What Explains Wage Differentials for Urban Wage Earners?

Returns to Education for Ethiopia's Urban Wage Employed

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Abstract

The Ethiopian labor market is facing the dual challenge of creating new employment opportunities for the rapidly expanding labor force and improving the quality of existing jobs in the labor market. This paper estimates an earnings function for the urban wage-employed to understand how investment in human capital shapes labor market outcomes and to what extent human capital returns have been realized. The key findings show that there are significant gains associated with acquiring higher levels of education in the urban labor market. Interestingly, the analysis also finds that the margin of completed primary compared to incomplete primary education is critical in explaining earning gains.

This finding has important implications for education policies in Ethiopia, a country in which about 5 percent of gross domestic product is invested in education annually, with nearly half of the budget earmarked for tertiary-level education. Understanding the returns from various levels of education, in different sectors, regions, as well as gender gaps in earnings is critical for thinking about public investment choices and labor market policies that can support nudging market inclusiveness, equity, and efficiency. Investments by the government aimed at incentivizing completion of primary education can go a long way in ensuing higher wages and improving standards of living in Ethiopia.

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I. Introduction

Ethiopia faces the challenge of creating sufficient new jobs for a rapidly growing labor force while at the same time improving the quality of existing employment. Ethiopia's working-age population is growing at two million per year, meaning that the labor force will increase by 20 million people between now and 2030. Even though high economic growth since 1999 has expanded opportunities in the labor market (World Bank, 2017), this expansion in employment has not been even across sectors. A substantial share of the current employment is in low-productivity subsistence agriculture or in the informal non-farm sector which barely brings workers above the poverty line, as reflected in the still substantial poverty rates. There has only been a modest increase in non-farm jobs driven mainly by rural to urban migration.

Despite improvements since the turn of the century, employment outcomes for a large part of the Ethiopian population remain precarious. According to the National Labor Force Survey (LFS), in 2013, slightly above 70 percent of employed working-age Ethiopians still had their primary occupation in agriculture, mostly in smallholder farming on increasingly fragmented plots.[1] Wage employment in the nonfarm sector—the type of employment that tends to have the highest average earnings—accounted for 10 percent of employment. Self-employment in the nonfarm sector, mainly in small household-run enterprises or own-account subsistence activities (such as fetching water and firewood), accounted for 19 percent of workers. Compared to men, women tend to be overrepresented in nonwage employment, and underrepresented in paid employment: in 2013, 8 percent of women had their main occupation in nonfarm wage employment, compared to 12 percent for men. Women also earn substantially less than men, a gap that is only partially explained by differences in endowments and job characteristics.

The structure of employment is a key defining difference between poorer and richer countries. While globally, about half of employment consists of wage employment, this rises to 90 percent for high-income Western Europe and falls to a mere 17 percent for low-income countries in Africa (Figure 0). In Ethiopia, about 12 percent of employment consists of wage-employment, over half of which is in the public sector.

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[1] Recent analysis using the Ethiopia Socioeconomic Survey (ESS), which includes information on the urban and rural labor market between 2014 and 2019, shows that limited structural transformation has taken place in recent years. Though there was strong employment growth between 2014 and 2019, it was mainly concentrated in the agricultural sector and employment outcomes for a large part of the Ethiopian population remain precarious and in 2019, employment remained largely dominated by agricultural and non-wage work. Nationally, almost three quarters of the population are employed in agriculture with 90 percent of rural Ethiopians employed in agriculture. Wage-employment in the nonfarm sector—the type of employment that tends to be the norm in richer countries—accounted for only 10 percent of total employment. Employment types are more diverse in urban compared to rural Ethiopia with wage employment—the type of employment that tends to have the highest average earnings—accounting for 38 percent and self-employment—mainly in small household-run enterprises or own-account subsistence activities—for 35 percent (Wieser & Mesfin, 2021).

Figure 0: Employment types along GDP per capita
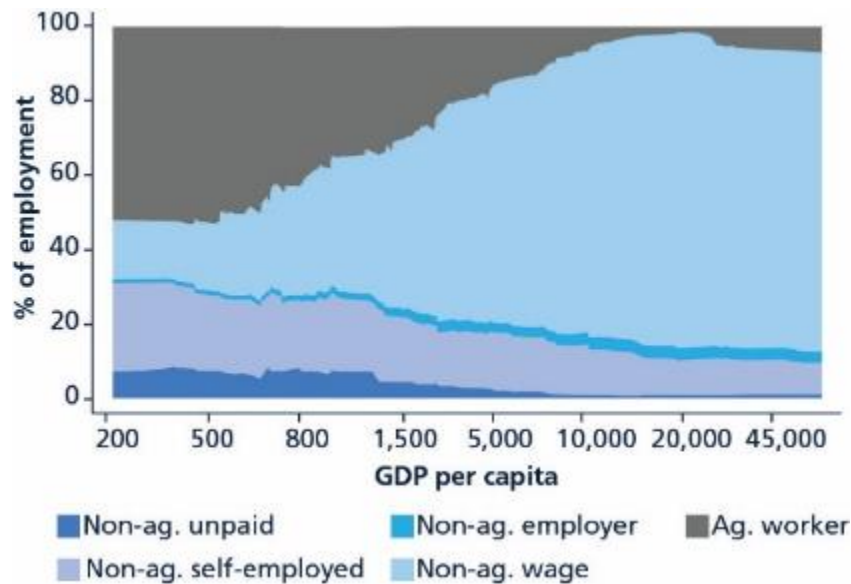
Source: World Bank Group, International Income Distribution Dataset (I2D2) for 141 countries over the years 1999-2016. Adopted from Merotto, Weber and Reyes, 2018.

Previous research on Ethiopia has indicated that the urban labor market provides many more opportunities for wage employment than the rural labor market (World Bank Group, 2016a). Yet, a large part of wage jobs are in the large public sector in Ethiopia. The public sector was the main non-farm job creator over the 1999-2013 period, creating well-paid jobs for tertiary-educated workers in urban areas. In fact, about half of the wage employment in urban markets was in the high paying public sector compared to the private sector. Yet, increasing fiscal pressures imply that this public sector-driven model of jobs growth is no longer sustainable. Moreover, employment in the formal private sector did not increase much despite Ethiopia's strong economic growth. According to the Urban Employment and Unemployment Surveys (UEUS), formal private sector employment grew by only 0.6 percent per year between 2012 and 2018, while public sector employment, including state-owned enterprises, grew by 7 percent per year over the same period. Moreover, some of the impending challenges that the government continues to face in urban Ethiopia are unemployment among youth and queuing[2] for public sector jobs (Deribe, Peace, and Paul, 2015; Bigsten, Mengistae, and Shimeles, 2007).

