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transitions in Ghana and Kenya**

Takahiro Fukunishi
Christian Samen Otchia

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The employment of youth has been a central concern in developing regions, where populations are young and growing rapidly. After the decade of economic growth, however, changes in youth employment in sub-Saharan Africa are not investigated. Focusing on school-to-work transitions, this paper compares employment performance between the senior cohort who entered into the labor market before the growth period and the younger cohorts who entered after, using data from several existing surveys in urban Ghana and Kenya. It demonstrates that the first job for young graduates is less likely vulnerable employment in Ghana and is in the industries with higher formality in the both countries. In mid-career, with experience of 2–10 years, the young cohorts earned as high as the senior cohort despite shorter experience. We found that the quality of the first job is positively associated with formality and earnings in mid-career. Young urban workers are better off on average.

Keywords: youth, employment, first job, Africa

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INSTITUTE OF DEVELOPING ECONOMIES (IDE), JETRO
3-2-2, WAKABA, MIHAMA-KU, CHIBA-SHI
CHIBA 261-8545, JAPAN

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Takahiro Fukunishi

Institute of Developing Economies, Japan External Trade Organization

Christian Samen Otchia

Nagoya University

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Abstract

The employment of youth has been a central concern in developing regions, where populations are young and growing rapidly. After the decade of economic growth, however, changes in youth employment in sub-Saharan Africa are not investigated. Focusing on school-to-work transitions, this paper compares employment performance between the senior cohort who entered into the labor market before the growth period and the younger cohorts who entered after, using data from several existing surveys in urban Ghana and Kenya. It demonstrates that the first job for young graduates is less likely vulnerable employment in Ghana and is in the industries with higher formality in the both countries. In mid-career, with experience of 2–10 years, the young cohorts earned as high as the senior cohort despite shorter experience. We found that the quality of the first job is positively associated with formality and earnings in mid-career. Young urban workers are better off on average.

1. Introduction

The employment of youth has been a central concern in the developing regions, where populations are young and growing rapidly. In sub-Saharan Africa, although youth in employment are more common than in other regions, labor statistics show a higher proportion of vulnerable employment and working poor among youth than adults (ILO 2017). To understand the mechanisms of the poor performance among youth, it is crucial to analyze the state of the labor markets during the period of economic growth, which has lasted for a decade in sub-Saharan Africa. This provides an opportunity to investigate the relationship between business cycle and youth employment.

Macroeconomic statistics show the unemployment rate of youth (aged 15–24 years) decreased monotonically during the economic growth period in sub-Saharan Africa (SSA) on average, falling from 16.2% in 1999 to 12.8% in 2015 according to the ILO estimates (World

Bank 2018). As African youth became more likely to have a job, the proportion of youth in NEET (not in education, employment and training) declined during this period, but this does not necessarily mean that poverty reduced among youth. Labor statistics indicate that employment in the informal sector, including self-employment and contribution to family work, is the most common form in many African countries (African Development Bank 2012), and youth are more likely to work in such unproductive sectors (Elder and Koné 2014). Accordingly, the average poverty rate among working youth in SSA is highest in the world and higher than the adult average in the region (ILO 2017; Figure 2.6). Therefore, it might be a case that the recent decline in the unemployment rate reflects that more youth work at a vulnerable job, generating low and unstable income.

Alternatively, under steady economic growth from the mid-2000s to the mid-2010s, the quality of jobs may have improved, with substantial job growth, and youth may have benefited from higher and more stable income opportunities. In developed countries, wages generally change pro-cyclically for both experienced senior and inexperienced youth. Studies in Canada and U.S. showed that cohorts that graduated from college during the economic boom got a job with higher earnings than those who graduated during the recession and, in Canada, the positive impact was larger for inexperienced young workers (Oreopoulos, Watcher, and Heisz 2012; Kahn 2010). If African youth have not benefited from the economic growth, then the structure of the African labor markets differs from that in developed countries with respect to the influence of macroeconomic conditions.

Despite the surge of concerns, the literature has not investigated recent changes in the employment of African youth. Studies of youth employment have focused on the difference in employment outcomes between young and senior generations (e.g., Hino and Ranis 2014; ILO 2017; African Development Bank 2012). However, poorer outcomes among youth do not necessarily indicate that employment performance was degraded recently because many young workers are still in transition. It may be a case that the proportion of formal employment *at the time of survey* is lower among young generations than senior generations; however, the proportion *at entry* to labor market is higher among young generations. This is possible, for example, if formal employment is more accessible to seniors due to longer experience.

In this paper, we fill this gap by comparing the employment outcomes of youth in Ghana and Kenya across cohorts who started their careers either before or after the economic growth period. Such comparisons are not generally easy because labor force surveys are collected less frequently or are not even available prior to the 1990s in SSA. In the case of Ghana, the Living Standard Survey, which includes a labor force survey module, was first implemented in 1988 and twice in the 1990s. Instead, of the national surveys, we use the STEP surveys collected in 2013 by the World Bank and contain information of school-to-work transitions including first jobs after

completing formal education. Based on recall data, information of employment when one was young is available for respondents at all ages and that entered the labor market either before or after the growth period. Although it requires senior respondents to recall memories of several decades, we consider that the first job is generally such an important event in one's life that they do not forget easily. To reduce measurement errors, we drop the respondents who spent longer than 20 years since completing education.

Empirical evidence demonstrates that school-to-work transition plays a critical role in a person's early career. The study in Canada demonstrates that the quality of the first job, measured by the average wage of a firm in which one was employed, is significantly correlated with the quality of subsequent jobs for 10 years (Oreopoulos, Watcher, and Heisz 2012). In the Japanese labor market, failing to obtain full-time employment with a permanent contract at the completion of college, which was a standard employment status for college graduates, has lasting negative effects on one's employment status for 10 years (Kondo 2007; Hamaaki et al. 2013). In Africa, retrospective data collected in Tanzania exhibit that the majority of workers who began their career as wage earners or self-employed remained in the same type of job for some years and starting as a wage earner is positively associated with earnings later in their career (Bridges et al. 2017). Therefore, job quality immediately after the school-to-work transition is an appropriate indicator of labor market performance of young workers.

This paper shows that in Ghana, people who completed formal education after 2003 got a better quality first job than those who were in the transition before 2002, when the economy was stagnant. Three years after completing their education, the younger cohorts were more likely to have wage-employment in the public or private sector as a first job and less likely than the senior cohort to start out as self-employed. The proportion of self-employment is lower by 14.0 percentage points in the youngest cohort having completed education after 2009. Therefore, vulnerable employment, which is composed of self-employment and unpaid work, is less prevalent among youth who completed the transition. In addition, the formality of the first job, as measured by industry-level proportion of formal sector workers, is higher in the young cohorts, reflecting the growth of employment in the public/education and health/ICT/financial/legal sectors. The speed of transition from school to job is slightly slower among the youngest cohort, but the difference is not significant. Similar trends are shared in the Kenyan labor market where changes are mainly found for the youngest cohort that entered into labor market after 2009. Changes in type of first jobs are small in Kenya, though job formality has significantly increased among the youngest cohort.

These differences can be generated by changes in both labor supply side and demand side. Given longer years of education in youth, supply-side factors are not negligible. When years of education are controlled, the differences become smaller but remain significant for the youngest

cohort in first job formality. Because education is the most important factor in labor supply side, these results suggest that the changes in first job cannot be attributed to supply side exclusively and suggest the possible influence of factors in the labor demand side, such as economic growth and technological changes.

To investigate job quality in later mid-career, we first present the average earnings in 2013 using STEP and the national household surveys. Despite shorter working experience for young workers, there are no clear differences in the average earnings between the young and the senior cohorts. This suggests that average earnings with conditioning experience are higher in the young cohorts. We also found that characteristics of first jobs are associated with formality and earnings of a job in 2013 among the young cohorts. Those who started to work as an employee in either the public or private sector are less likely to have an informal job in mid-career in the both countries. Earnings in mid-career are positively associated with first job in the public sector in Ghana, whereas first job in the private sector with high formality is correlated with higher mid-career earnings in Kenya. These results indicate that improved first job quality among the young cohorts is associated with higher mid-career wages.

This is the first study to document changes in school-to-work transitions for the last two decades in Africa. In Ghana and Kenya, young people made transitions to better quality of jobs and earned higher in the later career than the prior generations. Although we cannot conclude that economic growth made transitions better due to other changes in the society that may affect labor markets, it is clear that wage-employment increased substantially in the period of economic growth and young people benefited from it on average. These facts need to be reflected in the formulation of a youth employment policy in Africa.

In the next section, the methodology and data used in this paper are explained. Comparisons of school-to-work transitions across cohorts are shown in the third section and, to explore influence of the transition patterns among youth on later career, associations between quality of first job and mid-career earnings are shown in the fourth section. The last section concludes the analysis.

2. Methodology and Data

2.1 Empirical approach

We first compare the process of school-to-work transitions, specifically speed of transition to employment after education and first job quality between young and senior cohorts. The STEP survey asked about time to find the first job that a respondent worked for at least six months after completing formal education. This allows an investigation of the transition to employment excluding transitory employment lasting only for short periods.

