) opportunities, breaking down information barriers, enabling people to take collective action, and helping those in isolated communities engage in commerce. We use telephone and mobile phones (per 1,000 persons), expressed in natural log form, to proxy infrastructure.

Level of General Education

Education tends to broaden one's views, reduce ethnocentricity, and thus increase one's flexibility of accepting new customs and norms. As such, the level of education attained by the general population plays an important role in increasing access to the labour market and employment opportunities. Indeed, youth with higher levels of education are more likely to enter the labour market, especially in urban areas, which may reflect their higher wage premiums and higher opportunity cost of being inactive (see also Ogawa and Akter, 2007).

Demographic Factors

To measure the effect of key demographic variables on youth employment, three indicators are used: urban share of the population, population growth rate, and ratio of youth to total population. Increasing population growth is expected to increase youth employment. More specifically, increases in youth-population ratio, a measure of youth labour supply, are expected to lead to increases in youth employment. On the other hand, living in an urban area is associated with an increase in access to labour markets and formal employment opportunities. The youth have access to more economic opportunities in urban areas than in rural areas. This is because urban labour markets offer a wide variety of occupations, from manufacturing and services to clerical activities. Thus, increased urbanization rate is expected to lead to higher levels of youth employment.

Institutionalized Democracy

It has been hypothesized that democracy increases employment as the youth become empowered through the political process. This is because it is assumed that democratic regimes have greater respect for human rights, relative to authoritarian regimes. We use the measure democracy from the Polity IV Project, in which a country's level of democracy is ranked along a 21-point spectrum, ranging from -10 for fully institutionalized autocracies to $+10$ for fully institutionalized democracies, based on research done at the Center for International Development and Conflict Management, University of Maryland. Since it is

intuitively plausible that democratic countries encourage male employment, we expect that increasing levels of democracy act to increase women's employment more than men's. Democracy is fitted as a quadratic function for capturing possible average across country non-linear effects but turned out to be insignificant in all cases and was dropped.

Time Trend

Empirical results clearly suggest that there is a highly significant negative time trend, implying that labour market performance appears to deteriorate over time. Studies that have confirmed this include Petrongolo and Pissarides (2001), Fahr and Sunde (2004), Asiedu (2004), and Zierahn (2012). As Asiedu (2004) notes, the time trend also controls for changes caused by demand or supply shocks.

Sub-regional and Oil Effects

We include the five sub-regional dummies to capture sub-regional effects. In addition, to capture the effects of net oil exporters, we add two dummies representing net oil exporters and net oil importers.

4.2 The Model

Based on the above review and following the frameworks posited by Tseloni *et al*. (2011), Choudhry *et al*. (2012), Anyanwu (2012a), and Eastin and Prakash (2013), the relationship that we want to estimate can be written as:

$$\begin{aligned}\log YE_{it} = {} & \alpha_i + \beta_1 \log(inv_{it}) + \beta_2 \log(gce_{it}) + \beta_3 \log(inf_{it}) + \beta_4(rgdppc_{it}) + \beta_5(rgdppc_{it}^2) + \beta_6(rgdpgth_{it}) \\ & + \beta_7(X_{it}) + \beta_8(Z_{it}) + \varepsilon_{it}(i = 1, \ldots., N; t = 1, \ldots.., T),\end{aligned} \tag{1}$$

where *YE* is the measure of youth employment in country *i* at time *t*; α_i is a fixed effect reflecting time differences between countries; β_1 is the elasticity of youth employment with respect to domestic investment (as a percentage of GDP), *inv*; β_2 is the female employment elasticity with respect to government consumption expenditure, *gce*; β_3 is the coefficient of inflation rate, *inf*; β_4 is the coefficient of real per capita income in 2000, *rgdppc*; β_5 is the coefficient of quadratic real per capita GDP; and β_6 is the coefficient of real GDP growth, *rgdpgth*); *X* is the control variables, including trade openness (*open*), foreign direct investment (percentage of GDP) (*fdi*), access to credit by the private sector (*credit*), primary school enrolment ratio (*educ*), democracy (*domec*), population growth rate (*popg*), youth share in total population ratio (*ythpopratio*), urban population share (*urban*), telephone and mobile phones (per 1,000 persons) (*telemobile*), and time trend; *Z* represents sub-regional and oil effects dummies used as fixed effects; and ε is an error term that includes errors in the youth employment measure.