The structural rigidities of the Ethiopian labor market and the COVID-19 induced crises interact with one another and are likely to affect returns on human capital. COVID-19 has severely interrupted economic

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[2] Better-educated urban youth typically hail from better-off families and have the option to remain unemployed while waiting for a well-paid job to come their way. This phenomenon is called "queuing" and partly explains the higher unemployment rates among higher-educated youth in urban Africa, including Ethiopia.

activity in the country, with over 40 percent of businesses closed due to COVID-19 related restrictions and impacts, and 32 percent of businesses reported no revenues in the first month of the pandemic (March or April 2020) (Wieser et al., forthcoming). Moreover, employment rates plunged, with 8 percent of respondents losing their job at the beginning of the outbreak while a third of Non-Farm Household Enterprises (NFEs) closed. The economic impacts abated during the second half of the year. There have, for example, been no new firm closures reported in October 2020 and most firms in Addis Ababa reported operating at full capacity. Moreover, employment rates have rebounded to their pre-COVID levels in rural areas but remain slightly below pre-pandemic levels in urban areas (Wieser et al, forthcoming; Ambel et al. 2021).

Despite the rebound in employment since the onset of the COVID-19 pandemic, there is evidence of lingering effects of the pandemic on poverty reduction. The quality of jobs has deteriorated despite the recovery in employment levels, jeopardizing future incomes for Ethiopians (Ambel et al., 2021). Formal firms, those providing wage employment opportunities, responded to the crisis in three ways: (i) sending workers on paid leave, (ii) laying off workers, and/or (iii) reducing wages. Evidence from firm surveys suggests that lay-offs were relatively low – with 6 percent of firms laying off employees at the peak of lay-offs between April and May 2020 – but real wages have declined more the longer the pandemic lasted. Compared to the same month in 2019, real wages in 2020 were on average 3 percent lower in April and 17 percent lower in December (Wieser et al., 2021). In an environment with allocative distortions such as Ethiopia, people who re-enter the labor market after COVID-19 are joining less productive jobs (and, hence, jobs with lower remuneration). This also means that new labor market entrants will be entering a market with depressed wage and self-employment earnings, with potential for negative effects to transitioning to better paying jobs and lifetime earnings.

Moreover, disruptions in human capital accumulation during the COVID-19 period could exacerbate income inequality and stall social mobility. After Ethiopia closed all schools between March and November 2020, most primary and secondary students had no opportunity to learn (Wieser et al., 2020). The loss of learning opportunities for children with inaccessible distance learning opportunities will negatively impact schooling outcomes. This will likely have devastating negative consequences for labor market outcomes and will reduce economic mobility in the future. This coupled with large disruptions in children going to school are likely to affect returns on human capital in years to come.

Depressed wages coupled with challenges of children attending schools will likely affect returns on human capital moving forward. This could lead to negative effects on transitioning to better paying jobs and

lifetime earnings. Though looking at how COVID-19 impacted earnings and whether wage premia narrowed or widened following the pandemic is beyond the scope of this report, creating new job opportunities in the wage sector remains a crucial challenge for Ethiopia, particularly in the aftermath of the pandemic. Moreover, to better understand where important investments in Ethiopia's education system are needed to foster poverty reduction and provide Ethiopia's economy with the education and skills firms need, it is important to assess the returns to education in Ethiopia's urban labor market.

This report focuses on shedding light on the returns to education for the wage employed in the urban labor market in Ethiopia. The objectives of this report are multifold. First, we attempt at better understanding the differences in earnings across different levels of educational attainment in urban Ethiopia. The report discusses gains from earnings at each level of education and determines where the wage premium for additional education is highest. Second, we attempt at better understanding the factors that account for differences in earnings beyond the level of education by looking at aspects such as sectoral employment, sex, and employment in public vs. private firms. Third, based on the estimation of earning functions and understanding how much of the wage differential is explained by educational attainment and how much is determined by other factors, we provide inputs into the policy dialogue around educational attainment and designing employment interventions in support of providing employment opportunities at different levels of education.

The primary data sets for this analysis have been obtained from the Urban Employment and Unemployment Surveys (UEUS). We merge UEUS over multiple years to generate a pooled data set of the wage employed for the urban labor markets. This allows us to use a two-way fixed effects specification that drives identification. We incorporate fixed effects at the level of region and year to absorb any unobserved variables that explain the correlation between the errors and the schooling variable that the observed covariates could not incorporate.

Our key findings show that there are positive gains to completing primary education in the urban labor market. As related literature in developing countries has shown, the improvements are significant for individuals who receive tertiary education compared to those who complete secondary education only. However, we also find that the gains in wages are substantial at the margin of primary complete and primary incomplete in urban Ethiopia. This finding is important in light of the low educational attainment in Ethiopia—about half of the urban employed population has not completed primary education—and suggests that government interventions to incentivize individuals in urban areas to complete primary education can reap significant benefits for wages and living standards.

A rich set of covariates in the regression specification provides us interesting insights into understanding the variation in wages in urban Ethiopia. Our analysis shows that there is a consistent gender gap in wage employment. There are also positive gains associated with increasing age, most likely related to gaining experience. However, the gains diminish in magnitude beyond a turning point. We observe increasing returns to age until the age of 40-49 years for most education categories with the exception of higher education. The gains start to decline beyond this point.[3] We also find that there exists a significant wage differential between the public and the private sector in favor of the public sector. This wage gap deepens for individuals with higher education. This finding provides further evidence for the factors resulting in queuing for public sector jobs (Mengistae, 1999). We also find that higher-skill jobs pay a premium over low-skilled work.

II. Data

The primary data sets used for our analysis are obtained from Urban Employment and Unemployment Surveys (UEUS). We pool UEUS for the years 2014, 2015, 2016, and 2018.[4] The Central Statistics Agency (CSA) in Ethiopia initiated the UEUS starting in 2003 to collect employment and economic activity statistics for urban centers. Particularly, the survey collects detailed information on labor force participation, employment statistics such as earnings for both wage and non-wage earners along with the sector of employment, industry as well as a rich array of socio-economic and demographic characteristics (Central Statistics Agency (2012)). For sampling, primarily, the urban centers were grouped into major urban centers and other urban centers. A two-stage stratified cluster sampling was used for the major urban centers and a three-stage stratified cluster sampling for the other centers. Moreover, the primary sampling units were the enumeration areas for major centers but urban centers for the other center category (Central Statistics Agency, 2016).

According to the Labor Force Survey of 2013, non-farm employment comprised 29 percent of total employment. Although UEUS contains information on individuals in urban non-farm wage and non-wage employment, we focus our analysis on wage employed, which consists of only 21 percent of the urban labor market according to the UEUS 2018. We observe slightly above 14,500 wage earners for each survey year included in our study. We do not include the self-employed in our analysis because the earnings of

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[3] This is in line with the quadratic relationship of age and wages in related work (Bhuller et al., 2017).
[4] Even though a larger number of UEUS years is available, we focus our analysis on the years 2014 through 2018. Not all years have comparable indicators of interest (i.e. educational attainment) and a comparable CPI series, used to construct real wages, is only available after 2011.

