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Abstract

Despite the fact that the global gender gap in labor force participation has been decreasing over the past 30 years, male-sided gender disparity is still persistent in various economic activities. The objective of this study was to investigate the determinants of female labor force participation and the wage gap in urban Ethiopia. Employing urban employment and unemployment survey (2018) data, which was collected by the Ethiopian Statistical Service, descriptive statistics, Heckman selection model, and the Blinder-Oaxaca decomposition methods were used to address the objectives of the study. The descriptive result confirms that females have lower overall participation in wage employment, and those who participate tend to concentrate in clerical and support services, sales, and elementary occupations. The Heckman Selection model result indicated that, compared to males, females' participation in wage employment is lower by 32.4%. Females' participation in wage employment is positively and significantly associated with the age of individuals, training, head of household, and education of individuals, while it is negatively and significantly affected by age square and marital status. A positive effect of age and a negative effect of age square for the labor market participation revealed that as working individuals get older, the effect of age is lessened. Furthermore, the wage of female individuals is significantly affected by their age, training, education, sector of the economy, and skill. The findings of the Blinder-Oaxaca decomposition analysis revealed that the mean wage (natural logarithm) is 7.753 for males and 7.425 for females, which amounts to a difference of 32.8%. The result also revealed that the wage gap between males and females is estimated to be 32.8%, where 16.1% of the wage gap is explained by an effect and 24.5% is unexplained or gender discrimination. The implication of the result is that adjusting female endowment levels to male levels would increase female wages by 16.1%. The explained part of the wage gap is accounted for by differences in age, which is a proxy variable for experience, education, training, and sector of the economy, while the unexplained part of the wage gap is accounted for by differences in age square, education, training, skill, and sector of the economy. In order to minimize gender differences in labor market participation and earnings, the government should place special emphasis on those gender-sensitive policy variables such as education availability, access to finance, training, and working conditions.

Keywords: Gender gap; Labor force; Wage gap; Employment; Ethiopia

1. Introduction and Rational of the Study

Women comprise half of the global labor force, and their participation in productive activities is essential for economic development (Pimkina & De la Flor, 2020). At the micro level, females' participation in the labor market helps them escape poverty and improve their income and quality of life. (Verick, 2018). Even if the gender gap in labor force participation rates has narrowed over the past 30 years in almost every country in the world, women are still less likely to participate in the labor market than men (ILO, 2018a). In addition, based on the World Bank (2022), Globally, women face inferior income opportunities compared with men. Women are less likely to work for an income or actively seek work. Women are less likely to work in formal employment and have fewer opportunities for career progression. Moreover, when women do work, they earn less. According to the International Labor Organization (ILO, 2018a), the average global labor force participation rate of women is 48.5 per cent, while that of men was 75 per cent. This implies a 26.5 percent gender gap in labor force participation.

The gender gap in the labor market remains a pressing problem in contemporary Africa. Although there are large variations across countries in female and male labor market outcomes, evidence shows that, in several countries in the region, women are less likely to be in paid jobs, and those that are employed are disproportionately concentrated in informal and precarious employment and paid substantially less than men (ILO, 2002). The female labor force participation rate in Sub-Saharan Africa is 61.5 percent, which is 11 percent below the male labor force participation rate (72.32 percent) (ILOSTAT, 2022).

Ethiopia has a relatively fast-growing population and promising economic development trends; efficient utilization and appropriate management of its work force are indispensable to ensuring sustainability. According to the International Labor Organization (ILO, 2014), labor force participation provides an indication of the size of the supply of labor available for the production of goods and services relative to the working-age population. According to the Ethiopian Statistical Service (CSS, 2021), the national labor force participation rate of Ethiopia is about 64.7%. This indicates that 65 people out of 100 are readily available to engage in the production of goods and services. With regard to sex, the national gender statistics report (2017) indicated that in urban Ethiopia, the trend of women's force participation rate was lower than that of men from 2003 to 2016. For instance, in 2016, women's labor force participation was 57% compared to 71% of men's labor

force participation. The implication is that women's labor force participation is 14% lower than men's labor force participation.

According to the World Bank (2019) gender serves as a strong predictor of workforce participation in Ethiopia. Females are 17% less likely than males to participate in the labor force. This disparity widens to 29% when considering other factors such as age, education, accessing formal credit, household headship, marital status, and household wealth. In addition, females experience high rates of unemployment (50%), seasonal employment (37%), and temporary employment (13%). The result of the Central Statistical Service's (2021) labor force and migration Survey reveals that even if unemployment is a predominant problem in urban areas, females' unemployment rate is higher than that of males, which is 25.4%. In addition, females were more concentrated than men in the categories of domestic employment and unpaid care workers.

Although women make up about half of the country's population, their participation and benefit on economic, social, and political issues is low compared to men. Women have a lower status because gender roles in society have a negative effect on women. These low statuses are reflected in the social processes of gender labeling and the roles and responsibilities of the community for women and men. This work-gender relationship implies the imbalance of gender authority, which is illustrated by employment, wealth accessibility, income classifications, and decision-making inequality. In Ethiopia the urban labor market is characterized by high unemployment and underemployment. Based on the ESS (2018) urban employment and unemployment survey, the female unemployment rate (26.4%) is more than double that of male unemployment (12.2%). Moreover, female youth unemployment is higher than male youth unemployment. The implication is that even if employment opportunities are scarce for both sexes, the participation gap between female and male workers remains large, and female workers suffer much greater disadvantages than male workers.

The urban labor market in Ethiopia is characterized by poor labor market information, as reflected in informal labor recruitment systems such as networks and job referrals. This creates particular impediments for young women, who are more likely to stay at home in response to gender norms and attitudes, negatively affecting their access to communication. The female population remains underrepresented in the labor force and is disproportionately concentrated in certain occupations. The inability of the formal sector to generate adequate jobs can lead to female labor being more concentrated than male labour in the categories of domestic employment and unpaid family workers.

A major problem in the urban labor market is the persistent over-representation of female workers in the informal economy. Even if urbanization is associated with an increase in job creation in the formal sector, the informal sector is the main employer of the female labor force. Despite the decrease in the size of the informal sector, the proportion of females employed in the sector remains very high, with up to two-third of those employed in informal employment. In addition, females are marginalized in the labor market as urbanization increases, and the average wage in the informal sector is lower than in the formal sector. In most years, the share of females engaged in the informal economy was higher than that of males due to a variety of factors that may prevent them from entering the formal sector.

Since the quality of participation in the labor market is as important as the quantity of participation, it is not enough to look solely at levels of employment or unemployment in order to assess the state of female labor market participation. It is also necessary to examine the form this participation takes. Although empirical results from micro studies provide useful information on the size of the gender gap in participation and employment between females and males, they are less informative in providing evidence on the constraints faced in urban Ethiopia. In addition, there has not been an extensive study in urban Ethiopia. So, it is necessary to conduct empirical research at the country level in order to investigate factors that explain gender gaps in labor force participation and estimate and decompose gender gaps and their determinants in urban Ethiopia.

2. Theoretical, Methodological and Conceptual Framework of the Study

2.1 Theoretical framework of the study

There are several theoretical perspectives on analyzing female labor force participation. These include economical, anthropological, feminist, and sociological perspectives. But in this research, only an economic perspective will be used to identify determinants of female labor force participation in urban Ethiopia. The classical economist's such as Becker time allocation model (Becker, 1965) explains how rational individuals allocate their time between work and leisure to maximize utility. According to Becker, paid market work is distinguished from unpaid, household work and leisure. A family acts together as a single utility, maximizing under certain constraints such as price and income. With a given set of preferences, the household strives to maximize its utility, subject to available resource constraints.

The basic resource constraints for a household consisting of a married couple are their stock of material wealth and especially their time available for household production, market production, and leisure (Becker, 1985). Joseph (1983) augments the theoretical framework of household choice and resource allocation developed by Becker. He stated that females usually specialize in home production activities, including child care, as a result of being relatively less efficient in market activities, and family composition is strongly associated with female labor force participation. The household utility maximizing model recognizes not only the allocation of time between different competing uses but also between different activities of the household, including paid work outside the household and unpaid work within the household.

Neoclassical economic theory explains education as one of the key determinants of women entering the labor market. The higher the level of education, the greater women's participation in the labor market (Becker, 1980; Mincer, 1980). However, the structuralist school argued that there were many other factors other than education that hampered women's ability to participate and sell their labor. According to the structuralist school, women's household income is the primary determinant of women's sale of labor to earning activities. Hence, the lower women's household income, the greater their mandatory entry into the labor market (Benham (1980); Strober (1980). According to the traditional male breadwinner household model, women's primary role is in the home as caregivers, not in the job market. These traditional views on gender roles can lead to inactivity or part-time work with flexible hours in order to better balance work with family life and household duties such as childcare.

Female workers are also less likely than men to be paid for their work. For instance, over half of all women engaged in the agricultural sector receive no payment. Similar trends exist in other industries, such as small-scale manufacturing, where 58% of female workers are unpaid family workers, compared to 40% of male workers. Females experienced the largest drops in employment rates at the onset of the pandemic. For instance, 64% and 57% of the laid-off workers in April and June 2020, respectively, were female, despite females making up only 42% of the workforce (Christina *et al.*, 2020).

2.2 Methodological framework for labor force participation

In the study of female labor force participation, where the dependent variable is explained with binary variables, limited dependent variable models are suggested. Based on Wooldridge (1999), a limited dependent variable is broadly defined as a

dependent variable whose range of values is substantially restricted. Most economic variables are limited in some way because they must be positive. There are different types of limited dependent variable model, such as the linear probability model, the binary logit and binary Probit model, the Tobit model, and the truncation regression model. The linear probability model has drawbacks the fact that predicted probabilities will not be limited between zero and one and that the true relationship between a binary outcome and a continuous explanatory variable is inherently nonlinear. These limitations of the linear probability model can be overcome by using binary response models such as binary logit and Probit. The functional form of the Logit model is the cumulative distribution function of the logistic distribution, while the functional form of the Probit model is the cumulative distribution function of the standard normal distribution. The Probit and Logit models are estimated using the maximum likelihood method, and coefficients differ because of the functional form. When estimating Probit or Logit models, it is common to report the marginal effects after reporting the coefficients. As a result, the choice of the Logit or Probit model has theoretical significance but no practical significance if reporting marginal effects. These models have some advantages over the linear probability model because of the fitted probabilities are between zero and one, and the partial effects diminish. However, the primary cost of logit and Probit is that they are harder to interpret (Wooldridge, 1999).