Data for these variables are largely drawn from the World Bank's WDI Online database, except as indicated in the Appendix. The Feasible Generalized Least Squares (FGLS) regressions with sub-regional and oil fixed effects were estimated to investigate the determinants of youth employment. The Pooled Feasible Generalized Least Squares (FGLS) controls for panel autocorrelation/heteroscedasticity and non-stationarity of the series (see Stock and Watson, 2003; Nowak-Lehmann *et al*., 2006).

Table 1 provides detailed descriptions of the raw Africa dataset.

5. Model Estimation Results and Analysis

Table 2 presents the results of estimating the youth employment equation (1) for the entire data for all of Africa, sub-Saharan Africa and North Africa.

5.1 Macroeconomic Factors

Our results show that a nation's domestic investment rate is found to be positively and significantly associated with youth employment in the overall African, sub-Saharan and North African estimations. However, domestic investment rate is negatively

Table 1: Descriptive statistics of main regression variables (excluding dummies), 1991–2009

Variable	Observations	Mean	Standard Deviation
All youth employment ratio	950	45.13	16.50
Male youth employment ratio	950	50.12	16.14
Female youth employment ratio	950	40.12	19.00
Domestic investment-GDP	950	20.78	11.13
Govt. consumption expd-GDP	895	15.82	8.00
Inflation	877	92.63	1175.11
Real GDP per capita	960	1065.43	1573.73
Real GDP growth	966	3.95	7.68
FDI-GDP	962	3.88	9.45
Openness	942	75.10	38.56
Credit to private sector-GDP	950	19.40	21.60
Telephone/mobile phone	1002	2.93	5.10
Education	817	89.96	38.56
Youth population share (‘000)	988	3147.85	4444.42
Population growth	1007	2.33	1.14
Urban population share	1007	38.24	17.31
Democracy	916	-3.59	23.17

Note: These are raw data before the log and other transformations.
Source: Author’s calculations.

and significantly associated with youth employment in North Africa. This explanation may be rooted in wastages and inefficiency associated with most investment projects in most countries. Investments in white-elephant, unproductive activities, remain a development challenge in most parts of Africa.

Our results also show that government consumption expenditures negatively and significantly affect youth employment in sub-Saharan Africa. Crowding out of resources for productive investment and job creation are at play here.

It is only in North Africa that inflation matters for youth employment. We find that rising inflation is negatively and significantly associated with youth employment in North Africa.

In our results, the coefficient associated with the level of real GDP per capita is found to be negative and statistically significant in both Africa overall and North Africa. To test the hypothesis that real GDP per capita has a non-monotonic relationship with youth employment, the squared real GDP per capita is included as an explanatory variable. The quadratic term is positive in sign and significant for the whole of Africa youth employment. The result thus provides evidence of U-shaped relationship between real GDP per capita and overall youth employment in the continent. The result suggests that although higher levels of real GDP per capita are negatively associated with youth employment, the effect is not constant. Rather, for levels of real GDP per capita above a certain point, higher levels of real GDP per capita act to increase youth employment, holding other factors constant. This relationship suggests also that the marginal effect of real GDP per capita exhibits increasing returns for youth employment. However, this relationship does not hold for sub-Saharan and North Africa.

We find that real GDP growth positively and significantly affects both the overall Africa, sub-Saharan and North Africa results. This means that the current international agenda on inclusive growth is well placed.