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the self-employed have data quality issues and are underestimated to a large extent. Our analysis thus focuses only on a very small segment of the total Ethiopian labor market.

The primary outcome variable of interest is monthly wages and we start by examining the trend in the nominal wages over time. There has been a steady increase in nominal wages between 2014 and 2018, as indicated in figure 1 (left axis). For example, nominal wages in 2014 were at around ETB 1,635 per month but increased to around ETB 3,200 per month in 2018. However, most of these gains are eroded by high levels of inflation in Ethiopia. On the right axis, we plot the real wage over time, which is constructed by deflating the nominal wage by the official consumer price index (CPI). Although real wages have increased over time, the growth rate is much slower than nominal wages, indicated by a less steep slope (red line). Between 2014 and 2018, real wages of the urban wage employed increased by 30.4 percent on average.

Figure 1: Wages have steadily increased since 2014
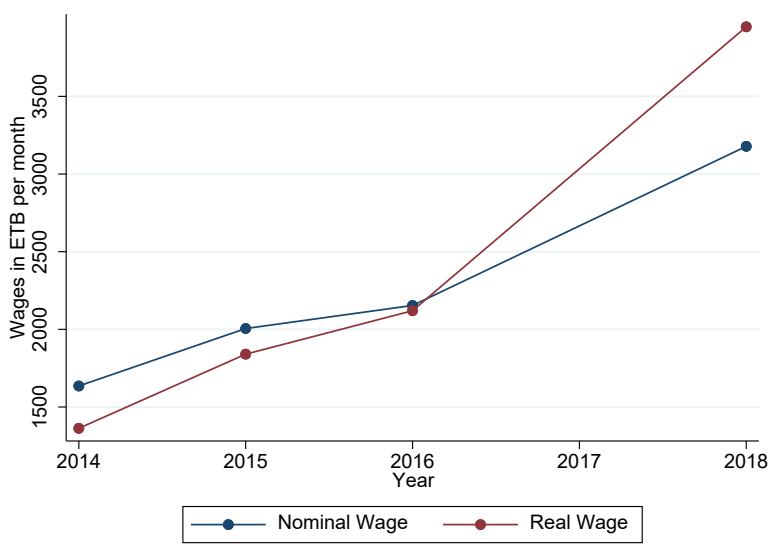
Notes: We use the average wage (UEUS) for the years 2014, 2015, 2016, and 2018 for this analysis. For the real wage calculation, the nominal wages were deflated using the national CPI.

Assuming that age is a proxy for experience, we see significant gains to experience in the urban labor market. We examine the age earnings profile by the levels of attained education for the urban wage-employed individuals. We plot the average real wages for individuals separately for each level of educational attainment and examine the variations across age groups (Figure 2). We find a quadratic relationship with age. However, there is a turning point beyond which these gains diminish. We observe increasing returns to age until the age of 40-49 years for most education categories with the exception of those with university education. The gains start to decline beyond this point. For schooling, we find that there are positive gains to acquiring higher levels of education. Additionally, we explore differences in wages for males and females in the sample by higher education attainment. We find that mean female wages are lower than those of their male counterparts irrespective of their education levels (Figure 3).

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Figure 2: Age earnings profile in 2018
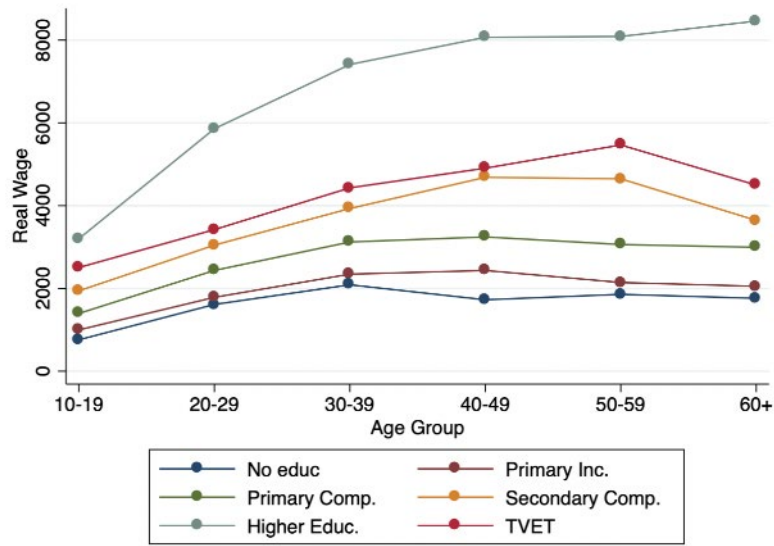
Notes: We use the average wage (UEUS) of the urban wage employed for 2018 for this analysis.

Figure 3: Age earnings profile in 2018 by Gender
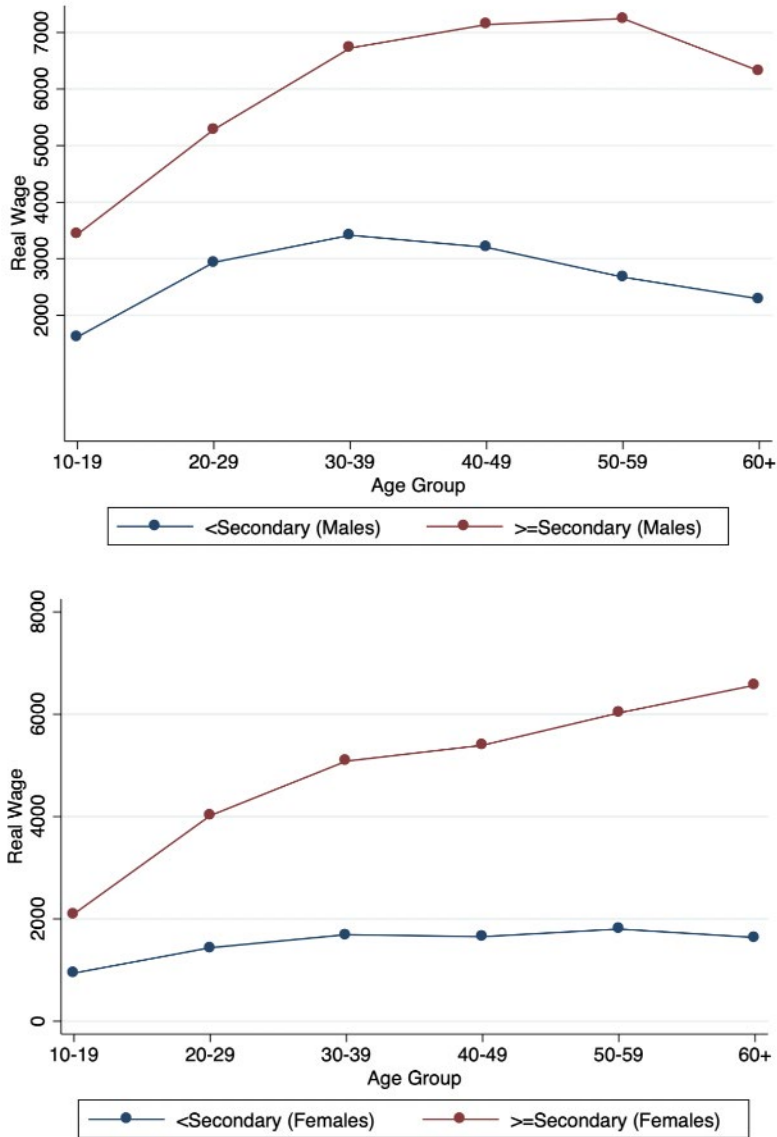
Notes: We use the average wage (UEUS) of the urban wage employed for 2018 for this analysis. The education categories are defined into less than and greater than or equal to secondary education.

