Job quality deprivation in Ghana and South Africa: How does gender matter?

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Introduction

The efforts to attain and maintain a modicum of economic security define the lives of the vast majority of employed people and those seeking employment. For many, especially women and the socially marginalized (e.g., migrant workers), these struggles often involve encountering physical and mental insecurity from various forms of violence at work or while commuting, the dangers posed by employment with few safety precautions, and a host of other adverse circumstances such as the poor physical infrastructure of the spaces they inhabit. In the eyes of many, a "good job" is seen as the path to economic security. But what is a "good job," and does it translate into economic security? And, what are the chances of getting and keeping a "good job"? What happens to those who fail? These questions also concern academics and policymakers.

Employment security refers to the capacity of the formal and informal institutions to deliver protection against economic risks faced by employed individuals and facilitate their economic advancement. It is related to, but not exclusively, the ability of the employed person to obtain an adequate level of cash earnings. Indeed, one of the key reasons to study employment security is to examine its relationship with cash earnings. Since most available measures of job or employment quality (e.g., those included in the United Nations' Sustainable Development Goals) encompass the earnings dimension in addition to aspects of employment security, the latter can be considered a subset of broader measures of employment quality. However, institutions that facilitate employment security, such as unions, are of intrinsic interest as well.

Generally, state-sponsored or state-facilitated institutions exist, with varying degrees of adequacy, to protect against the risks of old age, sickness, or disability, as well as short-term unemployment, in all high-income countries. In low and middle-income countries where the welfare state institutions are weak or nonexistent, the situation is quite different. At least some such protections, however scant they might be, is available mainly to the "labor aristocracy"[1] of these countries—a relatively small group of well-paid people in formal employment—of the vast pools of wage and salary workers (hereafter referred to as employees), as well as own-account workers (including unpaid family workers). Most employed rely solely on income and nonwage benefits from employment for their economic security in societies with

[1] In the context of the development of the English working class, Friedrich Engels first introduced the concept of 'labor aristocracy' in his correspondence with Marx as early as 1858, referring to the English proletariat becoming 'more and more bourgeois.' The concept was further developed in the 1870s–1890s, where Engels argued that a stratum of skilled, unionized, and relatively privileged workers in England had been 'bourgeoisified' or co-opted by the capitalist system. Engels further argued that by the late 19th century, a section of the English working class had distanced itself from the rest of the proletariat due to higher wages, stable employment, access to unionization (Engels, 1858; 1891).

weak welfare state institutions that do not provide a reasonable degree of financial security, thus placing them in various degrees of precarity depending on their employment contract (implicit or explicit), individual earnings, family income, family background, etc.[2]

Research and policy focusing on the quality of employment and employment security in low- and middle-income countries received a boost following the development of the Decent Work Indicators by the International Labour Organisation (ILO) since the early 2000s. These indicators were designed to monitor progress toward the four broad strategic goals of employment creation, social protection, rights at work, and social dialogue (International Labour Organisation, 2013). The United Nations has since incorporated these goals into the UN's 2030 Agenda for Sustainable Development, which calls for inclusive economic growth and full and productive employment that satisfies decent work characteristics.

Among other multilateral organizations, similar work was undertaken by the Organization for Economic Co-operation and Development (OECD) and the UN Economic Commission for Europe (UNECE) to develop indicators of employment quality (Cazes, Hijzen, and Saint-Martin, 2015; UN Economic Commission for Europe, 2015). Most recently, researchers at the World Bank have also produced a job quality index for a large group of countries in the developing world (Hovhannisyan et al., 2022). In contrast to the indicators described by the ILO, UNECE, and OECD, the World Bank measure is constructed at the individual level using microdata, which aligns with some previous research on testing dual labor market theories (see, e.g., Dickens and Lang, 1985).

