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***Decomposing Gender Gap in Employment and
Earnings: Do Urban and Rural Labor Markets
in Ethiopia Behave Differently?***

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Mebtu Mengesha¹ and Adem Feto², PhD

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¹ *Researcher in Center for Research in Public Sector Reform Studies at the Ethiopian Civil Service University*

² *Senior Researcher, Ethiopian Economics Association*

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Contents

Acronyms	iv
<i>Abstract</i>	1
1. Introduction and the rationale of the study	2
2. Literature Review	5
2.1 Gender Gap in Earning and Employment: Theory	5
2.2 Gender Gap in Earning and Employment: Empirics	7
2.3 Gaps in the empirical literature	10
2.4 Conceptual Framework of the Study	12
3. Methodology of the Study	13
3.1 The Data	13
3.2 Method of Data Analysis	13
3.3 Estimation Strategy	13
4. Results and Discussion	20
4.1 Descriptive Statistics	20
4.2 Behavior of Urban and Rural Labor Markets	21
4.3 Empirical results: Decomposition of gendered gap in earnings and labor market participation	24
5. Conclusion and Policy Implications	32
5.1 Conclusion	32
5.2 Policy Implications	34
References.....	36
Appendix.....	38

Acronyms

CSA	Central Statistical Agency
EEA	Ethiopian Economics Association
GDP	Gross Domestic Product
ILO	International Labor Organization
NLFS	National Labor Force Survey
OLS	Ordinary Least Squares
SNNPR	Southern Nations Nationalities Peoples Region
UN	United Nations
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
USD	United States Dollar
WEF	World Economic Forum

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Abstract

The development and individual welfare implications of gender issues such as gendered disparities in education, employment, and pay have gained global attention. Despite this effort, there are still persistent gender disparities in socio-economic and political participation and their respective outcomes. In light of this, the study is aimed at examining the factors behind gender disparities in earnings and labor market participation. To achieve this objective, we used the most recent nationally representative, containing both rural and urban statistics, labor force survey data for Ethiopia. We conducted our empirical investigation by using the linear Nueman-Oaxaca (the Post-Oaxaca-Blinder) for the decomposition of gendered earnings differentials. Whereas, to examine the gendered labor force participation gap, the non-linear Nueman-Oaxaca extended for the Binary Probit model is used. The results of our decomposition exercises strongly suggest that though human capital variables such as tertiary education, training, and skill have significantly explained the gender gap in earnings and labor market participation, there is still pervasive discrimination against women in both rural and urban labor markets in Ethiopia, though the extent is more severe in the former. Our study also suggests that while policy instruments that improve public investment in women's human capital development are instrumental, awareness-creation campaigns curtailing negative norms and traditions such as attaching domestic chores as the sole responsibilities of women are also crucial.

Key words: Earnings, Labor Force Participation, Gender Gap, Decomposition

1. Introduction and the rationale of the study

Gender inequality is a multifaceted phenomenon. The development and welfare implications of gender issues such as gendered disparities in education, employment, and pay have gained global attention. Despite the global attention towards mainstreaming gender issues in the development course, there are still persistent gender disparities in socio-economic and political participation and the respective outcomes (WEF, 2016; 2022; UNDP, 2018; Abegaz & Nene, 2022).

According to the WEF report of 2022, the overall global gender gap has been closed by 68.1 percent. It is also indicated in the report that it will take 132 years to reach full parity if the current progress rate is maintained (WEF, 2022). Moreover, the report has shown that no country has completely closed the gender gap, and only the top ten economies have closed at least 80 percent of their gender gaps. The Sub-Saharan Africa (SSA) region has closed about 68 percent of the gender gap (slightly less than the global average); however, the region has the world's third-highest gender gap (32.1 percent), trailing only South Asia (37.7 percent) and the Middle East and North Africa (36.6 percent) (WEF, 2022). Stressing the SSA further, the UNDP report on the gender inequality index (GII), which contains the disadvantages women face in reproductive health, education, political participation, and the labor market, indicated that the region ranked first in the GII, followed by developing regions of Arab states and South Asia (UNDP, 2018).

More importantly, the WEF report emphasized that it will take 155, 151, and 22 years to close the political empowerment (to be closed is 78 percent), economic participation and opportunity (to be closed is about 40 percent), and educational attainment gender gaps (over 5 percent to be closed), respectively. However, the time to close the health and survival gender gap (nearly 4 percent to be closed) remains undefined as its progress to parity has stalled (WEF, 2022). It can be underlined from the report that women around the world are highly disadvantaged in terms of political empowerment, economic participation, and opportunity, shedding light on the fact that these spheres require due attention. Of course, the statistics inherently expose the latter, which entails a tough journey ahead. For example, the SSA region achieved lower parity in political empowerment (21.3 percent) and economic participation and opportunity (67.7 percent) than it did in other sub-indices, despite outperforming some other regions in these dimensions (WEF, 2022).

Inequalities in labor market outcomes are one of the contributing factors to the gender gap in economic participation and opportunity. The inequalities in the labor market may take various forms: gaps in employment and labor force

participation, wages, as well as sectoral and occupational segregation (Temesgen, 2006; Ntuli & Kwenda, 2020; Abegaz & Nene, 2022). In this regard, the recent global report of the WEF (2022) indicates that gender parity in labor force participation stands at 62.9 percent, the lowest level registered since the index was first introduced; 129 countries reported a decline in women's labor force participation relative to men's, which negatively impacted their scores; and no region has scored gender pay parity more than 0.76, i.e., to the level scored by North America.

The gendered gap in labor market participation and earnings is highly persistent in developing regions like SSA, though it is so globally (Abegaz & Nene, 2022). SSA, for example, has the lowest growth in the share of women in non-agricultural wage employment (34 percent), falling far short of the average of developing regions (48 percent), according to the UN (2015). The UNDP (2016) report on the human development of Africa cautioned that increased women's participation in the labor market has not meant they are engaged in high-paying wage employment. According to the report, the gender wage gap outside of agriculture is pervasive across all labor markets, with an unadjusted gender pay gap of 30 percent.

A synthesis by Abegaz & Nene (2022) shows that, though the SSA region has the lowest average gender employment gap when compared to other developing regions, this low employment gap in the region hides significant labor market disparities. The authors, for instance, highlighted that the SSA has the lowest share of wage and salaried female workers (as a percentage of total female employment) and the highest gender gap in the composition of wage and salaried employment. The region's wage and salaried employment gap is approximately 13%, far exceeding second-ranked South Asia's 6 percent, implying that women in the SSA region are highly concentrated in non-wage and salaried employment in the informal sector (Abegaz & Nene, 2022).

When it comes to the gender wage (pay) gap, a number of studies using different data sources confirmed, with few exceptions, the persistence of gender disparity in pay, though the magnitude varies greatly by country, overtime, and the methodology used to measure the gap. More than two decades of research work in Africa shows that the gender wage gap is present in various African and Sub-Saharan countries in particular (see Appleton et al., 1999; Siphambe & Thokwena, 2001; Kabubo-Mariara, 2003; Temesgen, 2006; Nordman & Roubaud, 2009; Kolev & Robles, 2010a; 210b; Nordman et al., 2011; Abegaz & Nene, 2018; Ntuli & Kwenda, 2020).

Gender disparities in the labor market in general and employment and earnings/pay gaps, in particular, have a number of sources depending on the context or conditions of the specific country under consideration. A large body of empirical evidence (Hellerstein et al., 1999; Appleton et al., 1999; Siphambe & Thokwena, 2001; Temesgen, 2006; 2008; Kolev & Robles, 2010a; 210b; Nordman et al., 2011; Abegaz & Nene, 2018) confirms that workforce gender disparities are driven by one or more of the following factors: individual/worker, establishment/job, and firm-level characteristics.

Ethiopia is a country in which demographic transition is at its early stage and with a population of over 100 million that is predominantly young—the median being 18 years (UNDESA, 2017) and the sex ratio (the ratio of males per 100 females for the country is 100.7: 92.5 in urban areas and 103.1 in rural areas) (CSA, 2022). Even though the country is one of the fastest-growing economies, at the same time, it is one of the poorest countries in the world and has both promising and disappointing circumstances in socio-economic and political development in general and labor market conditions in particular.

The labor market in Ethiopia is characterized, though the scenarios differ in urban and rural areas, by high underemployment or unemployment (particularly among youth) and a high concentration of women in precarious informal sector employment and low-paying jobs (Denu et al., 2005; World Bank, 2007; Kibret, 2014; Poschke, 2019; Buehren et al., 2019). The work of Buehren et al. (2019) demonstrated that there is a pervasive gender gap in the country in key economic activities: agriculture, entrepreneurship, and wage employment, limiting the realization of full women's economic empowerment. The estimation of the economic cost of gender inequality shows the annual loss in agricultural productivity, business sales, and hourly wages amounts to 1.1 billion USD (1.4 percent of total GDP), 1.1 billion USD (1.4 percent of total GDP), and 1.5 billion USD (1.9 percent of total GDP), respectively (Buehren et al., 2019).

The World Bank (2007) report has shown that in the urban Ethiopian labor market, women are uniquely disadvantaged in that they face worse outcomes with higher levels of unemployment, lower wages, and a greater concentration in the informal sector. Working women tend to be engaged in the informal sector, or they often perform a larger share of unpaid household and care work (ILO, 2016). More evidence can be obtained from the CSA's consecutive Labor Force Surveys (2005, 2013, and 2021), which show that women have higher unemployment rates in all survey periods in Ethiopia's urban and rural labor markets, implying that the gender labor participation gap persists. The CSA (2021) report also indicates that females

receive lower monthly earnings compared to their male counterparts in both urban and rural labor markets (though the earning/pay gap is lower in rural areas).

In the Ethiopian context, studies conducted on labor market participation and the earning/wage gap are inadequate. The causes of the gender disparity in labor market participation of young women [aged 8 to 25 years] (Admasu et al., 2021), the economic costs of gender gaps (Buehren et al., 2019), and the investigation of gender wage gaps in the urban labor market only (Appleton et al., 1999; Temesgen, 2006; Kolev & Robles, 2010a; 210b; Nath & Wiese, 2021) are among the issues studied.

Owing to the lack of, to our best understanding after the careful review of the existing literature, inclusive [of all age categories, both urban and rural labor markets, etc.] empirical work investigating the extent, nature, and determinants of labor market participation (employment) and the earnings gap in Ethiopia using a recent national representative data set, the current work addressed the following research questions:

Do urban and rural labor markets in Ethiopia behave differently (extent and nature) in terms of earnings and labor force participation among men and women?

What factors explain gendered earnings and labor force gap in urban and rural labor markets?

2. Literature Review

2.1 Gender Gap in Earning and Employment: Theory

Across disciplines, there are several theoretical foundations to explain the existence of gender gaps in earnings and employment. Scholars argue that grounds can be categorized as discriminatory or non-discriminatory.

