Gender Wage and Employment Gaps in the Sub-Saharan Africa Economic Sectors

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1 Introduction

Gender inequality is multifaceted. It has social, economic, and political dimensions pervasively prevailing across the developing and developed countries. World leaders have spent a significant amount of time and resources to bridge the gender gap by setting global agendas outlining common visions and goals that many countries promised to incorporate in their development policies. In 2000, 191 United Nations (UN) member states committed to eight Millennium Development Goals (MDGs). Among the MDGs, the third goal was to promote gender equality and empower women with a specific target of eliminating gender disparity in access to primary and secondary education by 2015. The 2015 MDG progress report by the UN indicated that there was significant progress in narrowing the gender inequality over the years 2000–2015, particularly in primary education, but disparities across regions remained in all levels of education.

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The report also pointed that women continue to face discrimination in access to work, economic assets, and participation in the private and public decision-making process. The 2030 Agenda for Sustainable Development was introduced to advance several development goals including the unfulfilled MDG promises. In September 2015, 193 countries adopted the seventeen Sustainable Development Goals (SDGs) including achieving gender equality.

Despite the efforts and progress made by international organizations and governments at the national and local levels, gender inequality continues to be a significant problem, particularly in developing countries. The Global Gender Gap Report by the World Economic Forum (WEF) publishes national and regional gender gap indices on economic, education, health, and political aspects. According to the WEF 2016 report, the economic gender gap will not be closed for another 170 years if the current rate of change is maintained. At the global level, the composite gender gap index suggests that there is a 31.7% gap which is to be closed over the coming years and generations. The gaps between men and women were 41 and 77% in the economic participation and opportunity and the political participation categories, respectively. Based on the distance from parity, the Middle East and North Africa with a remaining gap of 40% followed by South Asia (33%) and SSA (32%) have higher levels of gender gap than the other regions.

Many SSA countries have made laudable achievements in reducing the gender gap in education and economic participation. Between 1991 and 2015, the ratio of girls to boys in primary and secondary education increased from 0.84 to 0.93 and from 0.77 to 0.87, respectively (UN 2015). Besides, the share of women in non-agricultural wage employment increased from 24 to 34%, the highest progress compared to other regions. However, the region has a long road ahead before it can achieve gender equality. It still lags in several gender gap measures behind the averages for developing countries. For instance, the developing region's average proportion of women in paid non-agricultural employment was 48% in 2015, far higher than that of SSA (34%) (UN 2015). As noted in the UNDP's (2016) Africa human development report, increased female participation in the labor market has not meant increased opportunities in highpaying jobs or enterprises. A gender wage gap outside agriculture is pervasive across all labor markets in SSA, where, on average, the unadjusted gender pay gap is estimated at 30% (UNDP 2016).

The two objectives of this chapter are: (i) provide a discussion of the trends and current levels of gender inequality in SSA, and (ii) present an in-depth review of the empirical work on gender wage and employment gaps. Setting a foundation for the empirical review, we present a summary of the two main theoretical frameworks of market discrimination. This is followed by

a discussion of the Oaxaca–Blinder empirical methodology popularly used in empirical studies of gender wage gap. The rest of the chapter is organized as follows: Sect. 2 presents descriptive statistics on gender trends in SSA, Sect. 3 provides a theoretical background to supplement understanding of the empirical review, and Sect. 4 discusses the empirical review. Finally, Sect. 5 summarizes and concludes the chapter.

2 Gender Gap Trends in SSA Based on WDI and UNDP Data

In this section, we present descriptive statistics of the trend and current levels of gender inequality in SSA using data from two sources, the World Bank's world development indicators (WDI) and the United Nations Development Programme (UNDP)'s human development index (HDI). We discuss disparities in labor market outcomes and human development in education, health, and living conditions. To this end, we will focus on the WDI employment gap indicator and two UNDP indices, the gender development index (GDI) and the gender inequality index (GII). A discussion of the employment gap is presented next.

Employment Gap Based on WDI Data

Inequalities in labor market outcomes involve various elements including gaps in employment, labor force participation, wages as well as sectoral and occupational segregation. A single measure or index that captures all aspects of the labor market is not available. An indicator used to capture labor market inequality in employment is the gap between the male and female employment to population ratio based on the International Labour Organization (ILO) estimates available in the World Banks's WDI database. The male and female employment to population ratio has been used to measure the employment gap in empirical studies (Wamboye and Seguino 2015; Wamboye et al. 2015). Figure 1 depicts the employment gap in twelve SSA countries with higher and lower average gaps for the period 1995–2018. In 2018, the average SSA female employment to population ratio was 11.3% lower than that of males, indicating fewer employment opportunities for women than men. Over the past 20 years, the region realized a slight decline in the employment gap with an increase in the female and a decrease in the male employment ratios.