We aim to contribute to this body of work on developing employment quality indicators for Ghana and South Africa, with a focus on gender disparities among employees. Specifically, we focus on three questions. First, what is the relationship between factors that may contribute to the individual's access to various nonwage benefits and the individual's entitlement? We consider an individual's employment relationship as conducive to the receipt of nonwage benefits if it is characterized by the existence of a written contract, expected job permanency, and union mediation. Our choice of nonwage benefits and indicators to characterize the employment relationship primarily reflects the consideration that we should be able to measure them using the microdata files of both countries, rather than our belief that the characterization and benefits constitute the best possible combination. In light of recent research reporting the favorable impact of unionization on the receipt of nonwage benefits, especially among women workers in Ghana, our research will contribute by extending the findings on Ghana and conducting a

[2] "…the phase of economic development *after* the emergence of a large class of wage labourers but *before* the developments of social security arrangements is potentially a deeply vulnerable one." (Amartya Sen, *Poverty and Famines*, 1981, p.173; quoted in Wuyts (2001). Although Sen refers to wage workers, the vulnerability also applies to own-account workers that own little or no means of production and employs no paid workers.

comparative exercise with South Africa (Owoo et al., 2020; Owusu-Afriyie, 2025). An interesting phenomenon identified in previous research is the fact that a sizeable proportion of workers report that they are not entitled to legally mandated nonwage benefits (such as pension coverage). This raises the possibility that access to certain benefits may not be a job characteristic in practice, but also depend on individual characteristics (e.g., educational attainment) that may differ along gender dimensions. Therefore, we explicitly consider the interaction between gender and the characteristics of the employment relationship in our analysis.

We then construct an employment quality index that combines two dimensions: access to nonwage benefits and favorable characteristics of the employment relationship. Following the analytical approach of multidimensional poverty analysis, we use the index to characterize the degree of job quality deprivation among employees. We also examine, using decomposition analysis, the main drivers of the gap in the index between the two countries. Furthermore, the available evidence from the large sample of developing countries studied by Hovhannisyan et al. (2022) indicates that the average values of the composite index of employment quality are practically identical for men and women. We assess if this holds for Ghana and South Africa. A multivariate analysis is undertaken to examine the roles played by individual-level characteristics, such as gender and living in a household with young children, and job characteristics, e.g., occupation, in driving individual differences in the degree of job quality deprivation.

Finally, we examine the relationship between the variables related to employment quality and gender wage gaps. Available composite indices of employment quality for South Africa show that, overall, there is no notable gender disparity (Yu, 2020; Mackett, 2020). Insofar as differences in employment quality indicators reflect labor market segmentation, the evidence suggests that it is absent along gender lines. However, other researchers have pointed to the existence of gender-based labor market segmentation in Ghana and South Africa. Our analysis aims to illuminate this paradox by examining various components of employment quality, their interaction with gender, and their potential impact on gender pay differentials after controlling for relevant covariates, such as educational attainment and sector of employment.

Employment relations and nonwage benefits

Background

The absence of a written employment contract often implies that the terms of employment, such as pay, the length of employment, and entitlement to mandatory benefits, may be subject to more contestation between the employer and the individual employee than in the presence of a written contract. Given the structurally weaker position of the employee (especially when there is no collective bargaining or welfare

state institutions), the contestation regarding employment conditions, if it arises, tends to settle in favor of the employer, irrespective of the presence of a written contract. The legal challenges to such outcomes by the employee or their representatives may be more effective if the outcomes can arguably be shown to violate the letter or spirit of a written contract. Of course, the degree of prevalence of written employment contracts is also a function of how economic relations in general (not just those concerning employment) are formalized in terms of written contracts.[3]

Perhaps because of the ambiguity in its interpretation, the International Labour Office did not use the absence of a formal contract as an indicator of informal employment, employment stability, or employment insecurity in its proposed indicators of decent work.[4] In contrast, the United Nations Economic Commission for Europe (UNECE) included the presence of a formal contract as an indicator of employment security because it considers this as a risk factor for the employees, i.e., they do not have a clear idea regarding what to expect from their employer regarding work conditions such as protection from dismissal (UN Economic Commission for Europe, 2015:206). World Bank researchers considered, without providing any argument or evidence, the presence of a written contract as an indicator of employment stability and included it in their measure of job quality (Hovhannisyan 2022:14). Empirical literature on South Africa (Yu, 2020; Mackett, 2020) and Ghana (Opoku, Nunoo and Kofinti, 2024) has treated the presence of a written contract as an indicator of employment security.