Quality of employment is generally evaluated by several characteristics of working conditions such as wage, social welfare, working hours, holiday, safety and healthcare in work place, nature of the employment contract, and compliance to regulations. However, because most survey data in developing countries do not contain complete information of working conditions or type, job formality is widely used as a proxy for employment quality. We use two indexes to examine first job quality. “Vulnerable employment” is defined as employment with poor quality by international organizations, including the ILO, and includes self-employed and unpaid family work (ILO 2018).

However, judging employment quality by distinction based on self-employment and wage-employment is not necessarily efficient because the quality of both types of employment is diverse and likely to overlap. Alternatively, the sector of employment, formal or informal, is used given that formal sector firms are bound by labor regulations. Although recent studies indicate that informal sector employment does not necessarily generate lower income than formal sector employment for unskilled workers¹, there are substantial gaps in earnings and working conditions on average. Due to lack of information, we construct industry-level formality measure defined as proportion of formal employment among young workers in individual industry. Since annual data of the formality measure is not available, time variation of the formality is limited. Therefore, our estimates reflect changes in formality through changes in industry composition of employment, while they underestimate changes within industries, which are positive on average in the both economies.

In the next step, we approach the question whether quality of the first job in the young cohorts is related with later career. Because the STEP data do not contain a complete employment history, we estimated the association between the first job and the job that respondents worked at the time of the survey (2013). This analysis covers only the young cohorts because the association between the first job and the 2013 job is likely weak in the senior cohort and different from that in the young cohorts. It is noted that, given the endogeneity of first job choice, though we control basic characteristics including education, estimates indicate associations between first job quality and mid-career job rather than causality. However, given job continuity, particularly in the formal sector, the estimated association should incorporate the influence of first job quality on the later career.

¹ Günther and Launov (2012) indicates that workers in Côte d’Ivoire voluntarily moved between informal and formal sectors. Through an intervention with young jobseekers in Ethiopia, Blattman and Dercon (2018) showed that those who were offered factory job in formal sector did not earn higher income than those who were not offered one year later. However, given minimal screening of jobseekers in a factory job, it pays lower than the average wage of formal sector jobs. Estimated earnings gap between sectors, with controlling unobserved worker’s heterogeneity, is 20% in Madagascar (Norman et al. 2015) and gap between self-employment and public employment is 50% in Ghana and Tanzania (Falco et al. 2011).

Differences in the transition process shown in our methodology are not necessarily caused by the macroeconomic conditions because other factors that occurred in the mid-2000s may have affected the school-to-job transitions of young people. Access to mobile phones and the Internet may be an influencing factor. There is also the possibility that young generations differ with seniors in characteristics related to transitions including educational attainment. Therefore, it should be interpreted as changes in school-to-job transitions that are caused by various factors in supply and demand sides of the labor market. We further explore the changes in transition caused by demand side because changes in labor demands have been argued as critical but not realized in Africa to mitigate the youth unemployment problem (e.g., Filmer and Fox 2014; African Development Bank 2102). In this study, we present estimates for controlling the difference in educational level as a supply-side factor while other individual characteristics are left uncontrolled. Although this is due to the limitations of the data, in which observations are cross-sectional, education accounts for most of the differences in personal characteristics across generations assuming a common distribution of individual innate ability. Therefore, much of the estimated difference is generated by demand-side factors, such as economic growth and technological changes.

2.2 Descriptive statistics of the sample

The STEP survey collected information of households that lived in urban areas in 2013. We began observations with those older than 17 years and divided the samples by year that one completed formal education: those who completed education before 1993 (cohort 0), between 1994 and 2003 (cohort 1), between 2004 and 2008 (cohort 2), and between 2009 and 2013 (cohort 3). Cohorts 2 and 3 are the young generation that completed education during the economic boom and cohort 1 is the senior generation that made their school-to-work transition during the stagnant period. We exclude cohort 0 who has working experience of 20 years or longer after completing formal education, considering possible recall errors in information of their first job.

Table 1 indicates the descriptive statistics by cohort². Cohorts differ in gender composition, age, and years of education. Gender distribution is not balanced in some cohorts due to an overrepresentation of females; thus, gender is controlled in the subsequent analysis. It is noted that the average years of education increases substantially, with four years of additional education for the three young cohorts in the both countries. In terms of status in the labor market, the proportion of NEET participants in the young cohorts is significantly higher than that in the senior cohort and the employment rate is lower even after conditioning labor force participation. This is in line with the argument of youth unemployment, showing that youth are less successful

² Sampling weights defined by survey designer are applied throughout the following analysis.

in the labor market.

However, job quality appears better for the young generations in the both countries. The proportion of employment in the informal sector conditional on being employed is smaller in cohorts 2 and 3, and proportion of self-employed workers is even much smaller. Strikingly, the average earnings per hour of the youngest cohort are significantly higher than the senior cohort and the average number of working hours does not differ. These results somewhat contrast to the trends in developing countries, which show that young people are more likely to work in the informal sector and be in working poverty³. We explore it further in the later section.

Those differences in employment outcomes across the cohorts incorporate the effects of age and work experience. It is likely that the number of people in NEET decreases with age and studies in developing countries indicate that the proportion of self-employed rises in middle-age based on their rich experience and assets (Bosch and Maloney 2010). In the following sections, we make comparisons of employment outcomes in the same career stage—school-to-work transition—to purge the effects of age and experience.

3. School-to-work Transition

3.1 Transition to employment

Figure 1 illustrates estimates of the survival function representing the proportion of people who have not completed transitions to employment, first job, after completion of education⁴. Gender and locations of respondents defined by regions are controlled⁵. It shows for all the cohorts in both countries that the survival rate reduces rapidly immediately after graduation and this reduction becomes slower with passing time. This means that a larger number of entrants found a job shortly after graduation. Table 2 indicates the predicted survival rates of three cohorts, corresponding to Figure 1. Survival rates are lower in Ghana, i.e., higher transition rate to first job: 37–48% of entrants did not find their first job within 13 months compared with 64–65% in Kenya. In the both countries, the survival rate in cohort 2 (2004–08) is slightly lower than in cohort 1 (1994–2003), whereas it is higher in cohort 3 (2009–13) and the differences increase until the 37th month. The difference is largest between cohorts 1 and 3 at the 37th month in Ghana (9 percentage points). The youngest cohort in Ghana, having completed education after 2009, made a slower job transition than the senior cohort that experienced transition during the stagnation.

³ See, for example, ILO (2017; Figures 2.6 and 2.7).

⁴ See Appendix A for definition of first job in this paper.

⁵ Cox proportional hazard model is applied in which the base hazard function is allowed to differ flexibly by cohort. See Appendix B for details.

Under economic growth, the number of job offers increases and offered wage raises generally. However, since reservation wage of job seekers rises accordingly, the change in transition speed is theoretically indeterminate. The above results indicate that transitions of the young cohorts in Ghana and Kenya are similar to the senior cohorts, except the youngest cohort in Ghana.

3.2 First job quality

The type of first job is classified as being in the public and education sector, other private sectors, self-employed, or unpaid family work, of which the latter two are defined as “vulnerable employment,” and compositions are compared across years after graduation (Figure 2). Because samples in the young cohorts are less likely to complete transitions at the time of survey, the type of first job taken within three years of graduation is considered for all observations⁶. Clear trends appear among the young workers in Ghana who graduated after 1999, with a steady decrease of self-employed jobs and an increase of employee jobs in the public sector. Composition of job type is much more stable in Kenya, where self-employed job kept its share between 11-16% and employee in public sector increased slightly.

To adjust for the unbalance of the sample structure with respect to gender and geographical location, differences between senior and young cohorts in probabilities of each job type are estimated by the multinomial logit model (see Appendix B for details of the estimation)⁷. In Table 3, the estimated marginal effects of the young cohort dummies are shown in Panel A. In Ghana, probabilities to work as an employee in the public sector are significantly higher in the younger cohorts while the probability to work as self-employed is lower. The youngest cohort is about four times more likely to work in the public sector (by 9.6 percentage points), and 67% less likely to work as self-employed (14.0 p.p.) than the senior cohort. No significant differences are found in the probabilities of working as employees in the private sector as well as not working (no transition yet) and engaging in unpaid work. The same trend appears in cohort 2 (completing education after 2003) but with smaller magnitude. In Kenya, changes in vulnerable employment are less clear. The reduction of self-employment is smaller and not significant in both of the young cohorts while the probability to engage in unpaid work slightly increased. Total changes in vulnerable employment, which is sum of self-employed and unpaid work, do not significantly

⁶ Without controlling timing at which the first job is defined, selection bias emerges when a type of job is associated with timing for job seekers to get a job. For example, if job seekers choose to be self-employed after searching for jobs, then the proportion of self-employed is necessarily smaller in young cohorts that have a shorter time after completing their education.