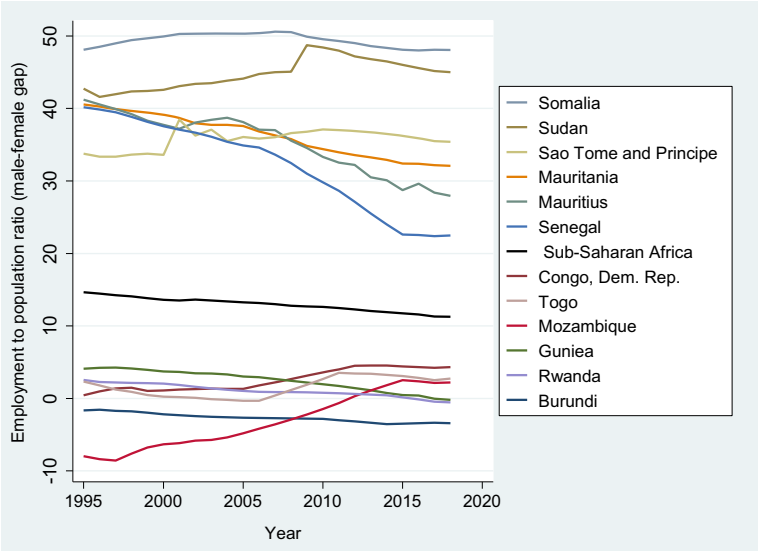

Fig. 1 Male–female employment-to-population ratio gap in sub-Saharan Africa (1995–2018) (*Source* Authors' compilation using data from the World Bank's WDI database)

SSA countries with an extremely higher male–female employment to population ratio gap of more than 30% include Somalia, Sudan, Sao Tome and Principe, and Mauritania. In 2018, there were ten countries with an employment gap of 20% or higher, and more than half of SSA countries had a gap of 10% or more, leaving women at a disadvantage. In contrast, there were a few countries, such as Burundi, Rwanda, and Guinea, with a higher employment to population ratio for females than males, generating a negative male–female employment gap. These countries also had a higher female labor force participation rate. Other countries with a lower male–female employment gap (less than 5%) include Mozambique, Togo, and Congo, Dem. Republic.

Compared to other developing regions, SSA has a lower average employment gap. In 2018, as shown in Fig. 2, the region had one of the highest female employment to population ratio and the lowest male–female employment gap. South Asia had the highest employment gap followed by the Middle East and North Africa, and Latin America and the Caribbean. However, the low employment gap in SSA hides significant labor market disparities in the region. For instance, as shown in Fig. 3, SSA has the lowest share of wage and salaried workers (23.4% of the total employment in 2018). The region with the second-lowest share of wage and salaried workers was South Asia (25.5%) followed by East Asia and the Pacific (55%). Besides,

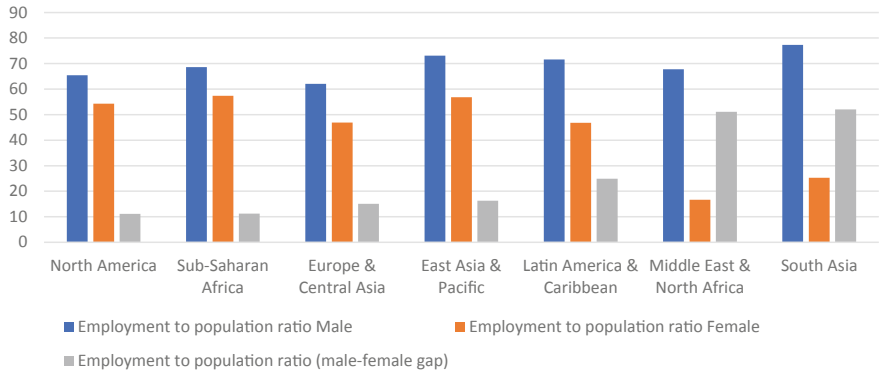

Fig. 2 Employment to population ratio (male, female, and the gap) across regions in 2018 (*Source* Authors' compilation using data from the World Bank's WDI database)

Fig. 3 Wage and salaried workers ratio (male, female, and the gap) across regions in 2018 (*Source* Using the World Bank's WDI database)

SSA has the lowest share of wage and salaried female workers (as % of the total female employment) and the highest gender gap in the composition of wage and salaried employment. The male–female gap in the share of wage and salaried employment was 12.8%, far higher than that of South Asia in the second place (6%). This suggests that, despite the high female employment to population ratio, women are concentrated in non-wage/non-salaried employment dominated by the informal sector.

While the employment gap helps shed light on gender inequality in the region, it is important to document measures based on different considerations that provide a good understanding of the issue. Next, we present a discussion of the gender gap based on the UNDP's gender human development index.

Gender Human Development Gap

Starting in 1990, the UNDP annually produced the HDI to measure the development of a country with special emphasis on the human dimension of development instead of only focusing on national income. HDI is a composite measure based on three key elements: health (measured by life expectancy at birth), education (measured by mean years of schooling for adults and expected mean years of schooling for children), and living standard (measured by gross national income per capita). The human development report also generates separate HDIs for females and males to address the issue of gender inequality.[1] As a result, the gender development index (GDI) introduced in 2014 is calculated as a ratio of the female HDI to the male HDI measuring gender disparities in human development achievements.