In South Africa, the legal system relies on common law and South African legal precedents to offer protections to employees under the nation's labor laws, rather than exclusively on the formal written contract between an individual employee and employer (Fourie and van Staden, 2022).[5] However, the judicial system generally intervenes after the violation has occurred. It appears that a written formal contract has reduced the incidence of violations of minimum wage laws in South Africa. We can speculate that this may also apply to other abuses such as arbitrary dismissal or denial of mandatory benefits (Benjamin 2013:17). In Ghana, the law requires that all wage workers (except casual workers) that are employed for six months or more within a year should be issued a written employment contract

[3] For a general discussion of the issues related to market institutions in the context of sub-Saharan Africa, see Fafchamps (2013). An alternative view regarding the legal systems of African countries previously under British colonialism is offered in Táíwò (2010: 157-201).

[4] In fact, the ILO recommended that the absence of a written contract should not be considered as a sufficient criterion for informal employment (International Labour Organisation, 2013: 44). The measure of insecurity or precarity proposed is the percentage of workers with short-term contracts (written or verbal). (International Labour Organisation, 2013: 127).

[5] For example, the Constitutional Court ruled in 2008 that a foreign national without legal authorization to work should be considered as an employee eligible for protection under labor laws even in the absence of a formal written contract. A similar ruling was issued in 2010 in the case of a sex worker, although sex work is illegal in South Africa (Fourie and van Staden, 2022: 567).

within two months from the start date of their employment. The law in South Africa requires a written contract to be signed at the start of employment. However, a written contract is not always required for protection under the prevailing labor laws for the Ghanaian wage workers, just as in South Africa, although the degree of constitutional provisions and enforcement appears to be weaker in Ghana (see Gyesi (2021) for a comparison of the two countries). In sum, we believe that the presence of a written contract contributes to the protection of employees' rights as employees (under the prevailing labor laws) and as citizens with vulnerabilities.

Unions are, in general, central to the protection and advancement of employees' rights, working conditions, and pay. Of course, they can and have played a larger role in ushering in progressive legislation and social change that moves societies towards greater justice and equality. In most OECD countries, unions have historically played a key role in the creation and expansion of nonwage benefits, such as pensions and medical insurance (see, e.g., Buchmueller, DiNardo, and Valletta, 2005). An additional aspect of union influence is promoting employees' awareness of the range and scope of nonwage benefits available to them, which has been termed the "facilitation effect" by John Budd (Budd, 2007). Recent research on Ghana, using household survey data, has found some evidence of the facilitation effect concerning nonwage benefits (Owoo et al., 2020; Owusu-Afriyie, 2025). Employers may not have an incentive to promote such awareness because it may lead to greater utilization of nonwage benefits and, therefore, potentially higher labor costs. We should also note that written contracts can play a similar role in that they clearly outline the benefits available with the job.

In addition to written contracts and unions, the duration of the employment contract also affects entitlement to nonwage benefits. As noted above (see note #2), the ILO considered employees with short-term contracts to be in precarious employment. The UN Economic Commission for Europe posited that short-term contracts often create psychological stress, insecurity, and financial risk (UNECE 2015:188). The prevalence of such contracts was seen as an element of employment security. Previous research on South Africa has also considered holding employment contracts with permanent duration as a contributor to employment security (Yu, 2020). A condition of precarity is often accompanied by a lack of access to employer-provided nonwage benefits, which are typically available to permanent workers. It can also deprive workers of other favorable working conditions. For example, as noted above, casual workers in Ghana are not required to have written employment contracts. Further, holding short-term contracts subjects workers to relatively more adverse terms of employment termination in Ghana.[6]

[6] Section 17 of the Labour Act 2003 provides that for employment contracts with a duration of three years or above, one month's notice should be served, whilst for employment contracts with less than three years, two weeks' notification applies. In the case of weekly contracts, seven days' notice is required.