Globalization

FDI-GDP ratio is only positively significant in the case of youth employment in sub-Saharan Africa. It has an insignificant effect on youth employment in the rest of the estimations. Our results, therefore, do not, in the main, support the proposition that the inflow of foreign direct investment enhances youth employment in Africa as a whole. This is not surprising given that most FDI inflows to Africa go to the natural resources sectors such as minerals, which are enclave and capital-intensive sectors, creating little local employment. Indeed, this result is consistent with Asiedu and Gyimah-Brempong (2008), which shows that liberalization does not have a direct impact on multinational employment — the effect is indirect: liberalization stimulates multinational investments which in turn increases multinational employment.

Table 2: FGLS estimates of the determinants of total youth employment (with sub-regional and oil fixed effects)

Variable	Africa	Sub-Saharan Africa	North Africa
Domestic investment-GDP	0.213 (3.68***)	0.270 (4.45***)	−0.162 (−2.46**)
Govt. consumption expd-GDP	−0.136 (−1.48)	−0.290 (−3.16***)	0.068 (0.52)
Inflation	−0.0004 (−0.81)	−0.0002 (−0.34)	−0.126 (−2.47**)
Log Real GDP per capita	−25.458 (−4.14***)	0.180 (0.16)	−13.493 (−5.68***)
Log Real GDP per capita^2	1.808 (4.02***)		
Real GDP Growth	0.300 (2.98***)	0.257 (2.50**)	0.104 (2.41**)
FDI-GDP	0.119 (1.16)	0.175 (1.67*)	0.091 (0.74)
Openness	−0.080 (−4.34***)	−0.191 (−4.92***)	0.011 (0.40)
Credit to private sector-GDP	0.027 (0.99)	0.001 (0.03)	0.040 (2.18**)
Log Tel. and mobile phone	−2.372 (−2.61***)	−1.472 (−1.59)	3.984 (3.12***)
Education	0.051 (2.18**)	0.047 (2.00**)	−0.096 (−3.21***)
Youth population share	−0.0003 (−1.82*)	0.0003 (2.26**)	−0.002 (−6.36***)
Population growth	3.112 (3.28***)	3.807 (3.99***)	7.696 (7.09***)
Urban population share	−0.045 (−0.77)	−0.223 (−3.63***)	0.041 (0.16)
Democracy	0.051 (1.80*)	0.052 (1.85*)	0.028 (0.09)
Time trend	0.010 (0.10)	−0.041 (−0.38)	0.630 (4.38***)
Net oil exporters			
Net oil importers	20.003 (13.73***)	25.160 (15.63***)	10.280 (4.02***)
North Africa			
Southern Africa	−1.556 (−0.73)	17.703 (8.30***)	104.231 98.44***)
Central Africa	10.128 (4.47***)	3.150 (1.93*)	
East Africa	4.172 (1.99**)	4.847 (3.04***)	
West Africa	2.194 (1.00)	19.221 92.14**)	
Constant	105.288 (4.90***)		
Log likelihood	−22216.756	−1927.979	−126.2036
Wald chi^2	812.38***	637.70***	2283.31***
Prob > chi^2	0.0000	0.0000	0.0000
N	586	511	75

Note: *t*-values are in parentheses; *** 1% significant level; ** 5% significant level; * 10% significant level.
Source: Author's estimations.

On the other hand, trade openness is negative in sign and statistically significant in the overall Africa and in sub-Saharan Africa data. These results fail to support the view that increasing levels of exports relative to imports may increase youth employment and further that an external market orientation may further enhance job opportunities for the youth. This may also suggest that capital-intensive export sectors dominate the labour-intensive sectors in Africa.

Credit to the Private Sector

The credit variable has a positive and statistically significant effect on only youth employment in North Africa. This North African result is consistent with the findings of IFC (2012), thus underscoring the huge role of access to finance in employment creation in North Africa. However, it has an insignificant positive effect in sub-Saharan Africa and in the all-Africa estimations.