The world average HDI for women in 2017 was 6% lower than for men (UNDP 2018). The gap was wider (13.8%) in low human development countries. SSA had the third-largest gap (10.7%) preceded by Arab states (14.3%) and South Asia (16.3%).[2] From hereon, our discussion focuses mainly on the 2017 HDI statistics. Figure 4 presents the trend of GDI for ten SSA countries with low and high inequality in 2017. The figure shows an increasing trend of the average GDI for SSA and the world, signifying a decrease in the human development gap between males and females. For instance, while the world average gap decreased from about 10% in 1995 to 6% in 2017, the average gap in SSA decreased from about 17 to 11%. However, the gap in SSA continued to be above the world average and the difference has persisted throughout the period. Countries in the region with the highest gap include Chad, Central Africa Republic, Guinea, Mali, and Niger. In 2017, the human development gap in these countries was more than 18%.

On the other hand, a few SSA countries have a lower HDI gender gap than the world average. Despite the low human development in Lesotho and Burundi, and a medium human development in Namibia, these countries achieved male–female HDI parity. Burundi scored the fastest growth in GDI narrowing the gap from 17% in 1995 to zero in 2015. Other countries with

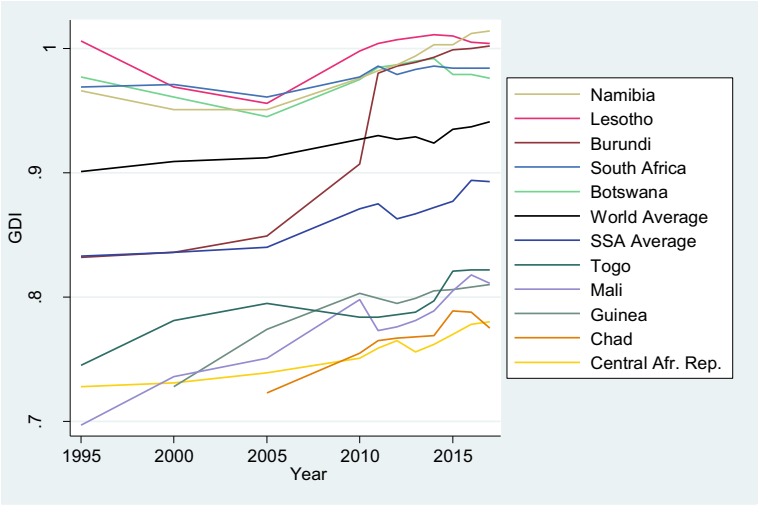

Fig. 4 GDI trend for a sample of SSA countries with low and high values (1995–2017) (*Source* Based on data from the UNDP data center: http://hdr.undp.org/en/data)

a lower gender human development disparity include South Africa (1.5% in 2017), Botswana (2.5%), and Mauritius (3%).

The UNDP also produces a gender inequality index (GII) with a primary focus on the disadvantages women face in reproductive health, education, political participation, and the labor market.[3] It addresses women's empowerment and gender achievement gaps in human development. Figure 5 depicts the trend of GII for SSA countries with low and high inequality. It shows that the average gender inequality in the region has been far greater than the world average, presenting a heavy constraint for women's empowerment in the region. According to UNDP (2018), SSA was ranked first among developing regions with a higher GII followed by Arab states and South Asia. The region has the lowest achievement in women's reproductive health with the highest maternal mortality ratio (549 deaths per 100,000 live births) and adolescent birth rates (101.3 births per 1000 women ages 15–19). Besides, it has the lowest achievement in education with only 29% of women and 39% of men have at least some secondary education. In contrast, SSA has the highest female labor force participation rate (65%) and the lowest labor force participation gap (9%). Moreover, the region has a higher share of parliament seats held by women (23.5%) than other developing regions except for Latin America and the Caribbean (28.8%).

Figure 5 also reveals that gender inequality is distributed unevenly across the region in which some countries (such as Central Africa Republic, Mali, Cote d'Ivoire, Liberia, and Congo) pose significantly higher disparity than

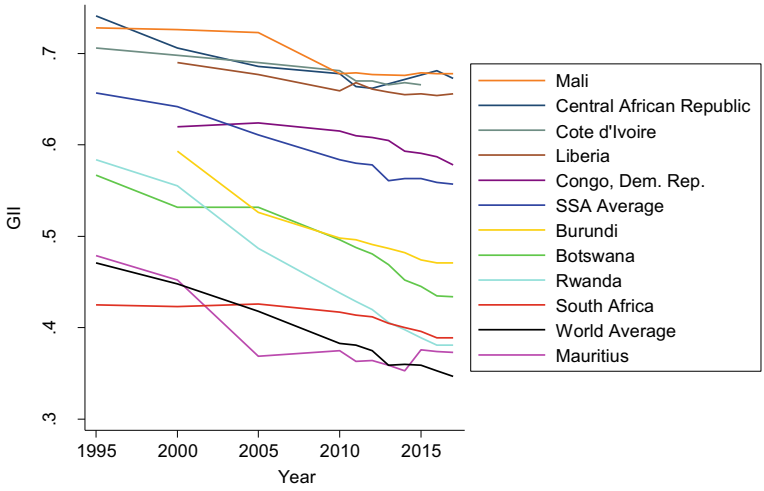

Fig. 5 GII for a sample of SSA countries (1995–2017) (*Source* Based on data from the UNDP data center: http://hdr.undp.org/en/data)

others (such as South Africa, Mauritius, Rwanda, Botswana, and Burundi). On the positive side, the trend shows that countries in the region achieved some progress in reducing the inequality over the past two decades. For instance, the average GII for the region decreased from 0.66 in 1995 to 0.56 in 2017, indicating a 15% decrease in the aggregate measure of gender disparity in human development. Overall, the data presents the existence of a wide gender gap in health, education, political participation, and labor market outcomes across the region.