According to Heckman (1974), a married woman participates in the labor force if the market wage based on an employer's valuation of her effort in the labor force is greater than the reservation wage of a housewife based on her valuation of her time in the household. Otherwise, a woman is not considered a participant in the labor force. In any given sample, we only have observations on the market wage based on an employer's valuation of her effort in the labor force for those women who participate in the labor force, and we have no observations on the market wage based on an employer's valuation of her effort in the labor force for the women not in the labor force. For women not in the labor force, we only know that the reservation wage of a housewife based on her valuation of her time in the household is greater than the market wage based on an employer's valuation of her effort in the labor force. In other words, the sample is not randomly selected, and we need to use the sample data to estimate the coefficients in a regression model explaining both the reservation wage of a housewife based on her valuation of her time in the household and the market wage based on an employer's valuation of her effort in the labor force.

The statistical model of labor supply behavior that is most prevalent in the literature was first analyzed by Heckman (1974). The model is derived from the

comparison of the reservation and market wage and, hence, has a strong theoretical foundation. The important contribution of Heckman's work is the characterization of the simultaneous labor force participation and supply of hours decisions. In Heckman's model, those two decisions are intrinsically linked. Given that not all females are employed and participation in the labor market often varies according to gender, there is a potential problem of selection bias in the estimation of sex discrimination in pay using standard regression models, as these only include employed individuals. The Heckman selection model (Heckman, 1979), estimated with the maximum likelihood method, is applied in order to take this issue into account. This model jointly estimates two equations: a Probit model, which predicts the probability of participation in the labor market (selection equation) and multiple linear regression, which predicts the natural logarithm of wage. In order to avoid the identification of the model relying on distributional assumptions alone, two variables are included in the selection equation but not in the wage equation. The assumption in the Heckman model is that the participation decision (the selection equation), and the decision on the intensity of participation (regression or outcome equation) are made simultaneously. In this case, the two equations are estimated simultaneously because the decisions are interdependent. Accordingly, the factors influencing both decisions are similar. But it is also possible to make the two decisions independently or separately, following the Cragg double hurdle model. In the double hurdle model, the selection equation (the first hurdle) and the outcome equation (the second hurdle) are assumed to be influenced by different factors. In this case, the two decisions are rather independent. Accordingly, the two equations could be estimated separately by censored or truncated regression.

2.3 Methodological framework for wage gap decomposition

Wage decomposition methods are used to explore the wage difference between female and male employees. There are two types of wage decomposition methods in the labor market: mean decomposition and distributional wage decomposition. The most widely used mean wage decomposition methods are Oaxaca (1973) and Blinder (1973). In this method, the mean wage difference is decomposed into differences in the level of explanatory variables and differences in the coefficients of explanatory variables (returns) using the estimates of female and male wage equations (Oaxaca 1973 & Blinder 1973). The differences in the coefficients of explanatory variables (returns) are called the unexplained part of the wage difference. This part of the gap is often used as a measure of wage discrimination. However, the

Oaxaca (1973) and Blinder (1973) wage decomposition methods focus on average gender wage differences. Thus, potentially important variations of the wage differences across the wage distribution are not considered. Hence, the attention in empirical gender studies has shifted towards investigating the degree to which the gender wage gap varies across the wage distribution.

The second decomposition method is distributional wage decomposition, such as García *et al.* (2001), Machado and Mata (2005), and Juhn, Murphy, and Pierce (1993). Most recently, studies have used quantile regressions in order to decompose the gender wage gap at different points of the wage distribution. García *et al.* (2001) propose to use quantile regressions in order to compare quantiles of the male and female wage distributions conditional on the same set of characteristics as an approximation of the unexplained part of the gap. Considering only the mean of the regressors, such as García *et al.* (2001) neglects some important factors explaining the difference between the two distributions. For instance, the sample means of the characteristics are the same for males and females, but the variance is much higher for males. In this setting, the distribution of the dependent variable will also have a higher variance for males. This feature cannot be analyzed with the method suggested by García *et al.* (2001).

Machado and Mata (2005) (MM) hence propose an alternative decomposition procedure that combines a quantile regression and a bootstrap approach in order to estimate counterfactual density functions. Albrecht *et al.* (2003) applied this method for the first time to decompose the gender wage gap in Sweden. They show that the gender wage gap in Sweden increases throughout the wage distribution and rises in the upper tail. The wage gap also increases throughout the wage distribution after controlling for gender differences in individual characteristics. De la Rica *et al.* (2008) used the Machado and Mata decomposition method, and the results show that the gender wage gap decreases throughout the wage distribution for workers with low education. Albrecht *et al.* (2009) investigate the gender wage gap in the Netherlands using the MM decomposition method and consider a selection of women for full-time employment. Also applying the MM decomposition method, Arulampalam *et al.* (2007) explore the wage difference for eleven European countries. Their results show a u-shaped raw wage gap for the private sector in Germany. However, in the public sector, the gender wage gap is smaller and wider on the left-hand side. While the unexplained part of wage differential is nearly constant across the wage distribution in the private sector, this part decreases throughout the distribution in the public sector. Fitzenberger and Kunze (2005) find that the German gender wage gap is highest in the lower part and

lowest in the upper part of the distribution. Their study highlights that occupational segregation and lower occupational mobility among females may explain the gender wage gap, a result that differs across the wage distribution. Using the MM decomposition method, they show that in the lower part of the wage distribution, females benefit less from occupational mobility than males. In the upper tail, the gains are similar for both sexes. Although the distributional decomposition methods discussed above are quite sophisticated and frontier in the field, the Oaxaca (1973) and Blinder (1973) decompositions are so fundamental that all other methods can be explained by them.

2.4 Empirical review of gender gaps in labour market participation

The factors that influence women's labor market participation are multiple and complex. Among the main determinants that explain the persistent gender gaps in labor markets are individual characteristics such as age, education, and work experience; family and household characteristics such as the presence of children or elderly relatives marital status; and the presence of unemployed partners; and institutions and policy factors such as childcare subsidies, parental leave, and flexible working time arrangements, employment protection legislation, tax schemes, and systems of unemployment benefit.

Ethiopia is the least urbanized country compared to most African countries, with 21.2% of the population living in urban centers in 2019, though this is expected to rise to 40% by 2050 (United Nations, 2019). Between 2003 and 2018, the urbanization level of Ethiopia rose from 15.31% to 20.76%. During this period, total employment in the urban economy slightly increased until 2009 but remained constant afterwards. The urban labor market in Ethiopia is characterized by high unemployment and underemployment. During the last decade, urban unemployment in Ethiopia stood at about 19%. More than a quarter of the youth (15-29 years old) in Ethiopia are unemployed. Similarly, about a quarter of women are unemployed. Young women face an even higher unemployment rate of 34%. Among those employed, about half are willing to work more, indicating a high level of underemployment (CSS, 2018).

In Ethiopia, the urban labor market is characterized by poor labor market information, which is reflected in informal recruitment systems such as networks and job referrals (Beyene & Tekleselassie, 2018). This creates particular impediments for young women, who are more likely to stay at home in response to gender roles and cultural practices that negatively affect their access to signaling (Beaman *et al.*,

2018). This is confirmed by Beyene and Tekleselassie (2018) who found that women face difficulty getting jobs unless they are matched or over-educated compared to men. Moreover, Tekleselassie and Weldesilassie (2019), estimated trends in real wages for male and female workers. The result indicates that women workers were paid less than men workers between 2003-2018. Even if the gap had slightly narrowed by 2018, women were paid 62% less than men.

A major problem in the urban labor market is the persistent over-representation of female workers in the informal sector. Despite decreases in the size of the informal sector, the proportion of women employed in the sector remains very high, with up to two-thirds of those employed in informal employment being women. Studies also show that average wages in the informal sector are lower than in the formal sector (Temkin, 2009). It suggests that women are being marginalized in the labor market as urbanization increases. It also characterizes women as unskilled, forcing them to remain in the informal sector and subjecting them to substantial inequalities.

One of the determinants of labor market outcomes in both developed and developing countries is education (Cazes and Verick, 2013). From a supply-side perspective, education has an important impact on an individual's decision to participate in the labor force. In addition, according to Becker (1980) and Mincer (1980), education is one of the key determinants of women entering the labor market. The higher the level of education, the greater women's participation in the labor market. Moreover, Education and human capital accumulation have also been shown to have a significant positive impact on female employment (Azmat *et al.*, 2006).

Women's labor depends primarily on the total income of the household. The lower the income, the higher is the probability of a woman entering the labor market. However, household income is difficult to estimate; hence, proxy variables such as the nature of the husband's job, wage rate, and number of adult male earners will be used. The research finding of Hamid (1991) indicates that as the number of earning adult males per household increases, the percentage of women entering the labor market will decrease. As the husband's daily or monthly income increases, the percentage of households containing earning women declines, and the husband's occupational status is inversely related to the percentage of women entering the labor market. In addition, the research result of Thevenon (2009) explained that the economic status of the partner is also relevant since having an unemployed husband may result in an added worker effect in which the woman engages in the labor market to compensate for the loss of income. The spouse's employment status has a significant effect on women's participation, and women with unemployed partners are more likely to be seeking work and hence participate in the labor market.