Additionally, we study the changes in wages over time for individuals with varying education levels. The returns to education in the labor market can be an important determinant of the decision to invest in education. Figure 4 examines the earnings gains for each additional education level for men and women separately. First, we see that across lower education categories the rise in male wages were higher than the increase in female wages between 2014 and 2018. For the sample with secondary complete or higher educational attainment, the rise in female wages have been steep, even though the average female wage

continues to be below male wage across all education categories. Second, we see that in 2014 an average male with no education receives almost twice the wage rate a female with no education does. While relative differences reduce with increased educational attainment, women who completed higher education still receive substantially less than their male counterparts.

Figure 4: Changes in wages overtime by gender
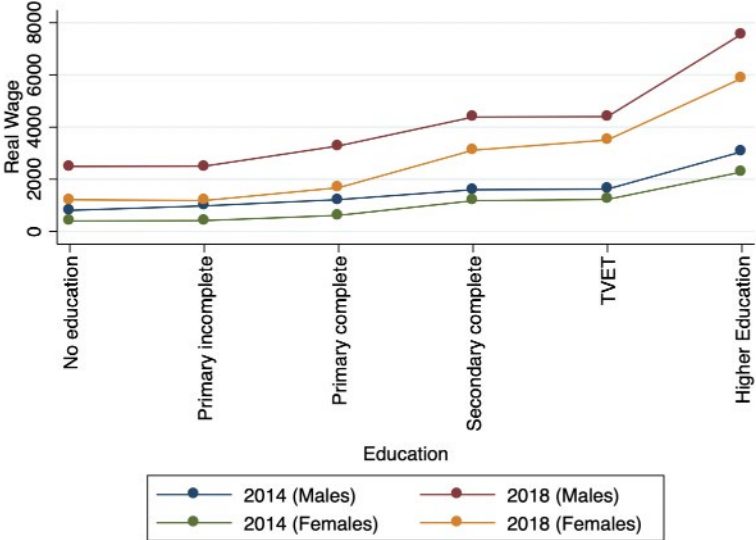
Notes: We use the average wage (UEUS) of the urban wage employed for 2014 and 2018 for this analysis.

Even though the age earnings profiles are in line with our expectations, some of the variation in wages across different schooling levels could be explained by other variables such as the sector of occupation and the job type. We therefore account for these additional covariates in our regression analysis. In table 1 we provide summary statistics of the composition of the urban sample over the survey years.

Table 1: Descriptive Statistics

	2018	2018	2016	2016	2015	2015	2014	2014
Gender								
Male	7880.0	55.5	8123.1	57.1	8465.7	58.3	8538.5	58.2
Female	6311.0	44.5	6091.9	42.9	6065.3	41.7	6135.5	41.8
Total	14191.0	100.0	14215.0	100.0	14531.0	100.0	14674.0	100.0
Age								
10-19	1132.1	8.0	1242.8	8.7	1277.7	8.8	1404.2	9.6
20-29	5791.4	40.8	5920.1	41.7	6048.6	41.6	6120.3	41.7
30-39	4132.7	29.1	3998.2	28.1	3977.5	27.4	3754.4	25.6
40-49	1832.6	12.9	1792.4	12.6	1873.5	12.9	1961.3	13.4
50-59	902.4	6.4	863.1	6.1	932.9	6.4	1024.0	7.0
60+	394.8	2.8	388.3	2.7	412.9	2.8	403.7	2.8
Total	14186.0	100.0	14205.0	100.0	14523.0	100.0	14668.0	100.0
Industry (Broad)								
Agriculture	296.0	2.1	278.0	2.0	446.5	3.1	434.0	3.0
Industry	2862.7	20.2	2793.8	19.7	2834.6	19.5	3552.9	24.2
Services	11032.3	77.7	11143.3	78.4	11249.9	77.4	10687.1	72.8
Total	14191.0	100.0	14215.0	100.0	14531.0	100.0	14674.0	100.0
Industry (Narrow)								
Agriculture	296.0	2.1	278.0	2.0	446.5	3.1	434.0	3.0
Industry	2862.7	20.2	2793.8	19.7	2834.6	19.5	3552.9	24.2
Wholesale Retail	704.6	5.0	763.0	5.4	650.6	4.5	676.1	4.6
PublicAdmin-Edu-Health	4213.8	29.7	4212.5	29.6	4281.8	29.5	4015.7	27.4
Other Services	6113.9	43.1	6167.7	43.4	6317.6	43.5	5995.3	40.9
Total	14191.0	100.0	14215.0	100.0	14531.0	100.0	14674.0	100.0
Region								
Tigray	921.2	6.5	915.6	6.4	1006.6	6.9	956.3	6.5
AFAR	204.6	1.4	179.4	1.3	244.1	1.7	275.2	1.9
Amhara	2570.6	18.1	2552.1	18.0	2650.1	18.2	2718.2	18.5
Oromia	3646.1	25.7	3890.4	27.4	3956.5	27.2	3833.0	26.1
Somali	193.1	1.4	162.9	1.1	177.6	1.2	201.1	1.4
Benishangul-Gumuz	179.0	1.3	166.8	1.2	196.6	1.4	152.6	1.0
SNNP	2171.4	15.3	2152.8	15.1	2011.6	13.8	1981.7	13.5
Gambella	92.3	0.7	110.3	0.8	107.1	0.7	80.6	0.5
Harari	130.9	0.9	137.8	1.0	129.9	0.9	122.4	0.8
AddisAbaba	3857.9	27.2	3732.9	26.3	3808.6	26.2	4101.5	28.0
DireDawa	223.9	1.6	214.0	1.5	242.3	1.7	251.4	1.7
Total	14191.0	100.0	14215.0	100.0	14531.0	100.0	14674.0	100.0
OccupationSector								
Public+	7150.7	50.4	6941.8	48.8	7008.6	48.2	6529.3	44.5
Private	7040.3	49.6	7273.2	51.2	7522.4	51.8	8144.7	55.5
Total	14191.0	100.0	14215.0	100.0	14531.0	100.0	14674.0	100.0
Nominalwages	14191.0	3151.7	14215.0	2091.0	14531.0	1993.0	14674.0	1629.5
Skill								
Unskilled	2171.2	15.3	2234.4	15.8	2772.3	19.1	2599.9	17.9
low	6696.0	47.3	7079.2	50.0	6737.5	46.5	7337.8	50.5
med	1915.5	13.5	2116.0	14.9	2161.5	14.9	2163.5	14.9
high	3367.2	23.8	2739.4	19.3	2824.7	19.5	2421.9	16.7
Total	14150.0	100.0	14169.0	100.0	14496.0	100.0	14523.0	100.0
Educ								
No education	1090.4	7.7	1090.1	7.7	1129.2	7.8	1308.8	8.9
Primary Incomplete	2330.1	16.4	2598.5	18.3	2717.4	18.7	3126.2	21.3
Primary complete	3388.0	23.9	3365.8	23.7	3410.0	23.5	3325.1	22.7
Secondary complete	1114.5	7.9	1274.6	9.0	1379.6	9.5	1522.8	10.4
Higher Education	4199.1	29.6	3367.2	23.7	3325.5	22.9	2873.5	19.6
TVET	2067.9	14.6	2518.9	17.7	2569.3	17.7	2511.6	17.1
Total	14190.0	100.0	14215.0	100.0	14531.0	100.0	14668.0	100.0