The human capital theory postulates that, to begin with, the non-discriminatory sources of earning and employment gaps between men and women stem from differences in productivity-enhancing characteristics such as education, skill, and labor market experiences between the two sexes (Becker, 1964; Mincer & Polachek, 1974). In this theory, since education, work, productivity, and earnings are seen as a linear continuum, the differences in the level of schooling, skills, and experiences between the two sexes are responsible for the consequential gap in labor market outcomes. The earliest work of Oaxaca and Blinder (Oaxaca, 1973; Blinder, 1973) empirically tested the human capital theory by decomposing the earning gap between men and women into components that can be ‘explained’ by productivity-

enhancing variables and another that represents the ‘unexplained’ component attributed to labor market discrimination.

The other theoretical justification for the gender gap in earnings and employment is discrimination. Labor market discrimination occurs when workers with equal productivity levels are paid different wages or face different employment opportunities. In the economics literature, there are three theoretical frameworks explaining the sources of labor market discrimination. These are prejudice (Becker, 1971; Arrow, 1972), asymmetric information in the labor market (Arrow, 1972; Aigner & Cain, 1977), or firms’ exploitative behavior (Roemer, 1979).

Prejudice, according to Becker’s (1971) theory, the earliest and most prominent model, is one of the sources of discrimination in the labor market. Becker’s explanation is that discrimination stems from prejudiced employers incurring costs to avoid contact with minority workers. This explanation is more appealing in the case of workers with disabilities and women (Rodgers, 2009). Becker’s theory is alternatively known as ‘taste-based discrimination’ in the labor market. The theory postulates that prejudiced employers will not hire minority workers unless the workers are willing to accept wages lower than those received by equally productive workers at the non-prejudiced employer. The unrealized prediction of this theory is that its explanation of discrimination will disappear in the long run because, in competitive markets, profit-maximizing employers will eventually expel discriminatory firms from the market.

Asymmetric information is the other theoretical justification for persisting discrimination in the labor market and is alternatively called statistical discrimination (Arrow, 1972). The models of statistical discrimination assume that employers have limited information on the productivity levels of workers from minority groups because of language barriers, cultural differences, a lack of experience hiring from the minority group, or other reasons (Rodgers, 2009). The asymmetric information employers have about minority workers regarding their productivity levels will result in discrimination for various reasons (see explanation in Rodgers, 2009; Abegaz & Nene, 2022).

The other alternative rationalization for the persistence of labor market discrimination is employers’ or firms’ exploitative behavior (Roemer, 1979). The Marxist or radical proponents postulate that employers exploit minority workers to increase profits. Firms exploit their workers using the monopsony power they own through union rights (Rodgers, 2009). The Marxists view discriminatory wage differentials as an ‘exploitation premium’ extracted from members of a minority

group who are powerless to demand equal treatment in the labor market. Roemer (1979) has forwarded a good explanation of this view.

2.2 Gender Gap in Earning and Employment: Empirics

There is a good deal of empirical work that explains the sources of the gender gap in earning and employment in developed countries, and it is also present in developing nations, though not sufficient. In the following section, we will highlight some of these empirical works.

2.2.1 Gender Gap in Earning

The gender gap in earnings is persistent across the globe, though its extent is more pronounced in developing nations. Now, what factors are peculiarly common in explaining the gendered disparity in earnings? This is an important question that needs a genuine investigation. It is prudent to discuss factors explaining the gender gap in a particular labor market by classifying the gap into explainable and unexplainable components, but literature makes it clear that detailing the reasons for the latter is not easy and its measurement is unachievable. Abegaz & Nene (2022) suggested that the unexplained component of the gender wage gap may reflect labor market biases and discrimination or the roles of social norms, religion, and ethnicity that disfavor women in the labor markets. For the explained component of the gap, plenty of previous studies identified diverse variables to explicate it, consisting of individual, human capital, household, and job-related characteristics.

In previous labor market studies of gender pay disparities, individual characteristics such as age and marital status played a central role. For instance, in urban Ethiopia, Kolev and Robles (2010) documented that the share of the gender earning gap attributable to differences in job characteristics is highest among young age cohorts compared to older ones. Applying the Oaxaca-Blinder decomposition procedure, Brixiová Schwidrowski et al. (2021) in the case of Eswatini discovered that marital status explains, on average, 9% of the gender pay gap, while age accounts for 10% of the gap. Though it is not directly linked to the gendered pay gap, Nath & Wieser (2021), in the Ethiopian context, also underlined the importance of age in wage determination in that they established that wages, on average, increase with age but diminish after a certain turning point.

Human capital variables such as education, experience, and training have a key effect on labor market outcomes. In this regard, the work of Kolev and Robles

(2010) confirmed the crucial role of education parity in closing gender pay disparities. For them, in the working labor force, moving up to the higher level of the education ladder significantly increases earnings across all the wage distributions considered in their analysis. In a more distinct explanation, the authors conclude that education has, with few exceptions, a greater impact on earnings for women. Indeed, this result contrasts with some studies done earlier in Ethiopia (Appleton et al., 1999). Using the Neumark and Cotton decomposition procedure, Kolev & Robles (2010) exposed that a significant amount (between 13 and 29%) of the gender wage gap is explained by disparities in education endowment between men and women. This result is incongruous with Brixiová Schwidrowski et al. (2021), who found tertiary education is negatively associated with gender pay parity, i.e., on average, it worsens the gap by 30%.

Work experience and training are the other significant human capital variables affecting labor market outcomes. Though the effect of experience is lesser in the formal private sector, Kolev and Robles (2010) found that it yields a slightly greater return for women in overall wage employment, the public and informal private sectors, and higher wage quantiles. The authors also confirmed that training variables bring significant, positive, and higher earnings for men than they do for their female counterparts. The positive role of experience in narrowing the gender earning gap has also been well articulated by others (Dutta, 2006; Madheswaran & Attewell, 2007; Agrawal, 2011). In total, Kolev & Robles (2010) have instituted differences in human capital characteristics (education, potential experience, and training) between men and women, which account for 24-49% of the gender pay disparities.

Abegaz and Nene (2022) scorched for the instrumental role of education and continued and uninterrupted labor market experience in narrowing the gender disparity in labor market outcomes such as labor market participation, productivity, and wages. Education helps women transition from precarious forms of employment in which wages are meager to formal sector employment in which wages are high and reasonable. Women in Africa, almost across the continent, spend much of their time doing domestic chores and caring for their families, and this disconnects them from continued participation in the labor market, which in turn reduces their earnings (Abegaz & Nene, 2022).

As far as job-related characteristics are considered, empirical work well-thought-out the type of enterprise, sector of activity, types of wage employment, terms of employment, and occupation as important correlates of pay differentials between men and women. When enterprises are classified as public or private, Mitra

(2016), in the Indian case, conveyed that regular workers in public enterprises have a higher wage premium than those in private enterprises. This corroborates what Kolev and Robles (2010) have found in their studies. However, the latter authors are distinctive in their findings that wage premiums associated with participating in the public and formal private sectors are higher for women. In their decomposition exercise, Kolev and Robles (2010) documented that selection across sectors of activity accounts for 20–30% of the gender wage gap in urban Ethiopia, while selection across occupations explains the gap at about 10%. The authors further noted that types and terms of employment also matter, but to a lesser degree.

Temesgen (2006), using matched employer-employee manufacturing data in an Ethiopian context, found that men, on average, earn 30% more than women, but this amount reduces to 5% when a number of individual and establishment characteristics in the investigation of the wage gap in the manufacturing sector are controlled for. Thus, the author underlined the importance of including establishment characteristics in the decomposition exercise. Abegaz and Nene (2022), in their synthesis of African labor markets, underscored the role played by job-related characteristics and industry affiliation by amplifying the fact that earning gaps are wider in the informal and self-employment sectors, in which women are overrepresented. The authors echoed that the concentration of women in precarious sectors is a clear indication of the presence of job segregation and discrimination against women in the African labor markets.

2.2.2 Gender Gap in Employment

When we turn our discussion to the gender employment gap, the pipeline is nearly the same as the review we did for the pay gap above. Yet, an important issue to confess is that labor market research suffers from a deficiency in empirical works that investigate the gendered disparity in employment outcomes, and at the same time, many of the variables used to explain the gendered employment gap are those used to solicit the pay gap.

To begin with, a strong study conducted by Bisschop et al. (2020) regarding the ethnic employment gaps between natives and minorities in the Netherlands has provided an interesting insight that is highly replicable in the current study at hand. The authors, after applying the Oaxaca-Blinder decomposition approach, found that part of the ethnic employment gaps are explained by observed characteristics, such as the level of secondary vocational education, the field of study, socioeconomic background, and household and neighborhood characteristics. Moreover, they

underlined the strong presence of the unexplained component of ethnic employment gaps among all ethnic groups, and the gap has persisted over a long period of time. Nearly similar covariates were used by Admasu et al. (2021) in the Ethiopian context to examine the determinants of young women's participation in paid labor. In fact, though the authors did not handle decomposition analysis, they have forwarded that the likelihood of women's participation in paid labor is significantly associated with marital status, educational attainment, household socio-economic condition, and access to services.

Gebre et al. (2021) have investigated the gender gap in the labor market participation of farm households in southern Ethiopia. The study indicated that there is a visible gender gap in market participation among the sampled farm households. The authors vividly underlined that their Oaxaca-Blinder decomposition procedure result echoes that for net seller farmers, access to credit and market information contributes to what they call the 'endowment effect' (explained component), while the training variable adds to all the endowment, coefficient, and interaction effects. But for the net-buyer farmers, the use of improved seed and training variables widens the coefficient effect portion of the gap and narrows the endowment effect.

2.3 Gaps in the empirical literature

Undeniably, there are good springboard works investigating the gender gap in earning, wage, and (to some extent) employment in different parts of the world, though it is not sufficient in developing countries, particularly in Ethiopia. In this section, we portray a 'bird-fly' review of the gap in empirical literature in the sense of what our current work is planning to contribute in terms of geography, theme, data, and methodology.

In Ethiopia, Kolev & Robles (2010) used the 2005 Labor Force Survey to analyze the gender pay gap in the country. The authors, using the Neumark and Cotton decomposition procedure, came up with the finding that a non-negligible portion of the gender pay gap is explained by education endowments between men and women; of course, job-related characteristics have also played a significant role. Furthermore, they underlined that some forms of discriminatory practices might have contributed to the wage gap, either directly through the unexplained component or indirectly through job selection. Other studies, such as Temesgen (2006) and Appleton et al. (1999) have also investigated the gender wage gap in Ethiopia, but in a narrower context. For instance, the former author decomposed the gender gap in urban Ethiopia using matched employer-employee manufacturing data. Conducting

both the Oaxaca-Blinder and Neumark-Cotton decomposition procedures, the author concluded that about 40% of the gendered wage gap remained unexplained (but still a larger portion is explained) by productivity-enhancing characteristics implying the presence of “discrimination” against women in the urban manufacturing sector of Ethiopia. The earliest study by Appleton et al. (1999), using the 1990 Survey of Adolescent Fertility, Reproductive Behavior and Employment Status of the Youth Population in Urban Ethiopia, has high corroboration with that of Temesgen (2006).