The extent of women's participation in earning activities depends on their household size and composition. As household size increases, the demand for income increases, which leads to increased participation of women in the labor market. However, younger children prevent the entry of women into the labor market due to the work load of women in childcare. As a result, women's participation in the labor market will decreased. On the other hand, the presence of adult female members in the household in the form of extended family increases the participation of women in the labor market due to assistance in childcare and home work (Hamid, 1991). In addition, the presence of children is a major determinant of a woman's decision to participate in the labor market. In particular, the presence of children under the age of three has the strongest negative impact on the probability of working (Del Boca *et al.*, 2009). There is scant and more mixed evidence on the effect of elderly care responsibilities on women's labor supply, probably because of differences in the samples studied or in the indicators used to measure the intensity of informal care (Crespo & Mira, 2014).

Age is used to measure the impact of life cycle changes on female labor force participation. Based on the research findings of Pampel and Tanaka (1986), the relationship between women's age and participation in the labor market is inverted U-shaped. At the individual level, age is among the most relevant predictors of female labor force participation. Age might affect participation non-linearly, having a positive effect up to a certain point and turning negative as one grows older. A number of studies also consider experience or previous employment status as relevant predictors of women's labor market participation. If returns to work experience increase with the number of years in employment, the attachment of women to the labor market will strengthen. Hyslop (1999) and Keane and Sauer (2009) find strong state dependence in intertemporal female labor supply behaviour, which means that previous working behaviour affects the current labor supply decision.

Marital status is also a significant determinant of female labor force participation. According to Becker's (1974) theory of marriage, gains from marriage and marital status decisions decrease as a woman's potential wage increases. This implies that married women are less likely to be employed. On the other hand, Hamid (1991) found that widows will have the lowest household income; hence, widowed households will participate in the labor market.

Institutional factors that influence women's participation in the labor market include social policies that provide childcare subsidies, parental leave, and flexible working time arrangements; labor market institutions, such as employment protection legislation, tax schemes, and systems of unemployment benefit. Most of

the studies investigating the effects of family policies, such as subsidized childcare services, paid maternity and parental leave, and the availability of part-time work, find that these have a positive impact on the participation decisions of women with children (Cipollone *et al.*, 2013).

Utilization of household technologies has an influence on female labor force participation in developing countries. For instance, Omotoso *et al.* (2016) empirically examine the effect of ownership of modern household technologies such as washing machines, gas cookers, and refrigerators on female labor force participation in Nigeria using the Logit model. The study concludes that in developing countries, ownership of household technology influences female labor force participation positively.

Ngoa and Song (2021) investigate the effects of information and communication technologies on female labor force participation in a sample of 48 African countries. The researchers specified and estimated a linear regression and a dynamic panel data model with fixed effects and a system-generalized method of moment estimation over the period 2001–2017. The finding indicates that information and communication technologies (mobile phones and the internet) significantly stimulate female labor force participation in Africa, particularly in the industrial sector.

In Ethiopia, limited research is conducted regarding women's empowerment, particularly participation in the labor market. For instance, Helen and Lamessa (2022) studied the status of gender gaps in wage and self-employment in the Ethiopia by using Ethiopian Socio-economic Survey (2018/2019) data set and found that the participation of women in wage employment is significantly lower than that of men, and the unconditional wage gap between men and women is estimated to be 62.7%, of which 26.2% are explained and 73.8% are unexplained. Additionally, a study done by Amsaya (1996) on the determinants of female labor force participation in urban Ethiopia using the logit model shows that female labor force participation in urban Ethiopia is positively related to age, education, and migration status, whereas it is negatively related to fertility, marital status, and income of the household head. Furthermore, Wubante (2015) examined the determinants of the employment status of women by using the logit model and found that training, household size, and household headship are the main determinants of employment status.

Bisrat (2019) empirically investigated the determinants of women's labor force participation in the labor market in Gondar city by using the logit model. The result concludes that out of the total sample, 40.1% of women participate in the labor market, and the determinants are age, marital status, educational status, presence of

young children, household size, fertility, and relationship to the household head. Moreover, a study done by Dagmawe (2022) identified and analyzed determinants of women's participation decisions in off-farm activities in Afar regional state by using descriptive statistics and a logit model. The result revealed that women's level of education and dependency ratio positively affect women's participation in off-farm activities, while the number of children younger than 5 years, nonfarm training, distance to the market, marital status, access to credit, ownership of livestock, and safety net adversely affect women's participation decisions off-farm activities.

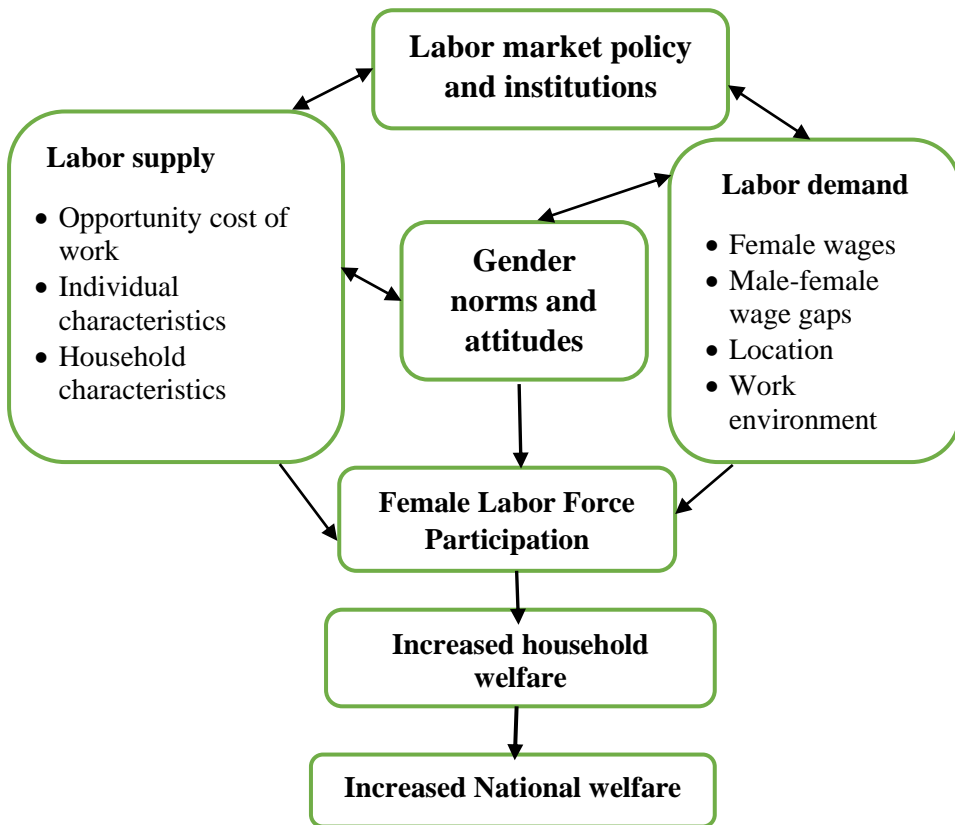
2.5 Conceptual framework of the study

Female labor force participation analysis is based on a supply and demand framework, as graphically illustrated in Figure 1 below. Here, labor supply refers to a woman's choice to participate in work given the available labor market opportunities. When deciding whether to participate and work, a female must balance the returns to labor (her wage and any non-monetary benefits) against the opportunity cost of foregone home production and leisure, as well as other monetary and non-monetary costs that she and her family members would incur if she performed work outside the home.

Gender norms and attitudes in society may be especially important in countries like Ethiopia, where the roles of women and men in the home and in society are often sharply differentiated. The household's broader financial situation will also influence labor supply. When other household income is low, the marginal benefit of additional income is very high, thus giving women a strong incentive to work, whereas when other household income is high, there is a less pressing need for female labor to supplement the household budget.

Labor demand refers to the set of labor market opportunities available to a female with a given set of individuals, household, and demographic characteristics. These opportunities may be limited by a number of factors, among them gender-based discrimination in hiring or wages, the quality of the work environment, the location of available jobs and commuting costs, and whether the available jobs allow a woman to balance work with obligations at home. A female's labor market behavior will be determined by the intersection of labor supply and demand, gender norms, and attitudes. While macro-level factors such as social policies and labor market institutions are significant determinants of female labor market participation, these are the same for different individuals in the same country.

Figure 1: Conceptual Framework for Female participation in the Labor Force



3. Methodology of the Study

3.1 Data Source of the empirical study

The study used the Ethiopian Urban Employment Unemployment Survey (2018) dataset, which is collected by the Ethiopian Statistical Service. In an effort to provide timely information on the labor market situation in the country, the Ethiopian Statistical Service launched the continuous Urban Employment and Unemployment Survey program in October 2003. The survey was planned to be conducted twice every year at the outset, but later on, since 2006, it has been conducted once a year. The survey was designed to provide continuous statistical data on the size and characteristics of the economically active and inactive population of the country.

The variables collected in the survey include socio-demographic characteristics of household members; economic activity during the last seven days and six months; characteristics of employed persons such as occupation, industry, employment status, and earnings from paid employment; unemployment; and characteristics of unemployed persons. The data set is designed to provide data on employment and unemployment in urban areas at the national level. The survey follows a household approach and covers all urban areas of the country except the pastoralist areas of the three zones of Afar and the six zones of Somali region using systematic random sampling.

3.2 Definitions and concepts of variables

As defined in international standards (19th ICLS, 2013), work comprises any activity performed by persons of any sex and age to produce goods or to provide services for use by others or for their own use. It is defined irrespective of its formal or informal character or the legality of the activity. Work excludes activities that do not involve producing goods and services, such as begging and stealing, self-care, and activities that cannot be performed by another person on one's own behalf (sleeping, learning, and activities for one's own recreation). A person engaged in any work must be of working age. Working age is defined as the age above the legal working age, but for statistical purposes, it comprises all persons above a specified minimum age threshold for which an inquiry on economic activity is made. To promote international comparability, the working-age population is often defined as all persons above the age of 15.

The labour force is the current supply of labor for the production of goods and services in exchange for pay or profit. There are three categories of labor force status such as: employment, unemployment, and not in the labor force. Employed person is defined as all those of working age who, during a short reference period, were engaged in any activity to produce goods or provide services for pay or profit. They comprise employed persons at work who worked in a job for at least one hour. An unemployed person is defined as all those of working age who were not in employment but who are seeking or available for work. Persons not in the labor force are defined as all persons of working age who, during the short reference period, were neither employed nor unemployed. This includes people below the specified minimum age. The workforce is those actually engaged in work, whereas the labor force is the sum of unemployed and employed people.