On average, real wages are higher in the public sector across all survey years with a premium of 47 percent on average for public sector wage jobs. Due to higher wages paid in the public sector, many young people queue for public sector jobs, observed by the high unemployment rates in urban areas for youth with completed secondary education. Figure 5 displays the wage gap between the public and the private sector. Over time, this wage gap has remained constant.[5] Yet, queuing for public sector jobs cannot be seen in isolation from the fact that to date few job opportunities in the private sector exist and that the private sector does not seem particularly lucrative to young jobseekers. Moreover, public sector jobs tend to be more or less uniform in terms of pay and conditions, while private sector jobs are heterogeneous.

Figure 5: Real wage differential between public and private sector
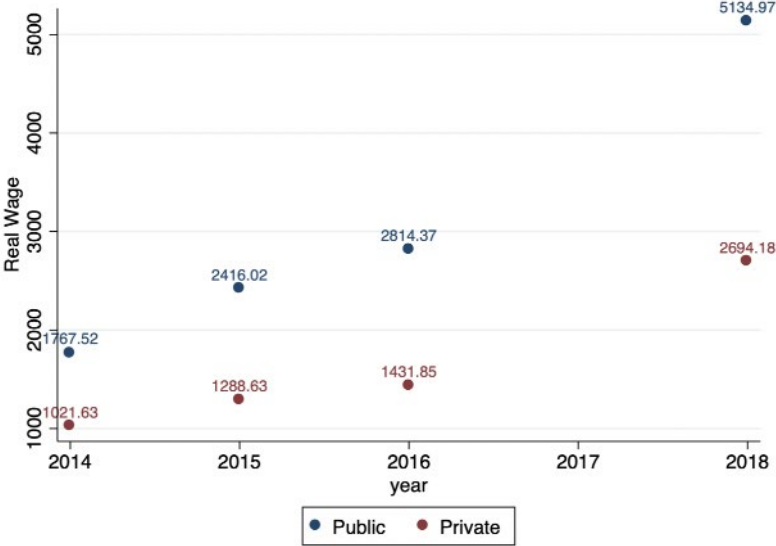
Notes: We use the average wage (UEUS) for the years 2014, 2015, 2016, and 2018 for this analysis. For the real wage calculation, the nominal wages have been deflated with the national level Consumer Price Inflation levels.

The Ethiopian labor market seems to generate the correct incentives to invest in education but returns to education seem to drastically differ in the public and private sector. The public sector pays a wage premium, irrespective of educational attainment, but the gap gets wider for higher education categories (Figure 6). In both the public and private sector, those with higher education earn about four times as much as those with no education. Moreover, growth in real wages in more pronounced in the public compared to the private sector between 2015 and 2018. However, one also has to consider the differences in job type in the public and private sector. About 88 percent of public sector jobs are in

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[5] The wage differentials get reflected in the real wage as shown in Figure 5. This is not evident if we only focus on nominal wages as displayed in table 1. For real wage calculations we deflate nominal wages with the national level CPI.

permanent employment compared to only 27 percent in the private sector. Average wages in permanent employment are higher compared to temporary employment. However, even for permanent employment, the public sector pays a clear wage premium and public sector permanent jobs pay 50 percent more in the public sector.

Figure 6: Changes in wages overtime in the public and private sector
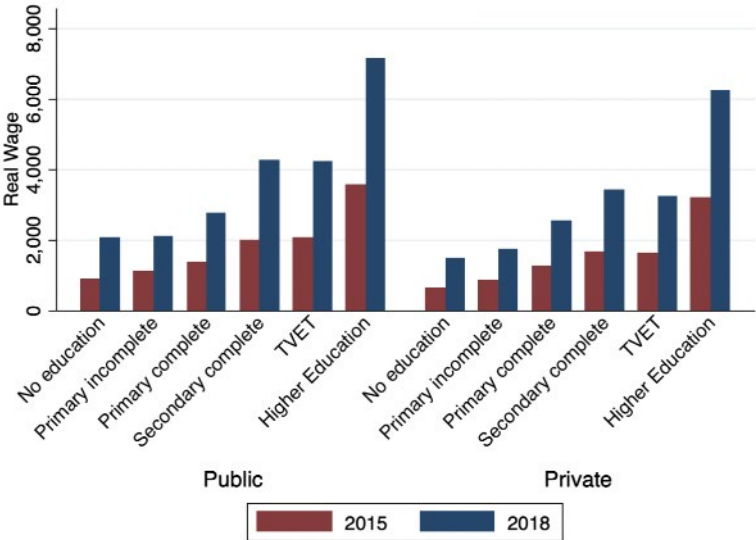
III. Methodology

We use a two-way fixed effects model for our analysis. The pooled data set provides labor market data on individuals active in the same urban labor market across multiple years. Our primary model is

$$wage_{irt} = \propto_r + \gamma_t + \beta * education_{irt} + x_{irt}\beta + \varepsilon_{irt}$$

The unit of observation is individual i in urban region r in year t. We include a rich set of covariates to disentangle the impact of schooling on wages from other observed characteristics. Inclusion of the covariates that have substantial explanatory power for wages will improve the precision of the coefficient estimates. We include fixed effects at the level of region and year. The region fixed effects capture unobserved characteristics invariant over time that could explain some of the correlation between errors and covariates. Additionally, any common unobserved shocks specific to a year would be soaked up by the year fixed effects. The identifying assumption is that once we account for the region and year fixed effect schooling attainment is independent of the remaining error.