Infrastructure

Our results show that the coefficient of the ICT infrastructure variable is positive and statistically significant in youth employment in North Africa. In this case, we can conclude that our result indicates that improvements in the level of the ICT infrastructure tend

to lead to improvements in youth employment in North Africa. This result is consistent with those of Chen (2004) who used five different indicators of ICT infrastructure (the number of computers per 1,000 persons, the number of Internet users per 1,000 persons, the number of telephones per 1,000 persons, ICT expenditure as a share of GDP and ICT expenditure per capita to estimate their effect on the ratio of the female to male labour activity rates. However, the infrastructure proxy is statistically insignificant in sub-Saharan Africa but has a statistically negative effect on youth employment in the overall Africa estimation.

Education

The education variable has a positive and statistically significant effect on youth employment in the all-Africa and sub-Saharan Africa estimations. This result is consistent with those of Asiedu (2004). This supports the hypothesis that education tends to broaden one's awareness of cultures and social norms that exist in industrial countries where both men and women are in most circumstances entitled to the same freedoms and opportunities. However, the coefficient is negative and significant in the North Africa result, mainly because primary education alone, in a region with higher levels of education, would be insufficient for higher youth employment.

Demographic Factors

The ratio of youth to total population has a negative and statistical significant effect on youth employment in all-Africa and North Africa samples. However, in sub-Saharan Africa, the ratio of youth to total population has a positive and significant effect on all-youth and male youth employment.

Furthermore, our results suggest that rising population growth rates have a strong, positive and statistically significant effect on all youth employment estimations. Increasing urbanization rates are found to be negatively and significantly associated with youth employment in sub-Saharan Africa.

Institutionalized Democracy

Institutionalized democracy has a positive and statistically significant effect on youth employment in the entire continent and sub-Saharan Africa. These confirm earlier findings such as those of Tseloni *et al*. (2011), and Eastin and Prakash (2013). However, it has an insiginificant positive effect on youth employment in North Africa.

Time Trend

Time trend is positively significant in North Africa for youth employment, contrasting the notion of the deterioration of the labour market performance over time in this case.

Sub-regional and Oil Effects

The sub-regional fixed effects, which shift the intercepts, have varied performance, depending on the region but Central and East Africa have consistent significant positive effects. For example, in our basic overall and sub-Saharan Africa estimations, Central Africa and East African countries have more youth employment compared to South, West and North Africa. Also, the West Africa dummy appears to have a positive and significant effect on youth employment in sub-Saharan Africa.

Our results also show that net oil importing countries have systematically more youth employment compared to net oil-exporting countries in Africa — continent-wide, in sub-Saharan Africa, and in North Africa. This result suggests that, holding other factors constant, net oil-exporting countries experience lower levels of youth employment than net oil-importing countries. In this sense, our results also suggest that oil-exporting nations have not utilized their huge oil revenues to create adequate jobs for their citizens, especially the youth.

6. Policy Recommendations

What are the implications of our results for African countries? First, our results show that apart from North Africa, investment has a strong and positive effect on youth employment creation in Africa. This calls for increased productive domestic investment, public and private, in African countries. In North Africa, in particular, productive and efficient domestic investment requires the development of coordinated, objective and transparent processes for decision-making based on thorough and rigorous cost-benefit analysis. All actors, from governments to civil society, share responsibility for making investment more productive, efficient and effective. Attention should be paid to both the design, implementation, and monitoring and evaluation phases of projects and programmes. At the design stage, the aim should be to create achievable and quantifiable targets and to have all-stakeholder ownership through the collaboration of governments, the private sector, civil society and other development agencies. All stakeholders must follow through to ensure that projects and programmes are implemented as designed. Also, stakeholders must ensure that those projects and programmes are regularly monitored and evaluated against indicators established in the design phase and that are agreed on by the development partners.

Second, given our finding that government consumption expenditure mostly reduces youth employment (especially in sub-Saharan Africa), achieving government expenditure effectiveness must remain as an active goal of governments in Africa. Adoption of high level best practice principles to inform the development of these processes will help African governments achieve this. Those broad principles should include the following key elements: a nationally coordinated approach to the development of significant strategic projects and programmes; the promotion of competitive markets; decision-making based on rigorous cost-benefit analysis to ensure the highest economic and social benefits to the nation over the long term; a commitment to transparency at all stages of the decision-making and project implementation processes; and a public sector financial management regime with clear accountabilities and responsibilities. At the same time, efforts to reform the fiscal system for consolidation by both the executive and legislative arms of government are imperative to reduce government consumption expenditure to avoid wastes, corruption and crowding out resources for public sector investment and employment creation.