3 Theoretical Frameworks of Gender Economic Gap

There are several ways to explain the existence of wage and employment gaps across gender and racial lines. One of the main reasons behind the persistence of female–male wage and employment gaps worldwide is discrimination. Discrimination results when members of a certain group are treated differently than others despite having the same productive skills. In the economics literature, there are two main theoretical frameworks in the area of market discrimination, taste-based and statistical discrimination.

First, we will provide a brief discussion of the taste-based discrimination model developed by Becker (1957). In his book, The Economics of Discrimination, Becker provided the first formal economic framework to analyze

market discrimination. Becker defined discrimination as the difference in wages between two workers of equal productivity. His framework focused on the relationship between racial prejudice among whites and discrimination against minorities in a perfectly competitive model. In the short-run equilibrium, minorities receive lower wages even in situations where they are equally productive as their white counterparts. This type of discrimination is referred to as taste-based discrimination. In the long run, the entry of more nondiscriminating employers will force discriminating employers to exit the industry. In sum, discrimination only exists in the short run and the long run is characterized by the absence of discrimination.

The departure from solely attributing wage gaps to the taste of dislike among employers was first challenged by Arrow (1972) who argued that by predicting the absence of discrimination in the long run, the Becker model fails to explain the persistence of discrimination. A second shortcoming with the Becker model was that discrimination tastes were taken as a given (Guryan and Charles 2013). The shortcomings of the Becker model led to the development of models focused on statistical discrimination. Arrow (1972) provides one of the first theoretical models of statistical discrimination. Such models are based on rational optimization with limited information (Guryan and Charles 2013). Employers assess a specific characteristic of a potential employee based on limited information. In addition to the imperfect signals of the applicant's productivity received by the employer during an interview, the employer has access to a lot of information including the potential employee's group membership including race, gender, and ethnicity. Because of the lack of perfect information on applicants, the employer would use a weighted average of the signals received during the interview and the average productivity of the workers who belong to the same group as the applicant (Guryan and Charles 2013). The employer will end up treating applicants as members of specific groups based on race, gender, or ethnicity which will lead to discrimination.

A few studies attempted to empirically test the extent of market discrimination in the context of both taste-based and statistical discrimination (Charles and Guryan 2008; List 2004). However, empirical works often do not attempt to test these theories directly in terms of which one explains discrimination the best. Much of the work which focused on wage and employment gaps quantifies discrimination based on the seminal works of Oaxaca (1973) and Blinder (1973). The Oaxaca–Blinder methodology attempts to measure the degree of wage discrimination by gender or race by decomposing the wage gap between the "explained" and "unexplained" components. The explained component is the proportion of the gap due to

differences in characteristics such as education, experience, and other individual factors. The unexplained wage gap attributed to the differences in returns to the wage generating characteristics is often argued to be the result of discrimination.

The Oaxaca–Blinder decomposition, which involves separate estimations of a standard Mincerian log wage equations for men and women, is:

$$\bar{w}_m - \bar{w}_m = \beta_m\left(\bar{x}_m^{'} - \bar{x}_f^{'}\right) + \left(\beta_m - \beta_f\right)\bar{x}_f^{'}$$

where $\bar{w}_m$ and $\bar{w}_f$ are the means of the natural logs of male (m) and female (f) wages, and $\bar{x}_m$ and $\bar{x}_f$ are the means of the observable productivity-related characteristics of males and females. Besides, the β_m and β_f are estimated coefficients from the male and female log earnings equations, respectively. The first part of the decomposition, $\beta_m\left(\bar{x}_m^{'} - \bar{x}_f^{'}\right)$, represents the wage gap explained by differences in characteristics, and the second part $(\beta_m - \beta_m)\bar{x}_f^{'}$ represents the unexplained component arising from differences in returns to characteristics.

The above decomposition uses the male wage structure as the nondiscriminatory benchmark based on the assumption that males are paid competitively but females are discriminated against. However, results could be different if the decomposition uses the female wage structure as a competitive outcome and assumes males are compensated differently. The sensitivity of the standard Oaxaca–Blinder approach to using the male or female wage structure as the nondiscriminatory outcome is known as the index problem. To solve this problem, Neumark (1988) proposed a general approach based on the assumption that the coefficients of a pooled (males and females) wage equation represent a nondiscriminatory wage structure. Therefore, the Neumark decomposition substitutes coefficients (β^*) from a pooled wage regression for the male coefficients (β_m) in the above Oaxaca–Blinder decomposition.

The practice of using the unexplained gap in the decomposition analysis as a measure of the degree of labor market discrimination is not without shortcomings. Lack of data or missing important productivity variables in wage regressions could lead to overestimating the degree of discrimination. The unexplained component also misses the fact that discrimination affects human capital accumulation and other productivity generating characteristics of male and female workers differently. However, there is no standard approach to mitigate these problems. The next section documents the empirical evidence on gender economic gaps in Africa.