In pointing out the gender employment gap, prior empirical work is very scant in Ethiopia. To the best of our reading, the only exception is Gebre et al. (2021), who investigated the gender gap in the labor market participation of farm households in southern Ethiopia using cross-sectional data collected from 560 samples. With the application of the Oaxaca-Blinder decomposition procedure, the authors conveyed that there existed a significant gendered gap in market participation in the net seller and net buyer positions between male and female decision-makers.

Some existing literature, such as Brixiová Schwidrowski et al. (2021), examined the gender pay gap in Eswatini, a South African country, using three successive Labour Force Surveys (2007, 2010, and 2013). By using the Oaxaca-Blinder decomposition procedure, the authors documented that an unexplained part of the gender wage gap is large, but a significant share of the gap is explained by the differences in observable characteristics between men and women. There are also studies that have focused on the gendered wage gap in the Indian context (see Madheswaran & Attewell, 2007; Agrawal, 2011; Mitra, 2016). In the European context, Bisschop et al. (2020), using the administrative data from the Social Statistical Database (SSB) of Statistics Netherlands, documented the ethnic employment gap between natives and minorities. The authors revealed, with the Oaxaca-Blinder decomposition, that there is a significant and non-negligible portion of the ethnic employment gap that persisted over a longer period of time but with a declining figure.

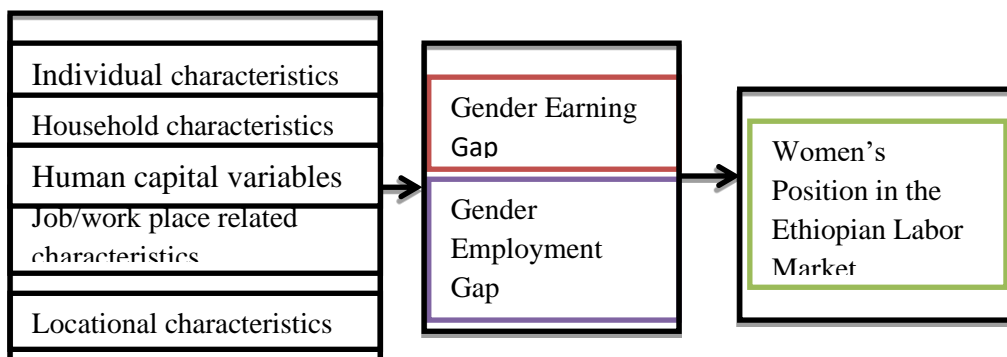
Despite the existence of few studies on wages and employment in Ethiopia, our present study has a multifold advantage over the previous studies. First, the majority of past studies (except Appleton et al., 1999; Temesgen, 2006; Kolev & Robles, 2010; Gebre et al., 2021) have largely focused only on the determinants of wage (Nath & Wieser, 2021) and employment (Admasu et al., 2021). Second, the data sources (surveys) used by almost all of the past works in Ethiopia have either limited geographical or sectoral coverage and are nowadays too old. Third, we propose to use a mix of decomposition procedures (of course, as few studies did) and regression models such as extended nonlinear models of Oaxaca-Blinder.

Therefore, investigating the gendered gap in earnings and employment using recent nationally representative (aggregate rural and urban) datasets, along with rigorous decomposition procedures and regression models, will provide us with a comprehensive understanding of women's position in the Ethiopian labor market.

2.4 Conceptual Framework of the Study

As discussed in the above section, existing empirical literature has come across different variables that explain the gendered wage and employment gap in different parts of the world and Ethiopia in particular. Thus, we frame our concept for the study by assuming that a number of individual, household, human capital, and job/work-related characteristics may affect (either narrow or widen) the gendered gap in earnings and employment, and this, in turn, will well inform us of the position of women in the Ethiopian labor market. The diagram below depicts the tentative conceptual framework of the study.

Figure 1: Conceptual Framework of the study



Source: authors' sketch from literature review

3. Methodology of the Study

3.1 The Data

This research was tasked with investigating the behavior of the Ethiopian labor market, both rural and urban, and empirically examining the factors behind the gendered gap in earnings and labor market participation in these markets. To achieve this objective, the study has used the most recent nationally representative labor force survey of the CSA of Ethiopia (CSA, 2021). The 2021 NLFS survey covered all regions of Ethiopia, both rural and urban areas, except the Tigray region. In the survey, enumeration areas (EAs) and households (HHs) were selected by using a stratified two-stage cluster sample design, with the former considered as primary and the latter the secondary sampling unit. By managing our data well, we used a refined total sample of 12956; comprising rural: 6393 and urban: 6563, to investigate the earnings differential between men and women. We deployed a total sample of 46,757; consisting of rural: 27045 and urban: 19712, to investigate the labor market participation disparity between the two genders.

3.2 Method of Data Analysis

To address the objectives of the study, we apply both descriptive statistics and an econometric approach. To explore the behavior (extent and nature) of rural and urban labor markets in terms of labor force participation and earnings among men and women, the study will depend on descriptive statistics. Following the first, to investigate the gender earning and employment gap and its determinants, we will deploy a series of econometric models [see the discussion below].

3.3 Estimation Strategy

3.3.1 Variable Measurement

As per the objectives outlined in the first chapter, in this study, two dependent variables are measured and estimated: earnings³ and labor force participation⁴ [employment] for two genders, i.e., men and women separately.

³ Earnings are gross remuneration, including bonuses, overtime, allowances, and other benefits obtained from the main job only, as in CSA (2022).

⁴ We defined the labor force participation as a bivariate choice, that is, whether an individual participates or not.

Earnings are defined as the monthly income earned (in logs) by working men and women. The logarithmic form of earnings is preferred due to the fact that it avoids bias that might arise due to variable omission or correlation of measurement with the error term (Dutta, 2006). For employment, the data on labor market participation, whether an individual participates or not, for the two genders is extracted and used. We assigned the value 1 if an individual participates and 0 otherwise. The explanatory variables that are deployed in this study consist of individual, household, human capital, and job-related characteristics (as discussed in the empirical literature of this paper). The summary of variables to be used in our study and their descriptions are given in Table 1 below.

Table 1: Variables used in econometric estimation

Variable family	Variable name	Variable label	Continuous or Categorical (and sub categories)	Expected sign	Source
Individual characteristics	Age	Age	Continuous (in years)	(-)	Kolev & Robles, 2010; Brixiová Schwidrowski et al., 2021
	Marital status	Mst	[1] Never married [2] Married [3] Divorced [4] Widowed [5] Live together	(+)	Brixiová Schwidrowski et al., 2021
Household characteristics	Household size	Hhsz	Continuous (in numbers)	(+)	
Human Capital Variables	Education	Educ	[1] Informal education [2] Primary Education [3] Secondary Education [4] Tertiary [5] Others	(-)	Kolev & Robles, 2010; Brixiová Schwidrowski et al., 2021
	Training taken	Train	[1] yes [0] otherwise	(-)	Kolev & Robles, 2010
	Skill level		[1] Skill matches [0] Otherwise	(-)	Kolev & Robles, 2010
	Type of Occupation	Typoccp			Kolev & Robles, 2010; Nath & Wieser, 2021
Job related characteristics	Status of employment	statEmp			Kolev & Robles, 2010
	Terms of employment	termEmp	[1] Permanent [2] Temporary [3] Contract [4] Casual [5] Others		Kolev & Robles, 2010
	Sector of economy	sectEcon	[1] Formal [2] Informal [3] Other	(-)	Kolev & Robles, 2010; Brixiová Schwidrowski et al., 2021
	Type of Industry	typInd			Nath & Wieser, 2021
Locational characteristics	Region dummies	regnDummy			Kolev & Robles, 2010; Brixiová Schwidrowski et al., 2021

Note: [1] We left the sub-categories of some variables for space saving sake and are as in the CSA data sets; [2] The expected signs displayed indicate the contribution of the variables in narrowing (-ve sign) or widening (+ve sign) the gender gap in earnings and employment.

3.4.2 Model Specifications

The study has two distinct models: one for earning and one for labor market participation [employment] decomposition. The wage estimation strategy starts with formulating the Mincerian earnings function (Mincer, 1974), mathematically expressed as:

$$\log E_i = \alpha + \beta_i X_i + \varepsilon_i \quad (1)$$

Where, i is the number of individual workers in the sample, $\log E_i$ is the log of monthly earnings of the i^{th} worker, X_i is a vector of covariates, α is a constant term, β_i are estimated coefficients, and ε_i is a randomly distributed error term.

Now, assume that \bar{X} is vector of mean values associated with individual workers and $\hat{\beta}$ is the respective vector of coefficients obtained from the OLS estimations of the specified Mincerian earnings function. Consequently, the average (mean) log of earnings ($\log E_i$) can be estimated from the fitted values of the ‘means’ of explanatory variables, and specified as:

$$\log E_i = \hat{\beta} \bar{X}' \quad (2)$$

Equation (2) above can be specified for the two genders and re-written as equations (3) and (4) below for males and females, respectively:

$$\log \bar{E}_m = \hat{\beta}_m \bar{X}'_m \quad (3)$$

$$\log \bar{E}_f = \hat{\beta}_f \bar{X}'_f \quad (4)$$

Where, m and f stand for male and female, respectively, and taking the differences between the fitted values of equations (3) and (4), the total gender wage gap is written as:

$$\log \bar{E}_m - \log \bar{E}_f = \hat{\beta}_m \bar{X}'_m - \hat{\beta}_f \bar{X}'_f \quad (5)$$

Adding and subtracting the term $\hat{\beta}_m \bar{X}'_m$ on the right side of equation (5) above and subsequently collecting like terms and rearranging, the decomposition becomes:

$$\log \overline{E}_m - \log \overline{E}_f = \hat{\beta}_f(\overline{X}'_m - \overline{X}'_f) + (\hat{\beta}_m - \hat{\beta}_f)\overline{X}'_m \quad (6)$$

Or it can interchangeably be written as:

$$\log \overline{E}_m - \log \overline{E}_f = \hat{\beta}_m(\overline{X}'_m - \overline{X}'_f) + (\hat{\beta}_m - \hat{\beta}_f)\overline{X}'_f \quad (7)$$

Equations (6) and (7) we obtained above are the results of what is known as the Oaxaca-Blinder (O-B, henceforth) decomposition procedure (Oaxaca, 1973; Blinder, 1973). In this procedure, the critical point of discussion is that the terms $\hat{\beta}_f(\overline{X}'_m - \overline{X}'_f)$ and $\hat{\beta}_m(\overline{X}'_m - \overline{X}'_f)$ reflect the differences in mean earnings of men and women arising from differences in mean productivity-enhancing/inhibiting characteristics included in the earnings model. This component is called the ‘explained’ part in a wage decomposition model. The second terms $(\hat{\beta}_m - \hat{\beta}_f)\overline{X}'_m$ and $(\hat{\beta}_m - \hat{\beta}_f)\overline{X}'_f$ show the portion that cannot be captured by the productivity-enhancing/inhibiting characteristics and are called the ‘unexplained’ component in the decomposition procedure. This is usually interpreted in empirical works as an earnings gap due to discrimination.