Labor force participation can be measured in two ways. The first approach is the current activity status approach, which measures the economic activity status of a person based on seven days. The second approach is the usual activity status approach which measures based on six months prior to the date of interview. All persons aged 15 years and above who were engaged in work or available to be engaged during the reference week or months were considered currently active, while those who were neither engaged nor available to be engaged in productive work were taken as currently not active. The choice of an appropriate measurement approach depends on the extent of the variability of economic activities. In rural areas where seasonal variation of activities is common, a longer reference period (the usual activity status approach) is found to be more appropriate, while in urban areas, activities are relatively less affected by seasonal variations, so a shorter reference period (the current activity status approach) is found to be more convenient.

3.3 Methods of Data Analysis

3.3.1 Method of data analysis for wage gap decomposition in the labor market

The most common approach to analyzing gender differences in earnings in the field of labor market is to estimate the wage gap using regression models and apply variants of the famous Blinder-Oaxaca decomposition method, which separates the part of the gap that can be imputed to differences between men and women in productivity characteristics (such as education, experience, and types of occupation, and sector of employment) from a residual part that cannot be accounted for by these variables and which is usually referred to as discrimination (Blinder, 1973; Oaxaca, 1973). A decomposition analysis is a standard approach to exploring the wage differential between female and male employees. It is often used to examine the sources of the gap and how much of the gap is attributable to discrimination.

In order to estimate the gender wage gap, standard multiple linear regression model is applied with log gross monthly wages as a dependent variable.

Assume that a multiple linear regression model which is specified as

$$W_i = \beta_0 + \beta_1 X_1 + \dots + \beta_i X_i + \varepsilon_i \quad (1)$$

Where W_i is dependent variable (monthly wage), X_i is independent variables which affect the dependent variable and ε_i is the error term which is satisfies zero mean given independent variables.

The mean of W_i (*monthly wage*) is given by

$$E(W) = \beta_0 + \beta_1 E(X_1) + \dots + \beta_i E(X_i) + E(\varepsilon_i) \quad (2)$$

Using the sample estimator to replace the population parameters and considering the definition of error terms, thus $\sum \varepsilon_i = 0$, then

$$\bar{W} = \hat{\beta}_0 + \hat{\beta}_1 \bar{X}_1 + \dots + \hat{\beta}_i \bar{X}_i \quad (3)$$

If the whole sample can be divided into male and female, then the regression of male and female monthly wage is given by

$$W_m = \beta_{m0} + \beta_{m1} X_{m1} + \dots + \beta_{mi} X_{mi} + \varepsilon_{mi} \quad (4)$$

$$W_f = \beta_{f0} + \beta_{f1} X_{f1} + \dots + \beta_{fi} X_{fi} + \varepsilon_{fi} \quad (5)$$

Accordingly, the mean monthly wage of male and female is computed as

$$\bar{W}_m = \hat{\beta}_{m0} + \hat{\beta}_{m1} \bar{X}_{m1} + \dots + \hat{\beta}_{mi} \bar{X}_{mi} \quad (6)$$

$$\bar{W}_f = \hat{\beta}_{f0} + \hat{\beta}_{f1} \bar{X}_{f1} + \dots + \hat{\beta}_{fi} \bar{X}_{fi} \quad (7)$$

$$\text{Let as assume; } \bar{X}'_m = (1, \bar{X}_{m1}, \bar{X}_{m2} + \dots \bar{X}_{mi}) \quad (8)$$

$$\hat{\beta}_m = (\hat{\beta}_{0m}, \hat{\beta}_{1m}, + \dots + \hat{\beta}_{im}) \quad (9)$$

$$\text{Then, } \bar{W}_m = \hat{\beta}_m \bar{X}'_m \quad (10)$$

$$\text{Similarly, } \bar{W}_f = \hat{\beta}_f \bar{X}'_f \quad (11)$$

The difference in mean of monthly wage of male and female is computed as

$$\bar{W}_m - \bar{W}_f = \hat{\beta}_m \bar{X}'_m - \hat{\beta}_f \bar{X}'_f \quad (12)$$

A small trick of plus and minus a term $\hat{\beta}_f \bar{X}'_m$ then,

$$\bar{W}_m - \bar{W}_f = \hat{\beta}_m \bar{X}'_m - \hat{\beta}_f \bar{X}'_m + \hat{\beta}_f \bar{X}'_m - \hat{\beta}_f \bar{X}'_f \quad (13)$$

$$= (\hat{\beta}_m - \hat{\beta}_f) \bar{X}'_m + \hat{\beta}_f (\bar{X}'_m - \bar{X}'_f) \quad (14)$$

The first term in equation 14 is coefficient effect, which describes how much the difference in the mean monthly wage is due to differences in the magnitude of the regression coefficients. The second term in equation 14 is the characteristics effect, which describes how much the difference in the mean monthly wage is due to differences in the level of explanatory variables (characteristics).

In the literature of labor economics, the male-female average wage gap can be attributed in two ways. The first one is the explained part, which is due to a difference in the level of explanatory variables such as education, experience, industry, and occupation. Such effects are reasonable in the economics of the labor market and are called characteristics, endowment, or composition effects. The second one is the unexplained part, which is due to differences in the coefficients of explanatory variables such as returns to education, experience, premium in industry, and occupation. In the literature of labor economics, wage gaps due to coefficient, return or structure effects are unreasonable, which is called discrimination.

3.3.2 Method of data analysis for determinants of female labor force participation

The analytical method used in this study is the Heckman two-stage sample selection model. The model is used to determine factors affecting women's decisions to participate in the labor market and the level of participation. Given that not all females are employed and participation in the labor market often varies according to gender, there is a potential problem of selection bias in the estimation of sex discrimination in pay using standard regression models, as these only include employed individuals. In order to tackle the problem, the Heckman selection model (Heckman, 1979) is estimated using the maximum likelihood method. This model, jointly estimates two equations: a Probit model which predicts the probability of

female participation in the labor market (the selection equation), and multiple linear regression, which predicts the natural logarithm of wage.

In Heckman's (1974) model, there are two equations that characterize labor supply behavior, such as the hours of work and wage equations, and there are two labor force states, such as working and not working. This model is derived from the comparison of reservation and market wages; individuals will work if their market wages are greater than their reservation wages at zero hours of work, and they will not work otherwise. In this case, the labor force participation decision is inextricably linked to the supply of hours decision.

The Heckman model is stated as

$$\begin{aligned}
 y_i(\text{participation}) &= 0 \text{ if } w < 0 \text{ or market wage is less than reservation wage} \\
 y_i(\text{participation}) &= 1 \text{ if } w > 0 \text{ or market wage is greater than reservation wage}
 \end{aligned}$$

The participation equation can be written as

$$y_i^* = \alpha_0 + \alpha_1 x_1 + \alpha_2 x_2 + \dots + \alpha_i x_i + \varepsilon_i \quad (15)$$

Where y_i^* is a latent variable, which is the wage an individual female gets when participate in the labor market.

The binary Probit model is then stated as

$$y = \begin{cases} 1, & \text{if an individual female participate in the labor market} \\ 0, & \text{otherwise} \end{cases} \quad (16)$$

In specific terms, the binary Probit model in stage one of the Heckman model estimations is stated as

$$\Pr(y_i) = f(x_1, x_2, x_3, x_4, \dots, x_5, \varepsilon) \quad (17)$$

Where $\Pr(y_i)$ is the probability of an individual female who participate in the labor market or not, $x_1, x_2, x_3, x_4, \dots, x_5$ are explanatory variables included in the model and ε is the normally distributed error term.

In the second stage of the Heckman model, the level of participation in the labor market measured by monthly wage estimated. The model is stated as

$$\text{Monthly wage} = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_i x_i + e_i \quad (18)$$

3.3.3 Variables included in the analytical model

In the Heckman two-stage model, there are two dependent variables. In this study, the dependent variable in the first stage is female labor force participation, which is a dummy variable equal to 1 if the individual female participates in the labor market and 0 otherwise. The dependent variable in the second stage is the natural logarithm of the monthly wage, which is measured in ETB. The independent variables included in the analytical model and their expected hypotheses are summarized in the following table based on the empirical review of female labor force participation and Urban Employment and Unemployment Survey data (2018).

Table 1: Dependent and independent variables used in the analytical model

Dependent variables	Measurement unit		
Female labor participation	a dummy variable equal to 1 if the individual female participates in the labor market and 0 otherwise		
Monthly wage	Monthly wage/salary an individual female earns by working productive activities which is measured by ETB		
Independent variables	Measurement unit	Expected sign	Sources
Age	Number of years	+/-	Bisrat (2019) Pampel and Tanaka (1986)
Age square	Number of years	+/-	Pampel and Tanaka (1986)
Education status	Categorical variable such as not educated, elementary education, secondary/preparatory school, TVET/diploma, Degree and above	+	Bisrat (2019) Becker and Mincer (1980) Azmat <i>et al.</i> , (2006)
Marital status	Categorical variable such as never married, married, divorced, widowed, separated	-	Bisrat (2019) Becker (1974) Hamid (1991)
Training	Dummy variable equal to 1 if the individual female gets training certificate and 0 otherwise	+	Wubante (2015)
Sector of the economy	Categorical variable such as agriculture and related, service, manufacturing and related, and wholesale and retail trade	+	Tekleselassie and Weldesilassie (2019)
Work Skill	Categorical variable such as high skill, skilled or semi-skilled, low skill	+	Lise and Postel-Vinay (2016)

4. Result and Discussion

4.1 Status of labor force participation

This sub-section presents the results of the gender gap in economic activities by conducting a descriptive analysis based on the Urban Employment and Unemployment Survey (UEUS) 2018 dataset. For this study, the working-age population is defined as individuals aged 15 years and older. For the descriptive analysis, participation in economic activities is defined based on the current activity status approach because, in urban areas, activities are relatively less affected by seasonal variations, and hence a shorter reference period is more convenient. In the current activity status approach, the economic activity status of an individual is determined based on a short reference period of seven days before the date of the interview. Based on this approach, individuals who spent one hour or more during the reference week in economic activities are considered active participants in the labor force.