Employer-provided nonwage benefits that are subject to query in (at least one round of) the labor force surveys in Ghana and South Africa are: medical insurance, pension coverage, vacation, sick leave, maternity leave, and paternity leave (only in South Africa). A summary of existing legal provisions regarding these benefits is provided in Table 1.

Table 1 Legal provisions regarding nonwage benefits and employment relations

Indicator	Ghana	South Africa
Paid vacation	15 working days with full pay in a calendar year of continuous service.	Minimum of three weeks
Paid sick leave	No mandate	One day of paid sick leave for every 26 days worked.
Maternity leave	A woman worker is entitled to a period of at least twelve weeks with full remuneration and other benefits.	Four consecutive months of maternity leave
Paternity leave	Not applicable	10 days
Unemployment insurance	Not applicable	From 1996, extended to domestic workers in 2002. Eligibility is based on being registered and making contributions. The maximum duration of benefits that can be claimed is for a period of up to one year (365 days) for every four years of employment.
Health insurance/Medical benefits	Requires employers to ensure their workers are registered with the National Health Insurance System.[1] Employer-provided health benefits are not mandatory.	No mandatory employer medical aid.

Pension	Three-tier system: a mandatory basic national social security scheme, a mandatory fully funded and privately managed occupational scheme, and a voluntary fully funded and privately managed provident fund and personal pension scheme. Contributions from employers and employees fund the first two tiers.	No mandatory public system; discretionary employer-provided pension coverage for private sector workers; and separate pension coverage for civilian government employees

Notes: 1. The National Health Insurance System (NHIS) is the social health insurance program in which enrollment is mandatory for all residents of Ghana.

A key element of economic security is health insurance, as incurring relatively sizable health expenditures for oneself or dependents can drain the financial resources available to meet other needs and may even lead to impoverishment. While access to adequate healthcare need not be via employment-based health insurance, employment is key to obtaining healthcare through private insurance or out-of-pocket expenditures in countries without a robust public healthcare system. In Ghana, approximately two-thirds of all employees report having some form of coverage; however, almost 90 percent of the same individuals also state that the largest portions of their healthcare expenditures are usually paid for by themselves or their family members, with only 7 percent naming the NHIS as the main payer.[7] Unlike Ghana, South Africa does not have a mandatory public health insurance system. The country's healthcare system has been described as made up of "… a large poorly funded public sector and a smaller better resourced private sector." (de Villiers 2021:3) According to a recent survey, only 13 percent of the adult population have private health insurance (Odipo et al., 2024), and as we shall discuss later, even among employees the coverage rate was only 30 percent in 2022.

Regarding pension coverage, Ghana has a public old-age insurance benefit (social security) system. In contrast, South Africa lacks such a system, leaving employees to rely on individual savings, private pension plans, and government cash assistance to support themselves in old age. However, South Africa

[7] Authors' tabulations based on the public-use datafile from the Annual Household Income and Expenditure Survey (AHIES) 2022. Healthcare variables used for the tabulations were s3bq2 (whether covered or not) and s3aq23 (who usually pays for the largest portions of health expenses. Sarkodie (2021) provides an analysis of the NHIS in terms of its impact on healthcare utilization, while the World Bank discussion paper by Agyekum et al. (2024) offers a broader view of the Ghanaian healthcare system and its financing with a special focus on the NHIS.

has a public unemployment insurance fund that provides income support to eligible unemployed individuals, while there is no such protection available to Ghanaian wage workers.