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IV. Key Findings

The returns to education in the labor market can profoundly affect the decision to invest in education and the level at which education is stopped. We calculate the returns to education for the urban wage employed by gender in 2014, 2015, 2016, and 2018 and see that there are large gains to acquiring additional levels of education. In this section, we discuss our key results. We begin by estimating equation 1 with wages as the outcome variable and education categories as the key explanatory variable. Column (1) in table 2 shows that there are gains to acquiring higher levels of education in the labor market. There are two critical margins where we witness high gains to education. On an average, individuals who completed primary education earn two and a half times the amount earned by those who did not complete primary education.[6] This is important particularly for the lower quintiles of the income distribution as they could change their well-being through additional income by completing primary education.

The latest Ethiopia Poverty Assessment (World Bank Group, 2020) for example, found that education is a main correlate of poverty, both in urban and rural areas. Relative to households with an uneducated head, households with heads who have any level of education have higher consumption and the difference increases with the level of education. While the association between education and consumption is stronger in urban areas, returns to education in rural areas are also substantial: Relative to a rural household with an uneducated head, a household headed by someone who completed primary school has consumption levels that are 21 percent higher. This increases to 34 percent for households whose head is secondary-educated, though this is rare in rural areas. In urban areas, returns are highest at the post-secondary levels, with households headed by someone with post-secondary education having consumption levels that are 64 percent higher, all else equal. Education of household members other than the head matters too. The more illiterate household members in the household, the lower consumption. Yet, educational attainment in Ethiopia is still very low. Even when looking at the urban wage employed (a small subset of the entire labor market) and as recent as 2018, 7 percent of Ethiopian wage employed have no education and another 16 percent have not completed primary education (Table 1).

The high returns to completed primary education are also important from a public policy perspective as investment in primary school completion is not only important because a vast number of Ethiopians is still uneducated, it is also more cost effective, progressive, and pro-poor. In addition to quantitative expansion

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[6] While conceptually there might be a contemporaneous relationship between wage and education, in most cases, investment in education takes temporal priority over wage employment and hence earning values.

of primary education, quality of education requires urgent improvements. About 90 percent of children are not able to read or comprehend a simple paragraph by age ten ("Learning Poverty"), which puts Ethiopia below average for Sub-Saharan Africa (86.4 percent). "Learning poor" children are unlikely to continue in the education system and therefore have no access to other skills development opportunities. Therefore, investing in primary school completion could have large returns in the labor market and thus lifetime earnings, which would most likely contribute to poverty reduction.

Returns to education increase largely with each additional level of education. Wage employed Ethiopians with completed secondary education earn more than twice the wages of those with completed primary education. Those with tertiary education have even larger payoffs, earning more than twice that of those with completed secondary and almost five times that of those with completed primary education.

In addition to large returns to completed primary, secondary, and tertiary education, we also find that there are positive gains associated with TVET. Yet, we also find that returns to the technical and vocational education and training (TVET) are only marginally higher than those associated with completed secondary education and the effectiveness of post-secondary TVET education is thus called into question. In Ethiopia, the recent expansion of TVET improved the access to formal training programs and total enrollment has grown from less than 10,000 students in the 1990s to more than 350,000 students (estimate) in 2020, and private institutions have contributed 18 percent. Yes, we observe that limited returns to TVET may be the reason why TVET programs are not widely taken up. Better understanding why returns from TVET education are low and only marginally better than high school, will be an important future research question.

On average, women earn lower wages than men in the urban labor market in Ethiopia. In column 2 in table 2, we add a female dummy to equation 1 along with education. We find that women have much lower wages than men. Nevertheless, even with the addition of gender, the returns to education remain qualitatively similar to the observation in column 1, with large returns for primary education.

Table 2: Wage Regression, baseline model

VARIABLES	(1) Real Wage	(2) Real Wage
Baseline (No Education)		
Primary incomplete	268.390***	126.154***
	[29.353]	[28.941]
Primary complete	689.931***	466.210***
	[33.380]	[31.276]
Secondary complete	1,461.113***	1,224.627***
	[54.790]	[55.076]
TVET	1,538.206***	1,427.779***
	[42.527]	[42.056]
Higher Education	3,539.777***	3,265.378***
	[79.643]	[77.149]
Townsize	112.997***	153.589***
	[42.680]	[42.317]
Female dummy		-820.149***
		[32.188]
Constant	574.623***	997.792***
	[125.113]	[125.811]
Observations	57,604	57,604
R-squared	0.392	0.416
Region FE	y	y
year FE	y	y

Notes: Standard errors clustered at Woreda in brackets. *** p<0.01, ** p<0.05, * p<0.1

Increasing age, public sector, and industry are associated with higher wages. We expand our model and add a rich set of covariates. The results for the complete model are provided in table 3. In column 1, we add the industry, sector of occupation, and age. As suggested in the age earnings profile, wages, on average, increase with age but the gains diminish beyond a turning point. Public sector jobs on average pay more than the jobs in the private sector, which is depicted by the negative private sector dummy.[7] We also find that wage employed in the industry sector earn higher wages compared to those employed in the services sector (or agriculture, which is our base group).[8] In column 2, we add the skill categories for the jobs, indicating, not surprisingly, large returns on wages for higher skill occupations. In column 3, we include an interaction between higher education dummy and the private sector dummy, showing that higher education has larger returns in the public sector compared to the private sector. Lastly, the

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[7] The impact of wage premia in the public sector is thus driven from low wages in the private sector for tertiary educated Ethiopians. Going forward, it will be important to better understand to what extent education mismatches in the private sector, with people are taking positions they are overqualified for, may explain these results.

[8] This is most likely related to the fact that industry mostly attracts the lower-educated part of the labor force but compared to services, does pay higher wages for them. For relevant literature on how industry pays wage premia, in particular FDI firms, please see Javorcik, B.S. 2014. Does FDI Bring Good Jobs to Host Countries? Policy Research Working Paper; No. 6936. World Bank, Washington, DC.

inclusion of covariates does not change the key results we find for returns to education in the urban labor market.

So far it appears that the labor market is generating the correct incentives to invest in education. However, these dynamics seem to differ in the public and private sector labor markets. From the private sector's viewpoint, the fact that higher educated people queue for public sector jobs means that the incorporation of less educated workers has produced an adjustment on their returns relative to highly educated public workers irrespective of gender.