Nonetheless, in the literature, OB decomposition has been criticized for one serious limitation. The OB decomposition bases its estimation on the assumption that in a typical labor market, there is discrimination against one group only, and the other group’s wage structure is taken as a non-discriminatory structure. In this case, the magnitude of discrimination that exists in a particular labor market fluctuates with the varying choice of two wage structures as a reference (see, e.g., Temensgen, 2006; Kolev & Robles, 2010; Wirba et al., 2021). This is known by scholars as the ‘index problem’. To address this problem, Neuman and Oaxaca (2004) introduced a non-discriminatory constant, β^* which is a vector of coefficients from the pooled model for men and women. This can also be described as a non-discriminatory earning structure that is common to both men and women in a given economy.

Thus, our decomposition model can be rewritten as:

$$\log \overline{E}_m - \log \overline{E}_f = \hat{\beta}^*(\overline{X}'_m - \overline{X}'_f) + (\hat{\beta}_m - \hat{\beta}^*)\overline{X}'_m + \overline{X}'_f\hat{\beta}^* - \hat{\beta}_f \quad (8)$$

In addition to solving the instability of the amount of discrimination component to the varying wage structure, this specification enables us to decompose the unexplained (discrimination) component further into men’s treatment advantage and women’s treatment disadvantage (Temensgen, 2006; Kolev & Robles, 2010).

The term $\hat{\beta}^*(\bar{X}'_m - \bar{X}'_f)$ is the usual explained (endowment) component and $(\hat{\beta}_m - \hat{\beta}^*)\bar{X}'_m + \bar{X}'_f(\hat{\beta}^* - \hat{\beta}_f)$ is an unexplained component of which $(\hat{\beta}_m - \hat{\beta}^*)\bar{X}'_m$ and $\bar{X}'_f(\hat{\beta}^* - \hat{\beta}_f)$ is men's treatment advantage and women's treatment disadvantage, respectively.

The gendered labor force participation gap and its determinants are examined using a binary Probit extension of the Oaxaca-Blinder decomposition, which was developed by Yun (2005). The labor force participation, say LFP is a Probit function Φ of a linear combination of independent variables, is expressed as:

$$LFP^* = \Phi(X'_i\beta + \varepsilon_i) \quad (9)$$

Where, $\varepsilon \sim N(0, 1)$

A typical worker's decision to participate in labor market is a bivariate choice that takes the value 1 if the worker participates and 0 otherwise and can be written as:

$$LFP = \begin{cases} 1 & \text{if } LFP^* > 0 \\ 0 & \text{otherwise} \end{cases} \quad \text{Or } LFP = \begin{cases} 1 & \text{if } \Phi(X'_i\beta + \varepsilon_i) > 0 \\ 0 & \text{otherwise} \end{cases} \quad (10)$$

Alternatively, $P(LFP = 1|X) = \Phi(X_i\beta)$ and $P(LFP = 0|X) = 1 - \Phi(X_i\beta)$

Where, P is the probability and Φ is the cumulative distribution function of the standard normal distribution.

Following the general specification, two separate regressions assuming that LFP_m and LFP_f are labor force participation for males and females, respectively, will be performed. Moreover, assume that β_m and β_f are coefficients from separate labor market participation equations for males and females i.e. LFP_m and LFP_f , respectively, and β^* refer to the 'non-discriminatory' coefficients, i.e., the true coefficients in a situation where there is no discrimination against women in the labor market.

The gender gap in labor market participation ($GGLMP$) is the mean difference in labor market participation between the two genders. Following the Neumark (1988) and Jann (2008) decompositions, it can be stated as:

$$GGLMP = \overline{LFP_m} - \overline{LFP_f} = \left[\overline{\Phi(X'_m \beta^*)} - \overline{\Phi(X'_f \beta^*)} \right] + \left[\overline{\Phi(X'_m (\beta_m - \beta^*))} + \overline{\Phi(X'_f (\beta^* - \beta_m))} \right] \quad (11)$$

The component of the decomposition $\left[\overline{\Phi(X'_m \beta^*)} - \overline{\Phi(X'_f \beta^*)} \right]$ is the ‘explained part’. This is the part of the difference that is attributed to the differences in observable characteristics between men and women. The second component $\left[\overline{\Phi(X'_m (\beta_m - \beta^*))} + \overline{\Phi(X'_f (\beta^* - \beta_m))} \right]$ is the ‘unexplained’ part.

Gender discrimination in a particular labor market is said to exist when the ‘unexplained part’ is non-zero. It exists for several reasons (see Chapter Two in this paper). The above decomposition is at the aggregate level, and following Yun (2004), we can disaggregate it into detail to evaluate the contribution of individual variable by assigning weights to the explained component. The detailed decomposition can then be expressed as:

$$\left[\overline{\Phi(X'_m \beta^*)} - \overline{\Phi(X'_f \beta^*)} \right] = \sum_{k=1}^K W_{\Delta x}^k \left[\overline{\Phi(X'_m \beta^*)} - \overline{\Phi(X'_f \beta^*)} \right] \quad (12)$$

Where, $W_{\Delta x}^k = \frac{(\bar{x}_m^k - \bar{x}_f^k) \beta^{k*}}{(\bar{x}_m - \bar{x}_f) \beta^*}$, $\sum_{k=1}^K W_{\Delta x}^k = 1$ and $W_{\Delta x}^k$ is the individual characteristic $k = (k - 1, \dots, K)$ to the explained component of the decomposition.

4. Results and Discussion

4.1 Descriptive Statistics

As indicated in Table 2 below, we have described our sample depending on two characteristics, i.e., gender and place of residence, since our very interest relies on how the two genders are treated in the rural and urban areas of Ethiopia in terms of the two labor market outcomes (earnings and labor market participation) per se. Moreover, here we present the description based on the labor market participation data because we believe that an individual can earn only if s/he participates in any income-generating activity.

The results in Table 2 indicate that for the urban sample, the mean age is 34.52 and 31.33 years for men and women, respectively, whereas it is 34.76 and 32.06 years for men and women, respectively, for the rural sample.

Table 2: Some descriptive statistics

Place of residence		Urban		Rural	
Sex	Individual Characteristics	Mean	Std. Dev.	Mean	Std. Dev.
Male	Age	34.52	14.47	34.76	16.520
	Household size	3.81	2.027	3.97	2.035
Female	Age	31.33	14.4	32.06	16.46
	Household size	3.02	1.830	3.00	1.812
(in Percentage)					
Male		14.8 (9382)		18.5 (11742)	
Female		15.4 (10330)		22.9 (15303)	
Total		30.2 (19712)		41.4 (27045)	

Source: authors' computation from NLFS, 2021

The result suggests that our sample, more or less, consists of an adult population for which men's age is higher than women's age in both rural and urban labor markets. The deviation in age is wider for males than it is for females in both rural and urban areas. We also note that the rural sample population is a few years older than the urban sample. We also report that the average family size for men-headed households in an urban sample is 3.81, while it is 3.02 for women-headed ones. In our rural sample, the average household size for men-headed households is 3.97, and for women, it is 3. As can be seen from Table 1, the urban sample contains

14.8 and 15.4% men and women, respectively, whereas the rural sample comprises 18.5 and 22.9% men and women. The statistics indicate that women are well represented in rural and urban samples.

4.2 Behavior of Urban and Rural Labor Markets

4.2.1 How Much on Average Do Men and Women Earn Monthly?

Table 3 below presents the mean monthly earnings outcomes of men and women in rural and urban labor markets in Ethiopia.

Our data indicates that the mean monthly earnings of men (6353.63) are much higher than those of women (4045.08) in urban labor markets. Urban men earn about 1.6 times more than their women counterparts. By the same token, in the rural labor market, men enjoy higher monthly earnings as compared to women. The data shows men enjoy average monthly earnings of 4174.08, while women earn 2394.06, on average. This means rural men earn, on average, 1.75 times more than their female equivalents in rural labor markets in Ethiopia.

Table 3: Mean monthly earnings comparison between men and women

Place of Residence	Sex	N	Mean	Std. Dev.
Urban	Male	4114	6353.63***(73.91)	5513.769
	Female	2449	4045.08***(60.27)	3320.381
Rural	Male	3663	4174.08***(66.41)	3803.716
	Female	2730	2394.06***(50.31)	2486.109
Total sample		12,956		

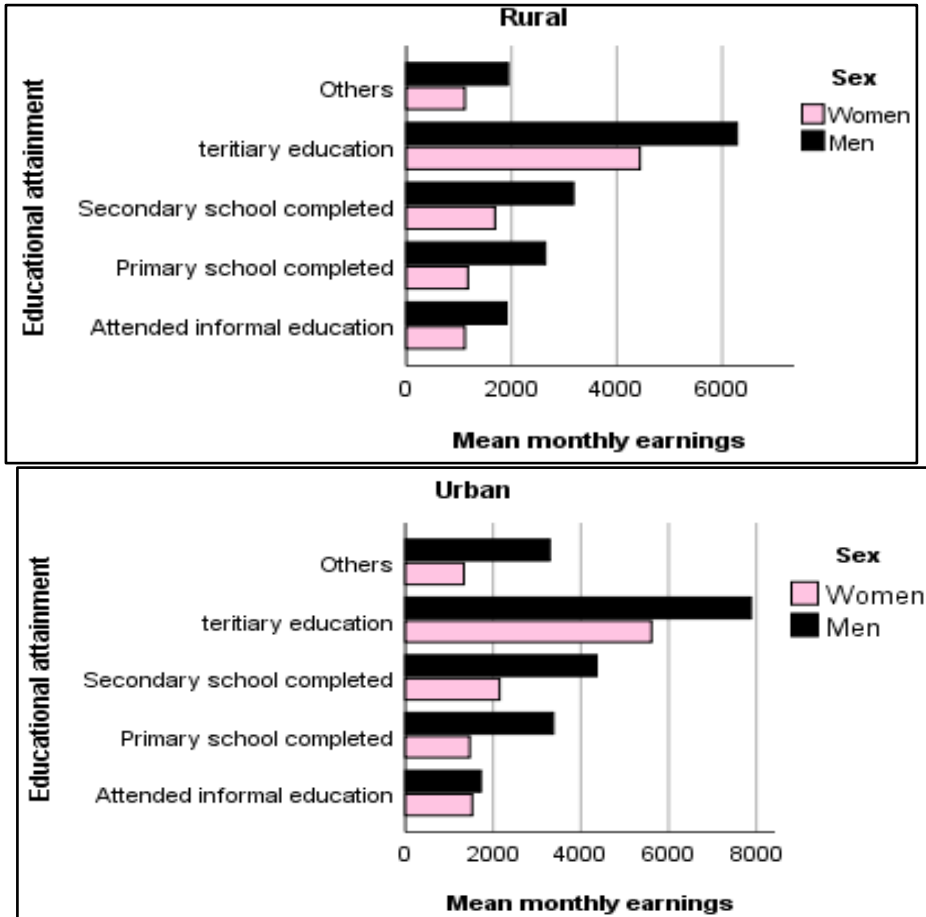
Note: the numbers in the parenthesis are t-values, ***, ** and * significance at 1%, 5% and 10% level, respectively.