Table 2: Profile of Labour force by region and sex

Region	Proportion (%)		
	Male	Female	Total
Tigray	42.45	57.55	7.13
Afar	49.36	50.64	3.84
Amhara	44.70	55.30	18.09
Oromia	46.79	53.21	26.88
Somali	46.57	53.43	5.64
Benishangul-Gumuz	48.68	51.32	2.41
SNNPR	47.12	52.88	11.49
Gambela	48.27	51.73	3.43
Harari	47.37	52.63	3.34
Addis Ababa	44.32	55.68	13.47
Dire Dawa	47.06	52.94	4.28
Total	22,486	26,374	48,860

Source: Based on UEUS (2018)

As indicated in Table 2, in 2018, the total sample of working-age individuals (15 years and older) in urban Ethiopia was 48,860, out of which 53.98% were females and 46.02% were males. The share of female workers is higher in Tigray national regional state and Addis Ababa, followed by Amhara and Somali national regional states. Moreover, in all regional states and city administrations, the share of female sample workers is higher than that of male workers.

4.2 Demographic characteristics of labor force

The average age of the labor force in urban Ethiopia is 33 years. The result indicated that the labor force in urban areas is in the productive age categories. Concerning the sex of the labor force, the mean female labor force is 1 year younger than its male counterpart. The majority of the labor force are household heads, followed by the son or daughter of the head or spouse. The majority of female laborers are spouses while, the majority of male laborers are household heads. Compared to males, a higher proportion of females are domestic workers and other relatives. As indicated in Table 3, the majority of the labor force is married (46.1%), and the percentage of married females is relatively higher than that of married males.

Table 3: Demographic characteristics of labour force

Characteristics	Female	Male	Total
Age (mean)	32.53	33.65	33.04
Household size (mean)	3.2	3.84	3.60
Relationship with household head (%)			
Head of household	36.85	63.15	39.63
Spouse	89.24	10.76	20.76
Son/daughter of head/&spouse	47.02	52.98	25.19
Mother/father/sister/brother of head/spouse	59.96	40.04	5.60
Domestic worker/other/non relatives	64.03	35.97	8.83
Marital status (%)			
Never married	47.88	52.12	40.18
Married	51.21	48.79	46.39
Divorced	77.88	22.12	5.47
Widowed	87.77	12.23	6.33
Separated	72.75	27.25	1.63

Source: Based on UEUS (2018)

4.3 Socio-economic characteristics of labor force

4.3.1 Educational profile of labor force by sex

Education is an important tool to acquire practical and theoretical knowledge that helps one participate in economic activities. As shown in Table 4, while a majority of the labor force participants have attended formal or informal education,

they have not received a training certificate, diploma, or above. Concerning the sex of the labor force, a higher proportion of females did not get informal or formal education and training certificates, diplomas, or above. The chi-square test indicated that there is a significant proportional difference between the male and female labor force in terms of education attainment. In addition, there is also a strong association between the sex of participants and a training certificate, diploma, or above.

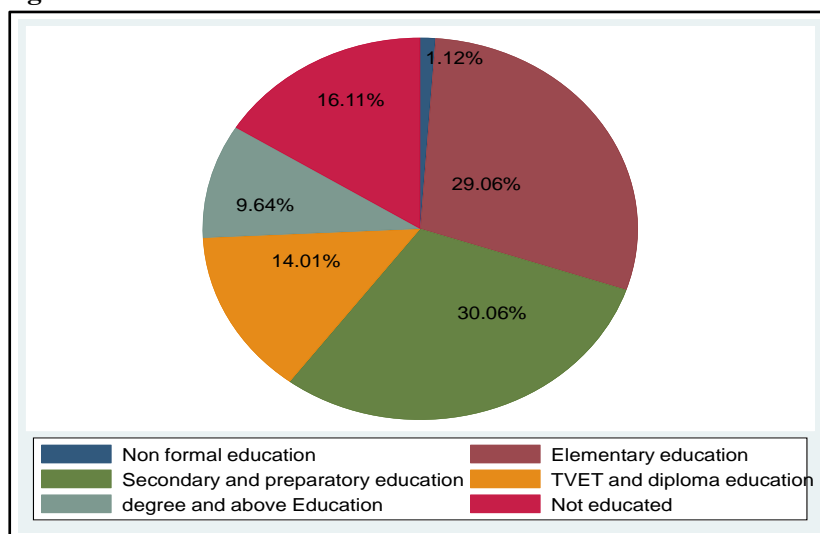
Table 4: Educational profile of labor force by sex

Characteristics	Proportion (%)			X ²
	Male	Female	Total	
Formal/Informal Education	50.15	49.85	83.89	0.0000
No Formal/Informal Education	24.53	75.47	16.11	
Training certificate, diploma or above	61.47	38.53	27.53	0.0000
No Training certificate, diploma or above	40.15	59.85	72.47	

Source: Based on UEUS (2018)

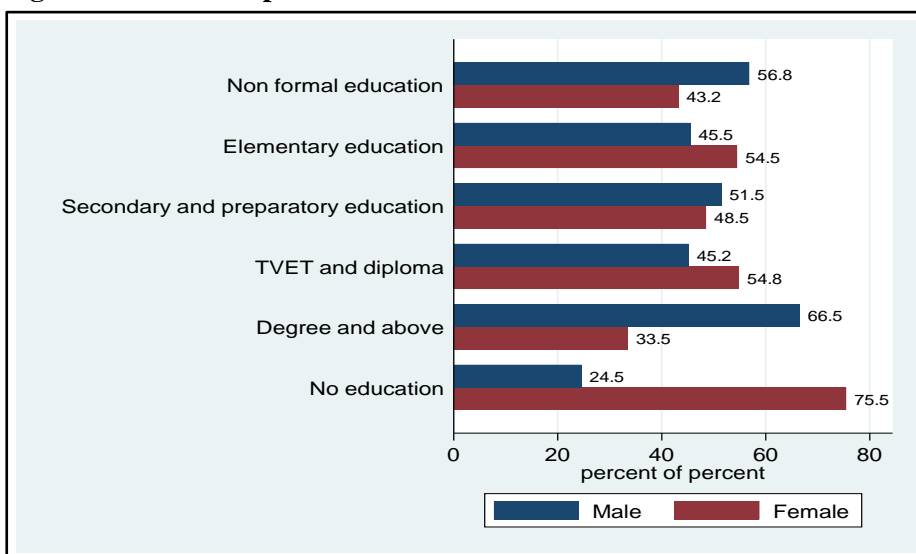
Among those with some level of education, Figure 2 indicated that labor force members with secondary/preparatory education and elementary education dominate the sample. In addition, as expected, in urban areas, a higher proportion of individuals are educated. The share of individuals with TVET and above education is significantly lower than elementary education and secondary and preparatory education.

Figure 2: Educational level of labor force



As shown in Figure 3, the percentage of females having a degree or above is significantly lower than that of males. In addition, compared to male working individuals, more than twice as many of female workers are not educated. The result revealed that except in elementary education and TVET/diploma education, the proportion of females is lower than that of males. The chi-square test indicated that there is a strong association between the education profile and sex of labor force participants at the 1% level of significance.

Figure 3: Education profile of labor force



4.3.2 Status of labor force by types of economic activity and sex

According to Table 6, out of the total working population, about 52.4 percent engage in economic activity, of which 56.61 percent are males and 43.39 percent are females. Even though there are more females than males in urban Ethiopia who are of working age, their engagement in economic activities is still 13.2 percent lower than that of males. The finding indicates that a higher percentage of women than men do not participate in economic activities. This result is in line with the findings of Helen and Lamessa (2022). To ascertain whether there is a relationship between sex and involvement in economic activities. According to the test results, there is a significant correlation between sex and economic activity involvement at the 1% level of significance. The outcome supports the notion that women generally participate in economic activities at a lower rate than men.

4.3.3 Labor force participants by sector of the economy

When examining labor force participation across various economic sectors, the service sector, where 52.8% of the labor force is employed, leads wage and salary employment in Ethiopia. In comparison to men, women participate in a considerably higher percentage of the wholesale, retail, and service industries, while men predominate in the construction and agriculture sectors. When just female employees are taken into account, the service sector has the highest participation rates, and the construction industry has the lowest. Figure 4 demonstrates that, aside from wholesale and retail trade, female involvement is lower than male participation in all sectors. The chi-square test result showed a significant difference between participants' gender and their involvement in the economy at the 1% level of significance.