⁷ Although sampling weights replicate random sampling with respect to location, there are differences in gender and location between the three cohorts. The estimation makes comparisons netting out those differences between the cohorts.

differ from zero in Kenya.

We constructed a measure of formality based on information recorded in the three rounds of the Living Standard Survey (1998, 2005, and 2012) for Ghana. Specifically, we calculated industry-level formality, which is the proportion of workers with formal employment among young workers for each industry, and assign the calculated measure in the nearest year to the timing of the first job observed. For Kenya, due to the absence of relevant information in national household survey data, we used industry-level proportion of formal workers recorded as the present job at the time of the survey⁸. Therefore, the formality measure for the Kenyan observations is constant within the industry and changes in average formality by cohorts represent only changes in the composition of the industries.

The average formality is substantially higher in Kenya with 30.5% of formal workers; however, sectoral patterns are quite similar between the two countries (Table 4). Formality is highest in the public/education sector followed by the health/ICT/finance/legal sector, in which more than half of employment is formal. It is much lower in the other sectors, with the lowest value in the trade/retail and agriculture sectors. In Ghana, formality slightly increased during the three surveys, but sectoral differences are relatively stable except the mining sector in 1998 and the public/education and health/ICT/finance/legal sectors in 2005. To construct the measure in Kenya, we use the observations in young cohorts to check if sectoral patterns of formality differ by age (column 5). Because the two measures are relatively similar, we use the one in column 4 that is based on a larger sample.

Among the young cohorts in Ghana, employment in the public/education and health/ICT/finance/legal sectors increased while the trade/retail sector lost its share (Figure 3a). Based on the industry-level formality in Table 4, these changes suggest that formal employment appears more common in the young cohorts. Changes in Kenya are similar but more modest, with increases in the health/ICT/finance/legal and public/education sectors and decreases in other sectors (Figure 3b). To adjust the distributions of gender and location, differences of formality by cohorts are estimated while controlling these variables. The young cohorts are more likely to have their first job in industries with higher formality, with the larger difference in the youngest cohort (Panel A, Table 5). The results suggest that the proportion of formal employment is higher by 15.9 percentage points in the youngest cohort compared with the senior cohort in Ghana, and by 8.9 p.p. in Kenya.

The differences in formality between the young and senior cohorts in Ghana are much larger than the growth of formality in aggregate employment (0.5 p.p. from 1998 to 2005 and 2.9

⁸ See Appendix A for definition of informal employment. Compared with vulnerable employment, informal employment excludes self-employment with employees and includes wage-employment without social security. This definition is applied also to the Ghana Living Standard Survey.

p.p. to 2012; Table 4). This indicates that the changes in industries of the first job, such as from trade/retail to public or health/ICT/finance/legal sectors, drove the increase of formality in the young cohorts. Given constant formality measures used for the Kenyan data, all differences between young and senior cohorts are attributed to changes in industries.

3.3 Controlling for gaps in educational achievement

As shown in Table 1, there are substantial gaps in educational attainment between the young and senior cohorts, and higher educational attainment among the young cohorts may affect their school-to-job transitions. Young educated job seekers may replace senior workers with less education if hiring and firing costs are substantially low. Because the educational gaps between entrants and incumbents after 2003 are larger than those before 2002 (due to the rapid rise in educational attainment), the young cohorts may have a greater advantage in transitions than the senior cohort⁹. Alternatively, if skilled and unskilled workers do not compete, i.e., skilled jobs match only with skilled workers, then firms increase their vacancies of skilled job when the labor supply with higher education grows (Acemogulu 1999)¹⁰. Provided that wage-employment requires higher skills than self-employment, vacancies of wage-employment increased during the growth period, which were mainly matched with educated young job seekers.

To study changes in the school-to-job transition induced by demand-side factors, we control for the education effect by using individual educational attainment. It is noted that because the competition between entrants and incumbents is imperfect in reality due to the non-negligible costs of hiring and firing, entrants compete more frequently with other entrants rather than incumbents; thus, the relative educational level among entrants is also important. For example, completing secondary education among young cohorts should have less advantage in transition than the same educational level in the senior cohorts, in which average educational attainment is lower. Therefore, estimations controlling individual educational attainment are likely to underestimate true inter-cohort differences in transition net of education. However, it is worth analyzing whether better performance remains among the young cohorts after controlling for educational levels.

The results are presented in Panel B of Tables 3 and 5. Once educational level is

⁹ The average years of education of cohort 1 is longer than that of cohort 0 by 0.64 years, whereas the average of cohort 2 (cohort 3) is longer than cohort 1 by 2.42 (4.11) years in Ghana. Gaps between entrants and incumbents are greater when the young cohorts entered into the labor market.

¹⁰ In the standard matching model like Pissarides (2000), the size of the labor supply does not affect the equilibrium employment rate due to the constant marginal product of labor. Therefore, a larger educated labor supply increases the number of vacancies and matched waged employee jobs. Acemogulu (1999) suggested the model explicitly separates skilled and unskilled jobs, and showed that skilled job vacancies increase with the growth in supply of skilled workers due to higher matching probabilities.

controlled, the probability to be an employee in the public sector does not differ across cohorts in either country (Panel B, Table 3). However, probability of being self-employed changes only slightly in Ghana and the difference is significant for the youngest cohort. Differences in first job formality also reduced substantially but remain significant between the youngest and senior cohort (Panel B, Table 5). This result is consistent with the estimates of the job type, showing that the probability to work in the sector with highest formality, namely, public and education, among the young cohorts reduced when education was controlled (Panel B, Table 3). These exercises show that inter-cohort differences in first job quality are not entirely accounted for by recent educational developments and suggest evidence of demand-side factors.

4. Employment in Mid-career

Table 6 shows average earnings of the three cohorts in 2013. To show mid-career earnings (excluding those with less than two years since starting their first job), the averages are standardized by gender and location¹¹. In STEP data, average earnings in the young cohorts are higher than in the senior cohorts in both countries, with a greater difference in Kenya (columns 1 and 3). Because these results are counter-intuitive, we calculated averages using the other national surveys, namely, the Ghana Living Standard Survey in 2012/13 and Kenya Household Budget Survey in 2015¹². These data show that earnings in the young cohorts are similar to those in the senior cohort, with the largest gap in the weekly earnings (5.6%) between cohorts 1 and 3 in Ghana (columns 2 and 4). Because earnings in the senior cohort reflect their longer experience, these results suggest that in mid-career, the young cohorts earn more than the senior cohort when work experience is conditioned.

Associations between first job quality and mid-career job quality are estimated. Specifically, the dependent variables are formality and earnings of a job in 2013, where formality is defined at individual-level rather than industry-level. Given evidence in the literature showing that the effects of a first job last for 10 years, the young cohorts are targeted. Selection into employment in 2013 is controlled (see Appendix B for details of the estimation).

For both countries, a mid-career job is less likely informal when the first job is in the

¹¹ Pooling all cohorts except cohort 0, observations are stratified by gender and location (region) in each country. The sample size in individual strata is used as a weight to calculate the weighted average of earnings. Sampling weights provided by the survey designers are also applied. For the Kenya earnings data that displayed larger variance in the young cohorts, top 3% rather than 1% are trimmed in Table 6.

¹² Observations of those aged 17–65 and living in urban areas are used. “Cohort” is defined by the age that one completed formal education and is calculated from the standard years of education. This differs from the definition of cohort in the STEP data, which provides the age that one actually completed education. The observation with earnings in the top 1% are excluded for all averages.

public or private sector compared with when it is self-employment, whereas it is more likely to be informal when doing unpaid work (columns 1 and 7, Table 7). Consistent with its formality, starting one's career in the public sector is associated with a reduction of probability by 58.8 percent points in Ghana compared with the associated reduction when starting in the private sectors by 23.4 p.p. at mean values of the covariates. Margins in Kenya is 22.8% for public job and 18.2% for private job. Working in the public sector as a first job is also associated with higher earnings in one's later career in Ghana by 147% ($= \exp(0.905) - 1$) in hourly earnings and 65.7% ($= \exp(0.505) - 1$) in weekly earnings, but no positive associations in Kenya (columns 2, 3, 8, and 9). The negative associations with starting one's career in unpaid work are clear in Kenya. There are one case that first job and mid-career quality are negatively and significantly associated: hourly earnings in mid-career for those who were employed in private sector is lower than self-employed in Kenya (column 8).

For both countries, first job formality is associated with a lower probability of having an informal job in mid-career (columns 4 and 10). The estimated coefficient in Ghana means that an increase of formality in the first job by 1 p.p. is associated with a lower probability of an informal mid-career job by 0.69 p.p. First job formality is positively associated with earnings but associations are significant only in Kenya (columns 5, 6, 11, and 12). Higher first job formality by 1 p.p. is associated with higher hourly earnings by 0.62% and higher weekly earnings by 0.35%.

The above results suggest positive associations between first and mid-career job quality although the magnitude and significance of association depend on its measure. A robust relationship is estimated in formality of mid-career job as it is significantly associated with both first job type and formality in the both countries. Association with mid-career earnings differs by country; working in the public sector is critical in Ghana, whereas it does not make a difference in Kenya. Rather, a first job in the private sector with high formality is associated with earnings in mid-career. This difference may be explained by higher formality of the Kenyan private sector as shown in Table 4, which provides formal employment opportunities for school graduates.