Source: authors' computation from NLFS, 2021

In Figure 2 below, we are interested to see how educational attainment affects the mean monthly earnings of men and women in urban and rural labor markets in Ethiopia. It is observed that the same level of educational achievement results in relatively higher mean earnings for urban workers than for rural labor market participants. We also note that for the same level of education, women are paid less compared to men in both labor markets (Figure 2). In the urban labor market, for instance, men with secondary education earn, on average, more than Birr 4,000 per month, while women with the same level of education earn not much more

than Birr 2,000 per month. For tertiary-level education, men earn, on average, close to Birr 8,000 per month, while women earn below Birr 6,000 per month.

Figure 2: Mean monthly earnings of men and women in urban and rural areas by education



Source: NLFS (CSA, 2022)

In the rural labor market, men with secondary education earn more than Birr 3,500 per month, while women earn below 2,000 (about 1,800). While tertiary education resulted in higher earnings for both genders, there is still a substantial difference in its effect on the earnings of men and women. Rural men with tertiary education earn more than Birr 6,000 per month, on average, while their female counterparts earn below Birr 4,500 per month (Figure 2).

Our t-test result also indicates there is a significant within- and between-group mean earnings difference among men and women in urban and rural labor markets in Ethiopia. In general, descriptively, our data indicates that women earn, on average, far less than their male counterparts in the Ethiopian labor market.

4.2.2 Labor Market Participations of Men and Women

In Table 4, the results of the description of labor market participation for men and women are shown. We notice from the result that in the urban labor market, of the total male sample considered in our study, 73.6% are participating and the remaining 26.4% are non-participants. Again, in urban areas, 44.6 and 55.4% of women are participating and non-participating, respectively, in the labor market. It can be noted from the result that the labor market participation of urban women is by far lower than that of their male equivalents.

Table 4: Descriptive behavior of labor market participation between men and women

Labor market participation by residence and sex					
Place of Residence	Sex			Frequency	Percent
Urban	Male	Valid	Participating	6907	73.6
			not participating	2475	26.4
			Total	9382	100.0
	Female	Valid	Participating	4605	44.6
			not participating	5725	55.4
			Total	10330	100.0
Rural	Male	Valid	Participating	8661	73.8
			not participating	3081	26.2
			Total	11742	100.0
	Female	Valid	Participating	7472	48.8
			not participating	7831	51.2
			Total	15303	100.0

Source: authors' computation from NLFS, 2021

As far as the rural labor market is concerned, 73.8% of rural men were participating, while 26.3 were not. Of the total women in our sample, 48.8% are participating in the labor market, and the remaining 51.2% are not taking part in the labor market. The result hints that women's participation in both rural and urban

labor markets in Ethiopia is very low when compared to men's participation. Arguably, this is because women's participation in economic activities is hindered by a number of factors.

4.3 Empirical results: Decomposition of gendered gap in earnings and labor market participation

In the following section, we discuss our decomposition results for earnings and employment (labor market participation) functions. We have the modeled outputs for rural and urban samples first, and then for the total sample for both earnings and labor market participation functions. An important note here is that in our Neuman-Oaxaca method, which has several advantages over the traditional Oaxaca-Blinder (O-B), we decided to take women as a reference category since we are interested in comparing their deviation in terms of labor market outcomes against their male counterparts, and as Jann (2008) recommends, such a choice is arbitrary and based on researchers' interests.

4.3.1 Decomposition of gendered earnings gap

Consistent with the existing body of literature, it is not surprising that being female matters in terms of discrimination in labor markets, but what is most concerning is the extent of discrimination or the disadvantages that women face in such markets. Table 5 shows the results of the Neuman-Oaxaca decomposition for log monthly earnings. As already stated, we decomposed the earnings function for the rural and urban samples separately, first, and then for the total sample.

The main components of the two-fold Neuman-Oaxaca result in Table 5 concretely indicate that men enjoy a large earning premium over their female counterparts. The earning premiums taken by men are 0.58, 0.56, and 0.5 log points for the rural, urban, and aggregate samples, respectively. It is observed that a very large portion of the total earnings difference between men and women remains unexplained by the demographic, human capital, job-related, and locational characteristics considered in our models. This is the case for all model specifications.

In the rural labor markets, the observed characteristics explained about 26.3% of the total earning differentials. The remaining 73.7% is attributed to differences in returns to endowment between men and women. For the urban sample, the endowment effect has contributed slightly more to the gender earning disparity, which stood at 31.3%, while the remaining 68.7% is captured as the discrimination

effect. The model result also shows that in the combined sample, the share of observed characteristics has dropped (24.7%) while that of returns to characteristics (75.3%) has moved up. The magnitude of discrimination in the urban labor market in our finding is close to that of Temesgen’s (2006) work, in which the size of the discrimination component in urban manufacturing is estimated to be between 57% and 61%. It is also clear that women in the rural segment of the country face higher earning discrimination than their equivalents in urban labor markets, other circumstances being the same. One possible reason could be that the rural segment of the economy is dominated by low-paying sectors such as agriculture, in which informality is one of the defining characteristics.

Table 5: Neuman-Oaxaca decomposition for Earnings

	Rural sample	Urban sample	Total Sample
Total earnings gap	0.5858***(0.0327)	0.5635***(0.0316)	0.5008***(0.0194)
Explained component	0.1542***(0.0239)	0.1767***(0.0221)	0.1237***(0.0137)
Unexplained component	0.4316***(0.0257)	0.3868***(0.0238)	0.3771***(0.0147)
Men advantage	-0.4316***(0.0259)	-0.3868***(0.0238)	-0.3771***(0.0147)
Women disadvantage	0.8632***(0.0507)	0.7737***(0.0467)	0.7543***(0.0290)

Source: authors’ computation from NLFS, 2021

More interestingly, men are favored twice as much as women are in terms of earnings, and hence the latter are disadvantageous, though they could have the same endowments. Interchangeably, for the same labor market characteristics, men are paid twice as much as women in the sample under consideration.

Table 7 in the annex presents the detailed decomposition in which we solicit our model to investigate what really contributes to the gender earnings disparity in the rural, urban, and national labor markets as a whole. In the rural labor market, being less endowed with the instrumental human capital variables of primary and tertiary education, training gained, and skill matches has strongly widened the gender earning disparity, and the effect of tertiary education is paramount. These characteristics enlarged the earning gap by 0.012, 0.037, 0.032, and 0.01 log points, respectively; tertiary education is the larger contributor. The result is an interesting indication that women in rural areas are less endowed with the aforementioned

earning-improving characteristics. In developing countries and sub-Saharan Africa in particular, it is common knowledge that women in rural areas are hindered by lack of inclusive access to social facilities such as education. In these countries, women are also disproportionately affected by societal norms and cultures, such that they are confined to domestic chores. We observe that our model result is self-indicating that marital status and hours of work have also widened the earning gap. Though it is not clear how marriage affects the earning pattern of women, for hours of work, we can arguably rationalize that women's supply of labor is lower than that of their male counterparts, leaving them with a lower average earning outcome.

Other characteristics that amplified the earnings gap between men and women through the endowment effect were permanent, casual, and public-sector employment. Working in permanent, casual, and public-sector employment has widened the earning gap by 0.097, 0.033, and 0.006 log points, respectively, signifying that in relative terms, the effect of the former is somewhat compelling. This is informative because women are less empowered with permanent and public-sector employment compared to men in rural settings. In our model, after controlling for regional dummies, we found that working in the Amhara region strongly widened the earning gap between men and women compared to working in Dire Dawa City. In the endowment effect, we witnessed the mitigating role of temporary employment and working in SNNPR and Gambella regional states only, but the narrowing effect of temporary employment on gender disparity is very large (which is 0.11 log points) compared to the contribution of other covariates. We can state that women dominate temporary employment positions in rural labor markets in Ethiopia.

When we turn our discussion to the effect of returns to endowment on the gender earning disparity between men and women, marital status through men's returns, all types of terms of employment through women's returns, and private sector employment channeled via both of the returns have significantly expanded the gap. Women's returns to permanent, temporary, casual, and contractual employment have aggravated the gender earning gap by log points of 0.43, 0.29, 0.11, and 0.086, respectively. The result shows that women are paid less in the above-mentioned terms of employment even though they could have similar labor market characteristics compared to their male counterparts, suggesting the presence of discrimination in women's returns.

We have noticed that our model strongly suggests the service and trade sectors and the formal sector through male return, age through women's returns and hours worked, and government employment through both of these return effects have played a significant role in narrowing the gender earning gap in the Ethiopian rural

labor market. Though we have noticed a powerful effect of returns to age for women on the earning gap, we also observed a strong recurring effect of hours worked and government employment for both groups' returns.

Table 7 in the annex also hosts the detailed decomposition that portrays the effect of each individual covariate on the gender earning gap in urban labor markets. When we look at the urban labor market, our model results have shown slightly different idiosyncrasies than those observed in rural labor markets.