Third, effective regulation of FDI is imperative. Apart from youth employment in sub-Saharan Africa, we find that FDI has an insignificant effect on youth employment in the continent as a whole and in North Africa. Thus, to promote youth employment and, in turn, to ensure the youth have complete access to productive resources, African countries should regulate the inflow of foreign capital to ensure labour-intensive industries are not displaced by globalization. Further, to protect against threats to individual basic rights, the government should mandate that MNCs adhere to core labour standards, as provided by the International Labor Organization (ILO). Since labour-intensive employment represents a viable channel through which job-seekers are able to realize gains in real wages and social capital, the protection of these industries should be a policy priority for African countries.

Fourth, trade openness significantly reduces youth employment in Africa. Part of the problem is that Africa's exports remain dominated by primary commodities, with fuels accounting for about 40 per cent and natural resources exports accounting for over 73 per cent (Anyanwu, 2012b). Thus, without further improvements to their business environments and the competitiveness of their export commodities, African countries risk being competitively trapped — selling low-skill, low-value products and services, with little chance to increase value-added share in global trade. In other words, without market knowledge, particular expertise, or competitive products and services, trade openness cannot work for employment creation in the continent. The value-chain approach needs to be adopted by African countries to add value to their products.

In addition, the promotion of diversification away from oil is also imperative. Indeed, developing a successful modern economy based on natural resource exports is, in principle, feasible, given the right institutions and policies, as demonstrated by OECD countries such as Canada, Australia or the Scandinavian countries. However, it is critical to use natural resources to develop a more diversified economic structure. Some policies are helpful in fostering diversification. These include establishing a conducive business environment and providing sufficient incentives to invest in non-natural resources sectors. A conventional measure is to use the tax system to assist the development of non-natural resource sectors. In addition to tax policy, there is also need for structural reforms, including financial sector and administrative reforms, to facilitate the diversification of economic activity. In many natural resource-dependent African economies, there is large scope to reduce the burdens imposed by heavy regulation and an often corrupt bureaucracy, which, in addition to strengthening the financial system, would help create a more level playing field and decrease barriers to entry.

Fifth, making credit for employment is important, especially in North Africa. African governments should start encouraging entrepreneurship and access to financing, for the youth. The continent needs young entrepreneurs ready and able to explore new opportunities. The youth need training in entrepreneurship and to be encouraged to take risks and start businesses and

subsequently become employers themselves (WEF, 2012a, 2012b) but some deliberate and focused credit targeting will be of immense help in this direction. In fact, the promotion of domestic investment through improved credit conditions for small and medium enterprises, for example, would yield significant gains in youth employment.

Sixth, in this study, we have found that infrastructure is critical in promoting youth employment in North Africa, hence the need for productive infrastructure development. The youth often face stark time trade-offs between school, household chores and market work, particularly in rural areas. Therefore, programmes targeted at reducing the youth's time on chores — for example, while maximizing school and work time through investment in infrastructure — are likely to increase their ability to engage in market-based income-earning opportunities.

Seventh, effective policies that invest in human capital of the workforce are needed. Policies that promote the up-skilling, better training and education for the low-skilled workforce are imperative. Both the up-skilling, labour market training, educational reforms that conform to industry needs will also help address the skills mismatches existing in many African countries.