Table 3: Wage Regression with complete set of covariates

VARIABLES	(1) Real Wage	(2) Real Wage	(3) Real Wage
Baseline (No Education)			
Primary incomplete	193.738***	173.113***	181.341***
	[28.855]	[28.700]	[29.174]
Primary complete	485.689***	420.092***	453.973***
	[32.172]	[31.217]	[31.729]
Secondary complete	1,017.702***	835.380***	1,080.528***
	[48.146]	[48.244]	[64.580]
TVET	1,327.598***	956.570***	1,185.355***
	[46.186]	[44.280]	[53.274]
Higher Education	3,059.619***	2,444.071***	2,653.944***
	[94.926]	[91.690]	[93.627]
Townsize	160.292***	176.650***	184.150***
	[41.501]	[41.634]	[41.799]
Baseline (Agriculture)			
Industry	306.306***	275.005***	284.269***
	[75.592]	[72.159]	[72.286]
Services	118.368*	6.620	12.602
	[67.544]	[63.747]	[63.556]
Private dummy	-265.403***	-206.021***	-18.363
	[40.089]	[41.486]	[40.403]
Private dummy × Higher Education dummy			-361.723***
			[61.701]
Baseline (Skill==1)			
skill = 2		318.519***	304.215***
		[27.912]	[27.377]
skill = 3		732.782***	701.419***
		[52.455]	[52.874]
skill = 4		1,127.893***	1,092.682***
		[58.265]	[57.495]
Female dummy	-692.963***	-648.426***	-648.531***
	[27.398]	[27.930]	[27.856]
Baseline (10-19)			
Age Group = 2, 20-29	157.799***	173.181***	196.234***
	[27.783]	[29.096]	[29.292]
Age Group = 3, 30-39	578.558***	580.691***	609.128***
	[34.742]	[35.271]	[34.804]
Age Group = 4, 40-49	717.424***	715.838***	751.797***
	[39.846]	[40.042]	[40.371]
Age Group = 5, 50-59	845.733***	825.805***	866.249***
	[82.445]	[80.335]	[80.439]
Age Group = 6, 60+	314.511***	298.836***	361.684***
	[104.036]	[99.520]	[99.655]
Constant	594.993***	348.693**	142.964
	[140.913]	[137.826]	[135.966]
Observations	57,575	57,302	57,302
R-squared	0.429	0.440	0.441
Region FE	y	y	y
year FE	y	y	y

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

V. Discussion and Policy Recommendations

Ethiopia is one of the fastest-growing economies in Sub-Saharan Africa, driven by investment in development programs. As a result of population growth and migration, Ethiopia is urbanizing fast from a low base, suggesting a strong need for appropriate management and efficient utilization of its young work force. Regular wage employment, especially in the formal sector, is the kind of employment that is strongly related to economic development, rising living standards, and the emergence of a middle-class. In this report, we therefore investigate the returns to education for the wage employed in the urban labor market in Ethiopia by estimating earning functions for the urban wage employed to understand the factors that account for differences in earnings levels. In other words, we estimate the education gains to labor market earnings and disentangle the variation in wages explained by schooling and other factors relevant for the Ethiopian labor market. Our analysis shows that, as expected, the main factors that account for differences in earnings levels include sector of employment, education, experience (proxied by age) and skill level. There are significant differences in how these returns have varied across levels of education for male and female workers over time.

Despite the importance of wage employment, we have also seen that COVID-19 has severely slowed the Ethiopian economy and its opportunity to create wage jobs. Though employment rates have rebounded to their pre-COVID levels in rural areas but remain slightly below pre-pandemic levels in urban areas (Wieser et al, forthcoming; Ambel et al. 2021), the quality of jobs has deteriorated despite the recovery in employment levels, jeopardizing future incomes for Ethiopians (Ambel et al., 2021). Moreover, The loss of learning opportunities for children with inaccessible distance learning opportunities will negatively impact schooling outcomes.

These negative impacts of COVID-19 on wages as well as deteriorating schooling outcomes will likely impact the earning potential of future labor market entrants. Our analysis shows that education is the largest predictor for future earning potential and returns to education increase with each additional level of education. The high returns to completed primary education are also important from a public policy perspective as investment in primary school completion is not only important because a vast number of Ethiopians is still uneducated, it is also more cost effective, progressive, and pro-poor.

Returns to education in the labor market can profoundly affect the decision to invest in education and the level at which education is stopped. Showcasing these large returns to education for the urban wage employed is thus important to enable the government to implement sound policies to ensure improved levels of education at all levels. The policy directions based on this analysis can be broadly grouped into

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two areas: (i) Policies for poverty reduction and improving primary education and (ii) Policies to facilitate access to wage employment opportunities.

Policies for poverty reduction and improving primary education

Our key findings show that there are positive gains to acquiring higher levels of schooling in urban Ethiopia. The improvements are significant for individuals who receive tertiary education compared to those who complete secondary education only. However, we also find that the gains in wages are substantial at the margin of primary complete and primary incomplete in urban Ethiopia. This finding is important in light of the low educational attainment in Ethiopia—about half of the urban employed population has not completed primary education—and suggests that government interventions to incentivize individuals in urban areas to complete primary education can reap significant benefits for wages and living standards.

Improving labor productivity and earnings will require a strong push on completion of primary education. Returns to education are higher at higher levels of education, but few Ethiopians, particularly the less well-off, reach those higher levels. Interventions to improve primary education—particularly in light of the negative impacts of human capital accumulation during COVID-19—could have significant payoffs for a large part of the population and are progressive and pro-poor in nature. Improving progression and completion rates in primary education would therefore likely require a reallocation in the sizable education budget towards primary education.

Interventions to improve primary education could have large payoffs for a large part of the population and are progressive and pro-poor in nature. While Ethiopia spends significant resources on education, completion rates in primary are among the lowest in Africa. Since 2010, the government has consistently spent a quarter or more of its budget on education, representing close to 5 percent of GDP. Most of this spending however is directed to tertiary education and Ethiopia currently spends relatively little on primary education (Figure 7). Less than one-third of the education budget went to primary education in 2018. As of 2015, the Ethiopian government dedicated about half of the education spending on the tertiary sector. A much lower fraction (28 percent) was invested in primary education and secondary education (18 percent) (World Bank Group, 2020). Ethiopia's public expenditure on education is skewed towards tertiary education. This means that the recurrent spending per university student is 26 times the amount spent on a primary school student (World Bank, 2016b). Moreover, the per capita spending for primary school is US$118, significantly lower compared to the SSA average of US$586 (World Bank Group,

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2020). The focus on tertiary education therefore leads to a spending pattern that mostly benefits the wealthier households in absolute terms.

Given the progressive and pro-poor nature of public spending on primary education and significant returns on wages associated with primary completion, the government could reassess their education budget allocation patterns. The most recent Fiscal Incidence Analysis for Ethiopia (World Bank Group, 2020) shows that primary education transfers are equalizing (benefitting those at the lower end of the consumption distribution to a larger extent) and poverty-reducing. This suggests that the poorest households benefit the most from primary education. Spending on primary education is pro-poor in Ethiopia because (i) the poor benefit disproportionately from public spending on primary education (conditional on children being in school) and (ii) the poor are more likely to be enrolled in public schools than their wealthier counterparts, particularly at the primary level. However, while primary education is strongly progressive and redistributive, tertiary education is regressive and unequalizing as richer households receive a larger share of public spending on education. For example, 44 percent of the benefits of public spending on tertiary education is received by students in the richest decile, while only 2.5 percent of the spending goes to the poorest decile (World Bank Group, 2020). Children from poor households are simply less likely to progress to secondary or tertiary education.