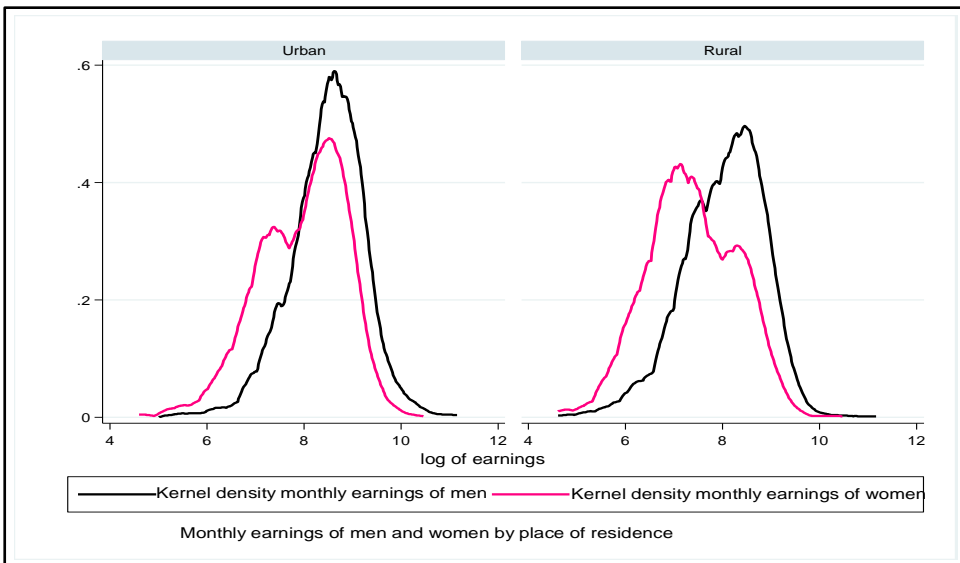
But the results still indicate that human capital characteristics, i.e., tertiary education, training received, and skill matches, have played a key role in widening the gender earning disparity in terms of endowment effects. This result clearly signals that women in urban labor markets, as they are in rural markets, are less endowed with productivity-enhancing attributes compared to men in similar places of residence. Among the human capital endowments, tertiary education has contributed the largest share, 0.071 log points, to the earning disparity. The model results also suggested that age, household size, hours worked, and being in the Amhara region significantly aggravated the gender earning gap in terms of endowment attributes. It is, at least qualitatively, expected and fairly interesting to see that larger family sizes and fewer labor hours supplied have an adverse effect on women's earning potential, thus widening the gap. As conveyed in the model result, it is only in the SNNPR state that it is observed to have a mitigating effect on the gender earning disparity through the endowment effect.

Regarding the contribution of returns to endowments, contractual employment and managerial occupation in terms of men's and women's returns, respectively, have widened the gender gap in earnings. We cannot provide any tentative justification for the widening effect of managerial roles on the earning gap. This might be a good idea for future research on why women in managerial positions are paid less than their male counterparts with similar endowments. On the other hand, model results revealed that all categories of education (tertiary being the highest contributor) and hours worked through returns to men's endowments, and age and formal sector employment through both men's and women's endowments' returns, have significantly reduced the gender earnings gap in the Ethiopian urban labor market. This finding is somehow consistent with the work of Kolev and Robles (2010), who revealed that private returns to education are progressively and systematically incremental and confirmed that education has a greater impact on women's earnings.

Figure 3 adds more description to what our empirical investigation of the gender earnings gap has revealed. To show the heterogeneity in earnings between

men and women, we have plotted a kernel density function that enables us to make non-parametric inferences about our sample data. It is clear that earnings are higher in urban labor markets for both genders than they are in rural labor markets. It is also indicated that in both urban and rural labor markets, the earnings distribution of men falls on the right side of that of women, indicating that the former earns more than the latter in both labor markets (Figure 3).

Figure 3: Kernel density function of rural and urban earnings by gender



We notice that the kernel earning distribution for men (Figure 3) is unimodal, implying that all men experience a uniform earning distribution in both rural and urban markets. On the other hand, in both labor markets, the earning distribution for women is bimodal, indicating that some groups of women in our sample data earn more than other groups. Moreover, one interesting point to note is that at higher levels of earnings distribution, gender disparity gets narrower than it does at lower earnings ranges in both rural and urban labor markets (Figure 3). However, it is revealed that the decline in the gender gap at higher distributions of earnings is slow in the rural segment compared to the urban labor market.

In our evaluation, we modeled the earnings gap for our combined sample. Our model results consistently and clearly suggest that the usual human capital endowments (primary and tertiary education, training received, and skill matches) have strongly widened the gender earning disparity. The variables have also maintained their position in terms of the magnitude of their contribution to earnings

outcome disparity, with tertiary education taking the lead. Age, marital status, household size, hours worked, all types of terms of employment, holding managerial roles, formal sector employment, and residing in Amhara and Harari regional states also have an aggravating effect on the gender earning gap via at least one of the channels.

On the other hand, in our total sample, we have also documented that age, primary education, hours worked, public and formal sector employment, and some of the regional dummies (Addis Ababa, SNNPR, and Sidama) have played a mitigating role in the gender earnings disparity.

4.3.2 Decomposition of gendered labor market participation gap

Next to the earnings model, we have investigated the gendered labor market participation gap to see the extent to which women are discriminated against. In the same fashion as we did for the gender earnings gap decomposition, we modeled the gendered labor market participation gap for our rural, urban, and total samples.

Table 6 and Table 8 in the annex part illustrate the results for the two-fold Neuman-Oaxaca decomposition with an extension for the non-linear model, the Binary Probit in our case, for the gendered labor market participation gap. Our model results revealed that gender discrimination in terms of labor market participation is persistent in both rural and urban labor markets in Ethiopia.

As can be seen from Table 6, in our total sample model, of the total gendered raw gap in labor market participation, the discrimination component accounts for 80%, while the remaining 20% is captured by the endowment effect of characteristics considered in the model. In the rural labor market, the discrimination and explained components are 81.4 and 18.6%, respectively, while in the urban labor market, these components account for about 78 and 22%, respectively. Our model results also convey an interesting point: that men are about 35 and 31% overrepresented (over-participated) in the rural and urban labor markets of Ethiopia, respectively. In our total sample, the amount of men's treatment advantage (women's treatment disadvantage) is the same as observed in the rural sample. It is a generalizable fact from the result that discrimination against women in terms of labor market participation in Ethiopia is factual, and it is more severe in rural labor markets.

Table 6: Labor market participation decomposition: Oaxaca-Blinder extension for non-linear models (Oaxaca-Blinder extended with Probit Model).

	Rural	Urban	Total Sample
Total difference	0.2450***(0.0080)	0.2738***(0.0087)	0.2801***(0.0042)
Explained component	0.0455***(0.0060)	0.0600***(0.0075)	0.0560***(0.0034)
Unexplained component	0.1995***(0.0107)	0.2138***(0.0122)	0.2241***(0.0058)
Men treatment advantage	-0.0694***(0.0028)	-0.0661***(0.0028)	-0.0693***(0.0014)
Women treatment disadvantage	0.2689***(0.0130)	0.2799***(0.0145)	0.2935***(0.0069)

Source: authors' computation from NLFS, 2021

Table 8 in the annex demonstrates the detailed decomposition of the labor market participation gap model. In this decomposition, we distil out the contribution of each covariate included in our model to the gendered labor market participation gap.

The results of the rural labor market model suggested that in terms of endowment, from human capital variables, primary education and skill are confirmed to have a strong widening effect on the gender labor participation gap. The widening effect size of primary education and skill in terms of endowment is 0.0011 and 0.015 log points, respectively. This result somehow implies the usual contention that women are less endowed with these characteristics compared to their male counterparts.

The other tributaries of covariates that widened the gendered labor participation gap in terms of endowment are all categories of status of employment (government, private organization, self-employment, and employer status), with self-employment taking the principal position, followed by public sector employment. We may instrumentally note that this result is indicative that there is an underrepresentation (self-assuring to the women's treatment disadvantage) of women in these statuses of employment compared to the men's equals. When we control for regional dummies residing in Amhara and Sidama regional states, the weight of the latter being strongest is found to have a widening effect on the labor market participation gap. Being married and household size was found to have a strong narrowing effect on the gendered labor market participation gap through endowment. One good reason could be that it is more demanding for a typical woman who is married and whose family size is larger, compared to otherwise, to support her family with additional monetary benefits by participating in a particular (or, at worst, in any) job offer.

We observe that through men's return effect, being married and all education categories were instituted to have a significant aggravating effect on the gender rural labor market participation gap, while age, training, skill, private organization, self-employment, and all regional dummies included in our model were found to have a significant mitigating effect. As part of women's return effect, marital status and primary education have exhibited a widening effect. We further documented other covariates such as training and self-employment, and all regional dummies except Benishangul, Sidama, and Harari had a significant narrowing effect.

In our urban sample, from the human capital variables, only training and skill predicted the gendered labor participation gap well, and the effect is seen to be widening through the explained component. Among these two variables, skill is noticed to be a stronger predictor with log points of 0.0223, while training has an effect size of 0.007 log points. As underscored in our rural sample, this model result is also very informative, showing that urban women are less endowed with human capital variables when compared with their male counterparts residing in the same geographic location, and thus contributing to widening the gender labor market participation gap. We found marriage to be the only demographic variable, and residing in Afar was the only regional dummy that played a mitigating role.

In the return's effect, secondary education via men, household size, primary education through women, and marriage through both of the return to endowment effects revealed a significant widening effect on urban labor market participation. On the other hand, model results indicated that age, skill, and all types of status of employment in terms of male returns and self-employment in women's returns have effectively mitigated the gap. In labor market studies, the widely accepted acclaim is that self-employment gives work-hour flexibility, which enables and accommodates women with family caring burdens (such as caring for children, the elderly, etc.), broadening their labor participation prospects.

In our aggregate sample model, the national gendered labor market participation gap is widened by employment-improving characteristics (training and skill), age, household size, statuses of employment and some of the region dummies, in terms of endowment effects. The mitigating role is exercised by marriage, secondary education, and Afar, Somale, and Gambella region dummies. From the result, we may draw the implication that, on an aggregate level, women's secondary education attainment in Ethiopia has brought, at least in qualitative terms, an improvement in labor market participation. In terms of returns on men's and women's endowments, we found a consistent widening effect of marriage, primary

education, and residing in the Amhara region, while a steady mitigating role is played by skill and all types of employment except being an employer.

5. Conclusion and Policy Implications

5.1 Conclusion

This research project has been tasked with investigating the behavior of the Ethiopian labor market, both rural and urban, and empirically examining the factors behind the gendered gap in earnings and labor market participation in these markets. To achieve this objective, the study has used the most recent nationally representative labor force survey of the CSA of Ethiopia.

By managing our data well, we used a refined total sample of 12956, comprising rural: 6393 and urban: 6563, to investigate the earnings differential between men and women. We deployed a total sample of 46,757, consisting of rural: (27045 and urban: 19712, to investigate the labor market participation disparity between the two genders. Our empirical results relied on the use of the Neuman-Oaxaca decomposition method, the post-Oaxaca-Blinder (OB), which is known for several advantages over the traditional OB. In the earnings decomposition, the study directly applied Neuman-Oaxaca after the specification of the linear Mincerian function. But for the labor market participation decomposition, Neuman-Oaxaca is extended to the non-linear model form, the binary probit in our case.

The study results, descriptively, indicated that men have experienced higher labor market outcomes in both urban and rural Ethiopia, while women are disproportionately disadvantaged. We find that urban women earn, on average, only about 64% of urban men's earnings. In the same fashion, in the rural labor market, women earn, on average, about 57% of men's income. Previous studies, such as Kolev and Robles (2010), in urban Ethiopia also found that women represented only about 66% of men's wages. The results of our analysis also revealed that, in terms of labor market participation, women have achieved lower than their male counterparts in both rural and urban labor markets in Ethiopia.