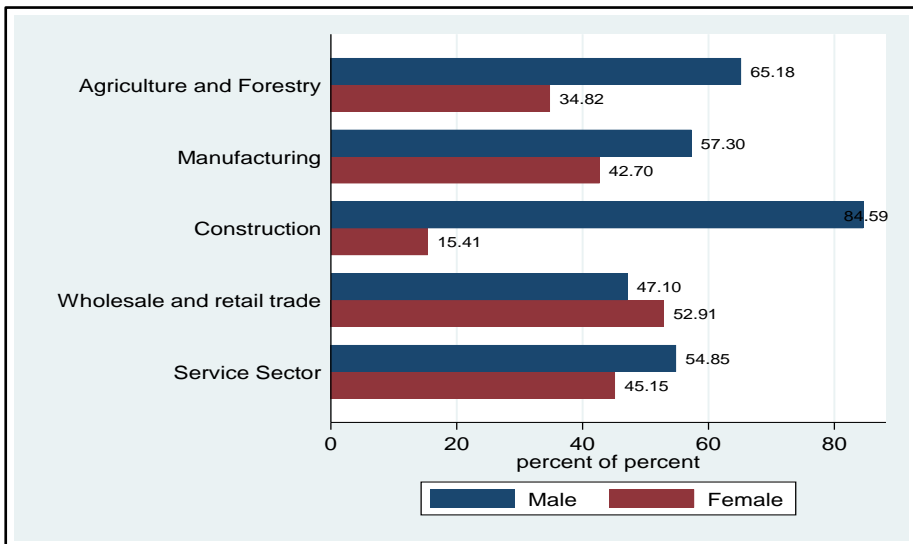
Table 5: Participation in work and types of main work

Descriptions	Proportion (%)			χ^2 -test
	Male	Female	Total	
Participated in economic activities	56.61	43.39	52.40	0.0000
Not participated in economic activities	34.36	65.64	47.60	
Total	46.02	53.98	100.00	
Types of main work				
Managers	71.38	28.62	3.25	0.0000
Professionals	64.00	36.00	10.12	
Technicians and associate professionals	60.72	39.28	8.46	
Clerical and support workers	39.13	60.87	3.93	
Services and sales workers	41.05	58.95	32.07	
Skilled agricultural and forestry workers	65.01	34.99	5.35	
Craft and related trade workers	67.95	32.05	14.04	
Plant and machine operators and assemblers	91.91	8.09	8.07	
Elementary occupations	49.47	50.53	14.54	
Armed force occupations	88.64	11.36	0.16	
Total	56.41	43.59	100.00	

According to Table 5, the dominant occupations that generate 32.07 percent and 14.54 percent of wage employment, respectively, are service/sales and elementary occupations. When compared to other types of employment, the share of managers occupation is often low. When considering the sex composition of

occupations, high-skill occupations have a much smaller representation of females (managers, professionals, technicians, and associate professionals). The finding showed that overall, females are less likely than males to participate in wage employment, and those who do tend to concentrate in occupations related to clerical and support work, services and sales work, and elementary occupations. The chi-square test result showed a significant relationship between workers' sex and occupational type at a 1% level of significance.

Figure 4: Labor force participation for different sector of the economy



Source: Based on UEUS (2018)

4.3.4 Place of main work by sex

Regarding the place of main occupation, the result of Table 8 shows that the majority of workers are engaged in office and business houses, which account for about 48.61% of the total workforce. In terms of sex, female workers predominantly work at home and in open market places, which accounts for about 78.6% and 62.81%, respectively. In addition, compared to males, a smaller percentage of females are engaged in construction sites or any work place. The finding revealed that, even if offices and business houses are the dominant places of main occupation for workers, the participation of females is 16% and 6.8% lower than that of males, respectively.

Table 6: Place of main work by sex

Place of main work	Proportion (%)		
	Male	Female	Total
Business house	53.41	46.59	20.68
Office	58.02	41.98	27.93
At home	21.40	78.60	12.79
On street	59.71	40.29	7.40
Open market	37.19	62.81	4.84
Farm area/field	67.87	32.13	5.17
Factory	61.94	38.06	2.66
Anywhere as found	86.30	13.70	7.03
In construction site	76.12	23.88	8.05
Where customer available	83.54	16.46	3.24
Lakes/river	69.09	30.91	0.21
Total	56.41	43.59	100

Source: Based on UEUS (2018)

4.3.5 Employment type of main work by sex

The finding in Table 9 indicates that self-employment and employees at private organizations are the major types of employment, which together account for more than 50% of employment. Even if the share of domestic employment and unpaid family work is less than 5% of total employment types, the result confirms that the share of females is more than double compared to males. In other words, the proportion of females in all other employment types is much lower than that of males, with the exception of domestic work and unpaid family responsibilities. The Chi square test result showed a significant difference between workers sex and employment type at a 1% level of significance.

Table 7: Employment type of main work by sex

Employment type of main work	Proportion (%)			χ^2 -test
	Male	Female	Total	
Government	56.59	43.41	18.24	0.0000
Government parastatal	62.79	37.21	7.80	
Private Organization	61.88	38.12	20.73	
NGO or International Organization	63.11	36.89	1.30	
Domestic	19.04	80.96	4.61	
Small & Micro enterprise	70.9	29.1	3.32	
Self-employment	56.62	43.38	39.81	
Unpaid family worker	39.57	60.43	3.81	
Employer	69.52	30.48	0.39	
Total	56.41	43.59	100	

Source: Based on UEUS (2018)

4.3.6 Terms of employment by sex

According to Table 10, most participants are permanent employees, whereas just a tiny percentage of workers are casual employees. Even though permanent employment is the major type of employment for women, there are 17 percent fewer female permanent employees than there are male permanent employees. Additionally, female participation is lower in casual work and higher for temporary employees. The chi-square test result showed a high correlation between the sex of the workers and their employment conditions.

Table 8: Wage/salary of main occupation and terms of employment by sex

Wage of main work in ETB	observation	min	max	average	t-test
Only Females	11,107	75	25,000	2,066.8	0.0000
Only males	14,494	100	50,000	2,914.1	
Pooled sample	25,601	75	50,000	2,546.5	
Terms of employment by sex					
Terms of employment	Proportion (%)			χ^2 -test	
	Male	Female	Total		
Permanent Employee	58.48	41.52	57.73	0.0000	
Temporary Employee	50.51	49.49	29.87		
Contract Employee	61.02	38.98	7.38		
Casual worker	72.78	27.22	5.02		
Total	57.00	43.00	100		

Source: Based on UEUS (2018)

4.3.7 Earning from paid/self-employment

Workers in the main occupation receive an average wage of roughly 2,546.5 ETB per month. Female employees make, on average, 847.3 ETB less than male employees. Additionally, there are differences in the minimum and maximum wages paid to employees based on their sexual orientation. The result in Table 11 shows that there is a disparity in pay between the sexes for workers' main occupations. The t-test results showed a significant mean wage/salary difference between male and female employees at a 1% level of significance.

4.3.8 Characteristics of enterprise by sex

Regarding the characteristics of the enterprise, the result in Table 12 revealed that the majority of the workers are engaged in licensed enterprises, the product or service of the enterprise is for the market, and the enterprise is a formal enterprise. Even though legal businesses employ more people than unlicensed businesses, females' participation is still 27.32 percentage points lower than males. Additionally, whereas the percentage of workers in formal enterprises is higher than in informal enterprises, the participation of females is 24.08 percentage points lower than that of males. On the other hand, the participation of females in informal enterprise is 8 percentage points higher than that of males. The chi-square test confirmed that there is a significant difference between the sex of workers and the characteristics of the enterprise at the 1% level of significance.

Table 9: Characteristics of enterprises by sex of workers

Characteristics of the enterprise (%)	Proportion (%)			χ^2 -test
	Male	Female	Total	
Licensed enterprise	63.66	36.34	57.22	0.0000
Unlicensed enterprise	50.25	49.75	42.78	
The enterprise has book account	61.56	38.44	22.56	0.0000
The enterprise has not book account	56.87	43.13	77.44	
the product/Service of the enterprise is for market	56.24	43.76	77.17	0.0000
the product/Service of the enterprise is not for market	63.63	36.37	22.83	
Formal Enterprise	62.04	37.96	66.21	0.0000
Informal Enterprise	45.98	54.02	33.79	

Source: Based on UEUS (2018)

4.3.9 Types of work search methods

In addition to the current activity method, sample respondents were asked about job seeking for the last three months. The result in Table 13 indicates that the majority of samples have been seeking jobs for the last three months, and in terms of sex composition, the percentage of females is more than double compared with males. Additionally, the result shows that seeking the assistance of friends and relatives is the dominant job-seeking method, while browsing the internet or a website and making a direct application to employers are the least popular job-seeking methods. Compared to males, the dominant job search method for females is trying to establish their own enterprise, unemployment card, and applying directly to employers.

Table 10: Work seeking methods by sex

Characteristics	Proportion (%)		
	Male	Female	Total
Seeking job for the last 3 months (%)	31.95	68.05	63.51
Not seeking job for the last 3 months (%)	54.11	45.89	36.49
Types of job search methods			
Searching vacancy advertising boards	48.22	51.78	7.41
Through newspaper, radio and TV	47.88	52.12	0.83
Unemployment card	34.52	65.48	0.63
Seeking assistance of friends and relatives	55.79	44.21	86.33
Trying to establish own enterprise	28.95	71.05	2.53
Direct application to employers	34.58	65.42	0.34
Checking at work sites	46.02	53.98	1.82
Browse through internet/website	62.50	37.50	0.10

Source: Based on UEUS (2018)

4.3.10 Causes of not seeking work

The result of Table 13 shows that of the total working individuals, about 36.49% did not seek a job for the last three months. The two main factors listed in Table 14 are education and training and the responsibility of home activities. Additionally, compared to males, more than double the number of female workers did not seek work for the last three months for a variety of reasons, including pregnancy, responsibility of family and home activities, education and training and no available work. Prior studies also show that in developing economies, investing in infrastructure that reduces the time women spend on household production has

yielded positive results in terms of female labor force participation (Cubas, 2016; Jain-Chandra *et al.* 2018)

Table 11: Reasons of not seeking work

Reason for not seeking job	Proportion (%)		
	Male	Female	Total
Pregnancy/delivery	0.00	100.00	6.62
Illness/Injury	39.39	60.61	8.14
Family responsibility	25.39	74.61	4.26
Responsibility of home activity	3.60	96.40	17.59
Old age/Pension	34.11	65.89	13.70
Education/Training	45.97	54.03	44.29
Already found/made an arrangement for work	48.84	51.16	0.24
Possibility to rejoin my previous work	48.89	51.11	0.25
No available work	37.32	62.68	1.92
Shortage of money and raw material to start business	32.07	67.93	1.03
Too young	42.31	57.69	0.15
Remittance	33.59	66.41	0.73
Culture/believes	0.00	100.00	0.02
Cannot speak local language	31.82	68.18	0.12
Fetch water & collect firewood for household	29.17	70.83	0.13
Work for Household Enterprise	40.43	59.57	0.79
Total	31.95	68.05	100.00

Source: Based on UEUS (2018)

4.3.11 Readiness to participate in paid work

The majority of working individuals, As indicated in Table 15, are ready to work in any urban area of the nation, whereas only a tiny percentage of working individuals are ready to work abroad. However, about 31% of working individuals are not ready to work due to major reasons such as being a student, a homemaker, being elderly, being sick or injured and being pregnant. In terms of sex, compared to males a higher proportion of females are not ready to work due to homemaker and pregnancy. In addition, compared to males, a higher proportion of females are ready to work only within their village or town, only in urban areas, and abroad. As a result, there is a gender gap in individuals' willingness to work if there is available employment.