Women are peculiarly vulnerable to employment insecurity because they are likely to go on maternity leave. The legal requirement that female workers can take paid maternity leave and return to their jobs at the end of it is essential for bolstering their employment security. In Ghana, a woman worker is entitled to at least twelve weeks of paid maternity leave with full remuneration and benefits. In contrast, South Africa provides four consecutive months of maternity leave under the Basic Conditions of Employment Act (BCEA), but this leave is generally unpaid. However, employees who have contributed to the Unemployment Insurance Fund (UIF) may claim partial income support (38–60% of earnings) during this period. Unlike Ghana, South Africa also offers paternity leave, which can support greater gender equality in the division of caregiving responsibilities, though this entitlement provides only 10 consecutive days of unpaid leave following the birth of a child.

Paid vacation and sick days are crucial for workers to maintain their physical and mental capabilities. We should also consider it a fundamental human right. Article 24 of the Universal Declaration of Human Rights states: “Everyone has the right to rest and leisure, including reasonable limitation of working hours and periodic holidays with pay.” (see Richards and Carbonetti, 2012). Paid vacation days can also enhance engagement in non-employment-related activities that contribute to a fuller life (Davison and Blackburn, 2023) In Ghana, workers are entitled to 15 working days of paid vacation per calendar year of continuous service, whereas in South Africa, the legal minimum is three weeks of paid leave per year. Moreover, paid sick leave protects workers from income loss and supports recovery from temporary illness. However, Ghana has no legal mandate for paid sick leave, while in South Africa, employees are entitled to one day of paid sick leave for every 26 days worked during the first six months of employment. After this period, they are entitled to the equivalent of six weeks of paid sick leave over a 36-month cycle.

Empirical evidence

We now turn to the empirical evidence on nonwage benefits in Ghana and South Africa. The primary sources of information for Ghana are the 2012-2013 and 2016-2017 rounds of the Ghana Living Standards Survey (GLSS), as well as the 2022 round of the Annual Household Income and Expenditure Survey (AHIES) (Ghana Statistical Service (GSS), 2012; 2017; 2023). For South Africa, we rely on the 2013, 2017, and 2022 rounds of the Labour Market Dynamics (LMD) data files, which are compiled from the Quarterly Labour Force Surveys (QLFS), particularly the data assembled in the PALMS database from the QLFS (Statistics South Africa, 2013; 2017; 2022; Kerr, Lam, and Wittenber, 2019). Detailed information regarding the data used in the paper is provided in Appendix A1 (Ghana) and Appendix A2 (South Africa).

We measured the prevalence of nonwage benefits using dummy variables. If an employee reports entitlement to a benefit, the dummy variable representing the benefit takes a value of 1 for the employee; otherwise, the variable takes a value of zero. We also measured the occurrence of factors that promote employee access to benefits in a similar vein: If the employee has a characteristic that can potentially enable entitlement, we code the dummy variable for that characteristic as 1 for the employee and as zero otherwise. The average value of a dummy variable representing either a benefit or characteristic in a given group (e.g., women) indicates the incidence of that benefit or characteristic in that group.

We find the incidence of nonwage benefits is generally higher in South Africa. (Table 2). Not a single benefit was designated as an entitlement by even half of all employees in Ghana. In contrast, all benefits except medical coverage reach about half or more of all employees in South Africa. Among the benefits, employer-provided medical coverage is the least prevalent in both countries. Similarly, in Ghana and South Africa, the most widely reported entitlements by both sexes are paid holiday and sick leave (except Ghana in 2022, where they rank below pension coverage). As we noted, pension coverage and paid holidays are mandatory in Ghana. Yet, they are far from universal. Another mandatory benefit, maternity leave, is also reported as an entitlement by around one-third of all women employees in Ghana and more than half of all women employees in South Africa.