Although those results do not purely represent a causal relationship, they must at least partly incorporate causality given the continuity of jobs, particularly in the formal sector. Therefore, higher job formality following the transition from education among the young cohorts is likely to raise the quality of mid-career jobs with experience from two to ten years.

5. Conclusion

Using the information of one's first job after completing formal education, school-to-work transitions in Kenya and Ghana are compared across the generations. People who completed education after 2003, when the economy started to grow, are more likely to get a first job in the

public or private sector and less likely to start working as self-employed than those who graduated before 2002. In terms of industries, employment grew in the public/education and health/ICT/financial/legal sectors, where the proportion of formal sector workers is high; however, employment decreased in the trade/retail sector. Measured by the industry-level proportion of formal sector workers, first job formality in the young cohorts is substantially higher than in the senior cohort. These changes are shared in the two countries, though the magnitude of change is larger in Ghana than in Kenya. Given the poor working conditions for self-employment and the informal sector in general, these changes indicate the improvement of first job quality during the period of economic growth.

Comparing earnings in mid-career, the young cohorts earn as high as the senior cohort does despite their shorter tenure and experience. This suggests that earnings with conditioning experience are higher among the young cohorts. We found that first job formality is correlated with mid-career job quality among the young cohorts. The type of first job, specifically in the public sector, is robustly associated with earnings in one's later career in Ghana while first job formality is so in Kenya conditional on workers' education. The realized increase of formality among the youngest cohort is associated with a reduction in mid-career formality by 11.0% in Ghana and with growth of hourly earnings by 5.5% in Kenya.

The favorable changes in school-to-job transition among the young cohorts partly remain when educational level is controlled, though the magnitude of the differences decreased for most outcomes. Assuming that large gaps in education is the most influential factor that affects the school-to-work transition from the labor supply side, these results suggest the possibility that the changes in transition reflect changes in labor demand side due to growth of the economy and technological changes after 2003. This is an important future research topic given the lack of literature demonstrating changes in labor demands during the growth decade in Africa.

It is, however, clear from our study that jobs were created in the period of economic growth and that young job seekers benefited more favorably than senior workers. Although the African economic growth in the 2000s has not been generally considered to contribute to the employment outcomes of youth, the fact is that more youth accessed formal employment with better quality and had higher mid-career earnings than the senior cohort. It is critically important how the benefited generations will change the economy and society in the future.

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Appendix A. Definition of Variables

First job

In the STEP data, the first work that lasted for at least six months since completing the highest education is recorded. We define this as the respondent's first job. It is assumed that observations with missing information for the first job did not work from completing education to the time of survey. We checked if those observations without first job information had information of a job at the time of the survey. If both items of information are missing, we define them as not working since completing education. However, we find a few observations with missing information of the first job but not of the job at the time of the survey. When it is clear that a job at the time of survey is their first job, i.e., when they respond that they were in education before the job, we impute information of their first job from their job at the time of the survey. Otherwise, the observations with inconsistency in information of first job and the latest job are dropped.

Formal/Informal sector

In the STEP data, informal employment is defined as either 1) self-employment without employees, 2) unpaid work, or 3) wage-employment without social security. Compared with vulnerable employment, this definition considers heterogeneity within self-employment in terms of size of business and wage-employment in terms of eligibility of social security. The same condition is applied to the Ghana Living Standard Survey.

Earnings

Hourly earnings are calculated from daily, weekly, biweekly, monthly, and annual earnings that the respondent received most recently, using hours worked per day and days worked per week. For wage-employees, net pay after tax and social security is recorded and net personal earnings from one's business are recorded for self-employed workers. The observations with earnings at the top 1% of the samples are excluded as outliers, whereas for STEP Kenya, the observations in top 5% are excluded since variance of earnings with trimming top 1% is much larger in the young cohorts than that in the senior cohort (statistics of earnings in Table 1 shows variance of the sample with trimming top 1%). Trimming top 5% reduces mean value as well as variance more intensively among the young cohorts.

Appendix B. Estimation Methods and Results

1. Transition to work (Figure 1 and Table 2)

The search spells for first jobs is based on information of time (in month) from completing formal education to finding the first job. For respondents that have not completed the transition, including inactive ones at the time of survey, their transition spells are treated as censored data.

The hazard rate for the transition from unemployment to employment is estimated using the Cox proportional hazard model. Let time t (months) represent the period of transition from unemployed to employed. The Cox model describes the hazard rate as

$$h(t|\mathbf{X}_i) = h_0(t)\exp(\mathbf{X}_i\boldsymbol{\beta}),$$

where $h_0(t)$ is the baseline hazard function and \mathbf{X}_i is a set of covariates of observation i . In this specification, covariates make proportional changes to the baseline hazard. Because we do not assume the hazard rate proportionally differs by cohort, we incorporate a heterogeneous baseline hazard function:

$$h(t|\mathbf{X}_i, i = c) = h_0^c(t)\exp(\mathbf{X}_i\boldsymbol{\beta}),$$

where c = cohorts 1, 2, and 3. Under this specification, marginal effect of covariates is common across the three cohorts, while base hazard functions differ without restrictions (base hazard functions need not be proportional). We applied the Cox model for its flexibility in baseline hazard function. The above specification is estimated with gender and location of respondent at the region level as covariates.

The baseline survival function, $S_0(t)$, depicted in Figure 1 is obtained from the estimated baseline hazard function:

$$S_0^c(t) = \exp\{-H_0^c(t)\} = \exp\left\{\int_0^t h_0^c(u)du\right\},$$

where H_0 is the cumulative base hazard function. The predicted survival rates with covariates at mean value reported in Table 2 are obtained by the following equation:

$$\begin{aligned} S(t|\mathbf{X}_i = \bar{\mathbf{X}}, i = c) &= \exp\{-H(t|\mathbf{X}_i = \bar{\mathbf{X}}, i = c)\} \\ &= \exp\{-\exp(\bar{\mathbf{X}}\boldsymbol{\beta})H_0^c(t)\} \\ &= S_0^c(t)^{\exp(\bar{\mathbf{X}}\boldsymbol{\beta})}. \end{aligned}$$

Sampling weights are applied to all the estimations.

2. Differences in type of first job by cohort (Table 3)

Type of first job is defined as either 1) employee in public sector, 2) employee in private sector, 3) self-employment, or 4) unpaid work. To make a consistent comparison of probabilities across the job types, observations that had not worked are included and assigned the status of “not working.” A standard multinomial logit model is applied with the sampling weights. Base

outcome is unpaid work. Estimated results are shown in Table A1.

It is noted that there is clear difference across the cohorts in time from completion of education to the time of survey and this may affect the type of first job. Given the theoretical relationship between search spells and reservations wages, job seekers with a high reservation wage are likely to search for a longer period and find a job with better quality. Among the young cohort, for whom the STEP data covers shorter period after entering into labor market, those with a higher reservation wage are more likely to continue search in 2013 than those who are in the senior cohort. Therefore, we used type of first job that a respondent engaged within three years after completing education.

3. Differences in formality of first job by the cohort (Table 5)

First job formality is defined by industry. The proportion of formal employment is calculated for 10 industry sectors based on workers aged 17–65. For the respondents in Ghana, we based this on three rounds of the Ghana Living Standard Survey (1998/99, 2005/06, and 2012/13) and assign the proportion in the nearest year that the respondent entered into the labor market to first job formality. We used the STEP 2013 for the Kenyan respondents due to the absence of a national-level survey with sufficient information of employment. Therefore, there is no time variation in the formality measure for the Kenyan observations.

For the same reason as first job type, differences in first job formality are compared only for respondents for whom at least three years had passed since the completion of education or those who got the first job within three years. The estimations consider selection bias with respect to availability of first job within three years by the standard Heckman selection model:

$$f_i = \mathbf{X}_{1,i}\boldsymbol{\alpha} + \sum_{c=2}^3 \eta_c \text{cohort}_i^c + \widehat{\lambda}_{1,i} + \varepsilon_i,$$

where f_i denotes first job formality for observation i in cohort c ; $\mathbf{X}_{1,i}$ contains a constant, gender, and region; cohort_i^c represents cohort dummies for cohorts 2 and 3; $\widehat{\lambda}_{1,i}$ is the inverse Mill's ratio estimated from the selection equation; and ε_i is the error term. In the specification for Panel B of Table 5, years of education is added as a covariate.

The selection equation for the above main equations is $s_{1,i} = 1[\mathbf{Z}_{1,i}\boldsymbol{\theta} + u_i > 0]$, where $s_{1,i}$ is a selection indicator, and the operator of RHS, $1[.]$, takes the value of one when the condition inside the brackets is satisfied, otherwise zero. $\mathbf{Z}_{1,i}$ is composed of information about one's education (age at completion of highest education, years of education, if a respondent dropped out education, and if they started education later than the standard age), one's household (if one has senior/younger sisters and brothers, defined respectively, if they live with either or both of parents, if one worked at age 15 and social economic status at age 15), and economic

situation before age 15 (number of economic shocks) as well as $\mathbf{X}_{1,i}$. Sampling weights provided by the survey designer are applied. The estimation results of the selection equations are reported in Table A2.