4 Empirical Evidence of Gender-Based Economic Gap in Africa

Studies on gender-based wage and employment gaps using African data can be grouped into two categories: studies using household data and those using manufacturing data. Most of the studies used household or labor force survey data. Besides, many recent studies have utilized employer–employee matched manufacturing sector data. As a result, the current section is organized based on the sources of data used in the studies. First, we will review studies that used household or labor force surveys. Second, we will cover studies that focused on the manufacturing sector data.

Evidence from Household Data

The work by Appleton et al. (1999) is among the first gender wage gap studies to use nationally representative household data from three SSA countries, Uganda (1992), Ethiopia (1990), and Cote d'Ivoire (1985, 1986, and 1987).[4] The data showed that male wages exceeded female wages by about 33, 25, and 3% in Uganda, Ethiopia, and Cote d'Ivoire, respectively. Decomposition of the gaps using the Neumark (1988) approach revealed that in the private and public sectors in Ethiopia and the private sector in Uganda and Cote d'Ivoire, the earnings differentials were largely due to differences in returns to the wage generating characteristics. In the public sector in Uganda and Cote d'Ivoire, however, differences in wage generating characteristics played a significant role. These results suggest that the public sector in Uganda and Cote d'Ivoire experienced less wage discrimination than the private sector, but no such evidence was found for Ethiopia.

Glick and Sahn (1997) for Guinea and Kabubo-Mariara (2003) for Kenya investigated gender differences in employment and earnings in three alternatives: self-employment, private sector wage employment, and public sector wage employment.[5] The studies showed that education strongly increases the likelihood of men and women being a private or public wage employee. Controlling for background characteristics, gender played an important role in determining labor market participation and earnings. Glick and Sahn (1997) for Guinea indicated that women of identical background to men had much lower chances of entering wage employment and faced significant earnings differentials, 120% in self-employment and 20% in public sector employment. In contrast, in private wage employment, women earned slightly higher than men do. According to Kabubo-Mariara (2003), the gender wage gap was lower in Kenya, 9% in the private and 4% in the

public sectors. Decomposition of the gender earnings differentials in Guinea revealed that unexplained factors account for more than half of the gap in self-employment and three-quarter of the gap in the public sector. Similarly, for Kenya, more than 70% of the gaps in the private and public sectors remained unexplained by differences in characteristics.

For Botswana, Siphambe and Thokweng-Bakwena (2001) used a 1995/6 Labor Force Survey to investigate the wage gap between men and women in the formal private and public sectors. The study showed that female workers earned 73 and 81% of male wages in the private and public sectors, respectively. Decomposition of the wage gaps using the Oaxaca–Blinder methodology revealed that 66 and 33% of the gaps in the private and public sectors, respectively, due to differences in rewards to labor market characteristics. Similar to Appleton et al. (1999) for Uganda and Cote d'Ivoire, the public sector in Botswana showed relatively less discrimination against women than the private sector.

Kolev and Robles (2010) studied the gender pay gap in Ethiopia using the 2005 labor force survey. They showed that female workers earned 80, 74, and 35% of male wages in the public, formal private, and informal private sectors, respectively. The gaps were relatively lower for older women and those in the upper wage distribution. The study indicated that differences between men and women in human capital and job characteristics accounted for more than three-quarters of the earnings gap and the rest remained unexplained.[6] In the public and private informal sectors, much of the gap can be explained by observed characteristics and selection across occupation and industry. In the private formal sector, more than half of the gap remained unexplained. This supports the findings of Appleton et al. (1999) which left 85% of the private sector wage gap in Ethiopia unexplained by human capital characteristics without control for occupation and industry. Finally, the inclusion of job characteristics in the decomposition process significantly lowered the contribution of differences in human capital and the unexplained component, suggesting that job selection may indirectly capture the effect of education, job discrimination, and individual work preferences.

In a related study, Nordman and Roubaud (2009) examined returns to human capital in urban Madagascar by introducing an actual measure of workers' experience rather than the often-used potential experience using matched biographical and labor force surveys. Results showed a higher gender difference in returns to experience when using actual than potential experience, as the latter fails to account for the labor market interruption of female workers. Besides, the earnings gap explained by observable characteristics greatly increased when an actual experience is used instead of a

proxy. Accordingly, the authors called for more precise measures of women's actual experience in the estimation and decomposition of the gender wage gap in developing countries. In another study for Madagascar, Nordman et al. (2010), used two cross-sectional household surveys (2001 and 2005) to examine gender employment and wage inequalities. The study found that education increased the probability of men and women getting public sector employment, followed by private formal employment and informal self-employment. The study also found a stable gender wage inequality of about 20% and that the portion unexplained by individual and job characteristics was about 35% in both survey years after controlling for job characteristics.

A recent study by Nordman et al. (2011) used urban household surveys from seven West African capitals for the period 2001–2003 to study gender and ethnic earnings gaps. The unadjusted log earnings differences between male and female workers (a measure of gender wage gap) vary significantly across cities, from about 0.49 in Niamey (Niger) to 0.78 in Lome (Togo). Decompositions of the gaps suggested that selection across sectors (public, private, and informal) accounted for 25% in Cotonou to 40% in Abidjan, and differences in individual characteristics accounted for 12% in Daka to 45% in Lome of the within-sector gender differences in earnings. More than half of the gaps remained unexplained by individual characteristics and sectoral location across the cities.[7] Further, results showed that the gender gaps are wide at the bottom of the distribution where women are disproportionately concentrated, and the unexplained component diminished in the upper earnings distribution.