The Government of Ethiopia could strengthen its impact on the poor by reallocating public spending from tertiary towards primary education. There are several reasons why the Government of Ethiopia spends almost half of its public education spending on tertiary education. First, tertiary education can reap benefits for long term economic growth through fostering increased competitiveness and technological convergence. Second, Ethiopia attempts to turn the growing labor force of the country into an important driver of industrialization and economic growth by attempting to maximize on the population dividend of the nation (as outlined in the Growth and Transformation Plan II). Third, youth are seen as a "development and democratic force" who can be productively engage in the economy by equipping them with the necessary knowledge and skills through tertiary education. With limited fiscal resources, however, the government is unlikely to deliver quality education at all levels and should consider focusing its public goods delivery where it reaches most young Ethiopians. This analysis has shown that scarce public resources on education should go to primary and secondary education based on returns in the labor market, social equity, pro-poorness, and capturing a larger share of the population.

Figure 7: Share of education budget spent on primary, %
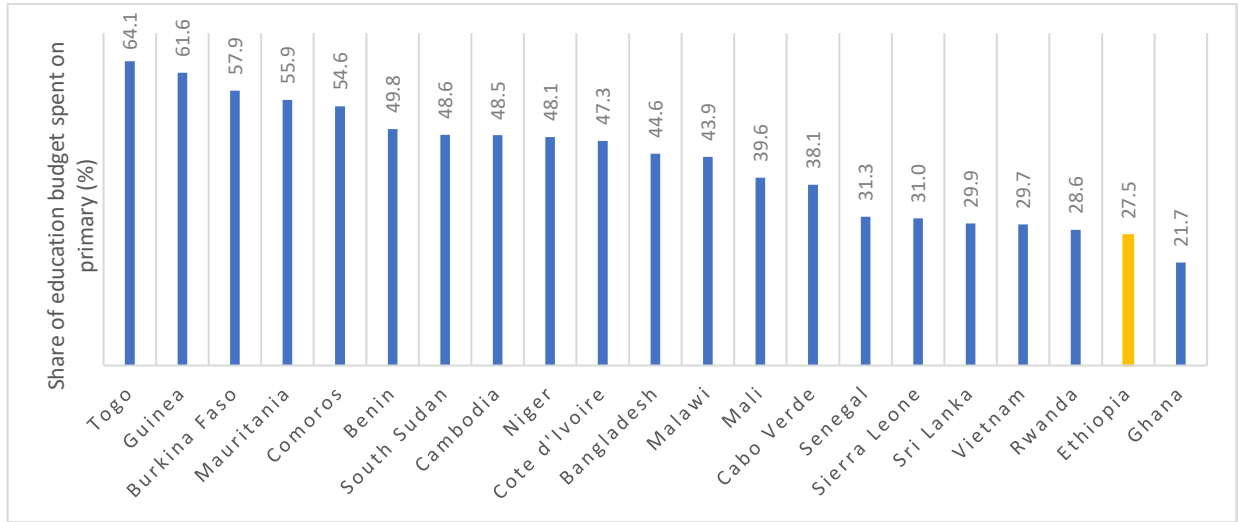
Source: WDI, 2018.

Policies to facilitate access to wage employment opportunities

In the short run after COVID-19, there is need to reboot jobs demand and connect people to wage employment opportunities to help them regain employment and boost non-farm incomes in urban areas. In the medium to long-term, there is need to address structural challenges on labor market vulnerabilities and provide access to wage employment opportunities. Policies for this aim at (i) facilitating a faster transition to formal wage employment which provides higher wages and job security and (ii) closing the gender gap for women in wage employment.

Expanding access to demand driven training through the Public Employment Services (PES) to enhance skills development and connect people to jobs. To create and transition to more formal and better paid jobs, there is need to strengthen inclusive and demand-driven skills development for Ethiopia's labor force that failed to attain tertiary education. One key focus is to ensure that these labor market participants can access demand-driven trainings and policies through PES and to provide them with an ability to signal their skills and connect them to better employment opportunities.

Alleviating constraints in searching for wage jobs—especially for the better educated young population— could support access to wage jobs. Job search in urban Ethiopia can be expensive (Abebe et al., 2019; Franklin, 2016). Vacancies for permanent and formal jobs are usually advertised on centrally located jobs boards, forcing jobseekers who live in the periphery of a city to travel frequently to the city center. This makes job search very costly. Moreover, young job seekers find it hard to signal their skills to employers

(Abebe et al., 2019). Employers in urban Ethiopia tend to select based on previous work experience, putting young first-time jobseekers at a disadvantage. Furthermore, many jobseekers do not seem to be familiar with the process and the standards of job applications.

Setting up an Employment Agency, streamlining Public Employment Services, and developing inclusive skilling programs to connect people to jobs. To reduce job search costs and matching frictions, labor market intermediation has to be strengthened in line with the National Plan for Job Creation 2020-2025. Public employment services can help address inequities on the labor market. Research from Ethiopia shows that young people with extensive social networks are more likely to find jobs, whereas individuals with few network connections remain excluded from work opportunities (Quinn and Witte, 2018). Job referrals in local labor markets are driven by a strong norm of reciprocity, which disadvantages individuals without many social ties. However, the study also shows that individuals can permanently overcome exclusion once given an opportunity. Therefore, free services offered by PES can help jobseekers in accessing opportunities which would normally not be available to them. Strengthening labor market intermediation will require addressing the fragmented nature of PES provision, with a range of different institutions having the mandate to provide support services to the unemployed.

On the labor demand side, accelerating product market deregulation and State-Owned Enterprises reforms could reduce entry barriers and promote competition needed to increase private sector investment and job creation in the formal, wage employment sector. The private sector in Ethiopia accounts for a lower share of formal wage employment than the public sector due to entry barriers and limited competition in sectors currently dominated by State-Owned Enterprises. Deregulation, fostering competition, and innovation will level the playing field for the private sector, transforming the sector to become the main driver of formal wage job creation. Not only are formal wage jobs typically associated with higher wages and job security, they also provide more easily taxable income to boost government revenues for financing better service delivery. Moreover, financial technology can alleviate financial frictions and foster entrepreneurship and productivity.

Expanding credit to the private sector to boost job creation by promoting enterprise development in both rural and urban areas. Structural financial sector reforms can reduce the bias in providing credit to State-Owned Enterprises. For SMEs, creating a regulatory environment and infrastructure to facilitate fintech and credit monitoring can support increased access to finance.

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