4. Associations between first job quality and job in 2013 (Table 7)

Associations among observations in the two young cohorts (2 and 3) are estimated. We exclude the observations with less than two years of working experience, measured by years since starting the first job so that they have work experience from 2 to 10 years.

The dependent variables are three outcomes of a job in 2013, namely, a dummy representing if the job is informal, a log of hourly earnings, and a log of weekly earnings. The main regressor includes one of the two variables about first job quality, namely, type and formality of the first job. The specification for the model with earning outcomes and type of first job is as follows:

$$y_i = \mathbf{X}_{2,i}\boldsymbol{\beta}^y + \sum_m \gamma_m^y q_i^m + \widehat{\lambda}_{2,i} + \varepsilon_i,$$

where y_i is logged hourly or weekly earnings, $\mathbf{X}_{2,i}$ contains a constant and is a set of covariates including years of education, gender and region, $\widehat{\lambda}_{2,i}$ is the inverse Mill's ratio estimated from the selection equation, and ε_i is the error term. The main explanatory variable q_i^m represents the type of first job with m = (employee in public sector, employee in private sector, unpaid work) and is equal to one when one's type is m . First job as self-employment is the reference category. The model with the informal dummy as an outcome is specified in probit form:

$$w_i = 1 \left[\mathbf{X}_{2,i}\boldsymbol{\beta}^w + \sum_m \gamma_m^w q_i^m + \widehat{\lambda}_{2,i} + v_i > 0 \right],$$

where w_i is informal dummy (= 1 if a job in 2013 is informal) and v is an error term with standard normal distribution. For the model with formality of first job f_i , as a main regressor, $\delta^y f_i$ or $\delta^w f_i$ replaces $\sum_m \gamma_m^y q_i^m$ or $\sum_m \gamma_m^w q_i^m$ in the above equations, respectively.

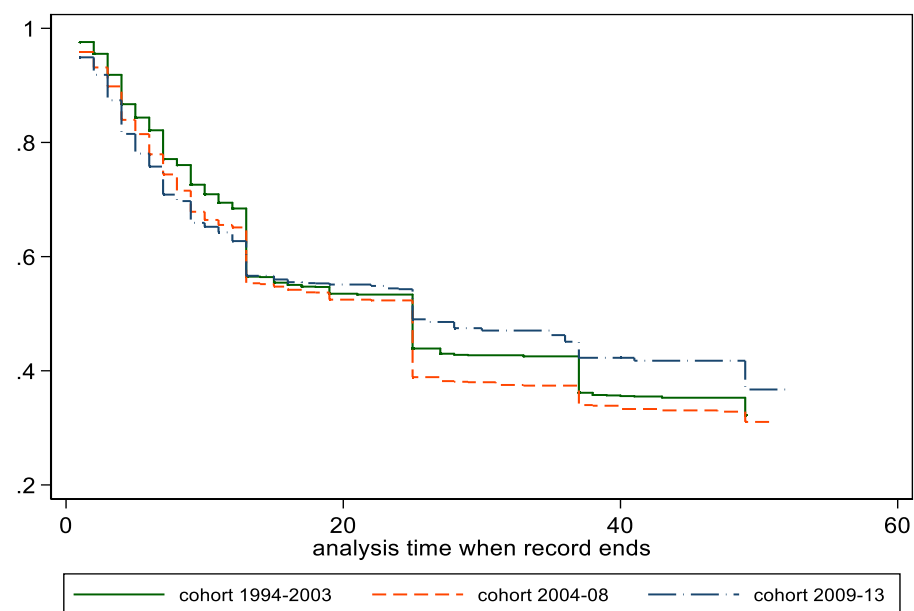
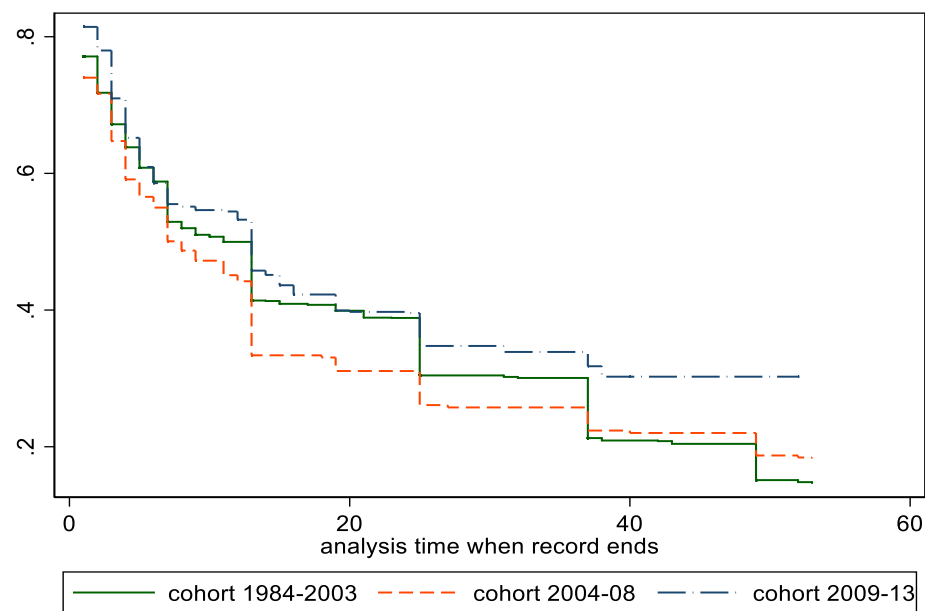
The common selection equation for the above main equations is $s_{2,i} = 1[\mathbf{Z}_{2,i}\boldsymbol{\theta} + u_i > 0]$, where $\mathbf{Z}_{2,i}$ is composed of age, squared age, number of children, interaction of gender and number of children, a dummy of household head, and a dummy indicating if one lives with the father as well as $\mathbf{X}_{2,i}$. Sampling weights provided by the survey designer are applied. The estimation results of the selection equations are reported in Table A3.

Table 1 Descriptive statistics by cohort

	Ghana			Kenya		
	cohort 1994-2003	cohort 2004-08	cohort 2009-13	cohort 1994-2003	cohort 2004-08	cohort 2009-13
Male	0.428 (0.527) 530	0.527 (0.506) 309	0.482 (0.461) 398	0.426 (0.509) 909	0.422 (0.489) 757	0.432 (0.486) 822
Age	31.73 (5.682) 531	27.12 *** (5.122) 310	22.95 *** (5.063) 400	31.17 (4.639) 903	25.65 ** (3.766) 751	22.77 *** (3.374) 816
Years of education	8.631 (4.875) 531	10.842 *** (4.304) 310	11.826 *** (3.415) 400	8.34 (4.616) 903	9.74 (3.942) 751	11.67 ** (3.356) 816
Status in the labor market						
Labor participation (=1)	0.889 (0.334) 530	0.848 (0.364) 309	0.756 *** (0.396) 398	0.844 (0.374) 909	0.834 (0.369) 757	0.804 (0.389) 822
NEET (=1)	0.150 (0.380) 530	0.199 (0.404) 309	0.293 *** (0.420) 398	0.298 (0.470) 909	0.324 (0.463) 757	0.418 (0.483) 822
Employment rate Active	0.937 (0.256) 475	0.870 * (0.335) 259	0.814 *** (0.361) 310	0.822 (0.393) 782	0.797 (0.397) 640	0.686 (0.457) 683
Quality of employment						
Informal (=1) Employed	0.844 (0.379) 441	0.667 *** (0.466) 226	0.755 *** (0.407) 268	0.784 (0.422) 653	0.721 (0.438) 511	0.694 ** (0.459) 489
self_employed (=1) Employed	0.546 (0.520) 441	0.319 *** (0.461) 226	0.202 *** (0.380) 268	0.460 (0.511) 653	0.369 (0.471) 511	0.292 * (0.452) 489
Hours worked Employed	8.621 (3.514) 441	8.890 * (2.750) 226	8.702 (2.926) 268	8.840 (2.821) 652	8.838 (2.729) 509	8.510 (2.779) 489
Earnings per hour Employed (Cedi/Kenya Shilling)	1.792 (2.246) 405	2.090 (2.035) 206	2.099 (2.299) 228	91.75 (118.39) 611	122.95 ** (165.44) 480	131.09 * (156.95) 445

Note: The figure indicates mean (top), standard errors (middle), and number of observations (bottom). Sampling weights are applied. For earnings, observations in top 1 % are trimmed. *** and ** indicates that the mean significantly differs with the mean of cohort 1984-2003 at 1% and 5% level.