Consistent with the findings of Kolev and Robles (2010) for Ethiopia, Glick and Sahn (1997) for Guinea, and Appleton et al. (1999) for Côte d'Ivoire and Uganda, Nordman et al. (2011) showed that gender earnings gaps are relatively small in the public and private formal sectors with some variations across the cities.[8] However, the log earnings gap in the informal sector appeared to be very large, ranging from 0.41 in Dakar to 0.74 in Ouagadougou. The authors provided three alternative explanations why the informal sector mainly dominated by self-employment has a larger earnings gap: gender differences in characteristics, lower productivity in jobs held by women, or lower female productivity in certain jobs, and gender differences in access to capital.

Recent studies with a specific interest in gender wage gap along the earnings distribution include Agesa et al. (2013) for Kenya and Bhorat and Goga (2013) for South Africa. The two studies used the re-centered influence function (RIF) and data from household surveys. While the latter found a higher gender wage gap at the bottom of the distribution than at the top in South

Africa, the former found a larger wage gap at the lower and upper ends of the distribution in Kenya. In South Africa, Bhorat and Goga (2013) indicated that the gap at the bottom is largely explained by differences in productive characteristics, while the unexplained component is responsible for the gap at the top of the distribution. In fact, the higher productive characteristics of women at the top of the distribution served to mitigate the discriminatory behavior of employers. In Kenya, Agesa et al. (2013) found that gender differences in characteristics, main occupation, industry, and education account for the largest share of the gender pay gap at the lower (10th and 20th) and upper (80th and 90th) percentiles of the distribution. However, in the middle of the wage distribution (between the 40th and 70th percentiles), gender differences in returns to attributes accounted for the largest share of the gender pay gap. The two studies provide different policy implications to combat gender wage inequality in the two countries along the earnings distribution. For instance, strategies to lessen wage discrimination should target employees in the middle- and upper-income distribution in Kenya and South Africa, respectively.

Evidence from Manufacturing Data

Fafchamps et al. (2009) used employer–employee matched manufacturing sector data from eleven African countries to investigate whether wage gaps associated with education and gender are driven by selection across occupations and firms. Despite large differences across countries, the study showed that, on average, sorting across firms and occupations accounted for over half of the total education wage gap. While sorting explained all the education wage gap in Ghana, a country with the lowest gap among the eleven countries, it played no role in Zimbabwe and Burundi. Results also showed the existence of a significant gender wage gap mostly explained by sorting among firms. Besides, a large gender difference in the education wage gap has been observed across the countries. With a higher education wage gap for women, largely attributed to sorting among firms, the gender wage gap narrows with education leaving less educated women at a disadvantage. An exception to this observation was Morocco where women with higher levels of education were paid less than men.

In a related study for Morocco, Nordman and Wolff (2009a) investigated the glass ceiling effect using a matched worker-firm dataset of more than 8000 employees and 850 employers. Results from a quantile earnings regression accounting for firm heterogeneity showed that the gender earnings gap is higher at the top of the wage distribution than at the bottom confirming the

existence of a glass ceiling effect in the Moroccan manufacturing sector. The gap after controlling for firm factors range from about 4.5% at the bottom to about 15% at the top of the earnings distribution. As in Fafchamps et al. (2009), the results suggested that the returns to education are slightly higher for men than for women throughout the earnings distribution. Furthermore, the study found that the observed earnings gap depends largely on differences in returns to labor market characteristics than differences in endowments. This suggests that female workers are rewarded less for their observed endowments than males all the way up to the top positions. Besides, the glass ceiling effect is reinforced over time in Morocco as high-wage male workers benefited from higher earnings growth than women.

Besides, Nordman and Wolff (2009b) examined the relevance of the glass ceiling hypothesis in Mauritius and Madagascar using matched employer–employee data collected in 2005. Linear log hourly wage regressions showed a significant within-firm gender wage gap of more than 35% in the Mauritius manufacturing sector, but no significant gap existed in Madagascar. Decomposition results indicated that the large wage gap in Mauritius was mainly due to differences in returns to labor market characteristics, suggesting that female employees endowed with the same characteristics as men would earn on average 25% less. The results also showed that accounting for firm heterogeneity is important for both islands. Selection across firms indicates the existence of high paying firms for men and low paying firms for women. The study found no compelling evidence of a glass ceiling phenomenon in the manufacturing sectors of Mauritius and Madagascar. This is contrary to the glass ceiling effects in the manufacturing sector of Morocco shown in Nordman and Wolff (2009a).

For Ethiopia, Temesgen (2006) used survey data collected by the Investment Climate Unit of the World Bank in 2002, which covered 427 manufacturing firms and more than 2500 workers. The study found an average gender wage gap of up to 30%, showing that men outearning women in the manufacturing sector. However, the wage premium for men declined to 5% after controlling for individual and establishment-level characteristics. Decomposition of the gap using the Oaxaca–Blinder and Neumark approach revealed that close to 60% of the premium is due to wage differentials in returns to human capital, referring to discrimination or differing treatments to men and women in the labor market. Temesgen (2006) also indicated that decomposition exercises that do not account for firm characteristics would lead to a biased estimation; in his case, underestimate the discrimination component by nearly half.