The findings of our empirical investigation strongly suggest that discrimination against women is persistent in both rural and urban labor markets in Ethiopia. Men enjoy a higher earnings premium over women in both markets. Rural men enjoyed a 0.58 log points earning premium, while urban men enjoyed a premium of 0.56 log points over their female counterparts in similar places of residence. Women face severe discrimination in earnings in the Ethiopian labor market. The

magnitude of discrimination in the rural labor market is about 74%, and it is close to 69% in urban settings, keeping other circumstances the same. In our combined sample, we document gendered earnings discrimination at 75%. The magnitudes are fair when compared to the previous case-specific findings.

We firmly document that women in both urban and rural labor markets are less endowed with human capital resources, which in effect has resulted in widening their disparities in terms of earnings. The effect of tertiary education, training, and skill is very compelling and consistent in both rural and urban labor markets. Previous empirical findings on the effect of tertiary education on narrowing the gender earnings gap are inconsistent. For example, Brixiová Schwidrowski et al. (2021) found tertiary education is negatively associated with gender pay parity, i.e., it worsens the gap. Nonetheless, Kolev and Robles (2010) claimed that moving up an additional ladder in educational attainment has strong power to close the pay disparity. Equally important is that women in both markets are also endowed with lower average hours worked, leaving them with a lower earnings outcome. Our model results indicated that women's returns to human capital endowments and more labor hours supplied resulted in a significant and steady reduction of the gendered earnings gap.

The model result also indicated that women's returns to age (which can be a good proxy for labor market experience) have played a mitigating role in both rural and urban labor markets. This result corroborates the findings of Nath and Wieser (2021), who established that wages in Ethiopia increase with age but only up to a certain turning point. We find that the effect of marriage on the gendered earnings gap is pronounced in the rural labor market, while household size matters very well for urban workers. In our results, it is uniquely noticed that women in rural labor markets are highly underrepresented in the public sector and permanent employment, where earnings are higher and more stable. As indicated in Kolev and Robles (2010), the role of public sector employment is also found to be important in our investigation. Women in rural settings dominantly held temporary jobs, and this has a significant, at least in the short run, narrowing effect on gender disparities in earnings. Low returns for women in private sector employment in rural Ethiopia have played a central role in widening the earning disparity between men and women. We are able to see the effect of employment in the formal sector of the economy being crucial only in the urban labor market. After controlling for regional dummies, our results consistently indicate that working in the Amhara region has widened the gendered earnings gap while working in the SNNPR has smoothly mitigated the gap. This result may be because of cultural and normative differences between regions

that affect women's earnings prospects differently and may require an anthropological investigation.

In our labor market participation model, the rural labor market experienced discrimination against women at 81.4% of the total raw gap, while the urban labor market experienced 78%. Model results indicate that, when compared to women, men are about 35 and 31% overrepresented (over-participated) in rural and urban labor markets in Ethiopia, respectively. In sum, discrimination against women is greater in rural labor market when compared to urban labor markets. In the same way as seen in our earnings model, in both rural and urban labor markets, women are less equipped with employment-enhancing characteristics, particularly skill, which has hampered their labor market participation. From demographic characteristics, marriage improves women's labor market engagement, but once women join the labor market, it has a consistent widening effect, as evidenced by both men's and women's return effects.

We obtain results showing that in all statuses of employment, women are disadvantaged in terms of labor market participation. Our findings strongly suggest that improving women's return to public sector employment is crucial to narrowing the urban labor market participation gap, while self-employment has an instrumental and solid effect on alleviating the gap in both labor markets.

5.2 Policy Implications

The current work has achieved at least its primary objectives set initially. We believe that since our work has used the most recent and nationally representative data and followed reasonable methodology, some important policy implications can be drawn. It is important to duly recognize that there is persistent discrimination against women in the Ethiopian labor markets, particularly in terms of earnings and labor market participation, so 'the what factors' can be important for an appropriate policy response. From the results of our investigation, it is important to devise different policy instruments by recognizing that 'one-size-fits-all' does not work since the behavior of rural and urban labor markets is different. The following specific policy implications might have far-reaching outcomes:

Investing in women's human capital development and evaluating the subsequent outcome: to realize women's empowerment in economic participation in Ethiopia, searching for instruments that help achieve earnings and labor market participation gender parity is crucial. For this sake, increasing public investment in women's human capital development and ensuring that that investment has achieved

the targeted objective has no substitute. The results of our empirical investigations clearly indicate that improving women's positions through tertiary education, training, and skill enhancement is vital to removing discrimination in earnings and labor market participation in both rural and urban labor markets.

Improving women's labor hours and their participation in the formal sector economy: as indicated in our results, women have supplied fewer labor hours when compared to men. This may be due to cultural issues and norms that attach women to sole domestic chore responsibilities, such as caring for children, which is very common in patriarchal societies such as ours. Policies geared towards access to childcare services may be vital in this respect. Giving due consideration to the creation of awareness that domestic work must be shared between men and women is also important. Enhancing women's transition from informal to formal sector employment is critical to eliminating discrimination against women in earnings, particularly in the urban labor market.

Assuring women's participation in better-paying jobs and stable terms of employment: Women in most developing countries and Ethiopia in particular are underrepresented in better-paying jobs and in secured terms of employment, which negatively affects their labor market outcomes. From this perspective, improving women's participation in public sector jobs in rural labor markets and formal self-employment in both urban and rural labor markets could have far-reaching positive outcomes.

Finally, we put forward future research to take advantage of our current study. It would be very rewarding to examine the gendered earnings and employment gap using a longitudinal dataset, which might enable us to see changes over time. It is also important to evaluate gendered disparities in labor market outcomes in different aspects, e.g., across sectors of the economy. We put forward for future research the idea of augmenting a quantitative investigation with a qualitative gendered-anthropological inquiry to see how cultures, norms, dogmas, etc., which are not captured in the administrative data, affect discrimination against women in Ethiopian labor markets.

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Appendix

Table 7: Decomposition for earnings model

Explanatory Variables	Rural Sample			Urban Sample			Total Sample		
	Endowment effect	Men's returns effect	Women's returns effect	Endowment effect	Men's returns effect	Women's returns effect	Endowment effect	Men's returns effect	Women's returns effect
Age	-0.0045(0.0053)	-0.0064(0.0172)	-0.1180*(0.0712)	0.0150***(0.0049)	-0.0603***(0.0229)	-0.1696***(0.0833)	0.0076***(0.0025)	-0.0284***(0.0117)	-0.1205***(0.0452)
Married	0.0163***(0.0064)	0.0076***(0.0033)	0.0146(0.0158)	0.0057(0.0037)	-0.0007(0.0029)	-0.0176(0.0139)	0.0084***(0.0027)	0.0036***(0.0016)	0.0054(0.0080)
Household size	0.0089(0.0085)	0.0131(0.0114)	-0.0167(0.0327)	0.0194***(0.0063)	0.0148(0.0106)	-0.0043(0.0331)	0.0082***(0.0041)	0.0104(0.0065)	-0.0056(0.0206)
Informal education	-0.0011(0.0010)	0.0001(0.0008)	-0.0001(0.0019)	-0.0006(0.0005)	-0.0008***(0.0004)	-0.0005(0.0005)	-0.0010***(0.0005)	-0.0005*(0.0003)	-0.0003(0.0008)
Primary education	0.0120***(0.0044)	0.0047(0.0073)	0.0172(0.0132)	-0.0075(0.0048)	-0.0151*(0.0085)	0.0001(0.0131)	0.0043***(0.0020)	-0.0069*(0.0037)	0.0026(0.0079)
Secondary education	0.0032(0.0056)	0.0017(0.0055)	0.0055(0.0117)	0.0009(0.0065)	-0.0167***(0.0100)	0.0105(0.0142)	0.0004(0.0032)	-0.0053(0.0034)	0.0050(0.0080)
Tertiary education	0.0373***(0.0152)	0.0103(0.0168)	0.0182(0.0444)	0.0710***(0.0178)	-0.0761***(0.0381)	-0.0833(0.0662)	0.0389***(0.0090)	-0.0147(0.0108)	-0.0242(0.0317)
Training	0.0318***(0.0071)	0.0074(0.0123)	0.0323(0.0412)	0.0355***(0.0072)	-0.0053(0.0153)	0.0537(0.0545)	0.0387***(0.0044)	0.0022(0.0068)	0.0255(0.0278)
Skill	0.0105***(0.0030)	-0.0025(0.0097)	0.0103(0.0241)	0.0165***(0.0038)	-0.0062(0.0109)	0.0111(0.0281)	0.0132***(0.0020)	-0.0025(0.0056)	0.0029(0.0157)
Hours worked	0.0112***(0.0033)	-0.0414***(0.0152)	-0.0167***(0.0327)	0.0153***(0.0038)	-0.0221*(0.0134)	-0.0280(0.0388)	0.0163***(0.0023)	-0.0201***(0.0078)	-0.0759***(0.0239)
Permanent employee	0.0987***(0.0378)	0.1646(0.1139)	0.4263***(0.1842)	0.0080(0.0145)	0.0209(0.0229)	-0.0054(0.2652)	0.0031(0.0050)	0.0658*(0.0389)	0.2557(0.1659)
Temporary employee	-0.1095***(0.0442)	0.0598(0.0368)	0.2926***(0.1113)	0.0040(0.0202)	0.0061(0.0038)	0.0035(0.0650)	0.0054(0.0128)	0.0221***(0.0097)	0.1126*(0.0588)
Contractual employee	-0.0052(0.0104)	0.0254(0.0155)	0.0862***(0.0325)	-0.0003(0.0015)	0.0098***(0.0028)	0.0289(0.0294)	-0.0001(0.0010)	0.0118***(0.0045)	0.0455***(0.0186)
Casual worker	0.0332*(0.0170)	0.0423(0.0278)	0.1124***(0.0415)	-0.0008(0.0060)	-0.0004(0.0025)	-0.0022(0.0164)	-0.0015(0.0068)	0.0131***(0.0065)	0.0438***(0.0201)