Figure 1: Estimates of survival function



A: Ghana

B: Kenya

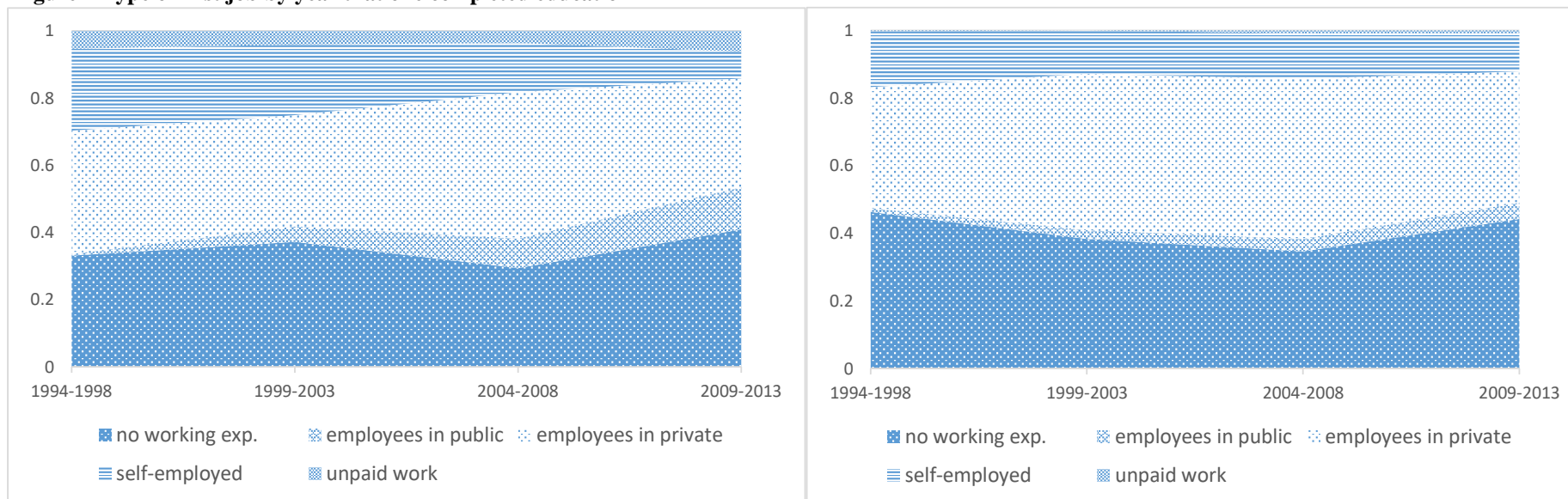
NOTE: Estimates of baseline survival function are illustrated. Estimations are based on the Cox model with heterogeneous baseline hazards across the cohorts.

Table 2 Predicted values of survival rate

Months from graduation	Ghana			Kenya		
	Cohort 1994-2003	Cohort 2004-2008	Cohort 2009-2013	Cohort 1994-2003	Cohort 2004-2008	Cohort 2009-2013
13	0.445 (0.044)	0.372 (0.045)	0.483 (0.043)	0.650 (0.012)	0.638 (0.013)	0.647 (0.013)
25	0.338 (0.045)	0.297 (0.044)	0.372 (0.045)	0.542 (0.015)	0.503 (0.015)	0.580 (0.014)
37	0.249 (0.043)	0.257 (0.043)	0.342 (0.045)	0.471 (0.016)	0.454 (0.016)	0.516 (0.015)

NOTE: Predicted values of survival rate at mean value of gender and locations are shown. Estimations are based on the Cox model with heterogeneous baseline hazards across the cohorts. Standard errors are in parentheses. ***, ** and, * indicate significance of difference with the cohort 1994-2003 at 1%, 5%, and 10%.

Figure 2 Type of first job by year that one completed education



A: Ghana

B: Kenya

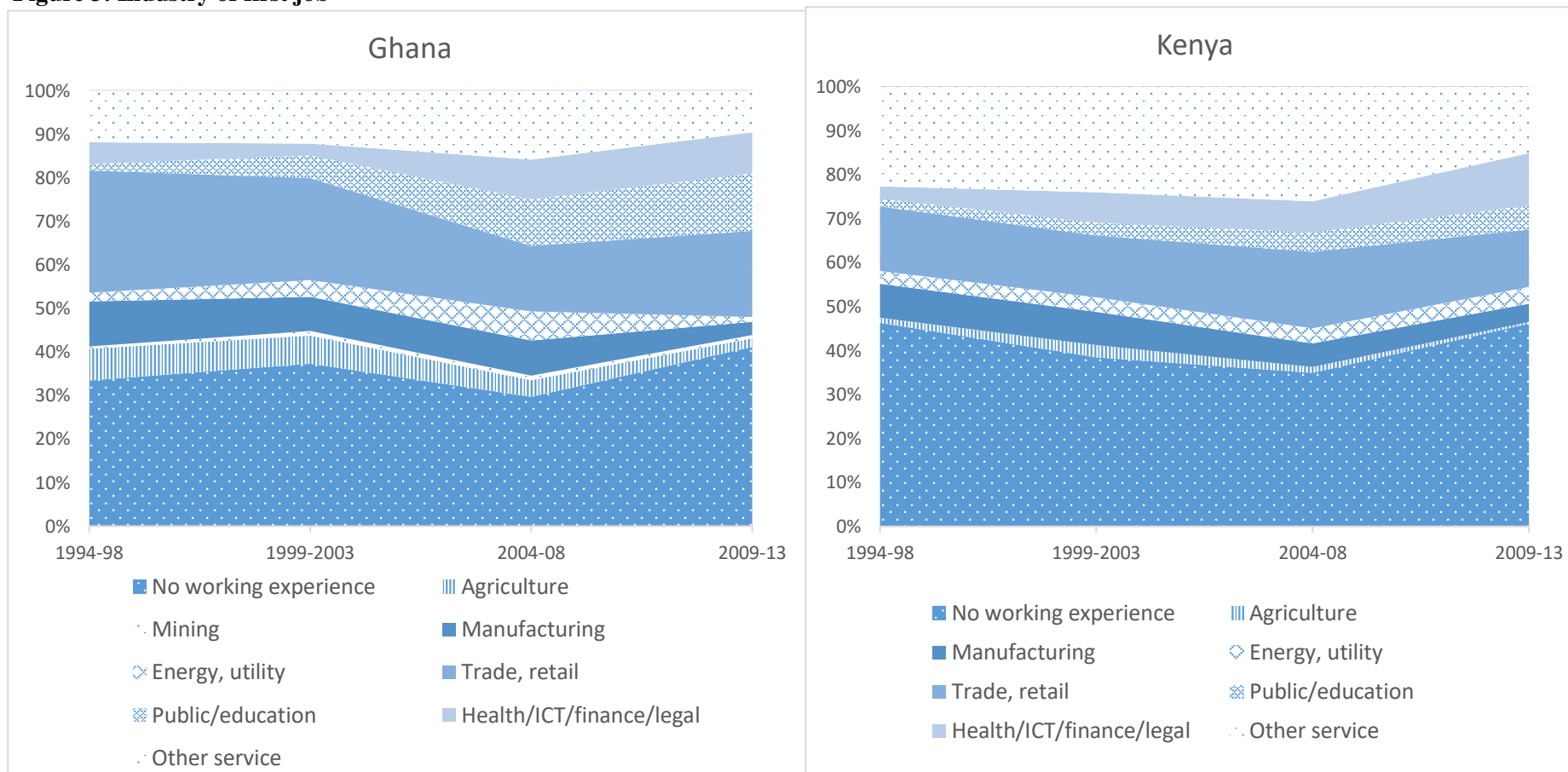
Note: The figure shows the type of first job that respondents worked within three years after completion of formal education.

Table 3 Estimation of probabilities by type of first job

	Dependent variable				
	no work	employees in public	employees in private	self- employed	unpaid work
Panel A: adjusting gender and location					
Ghana					
Cohort 2004-08	-0.050 (0.040)	0.056 ** (0.024)	0.073 (0.044)	-0.067 * (0.035)	-0.011 (0.015)
Cohort 2009-13	0.059 (0.041)	0.096 *** (0.023)	-0.027 (0.039)	-0.140 *** (0.029)	0.012 (0.017)
Proportion in Cohort 1994-2003 (reference)	0.350	0.029	0.353	0.220	0.048
Observations			1,227		
Pseudo R-squared			0.0544		
Kenya					
Cohort 2004-08	-0.066 ** (0.028)	0.016 * (0.010)	0.049 * (0.029)	-0.006 (0.020)	0.007 (0.006)
Cohort 2009-13	0.033 (0.029)	0.027 *** (0.010)	-0.038 (0.028)	-0.029 (0.019)	0.007 ** (0.004)
Proportion in Cohort 1994-2003 (reference)	0.412	0.021	0.425	0.142	0.001
Observations			2,422		
Pseudo R-squared			0.0303		
Panel B: adjusting gender, location, and education					
Ghana					
Cohort 2004-08	-0.024 (0.044)	0.005 (0.005)	0.064 (0.047)	-0.043 (0.037)	-0.002 (0.014)
Cohort 2009-13	0.127 *** (0.046)	0.006 (0.005)	-0.055 (0.043)	-0.114 *** (0.032)	0.035 ** (0.020)
Proportion in Cohort 1994-2003 (reference, education=10 yrs)	0.359	0.008	0.389	0.208	0.037
Observations	1,227	1,227	1,227	1,227	1,227
Pseudo R-squared	0.1244	0.1244	0.1244	0.1244	0.1244
Kenya					
Cohort 2004-08	-0.036 (0.028)	0.006 (0.006)	0.028 (0.030)	-0.005 (0.022)	0.008 (0.006)
Cohort 2009-13	0.114 *** (0.031)	0.001 (0.005)	-0.096 *** (0.030)	-0.028 (0.022)	0.008 ** (0.004)
Proportion in Cohort 1994-2003 (reference, education=10 yrs)	0.378	0.014	0.463	0.144	0.001
Observations			2,404		
Pseudo R-squared			0.0568		

NOTE: Marginal effects and robust standard errors obtained from multinomial logit estimates are presented. Years of education are set at 10 years for predictions in Panel B. ***, **, and * indicate significance of difference with the cohort 1994-2003 at 1%, 5%, and 10%.