Many of the studies discussed above used variants of the Oaxaca–Blinder decomposition method. Such studies often attribute the unexplained wage gap by the observed worker, job, or firm characteristics to discrimination. However, this approach fails to disentangle wage gaps due to unobserved productivity differentials and those attributed solely to labor market discrimination (Hellerstein et al. 1999). Using firm-level matched employer–employee data, Hellerstein et al. (1999) proposed a methodology that allows joint estimations of firm-level wage equation and production function. Accordingly, one could perform statistical tests to examine whether gender productivity differentials equal gender wage differentials to determine the presence, or lack thereof, of wage discrimination unexplained by productivity gaps.

Van Biesebroeck (2011) followed the Hellerstein et al. (1999) approach to evaluate whether productivity premia associated with worker characteristics (education and experience) are equal to the corresponding wage premia in the manufacturing industries of three Sub-Saharan Africa countries. Results showed that the gaps between wage and productivity premia for experience and school are the largest in Tanzania, followed by Kenya. In Zimbabwe, the wage and productivity premiums were statistically equal to each other, reflecting a rather competitive labor market in the more developed economy of the three countries. The study also showed that productivity premia for an extra year of schooling to be higher for female than male workers. This may be due to the lower average schooling level of women in which the diminishing returns to schooling is less important. Besides, the gap between productivity and wage premia of schooling are large for female workers in Kenya and Tanzania, showing that women are not fully compensated for their increased productivity due to an extra year of schooling.

Abegaz and Nene (2018) also followed the Hellerstein et al. (1999) approach to examine whether women in the manufacturing sector of Ghana were paid lower than their productivity. The study compared gender wage and productivity gaps using firm-level panel data for the period 1992–2003.[9] Apart from the existence of a significant gender wage gap, results showed no statistically significant difference between the gender wage and productivity gaps, indicating the absence of within-firm gender wage discrimination. The study argued that causes for the observed gender wage gap may include between-firm wage inequalities and sorting of female workers to low productivity and low wage firms in the sector.

Finally, apart from the exercises involving wage decomposition and the comparison of wage and productivity gaps, some studies employed manufacturing data to examine the gender-ethnicity intersectionality and the effects

of market institutions on the gender wage inequality in Africa. Using the 2004 Tanzanian Household Worker Survey, which collected information on earnings in the manufacturing sector, Elu and Loubert (2013) examined the intersectionality of ethnicity and gender as a source of gender inequality. In a quantile regression, the study indicated that gender alone is not an independent source of earnings differentials in the Tanzanian manufacturing sector. However, the interaction of gender with ethnicity revealed that women who belong to five different ethnic groups, in contrast to the other fourteen ethnic groups, faced earnings discrimination and lower returns to schooling.

On the effects of market institutions on the gender pay gap, Temesgen (2008) used establishment-level data for the urban manufacturing sector of Nigeria. The study found that market institutions such as unions and firm characteristics affect the level of gender wage inequality in Nigeria. Women are less likely to benefit from union wage premia and that the wage gaps are higher in unionized firms because women are generally less likely to join unions. On the other hand, the study indicated that public enterprises are more gender-egalitarian compared with private firms. Besides, firm-level investment in workers' training plays an important role in narrowing the gender wage gap.

5 Summary and Conclusion

The works reviewed above laid out some of the main causes of gender wage inequality in SSA. Table 1 provides a summary of the wage decomposition results of some of these studies. Although it is difficult to rank causes of the gender wage gap in the region, the major factors identified include:

1. **Discrimination**: Studies have found a substantial amount of wage gaps unexplained by the observed worker, occupation, and industry characteristics (see, Table 1). In some cases, women's relatively higher levels of schooling and other productivity-enhancing characteristics served to lower the gender wage gap. However, differences in returns to these characteristics still remained excessively high as evidenced by the negative contribution of the differences in characteristics and the more than 100% contribution of the unexplained component to the total gender wage gap.[10] The unexplained portion of the gender wage gap may reflect labor market biases and discrimination against women in Africa. It may also capture the roles of social norms, religion, and ethnicity in the allocation of labor and gender disparities in labor market outcomes.

Table 1 Summary of wage decomposition results of empirical studies using African data