Gov't employee	0.0060**(0.0028)	-0.0211***(0.0076)	-0.0659**(0.0240)	0.0009(0.0010)	-0.0090(0.0090)	-0.0384(0.0340)	0.0004(0.0004)	-0.0098**(0.0049)	-0.0361***(0.0163)
Private employee	0.0001(0.0005)	0.0077**(0.0034)	0.0237**(0.0108)	-0.0003(0.0005)	-0.0044(0.0031)	-0.0040(0.0107)	0.0003(0.0003)	0.0015(0.0018)	0.0062(0.0062)
Self-employed	0.0000(0.0001)	0.0001(0.0008)	-0.0009(0.0024)	0.0002(0.0009)	-0.0002(0.0010)	0.0009(0.0038)	0.0001(0.0002)	0.0006(0.0006)	0.0027(0.0022)
Managers	0.0001(0.0004)	0.0006(0.0011)	0.0034(0.0031)	-0.0001(0.0003)	0.0016*(0.0008)	0.0058*(0.0032)	-0.0000(0.0001)	0.0011**(0.0006)	0.0037*(0.0020)
Professionals	0.0001(0.0006)	-0.0068(0.0070)	-0.0227(0.0231)	-0.0004(0.0011)	0.0068(0.0061)	0.0198(0.0234)	0.0003(0.0004)	0.0039(0.0039)	0.0074(0.0150)
Clerical workers	-0.0001(0.0005)	-0.0005(0.0014)	-0.0026(0.0048)	-0.0000(0.0002)	-0.0013(0.0013)	-0.0066(0.0046)	-0.0000(0.0001)	0.0000(0.0008)	-0.0008(0.0027)
Service and trade	0.0004(0.0011)	-0.0082*(0.0045)	-0.0195(0.0153)	0.0002(0.0008)	-0.0003(0.0037)	-0.0032(0.0143)	-0.0001(0.0004)	-0.0001(0.0024)	-0.0013(0.0090)
Skilled agricultural workers	-0.0004(0.0006)	-0.0001(0.0007)	-0.0000(0.0028)	-0.0000(0.0006)	-0.0002(0.0006)	-0.0008(0.0023)	0.0000(0.0001)	0.0005(0.0004)	0.0007(0.0016)
Elementary occupations	-0.0000(0.0004)	-0.0063(0.0053)	-0.0183(0.0169)	0.0011(0.0011)	0.0023(0.0044)	-0.0015(0.0183)	0.0000(0.0001)	0.0015(0.0029)	0.0017(0.0109)
Formal	0.0033(0.0027)	-0.0381**(0.0166)	-0.0449(0.0412)	0.0032(0.0020)	-0.0616*** (0.0229)	-0.1518** (0.0656)	0.0026** (0.0010)	-0.0389*** (0.0100)	-0.0855*** (0.0318)
Informal	-0.0001(0.0003)	0.0007(0.0012)	0.0034(0.0033)	-0.0000(0.0003)	-0.0005(0.0005)	-0.0020(0.0020)	0.0000(0.0002)	-0.0003(0.0005)	0.0003(0.0016)
Addis Ababa	-0.0001(0.0003)	-0.0008 (0.0023)	-0.0014(0.0133)	-0.0034(0.0028)	0.0001(0.0019)	-0.0046(0.0124)	-0.0073*** (0.0020)	0.0018 (0.0012)	0.0052(0.0080)
Afar	-0.0008(0.0013)	-0.0014(0.0016)	-0.0074(0.0062)	0.0004(0.0010)	-0.0032(0.0020)	-0.0091(0.0111)	0.0001(0.0003)	-0.0012(0.0009)	-0.0058(0.0044)
Amhara	0.0366*** (0.0093)	-0.0006(0.0055)	-0.0209(0.0403)	0.0065*(0.0035)	0.0026(0.0046)	0.0052(0.0274)	0.0112*** (0.0027)	0.0053** (0.0023)	0.0081(0.0151)
Oromia	-0.0023(0.0049)	-0.0018(0.0078)	-0.0185(0.0396)	-0.0049(0.0030)	-0.0064(0.0061)	-0.0217(0.0268)	-0.0012(0.0013)	0.0010(0.0030)	-0.0045(0.0160)
Somale	0.0003(0.0006)	0.0000(0.0005)	-0.0001(0.0026)	0.0009(0.0010)	-0.0007(0.0011)	0.0002(0.0038)	-0.0014(0.0011)	-0.0012(0.0009)	-0.0039(0.0044)
Benishangul	-0.0057(0.0043)	0.0010(0.0031)	-0.0019(0.0133)	-0.0005(0.0010)	-0.0002(0.0016)	0.0013(0.0069)	-0.0015(0.0011)	0.0012(0.0010)	0.0018(0.0042)
SNNPR	-0.0133** (0.0052)	0.0012(0.0046)	0.0030(0.0179)	-0.0054*(0.0029)	-0.0014(0.0036)	0.0015(0.0147)	-0.0109*** (0.0023)	0.0007(0.0020)	0.0005(0.0078)
Sidama	-0.0066** (0.0032)	0.0009(0.0018)	0.0007(0.0062)	-0.0015(0.0017)	-0.0002(0.0013)	-0.0021(0.0050)	-0.0104*** (0.0019)	-0.0006(0.0010)	-0.0052(0.0033)
Gambella	-0.0049** (0.0027)	-0.0018(0.0017)	-0.0071(0.0063)	-0.0030(0.0021)	-0.0039(0.0024)	-0.0099(0.0095)	-0.0004(0.0006)	-0.0009(0.0010)	-0.0040(0.0048)
Harari	-0.0005(0.0010)	0.0003(0.0006)	0.0003(0.0019)	0.0008(0.0009)	0.0008(0.0011)	0.0030(0.0059)	0.0000(0.0002)	0.0011** (0.0006)	0.0039(0.0028)

Table 8: Decomposition for employment model

Explanatory Variables	Rural Sample			Urban Sample			Total Sample		
	Endowment effect	Men's returns effect	Women's returns effect	Endowment effect	Men's returns effect	Women's returns effect	Endowment effect	Men's returns effect	Women's returns effect
Age	0.0008 (0.0007)	-0.0095*** (0.0035)	0.0075 (0.0131)	-0.0011 (0.0009)	-0.0178*** (0.0042)	-0.0115 (0.0155)	0.0015*** (0.0004)	-0.0113*** (0.0016)	-0.0106 (0.0078)
Married	-0.0104*** (0.0027)	0.0283*** (0.0043)	0.0155*** (0.0031)	-0.0096*** (0.0024)	0.0250*** (0.0040)	0.0157*** (0.0042)	-0.0066*** (0.0012)	0.0020*** (0.0014)	0.0155*** (0.0021)
Household size	-0.0025** (0.0012)	0.0002 (0.0030)	0.0131 (0.0080)	-0.0012 (0.0011)	0.0037 (0.0030)	0.0208** (0.0086)	0.0014** (0.0006)	0.0265 (0.0021)	0.0193*** (0.0046)
Informal education	-0.0001 (0.0001)	0.0003* (0.0002)	0.0007 (0.0007)	-0.0001 (0.0002)	0.0000 (0.0001)	0.0002 (0.0007)	-	0.0002*** (0.0001)	0.0005 (0.0004)
Primary education	0.0011* (0.0006)	0.0028** (0.0011)	0.0060** (0.0027)	-0.0001 (0.0002)	0.0016 (0.0010)	0.0068* (0.0035)	0.0002 (0.0003)	0.0016*** (0.0005)	0.0042** (0.0014)
Secondary education	0.0002 (0.0004)	0.0013** (0.0006)	0.0027 (0.0017)	-0.0000 (0.0002)	0.0014* (0.0008)	0.0040 (0.0026)	-0.0002** (0.0001)	0.0006** (0.0003)	0.0007 (0.0010)
Training Skill	0.0004 (0.0009)	-0.0029** (0.0009)	-0.0075*** (0.0026)	0.0070*** (0.0020)	0.0015 (0.0019)	0.0024 (0.0045)	0.0010*** (0.0004)	-0.0005 (0.0005)	-0.0036** (0.0015)
Gov't employee	0.0137*** (0.0018)	0.0003 (0.0013)	0.0016 (0.0023)	0.0280*** (0.0030)	-0.0066*** (0.0013)	-0.0143** (0.0049)	0.0114*** (0.0009)	-0.0025*** (0.0005)	0.0045*** (0.0016)
Private employee	0.0056*** (0.0010)	-0.0011* (0.0006)	-0.0007 (0.0016)	0.0064*** (0.0011)	-0.0013** (0.0006)	-0.0008 (0.0017)	0.0036*** (0.0004)	-0.0011*** (0.0002)	-0.0018** (0.0008)
Self-employed	0.0178*** (0.0021)	-0.0105*** (0.0014)	-0.0223*** (0.0038)	0.0078*** (0.0017)	-0.0051*** (0.0010)	-0.0100*** (0.0031)	0.0248*** (0.0013)	-0.0101*** (0.0007)	0.0216*** (0.0021)
Addis Ababa	0.0003* (0.0002)	0.0000 (0.0000)	-	0.0000 (0.0002)	-0.0001 (0.0001)	-0.0002 (0.0004)	0.0002** (0.0001)	-	-0.0001 (0.0001)
Afar	0.0006 (0.0004)	-0.0016** (0.0007)	-0.0031* (0.0017)	0.0006 (0.0004)	0.0000 (0.0005)	-0.0010 (0.0026)	0.0003* (0.0002)	-	-0.0004 (0.0010)
Amhara	-0.0002 (0.0002)	-0.0015* (0.0008)	-0.0025* (0.0015)	-0.0006* (0.0003)	0.0009 (0.0007)	0.0033 (0.0023)	-0.0002** (0.0001)	0.0005* (0.0003)	0.0017 (0.0011)
Oromia	0.0014* (0.0007)	-0.0079*** (0.0027)	-0.0125** (0.0055)	0.0006 (0.0006)	0.0019 (0.0015)	0.0084 (0.0059)	0.0002 (0.0001)	0.0012** (0.0006)	0.0058** (0.0027)
Somale	-0.0002 (0.0002)	-0.0100*** (0.0034)	-0.0144*** (0.0051)	-0.0001 (0.0003)	0.0024 (0.0022)	0.0086 (0.0066)	0.0002* (0.0001)	0.0001 (0.0008)	0.0017 (0.0029)
Benishangul	-0.0001 (0.0005)	-0.0010*** (0.0003)	-0.0049*** (0.0012)	-0.0002 (0.0002)	0.0001 (0.0003)	0.0004 (0.0015)	-0.0009** (0.0004)	0.0003 (0.0002)	-0.0006 (0.0018)
SNNPR	-0.0005 (0.0004)	-0.0036** (0.0014)	-0.0027 (0.0021)	0.0000 (0.0001)	0.0003 (0.0005)	0.0018 (0.0016)	0.0003*** (0.0001)	0.0002 (0.0003)	0.0010 (0.0009)
Sidama	0.0004 (0.0005)	-0.0060*** (0.0021)	-0.0066** (0.0027)	-0.0004 (0.0006)	0.0006 (0.0012)	0.0011 (0.0030)	0.0001 (0.0002)	-0.0004 (0.0005)	-0.0009 (0.0016)
Gambella	0.0013*** (0.0004)	-0.0016* (0.0009)	-0.0003 (0.0012)	0.0004 (0.0003)	0.0003 (0.0005)	0.0011 (0.0013)	0.0025*** (0.0004)	-0.0003 (0.0003)	-0.0002 (0.0008)
Harari	0.0002 (0.0003)	-0.0031*** (0.0011)	-0.0049*** (0.0017)	0.0003 (0.0002)	0.0008 (0.0008)	0.0028 (0.0023)	-0.0002*** (0.0001)	-0.0004 (0.0002)	-0.0015 (0.0010)