Table 12: Readiness to work

Readiness to work, if there is work	Proportion (%)		
	Male	Female	Total
Not ready to work	33.34	66.66	31.06
Within residence village or town only	14.42	85.58	0.89
Only in urban areas of Ethiopia	25.46	74.54	6.28
Any urban center in Ethiopia	56.10	43.90	56.12
Anywhere in Ethiopia	43.50	56.50	5.59
Overseas	33.33	66.67	0.05
Total	46.02	53.98	100.00
Reasons for not ready to work			
Home maker	8.61	91.39	18.98
Pregnancy/delivery	0.00	100.00	6.05
Student	45.91	54.09	50.17
Disabled	50.54	49.46	0.61
Illness/ Injury	37.91	62.09	7.30
Too young	46.15	53.85	0.09
Old age	33.17	66.83	15.87
Remittance	31.91	68.09	0.93
Total	33.34	66.66	100.00

Source: Based on UEUS (2018)

4.3.12 Types of work and problems to start business by sex

According to Table 16, the majority of workers are looking for any available work, whereas a small percentage is looking for paid private and government employment. In contrast to males, a greater percentage of females are looking for self-employment and paid private and government employment, while a smaller percentage of females are looking for any available work. Additionally, compared to male workers, females are dominantly looking for self-employment. Even if just 7% of working-age individuals seek self-employment, starting a new business presents a number of challenges. Among the challenges, the major problems include a shortage of finance and a lack of a working place. Compared to males, the problems of starting a new business are more severe for females. For instance, compared to males, a shortage of finance, a lack of training, a lack of a working place, and a lack

of finance are 47%, 50%, and 56% higher for females, respectively. The result confirmed that there is a gender gap in financial inclusion and inputs to start new businesses in urban Ethiopia.

Table 13: Types of work looking and problems to start new business

Type of work looking	Proportion (%)		
	Male	Female	Total
Self-Employment	24.36	75.64	6.86
Paid employment-private	44.93	55.07	1.35
Paid employment-government	35.89	64.11	2.21
Any Available work	54.32	45.68	89.58
Total	51.73	48.27	100.00
Problems to start new business			
Shortage of finance	26.66	73.34	54.87
Lack of training	25.00	75.00	5.71
Problem of working place/land	16.81	83.19	10.04
Lack of finance and training	29.63	70.37	3.50
Lack of working place & finance	22.04	77.96	23.76
Shortage/absence of equipment	18.18	81.82	0.48
Lack of information	25.00	75.00	0.87
Lack of support from Household	5.56	94.44	0.78
Total	24.36	75.64	100.00

Source: Based on UEUS (2018)

4.3.13 Duration and reasons of unemployment

The result in Table 17 shows that the majority of working individuals have been unemployed for 3 years, while a small proportion have been unemployed for 5 years. The length of unemployment for females is much longer than for males. For instance, the percentage of females who have been unemployed for more than 4 years is more than double that of males. Professional mismatch, lack of job opportunities, and lack of training and experience are the main causes of unemployment. Looking at the sex of unemployed working individuals, the major problems for female unemployment include professional mismatch, a lack of job opportunities, and a lack of training.

Table 14. Duration and reasons of unemployment

Duration of unemployment (%)	Proportion (%)		
	Male	Female	Total
1 year	37.56	62.44	11.18
2 years	33.98	66.02	3.53
3 years	34.68	65.32	72.78
4 years	28.86	71.14	1.28
5 years	23.62	76.38	0.55
6 year and above	30.15	69.85	10.68
Total	34.36	65.64	100.00
Main Reason for unemployment			
No work was found related to in my profession	33.64	66.36	83.27
Lack of job opportunity	38.55	61.45	10.68
Lack of training	31.35	68.65	1.66
Lack of experience	38.46	61.54	1.56
Lack of vacancy advertisement	43.75	56.25	0.69
Introduction of modern system of work	50.00	50.00	0.07
In search for better job opportunity	45.05	54.95	0.48
Not to work at distant place	20.55	79.45	0.31
To alter the usual place of work	36.84	63.16	0.08
Low payment/salary	40.00	60.00	0.19
Slack period	43.06	56.94	0.62
Off season	48.78	51.22	0.18
Inconvenience of working time	16.67	83.33	0.21
Total	34.36	65.64	83.27

Source: Based on UEUS (2018)

4.3.14 Problems faced due to unemployment

Lack of work causes a variety of personal and societal problems. According to Table 18, the major problems of unemployment in urban Ethiopia include hopelessness, being unable to cover household expenses, family dissolution, and decreased household income. The problems are worse for females than they are for males. For instance, females exposed to family dissolution are 19.2% higher than males, and females unable to cover household expenses are 78% higher than males. Additionally, the severe problems females face due to unemployment include being unable to cover household expenses, losing household income, being isolated from social participation, and being exposed to different addictions.

Table 15: Problems faced due to unemployment by sex

Main problem due to jobless	Proportion (%)		
	Male	Female	Total
Decreased household/ personal income	30.71	69.29	12.64
Unable to cover household expense	11.16	88.84	22.18
Family dissolution	40.37	59.63	16.45
Getting stress	38.39	61.61	1.93
Hopelessness	49.27	50.73	28.87
Exposed to different addictions	35.67	64.33	7.50
Isolated from social participation	32.39	67.61	6.20
Wandering for job	40.51	59.49	4.23
Total	34.36	65.64	100.00

Source: Based on UEUS (2018)

4.4 Determinants of female labor force participation in urban Ethiopia

This section examines factors that have an impact on both males and females' participation in the labor market. Based on the model diagnostic result, which is displayed in Table 19, the Heckman sample selection model is suitable to analyze the dataset. Inverse mills ratio, also known as lambda, which is an estimated selection coefficient, is statistically significant at the 1% level of significance, which confirms that there is a sample selection problem in the dataset. Additionally, rho is different from zero, which indicates that there is a correlation between the two models (participation and wage equation), and Wald chi2 is large and the probability is significant at the 1% level of significance. Consequently, the Heckman sample selection model is the appropriate model to analyze the data set.

The result generally revealed that females' participation in wage employment is 32.4% lower than that of males. Additionally, females also receive 32.4% less wage than males while controlling significant variables in the model. This result is consistent with the previous findings of Helen and Lamessa (2022). Factors that affect both males and females' participation in productive economic activities include age, training, education, being household head, and marital status. The age of a working individual positively affects participation in wage employment at the 1% level of significance. The participation of working individuals in wage

employment increases by 3.4% for every additional year. Additionally, both females and males' participation in wage employment is positively correlated with educational attainment. For instance, the likelihood of participation in wage employment is increased by 16.8% and 60.7% for both sexes with TVET/Diploma and degree and above levels of educational attainment, respectively. Furthermore, Household heads, workers who get training, educated females and females with training are more likely to participate in wage employment. However, age squared, being married, and being female with marital status are associated with a lower likelihood of participation in wage employment. The result of the wage equation indicates that educational attainment and age, which are proxy variables for experience, training, and skill, significantly affect the wage of workers. For instance, every additional year of age is associated with a 3.4% increase in the wage of workers, while compared to high-skilled workers, the wage of skilled or semi-skilled and low-skilled workers is associated with a 30% and 44.4% decrease in wage payment, respectively.

The sub-group analysis of the female sample indicated that for each additional year of female age, there is a 12.2% higher chance of participation in wage employment and a 5.2% higher wage rate, and the result is in line with the findings of Helen and Lamessa (2022), Bisrat (2019), and Amsaya (1996). Additionally, females with TVET/diploma and degree and above education also have 21.2% and 66.1% higher likelihood of participation in wage employment, respectively, and earn 21.2% and 66.1% higher wages than females without such educational attainment. The findings indicate that elementary education, TEVT/diploma, and a degree and above educational level matter more for females to participate in wage employment and earn better wages compared to females with no education. Prior studies also show that investing in females' education increases the likelihood of participation in the labor market and earns a better wage rate (Becker & Mincer, 1980; Azmat *et al.*, 2006; Dagmawe, 2022; Cazes & Verick, 2013; Helen & Lamessa, 2022). Moreover, female household heads have a higher likelihood of participating in wage employment, which is in line with the findings of Wubante (2015) and Bisrate (2019), whereas married females have a lower likelihood of participating in wage employment, which is consistent with previous findings of Hamid (1991); Becker (1974); Helen and Lamessa (2022). Concerning to sector of the economy, compared to service sector the participation of females has 27.8%, 15%, 21.1%, 23.7% higher in agriculture, manufacturing, construction and wholesale and retail trade respectively.