Paper	Country (Data year)		Mean log wage gap	Explained	Unexplained
Appleten et al. (1999)	Ethiopia (1990)	Private	0.56	14%	86%
		Public	0.20	−18%	118%
	Uganda (1992)	Private	0.38	4%	96%
		Public	0.31	41%	59%
	Cote d'Ivoire (1985, 86,87)	Private	−0.05	−260%	360%
		Public	0.24	47%	53%
Glick and Sahn (1997)	Guinea (1990)	Self-employment	0.79	44%	56%
		Private wage	−0.05	−380%	280%
		Public wage	0.18	23%	77%
Siphambe and Thokweng-Bakwena (2001)	Botswana (1995/6)	Private	0.84	34%	66%
		Public	0.92	67%	33%
Kolev and Robles (2010)	Ethiopia (2005)	No control for job characteristics	0.74	81%	19%
		Control job for job characteristics		58%	32%
Nordman et al. (2011)	7 West Africa cities (2001–2003)		0.69	41%	59%
Bhorat and Goga (2013)	South Africa	10th percentile	0.63	41%	59%
		50th percentile	0.35	24%	76%
		90th percentile	0.07	−303%	403%
Nordman et al. (2010)	Madagascar	2001	0.23	66%	34%
		2005	0.22	62%	38%
Baye et al. (2016)	Cameroon (2005, 2010)	25th percentile	0.36	16%	84%
		50th percentile	0.20	63%	37%
		75th percentile	0.20	51%	49%
Nordman and Wolff (2009a)	Morocco	10th percentile	0.12	45%	55%
		50th percentile	0.23	40%	60%
		90th percentile	0.39	53%	47%
Nordman and Wolff (2009b)	Mauritius (2005)		0.37	40%	60%
	Madagascar (2005)		−0.07	42%	−142%
Temesgen (2006)	Ethiopia (2002)		0.27	40%	60%
Kabubo-Mariara (2003)	Kenya (1994)	Private	0.90	28%	72%
		Public	0.42	22%	78%

Source Authors compilation

2. **Job characteristics and industryaffiliation**: The type of employment (formal, informal, and self-employment) and industry characteristics account for a larger proportion of the explained component of the gender wage gap. In many cases, job characteristics are less favorable for women in Africa. The reviewed studies show that wage and earning gaps are much higher in the informal and self-employment sectors in which women are overrepresented. The concentration of women in jobs less favorable to them indicates the presence of structural and socioeconomic factors leading to job segregation and job discrimination against women.
3. **Firm selection**: Studies indicated that accounting for firm heterogeneity in the wage regressions reduces the magnitude of the gender wage gap, reflecting the effect of a selection process that leads to the presence of high-paying firms for men and low-paying firms for women.[11]
4. **Education gap**: Education plays an instrumental role in combating gender-based economic inequality by reducing the opportunity and earnings gaps between male and female workers. Higher educational attainment increases labor market participation, productivity, and wages of women. Studies showed that education increases the probability of women entering formal private and public wage employment in which the gender earnings gap is lower than the informal wage employment and self-employment sectors.[12] In the manufacturing sector, returns to education are positive and serve to reduce the male–female wage gap.[13] Besides, gender differences in education account for a significant proportion of the wage gap due to differences in attributes.
5. **Experience gap**: Continued and uninterrupted occupational experience and labor market attachment benefit women and explains a significant component of the explained gender wage gap next to education. However, throughout Africa, women are responsible for most domestic works, including parenting and taking care of the elderly. Such obligations reduce their attachment to the labor market and the prospects to advance human capital.

To sum, apart from the above general observations, the review provides a glimpse of the labor market heterogeneities in SSA countries. Results show significant variations in the magnitude and underlining causes of gender wage inequalities across countries. However, there is a significant void in the literature with respect to the dynamics of gender-based wage inequalities over time and across sectors. There are only a few studies that address the issue in the manufacturing sector. In addition, research on institutional factors that may

affect male–female wage and employment inequalities is largely absent. Institutions such as collective bargaining, labor regulations, and policies on wage discrimination could influence gendered labor market outcomes. The roles of social, cultural, and religious practices and governance systems also need a thorough examination.

Notes

1. While life expectancy and mean years of schooling for females and males are readily available from different data sources, the report generates estimates of gross national income per capita for female and male based on the respective shares of the economically active population and the total population. For more details, refer to UNDP (2018).
2. The most current available data on HDI is the 2017 data.
3. The index incorporates data on materiality mortality rate, adolescent birth rates, proportion of parliamentary seats occupied by females, proportion of adult females and males (aged 25 years and older) with at least some secondary education, and the female and male labor force participation rates.
4. The surveys were the "Integrated Survey of Uganda" (1992), "Survey of Adolescent Fertility, Reproductive Behavior and Employment Status of the Youth Population in Urban Ethiopia" (1990), and the "Living Standards Measurement Surveys of Cote d'Ivoire" (1985, 1986 and 1987).
5. The studies used household surveys for Guinea (1990) and Kenya (1994) and estimated a Mincerian earnings function for men and women in each employment type by including selection bias terms (inverse Mill's ratios) to account for selection bias of employment in a given sector.
6. Job characteristics include the sector of activity, types of wage employment, terms of employment, and occupation. Human capital characteristics include education, potential experience, and training.
7. Lome is an exception where about 45% of the gap remained unexplained by such labor market features.
8. Gaps are actually negative (meaning that females earn more than males on average) in the public sector in Niamey and the private sector in Ouagadougou.
9. The data was collected by the Regional Program for Enterprise Development (RPED) of the World Bank and the Center for the Study of African Economies (CSAE).
10. See, Appleton et al. (1999) for Ethiopia, Glick and Sahn (1997) for Guinea in the private sector, and Bhorat and Goga (2013) for South Africa in the 90th percentile income group.
11. See, Fafchamps et al. (2009), Nordman et al. (2010), Nordman and Wolff (2009b), and Abegaz and Nene (2018).
12. See, Glick and Sahn (1997) and Kabubo-Mariara (2003).

13. See, Fafchamps et al. (2009) and Temesgen (2006). The exception from the reviewed studies is Nordman and Wolff (2009a) for Morocco in which education does not contribute to reducing the wage gap.

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