Figure 3: Industry of first job



Note: The figure shows industry of the first job that respondents worked within three years after completion of formal education.

Table 4 Proportion of formal employment by industry (formality measure)

	Ghana			Kenya	
	GLSS4, 1998	GLSS5, 2005	GLSS6, 2012	STEP, 2013	STEP, 2013
	17-35 yrs	17-35 yrs	17-35 yrs	17yrs <	Cohort 2 and 3
	1	2	3	4	5
Agriculture	0.012	0.015	0.015	0.090	0.070
Mining	0.536	0.054	0.129		
Manufacturing	0.068	0.111	0.116	0.199	0.296
Energy, utility	0.045	0.135	0.145	0.537	0.284
Trade, retail	0.040	0.050	0.068	0.025	0.073
Public/education	0.677	0.471	0.631	0.771	0.661
Health/ICT/finance/legal	0.552	0.368	0.507	0.626	0.614
Other service	0.115	0.091	0.116	0.274	0.268
Total	0.059	0.064	0.088	0.305	0.295

NOTE: Formal employment is defined as those who are not in self-employment or unpaid work, and eligible for social security.

Table 5 Differences in formality of first job by cohort

	Ghana	Kenya
	1	2
Panel A: adjusting gender and location		
Cohort 2004-08	0.040 ** (0.020)	0.002 (0.014)
Cohort 2009-13	0.159 *** (0.024)	0.089 *** (0.016)
Average in Cohort 1994-2003 (reference)	0.208	0.332
Observations	1207	2,293
Wald test of null $\rho=0$ (p-value)	0.000	0.000
Panel B: adjusting gender, location, and education		
Cohort 2004-08	-0.002 (0.018)	-0.008 (0.013)
Cohort 2009-13	0.080 *** (0.022)	0.044 *** (0.016)
Average in Cohort 1994-2003 (reference, education=10 yrs)	0.191	0.310
Observations	1207	2,293
Wald test of null $\rho=0$ (p-value)	0.000	0.000

NOTE: The table reports the estimates from the second stage of the Heckman regression where the dependent variable is the share of formality in the first job. Wald test of the null that association of inverse Mills ratio (ρ) is zero is reported. ***, **, and * indicate significance of difference from zero at 1%, 5%, and 10%.

Table 6 Standardized means of earnings by cohort

	Ghana (Cedi)		Kenya (Kenya Shilling)	
	STEP, 2012/13	GLSS6, 2012	STEP, 2012/13	HHBS, 2015
	1	2	3	4
Panel A: Hourly earnings				
Cohort 1994-2003	1.745 (0.110) 405	2.402 (0.075) 2206	79.13 (3.21) 598	77.54 (2.04) 3,329
Cohort 2004-08	1.953 (0.172) 203	2.364 (0.135) 960	88.39 (4.22) 455	70.47 (1.96) 1,657
Cohort 2009-13	1.965 (0.169) 138	2.401 (0.198) 466	100.72 (8.06) 415	74.70 (3.14) 816
Panel B: Weekly earnings				
Cohort 1994-2003	63.71 (4.355) 406	95.14 (2.63) 2289	3349.09 (133.19) 595	3280.31 (74.15) 3324
Cohort 2004-08	75.05 (5.386) 203	89.64 (4.73) 990	3850.93 (208.06) 453	3024.55 (81.58) 1654
Cohort 2009-13	64.86 (5.077) 137	89.78 (5.72) 481	4073.02 (319.33) 413	3189.08 (122.24) 815

Note: Standardized mean (top), standard errors (middle), and number of observations (bottom) are shown. Standardization is based on gender and locations; therefore, differences in gender and locations between cohorts are adjusted. Apart from the standardization, the sampling weights defined in the survey design are applied. For all surveys, observations are of those located in urban areas and aged 17 to 65 years with experience of longer than two years. Those who have earnings higher than top 1% are excluded except STEP Kenya, in which top 5% are excluded considering substantial differences in variance by cohort.

Table 7 Associations between first job and job in mid-career.

dep var: quality of a present job	Ghana						Kenya					
	Informal job	Hourly	Weekly	Informal job	Hourly	Weekly	Informal job	Hourly	Weekly	Informal job	Hourly	Weekly
	(=1)	earnings (log)	earnings (log)	(=1)	earnings (log)	earnings (log)	(=1)	earnings (log)	earnings (log)	(=1)	earnings (log)	earnings (log)
	1	2	3	4	5	6	7	8	9	10	11	12
First job type (Base category: Self-employed)												
Employee in public	-1.662 *** (0.537)	0.905 *** (0.290)	0.505 * (0.259)				-0.593 *** (0.186)	-0.017 (0.106)	-0.036 (0.136)			
Employee in private	-0.721 *** (0.249)	0.415 (0.306)	0.195 (0.248)				-0.479 * (0.256)	-0.088 * (0.051)	0.060 (0.075)			
Unpaid work	6.974 *** (1.156)	0.457 ** (0.224)	0.055 (0.130)				5.139 ** (1.994)	-0.608 *** (0.045)	-0.981 *** (0.058)			
Formality in the first job												
Formality				-1.817 *** (0.475)	0.447 (0.636)	0.069 (0.523)				-0.693 *** (0.234)	0.619 *** (0.181)	0.350 * (0.137)
Controls												
Years of education	-0.228 *** (0.029)	0.015 (0.030)	-0.002 (0.034)	-0.230 *** (0.041)	0.042 (0.034)	0.007 (0.038)	-0.151 *** (0.029)	0.104 *** (0.011)	0.097 *** (0.011)	-0.143 *** (0.034)	0.094 *** (0.010)	0.090 *** (0.009)
Gender, location, experience	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes		
Wald test of null $\rho=0$ (p-value)	0.003	0.190	0.114	0.045	0.721	0.083	0.206	0.740	0.464	0.198	0.756	0.349
N	545	578	576	541	575	573	1,489	1,533	1,527	1,489	1,535	1,529

Note: The table reports the coefficient estimates from a Heckman regression of the designated outcome. The specification controls for the inversion Mills ratio (ρ) obtained from the first stage model to account for sample selection bias. Wald test of the null that association of inverse Mills ratio (ρ) is zero is reported. Standard errors in parentheses are clustered at regional level. ***, **, and * indicate significance of difference from zero at 1%, 5%, and 10%. Sample used for the estimation is same as one in Table 6.

Table A1 Estimates of first job type (Coefficients in multinomial logit)