Indeed, African governments need to enter into dialogue with large employers in creating employment for the youth through strategic skills planning, skills development and skills matching. Addressing the skills mismatch in the short run will require improved training programmes and closer links between schools and vocational educational institutions on the one hand, and the private sector on the other. Training programmes should include on-the-job initiatives targeting those already working, as well as graduates with a general education who lack specific work skills. In addition, governments need to develop innovative public-private partnerships and the opportunities for collaboration among large employers, governments and other relevant stakeholders such as higher and vocational educational institutions to transform institutional structures and strengthen the continent's economies (Ncube and Anyanwu, 2012). Also, general education at schools as well as different forms of vocational education and training, either at schools or on the job or combining both elements in a 'dual apprenticeship' are necessary pre-conditions for the employability and productivity of young people. Vocational education and training is a crucial element as it can link young people's competences with employers' needs. Without doubt, bringing vocational training closer to the needs of dynamically changing and evolving labour markets and economies can help young people move into more productive and sustainable jobs (Biavaschi *et al*., 2013).

In particular, in North Africa, where primary school education alone is insufficient for obtaining jobs, successful innovative and effective education to employment programmes must have two key features. The first is that education providers and employers have to actively step into one another's worlds. Employers might help to design curricula and offer their employees as faculty, for example, while education providers may have students spend half their time on a job site and secure them hiring guarantees. The second feature is that employers and education providers should work with their students early and intensely. Thus, instead of three distinct intersections occurring in a linear sequence (enrolment leads to skills, which lead to a job), the education-to-employment journey should rather be a continuum in which employers commit to hire youth before they are enrolled in a programme to build their skills (Mourshed *et al*., 2012). However, for this to succeed, new incentives and structures are imperative. For one, stakeholders need better data to make informed choices and manage performance. Parents and young people, for example, need data about career options and training pathways such that young people would have a clear sense of what they could plausibly expect upon leaving a school or taking up a course of study, while education institutions would think more carefully about what they teach and how they connect their students to the job market. Secondly, collaborations involving multiple providers and employers working within a particular industry or function are transformational. Such collaborations, for example, can solve the skill gap at a sector level; by splitting costs among multiple stakeholders (educators, employers and trainees), while investment is reduced for everyone, thus providing an incentive for increased participation. Indeed, vocational education and on-the-job-training with young workers and companies need to involve governments, social partners or other societal actors to be stable and effective (Biavaschi *et al*., 2013). In addition, agreements such as non-poaching deals can also boost employers' willingness to collaborate, even in a competitive environment. Thirdly, African countries need system integrators (defined by sector, region or target population) responsible for taking a high-level view of the entire heterogeneous and fragmented education-to-employment system. The role of the system integrator would be to work with education providers and employers to develop skill solutions, gather data, and identify and disseminate positive examples and best practices (Mourshed *et al*., 2012).

Eighth, the promotion of effective democracy will help in the design of policies conducive to youth job creation. This requires political will, commitment, good governance (including the control of corruption, transparency and accountability, the rule of law, government effectiveness and political stability) and inclusive development. It also requires collaborative spirit to formulate and faithfully implement the requisite policies, strategies, plans and collective action as well as the institutional changes needed for increased job creation for the youth.

We have shown in this study that being a net oil-exporting country decreases youth employment across African countries. Thus, efficient management of oil and other natural resources in Africa requires actions throughout the value chain. In particular, a new natural resources management framework is needed for better governance, sectoral linkages, economic growth and human, capacity and infrastructure development — with strong parliamentary legislation, oversight and representation throughout the resources value chain (Anyanwu, 2012c).

In conclusion, without doubt, sustainable inclusive growth and development as well as inclusive governance should be the basis for policy-makers and leaders in Africa to bridge the transformation between the pain of the current youth unemployment time bomb, especially in North Africa and net oil-exporting countries, and the promise of the future.

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Appendix

Table A1: Description of variables

Variable	Source
Employment ratios	International Labor Organization (ILO) database
Per capita GDP (constant 2000 US dollar)	World Development Indicators
Telephone and mobile phones	World Development Indicators
Democracy	Polity IV Project
Trade openness ((imports + exports)/GDP)	World Development Indicators
School enrolment rate	World Development Indicators
Inflation (annual percentage change in CPI)	World Development Indicators
Urban population ratio	World Development Indicators
Population	World Development Indicators
Domestic investment	World Development Indicators
FDI	World Development Indicators