Table 16: Participation in wage employment (Heckman selection model, Pooled Sample)

Variables	Logarithm of wage	Participation (Coefficients)	Participation (Margins (dy/dx))
Female	-0.324*** (0.020)	-0.272*** (0.038)	-0.324** (.020)
Age	0.034*** (0.002)	0.129*** (0.002)	0.034*** (0.002)
Age square	-0.00035*** (0.000)	-0.002*** (0.000)	-0.000*** (0.000)
Training	0.204*** (0.011)	0.491*** (0.025)	0.204*** (0.011)
Female and Education	0.012** (0.005)	0.066*** (0.010)	0.012*** (0.005)
Female and Marital status	0.041*** (0.005)	-0.152*** (0.009)	0.041*** (0.005)
Female and Training	0.070*** (0.014)	0.082*** (0.031)	0.070*** (0.014)
Education: Reference: No Education			
No formal education	-0.019 (0.032)	0.360*** (0.069)	-0.019*** (0.032)
Elementary education	0.051*** (0.015)	0.298*** (0.034)	0.051*** (0.015)
Secondary and Preparatory school	0.135*** (0.014)	0.108*** (0.030)	0.135*** (0.014)
TEVT and Diploma	0.168*** (0.016)	0.088*** (0.032)	0.168*** (0.016)
Degree and above	0.607*** (0.017)	0.316*** (0.037)	0.607*** (0.017)
Skill of Individuals: Reference: High skill			
Skilled or semi-skilled	-0.300*** (0.010)		-0.300*** (0.010)
Low skill	-0.444*** (0.012)		-0.444*** (0.012)
Household Head		0.790*** (0.016)	
Marital status		-0.032** (0.014)	
Constant	7.023*** (0.048)	-2.506*** (0.053)	
Lambda	-0.049*** (0.017)		
Wald chi2(14)=12084, pro>chi2=0.0000 rho -0.100			
Observations	48,451	48,851	26,783

Source: Model result; Standard errors in Parenthesis, **** p<0.01, ** p<0.05

4.5 Wage gap decomposition analysis

The mean wage predictions of males and females and their wage differences are shown in Table 21 below. The finding indicates that the mean log wage (lnwage) is 7.753 for males and 7.425 for females, which is a 32.8% difference. According to the result of the Blinder-Oaxaca decomposition, the wage gap between males and females is estimated to be 32.8%. Of this gender wage gap, 16.1% is explained and the remaining 24.5% is unexplained. The result is in line with the findings of Helen and Lamessa (2022), which illustrate that the unconditional wage gap between men and women is estimated to be 62.7%. In the Blinder-Oaxaca decomposition result, the wage gap is divided into three parts. The first part, which is explained as endowment reflects the mean increase in female wages if they had the same characteristics as males. The implication is that, on average, females' wages would be increased by 16.1% by adjusting female endowment levels to the levels of male endowment. The second part quantifies the change in female wages when applying the males' coefficients to the females' characteristics. The findings indicate that gender discrimination or unexplained factors account for 24.5% of wage disparities. The third component is the interaction effect, which measures the simultaneous impact of variations in endowments and coefficients. The findings indicate that endowment effects and coefficients together account for 7.9% of wage disparity. Using the detail options command, a detailed decomposition analysis is carried out to determine how much of the explained and unexplained gender pay difference is related to each predictor. Moreover, the explained wage gap is accounted for by differences in age, which is a proxy variable for experience (15.9%), education (0.4%), training (7.9%), and sector of the economy (0.8%), whereas the unexplained wage gap is accounted for by differences in age square (22.7%), education (19.4%), training (4.3%), skill (9%), and sector of the economy (23%).

Table 17: Wage gap decomposition and determinants of wage gap

Differential		
Variables	Mean	Std.Err.
Mean log wage (Males)	7.753***	0.005
Mean log wage (Females)	7.425***	0.006
Difference	0.328***	0.008
Decomposition		
Explained/Endowments	0.161***	0.006
Unexplained/Coefficients	0.245***	0.007
Factors explaining the wage gap		
Explained/Endowments		
Age	0.159***	0.010
Age square	-0.117***	0.009
Training	0.079***	0.004
Education	-0.004***	0.001
Skill	0.036***	0.003
Sector of the economy	0.008***	0.001
Total	0.161***	0.006
Unexplained/Coefficients		
Age	-0.841***	0.086
Age square	0.279***	0.039
Training	-0.043***	0.005
Education	0.194***	0.018
Skill	0.090***	0.025
Sector of the economy	0.230***	0.022
Constant	0.337***	0.064
Total	0.245***	0.007
Interaction Effects		
Age	-0.077***	0.009
Age square	0.050***	0.007
Training	-0.022***	0.003
Education	-0.014***	0.002
Skill	-0.005***	0.001
Sector of the economy	-0.011***	0.001
Total	-0.079***	0.004
Observations	26,592	

Source: Model result and **** p<0.01

5. Conclusions and Policy Implications

5.1 Conclusion

Females' participation in the labor market varies greatly across countries due to differences in social norms, economic development, fertility rates, education attainment, access to childcare, and other supportive policies. Even if there is an improvement in female participation in high-ranking government positions, there are still persistent gender gaps in economic participation and wages. In order to address these problems, this study examines the determinants of females' labor force participation and wage gap in urban Ethiopia using data from the Ethiopian Urban Employment Unemployment Survey (2018) data set, which is collected by the Ethiopian Statistical Service. Both descriptive statistics and an econometric model are utilized to achieve the study objectives.

According to the descriptive analysis, 52.4% of working individuals participated in economic activities. Of those that participated, 43.39% were female, whereas 56.61% were male. Even though there are more females than males in urban Ethiopia who are working age, the results revealed that they participate in productive economic activities at a 13.2% lower rate than males. While the majority of labor force participants have attended formal or informal education, the percentage of females with degrees and above education attainment is significantly lower than that of males.

In comparison to the construction and agricultural sectors, where males predominate, females make up a considerably higher percentage of participation in the wholesale and retail trade and service sectors. The findings confirmed that in urban Ethiopia, service and sales occupations and elementary occupations are the dominant occupations, accounting for 32.07% and 14.54% of all wage employment, respectively. Additionally, in high-skill occupations, there are disproportionately fewer females employed (managers, professionals, technicians, and associate professionals). According to the results, females are less likely than males to participate in wage employment overall, and those who participate do tend to concentrate in clerical and support workers, service and sales workers, and elementary occupations.

The findings show that female participation in all other employment types is much lower than that of males. Even though permanent employment is the major term of employment for females, compared to males, the concentration of females is lower by 17%. For those who are employed, the average payment is about 2,546.5 ETB. On average, female workers' payments are 847.3 ETB lower than male

workers. The finding indicates that there is a gender difference in main occupation of workers.

Even though licensed enterprises employ more working individuals than unlicensed enterprises, females' engagement is still 27.32% lower than males. About 36.49% of working individuals did not seek employment for the last three months due to education, training, and responsibility of home and family activities. Females are less likely to have sought work for the past three months for a variety of reasons, including pregnancy, responsibility for home and family activities, education or training, and no work available. Additionally, females have more severe difficulties starting new businesses than males. For instance, females experience shortages of finance, lack of training, lack of a working place and lack of finance rates that are 47%, 50%, and 56% higher than those experienced by males.

Females have significantly less participation in productive economic activities that have wage or salary payments compared to males. Particularly, the participation of females in wage employment is 32.4% lower than that of males. Additionally, the finding revealed that females also receive 32.4% less than males.

Factors that affect both males and females' participation in productive economic activities are age, training, education, being household heads, and marital status. The implication is that for every additional year, the participation of working individuals in wage employment increases by 3.4%, and individuals with TVET/diploma and Degree and above levels of education are 16.8% and 60.7% more likely to participate in wage employments, respectively. Being household heads, workers who get training, females with education and females with training are more likely to participate in productive economic activities. However, age squared, being married, and female with marital status are associated with a lower probability of participation in paid employment. The result of the wage equation indicates that education and age, which are proxy variables for experience, training, and skill, significantly affect the wage of workers.

Females' participation in wage employment is positively and significantly affected by the age of individuals, training, head of household, and education of individuals, while it is negatively and significantly affected by age square and marital status. On the other hand, the wage of female individuals is significantly affected by their age, training, education, sector of the economy, and skill. Females additional year of age is associated with a 12.2% higher chance of participation in wage employment and a 5.2% higher wage. Females with TVET/diploma and degree and above education also have 21.2% and 66.1% higher probability of participation in wage employment, respectively, and earn 21.2% and 66.1% higher wages than

females with no such education. Moreover, female household heads have more propensity to participate in wage employment, while married females have less participation in wage employment. In addition, compared to service sector, females earn 27.8%, 15%, 21.1%, and 23.7% more in agriculture, manufacturing, construction, and wholesale and retail trade, respectively.

According to the Blinder-Oaxaca decomposition analysis, the average wage is 7.753 for males and 7.425 for females, which amounts to a difference of 32.8%. The findings revealed that there is an estimated 32.8% wage discrepancy between males and females, of which 16.1% can be attributed to the explained/endowment effect and 24.5% to unexplained/gender discrimination. The implication of the findings is that adjusting female endowment levels to male levels would increase female wages by 16.1%. The explained part of the wage gap is accounted for by differences in age, which is a proxy variable for experience (15.9%), education (0.4%), training (7.9%), and sector of the economy (0.8%), while the unexplained part of the wage gap is accounted for by differences in age square (22.7%), education (19.4%), training (4.3%), skill (9%), and sector of the economy (23%).

5.2 Policy Implications

The findings imply that there is a gender difference in the participation in economic activities and wage earnings in urban Ethiopia. Additionally, there is occupational segregation of females, which concentrates in clerical and support workers, service and sales workers, and elementary occupations. To minimize gender discrepancy in labor market participation and earnings, the government could therefore revise and update gender-sensitive labor force policies to address gender discrepancy in the participation of economic activities and wage earnings.

The major reasons for females not seeking jobs are pregnancy, responsibility for home activities and family, education or training and no work available. Additionally, the major problems with starting self-employment are a shortage of finance, a lack of training, a lack of a working place, and a lack of finance. Hence, government support programs and non-governmental organizations should focus on reducing the reproductive role of females through different extension approaches and improving the availability and access of finance, training, and working places for females.

Educational attainment and age, which is a proxy variable for experience and training, are crucial factors in increasing females' participation and wage earnings. On the other hand, it is negatively and significantly affected by marital status and

age. Additionally, female wage is significantly affected by age, training, educational status, sector of the economy, and skill of females. As a result, the government gives a special emphasis on those gender-sensitive policy variables in an effort to reduce gender disparities in wage and labor market participation.

The findings of the gender wage gap decomposition suggest the need for deliberate government efforts to create policies that reduce explained and unexplained wage gaps in employment. Special emphasis should be given to improving the educational attainment, training, and skill gaps of females and designing effective policies that encourage the public and commercial sectors to narrow gender wage discrepancies.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this manuscript.

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