	no work	employees in public	employees in private	self_employed
Panel A				
Ghana				
cohort 2004-08	0.137 (0.409)	1.389 ** (0.563)	0.511 (0.409)	-0.092 (0.445)
cohort 2009-13	-0.059 (0.361)	1.264 ** (0.494)	-0.267 (0.369)	-1.248 *** (0.431)
male	0.240 (0.370)	1.172 *** (0.440)	1.014 *** (0.369)	-0.292 (0.407)
region (other than Accra)	-1.603 *** (0.544)	-1.609 *** (0.620)	-1.867 *** (0.543)	-1.311 ** (0.562)
cons	3.244 *** (0.607)	0.268 (0.710)	3.026 *** (0.606)	2.753 *** (0.618)
Observations		1,227		
Pseudo R-squared		0.054		
Kenya				
cohort 2004-08	-2.345 * (1.237)	-1.583 (1.279)	-2.048 * (1.235)	-2.203 * (1.243)
cohort 2009-13	-2.071 * (1.086)	-1.313 (1.126)	-2.253 ** (1.085)	-2.392 ** (1.094)
male	-0.714 (0.773)	-0.079 (0.811)	0.243 (0.772)	0.331 (0.781)
region (other than Nairobi)	0.536 (0.907)	-0.174 (0.950)	0.487 (0.903)	0.747 (0.926)
cons	5.861 *** (1.323)	3.254 ** (1.376)	5.554 *** (1.321)	4.171 *** (1.339)
Observations		2,422		
Pseudo R-squared		0.030		
Panel B (Adjusting education)				
Ghana				
cohort 2004-08	-0.014 (0.424)	0.560 (0.592)	0.219 (0.426)	-0.184 (0.461)
cohort 2009-13	-0.367 (0.414)	-0.071 (0.559)	-0.823 * (0.424)	-1.461 *** (0.481)
years_educ	0.094 ** (0.040)	0.711 *** (0.079)	0.190 *** (0.044)	0.063 (0.041)
male	0.076 (0.383)	0.311 (0.482)	0.709 * (0.384)	-0.402 (0.418)
region (other than Accra)	-1.544 *** (0.542)	-1.133 (0.688)	-1.758 *** (0.546)	-1.271 ** (0.561)
cons	2.597 *** (0.623)	-7.817 *** (1.371)	1.536 ** (0.651)	2.330 * (0.638)
Observations		1,227		
Pseudo R-squared		0.124		
Kenya				
cohort 2004-08	-2.344 * (1.219)	-1.880 (1.263)	-2.178 * (1.216)	-2.274 * (1.225)
cohort 2009-13	-2.034 ** (0.992)	-2.212 ** (1.040)	-2.554 ** (0.991)	-2.541 ** (1.004)
years_educ	-0.006 (0.069)	0.416 *** (0.080)	0.082 (0.070)	0.035 (0.071)
male	-0.716 (0.737)	-0.370 (0.779)	0.171 (0.736)	0.327 (0.745)
region (other than Nairobi)	0.552 (0.902)	-0.233 (0.946)	0.486 (0.898)	0.732 (0.921)
cons	5.879 * (1.562)	-1.049 (1.672)	4.919 *** (1.562)	3.915 ** (1.578)
Observations		2,404		
Pseudo R-squared		0.057		

NOTE: There are five types of outcomes and base outcome is unpaid work. Heteroskedasticity robust standard errors are in parentheses. ***, **, and * indicate significance of difference from zero at 1%, 5%, and 10%.

Table A2 First-stage Results for Table 5

	Results for Panel A Table 5				Results for Panel B Table 5			
	Ghana		Kenya		Ghana		Kenya	
age_grad	0.085	(0.016)	0.088	(0.017)	0.088	(0.017)	0.063	(0.014)
late_first_grade	-0.135	(0.120)	-0.153	(0.122)	-0.153	(0.122)	-0.147	(0.094)
old_brothers	-0.018	(0.030)	-0.021	(0.030)	-0.021	(0.030)	-0.019	(0.022)
old_sisters	-0.023	(0.027)	-0.024	(0.029)	-0.024	(0.029)	-0.027	(0.025)
young_brothers	-0.056	(0.033)	-0.061	(0.037)	-0.061	(0.037)	-0.017	(0.032)
young_sisters	-0.004	(0.029)	0.000	(0.032)	0.000	(0.032)	-0.026	(0.024)
father_mother	-0.086	(0.064)	-0.076	(0.069)	-0.076	(0.069)	-0.065	(0.074)
shocks2	0.066	(0.058)	0.075	(0.062)	0.075	(0.062)	-0.001	(0.039)
ses15	0.104	(0.068)	0.148	(0.075)	0.148	(0.075)	0.030	(0.057)
work15	0.207	(0.113)	0.255	(0.127)	0.255	(0.127)	0.031	(0.093)
dropout	0.237	(0.129)	0.195	(0.149)	0.195	(0.149)	0.004	(0.084)
years_educ	0.053	(0.020)	-0.001	(0.021)	-0.001	(0.021)	0.014	(0.013)
cohort 2004-08	-0.167	(0.120)	-0.044	(0.124)	-0.044	(0.124)	0.077	(0.081)
cohort 2009-13	-0.543	(0.126)	-0.428	(0.127)	-0.428	(0.127)	-0.394	(0.086)
male	0.025	(0.105)	0.140	(0.105)	0.140	(0.105)	0.501	(0.069)
region dummies (9 dummies)	Y		Y		Y		Y	
_cons	-1.585	(0.308)	-1.321	(0.327)	-1.321	(0.327)	-1.128	(0.252)
Observations	1207		2,293		1207		2,293	
Wald test of null $\rho=0$ (p-value)	0.000		0.000		0.000		0.000	

NOTE: This table report first-stage results of estimations in Table 5. Dependent variable is a dummy variable, which is equal to one if an observation is employed by three years after completing education. Figures in parenthesis is heteroskedasticity robust standard errors. age_grad: age at completion of the highest education, late_first_grade: =1 if one started education later than standard age, old_brothers(sisters): =1 if one has elder brothers (sisters), young_brothers(sisters): =1 if one has younger brothers (sisters), father_mother: =1 if one lives with either or both of parents, shocks2: number of economic shocks before age 15, ses15: social economic status at age 15, work15: =1 if one worked at age 15, dropout: =1 if one dropped out education before graduation.

Table A3 First-stage Results for Table 7

Table A3 First-stage Results for Table 7												
Ghana												
	Results for col. 1		Results for col. 2		Results for col. 3		Results for col. 4		Results for col. 5		Results for col. 6	
age	0.386	(0.054)	0.324	(0.044)	0.338	(0.047)	0.385	(0.058)	0.330	(0.049)	0.328	(0.048)
age2	-0.005	(0.001)	-0.004	(0.001)	-0.004	(0.001)	-0.005	(0.001)	-0.004	(0.001)	-0.004	(0.001)
children	-0.122	(0.110)	-0.109	(0.098)	-0.099	(0.086)	-0.120	(0.111)	-0.121	(0.099)	-0.096	(0.083)
childxmale	0.255	(0.127)	0.148	(0.099)	0.105	(0.124)	0.267	(0.125)	0.138	(0.116)	0.076	(0.116)
head	0.405	(0.127)	0.488	(0.119)	0.309	(0.229)	0.397	(0.123)	0.474	(0.104)	0.266	(0.223)
liv_father	-0.057	(0.179)	-0.202	(0.201)	-0.216	(0.154)	-0.122	(0.163)	-0.256	(0.233)	-0.186	(0.132)
years_educ	0.013	(0.017)	0.026	(0.018)	0.025	(0.017)	0.021	(0.015)	0.027	(0.018)	0.026	(0.017)
male	0.356	(0.202)	0.311	(0.222)	0.309	(0.177)	0.314	(0.194)	0.325	(0.232)	0.315	(0.172)
region dummies (9 dummies)	Y		Y		Y		Y		Y		Y	
_cons	-6.809	(0.770)	-6.068	(0.669)	-6.245	(0.697)	-6.844	(0.844)	-6.116	(0.719)	-6.114	(0.727)
Wald test of null $\rho=0$ (p-value)	0.003		0.190		0.114		0.045		0.721		0.083	
Observations	545		578		576		541		575		573	
Kenya												
	Results for col. 7		Results for col. 8		Results for col. 9		Results for col. 10		Results for col. 11		Results for col. 12	
age	0.695	(0.133)	0.761	(0.060)	0.751	(0.068)	0.694	(0.137)	0.762	(0.060)	0.749	(0.068)
age2	-0.011	(0.003)	-0.013	(0.001)	-0.013	(0.001)	-0.011	(0.003)	-0.013	(0.001)	-0.012	(0.001)
children	0.041	(0.077)	0.058	(0.071)	0.092	(0.085)	0.041	(0.073)	0.057	(0.073)	0.093	(0.088)
childxmale	0.257	(0.119)	0.207	(0.150)	0.145	(0.152)	0.254	(0.117)	0.204	(0.148)	0.143	(0.150)
head	0.700	(0.114)	0.737	(0.158)	0.745	(0.158)	0.693	(0.112)	0.731	(0.158)	0.738	(0.159)
liv_father	0.153	(0.122)	0.097	(0.060)	0.081	(0.052)	0.145	(0.115)	0.098	(0.060)	0.082	(0.053)
years_educ	-0.032	(0.007)	-0.016	(0.014)	-0.017	(0.014)	-0.033	(0.008)	-0.016	(0.014)	-0.017	(0.014)
male	0.266	(0.078)	0.231	(0.099)	0.244	(0.113)	0.277	(0.067)	0.241	(0.094)	0.254	(0.106)
region dummies (9 dummies)	Y		Y		Y		Y		Y		Y	
_cons	-10.942	(1.425)	-11.795	(0.713)	-11.606	(0.826)	-10.917	(1.475)	-11.795	(0.706)	-11.584	(0.821)
Wald test of null $\rho=0$ (p-value)	0.206		0.740		0.464		0.193		0.756		0.349	
Observations	1,489		1,533		1,527		1,489		1,535		1,529	

NOTE: This table report first-stage results of estimations in Table 7. Dependent variable is a dummy variable, which is equal to one if an observation has paid employment at the time of survey. Figures in parenthesis is clustered standard errors at region level. age2: square of age, children: number of children, childxmale: an interaction term with children and male, head: =1 if one is a household head, live_father: =1 if one lives with father.