Table 2 Incidence of nonwage benefits and characteristics favorable to their recipiency among employees (15 years or older), percent, by country and sex: 2013, 2017, and 2022

		Ghana				South Africa			
		All	**Male**	**Female**	**Difference**	**All**	**Male**	**Female**	**Difference**
2013	Pension	37.9	38.0	37.6	0.4	47.6	50.5	44.2	6.3*
	Medical	21.8	22.5	20.2	2.3	31.4	32.6	30.0	2.6*
	Holiday	44.3	43.6	46.0	-2.4	63.1	64.6	61.3	3.3*
	Sick Leave	45.4	45.5	45.2	0.3	68.1	69.4	66.6	2.8*
	Natal leave	10.1	N.A.	33.2	N.A.	52.4	51.0	54.1	-3.1*
	Written contract	41.7	40.9	43.3	-2.3	80.2	81.5	78.7	2.8*
	Permanent job	67.6	68.7	65.2	3.5*	62.7	64.1	61.1	3.0*
	Union	31.1	31.5	30.0	1.6	29.0	31.1	26.5	4.6*
2017	Pension	35.5	34.6	37.3	-2.7	47.9	50.4	44.8	5.6*
	Medical	20.4	20.3	20.5	-0.2	30.0	30.8	29.0	1.7*
	Holiday	39.7	37.3	44.7	-7.4*	66.7	68.2	64.9	3.3*
	Sick Leave	40.7	38.7	44.7	-6.0*	71.1	72.4	69.6	2.8*
	Natal leave	11.2	N.A.	34.6	N.A.	58.0	57.1	59.1	-1.9*
	Written contract	44.4	43.1	47.0	-3.8*	80.4	80.1	80.6	-0.5
	Permanent job	85.5	85.8	85.1	0.7	61.6	63.3	59.6	3.7*
	Union	35.0	35.5	34.1	1.4	29.3	31.0	27.3	3.7*
2022	Pension	39.4	38.5	41.0	-2.5	46.1	47.1	44.9	2.2*
	Medical	19.4	20.8	17.0	3.8*	29.9	29.4	30.6	-1.2*

		Ghana				South Africa			
		All	**Male**	**Female**	**Difference**	**All**	**Male**	**Female**	**Difference**
	Holiday	35.4	33.4	38.8	-5.4*	65.6	65.6	65.5	0.1
	Sick Leave	37.4	36.4	39.1	-2.6	71.8	72.0	71.6	0.4
	Natal leave	11.2	N.A.	30.0	N.A.	53.5	50.6	56.9	-6.3*
	Written contract	47.7	45.5	51.4	-5.9*	82.4	81.6	83.3	-1.7*
	Permanent job	86.8	88.8	83.5	5.3*	61.1	62.1	59.8	2.3*
	Union	37.7	38.8	35.9	2.9	30.3	31.2	29.3	1.9*

Notes: (1) "Difference" shows the result of subtracting the average value for women from the average value for men. (2) "Union" refers to a unionized workplace in Ghana and union membership in South Africa. The estimates for Ghana in 2017 and 2022 are imputed (see Appendix for a discussion of the imputation procedure). (3) The variable "Permanent" was imputed for Ghana in 2013 because the survey did not contain the relevant question (see Appendix for details). (4) *– difference is significant at the 5 percent level. (5) "N.A."– Not available. (6) Total number of observations for Ghana: 5802, 5232, and 3814 for 2013, 2017, and 2022. (7) Total number of observations available for South Africa: 72117, 60374, and 43469 for 2013, 2017, and 2022.

Our estimates show that the percentage-point differences in recipiency rates (shown in the column with the heading "Difference") of nonwage benefits between men and women are generally not statistically significant in Ghana. The only exceptions to this occur for paid holidays and sick-leave entitlement in 2017, and paid holidays and medical coverage in 2022. For sick leave and holidays, women register a higher incidence, while men fare better in terms of medical coverage. South Africa represents a stark contrast, as gender differences are statistically significant in most cases, except for holiday and sick leave entitlement in 2022, when there is gender parity. Once again, as distinct from Ghana, female disadvantage is the norm across benefits except for medical coverage in 2022. Although Ghanaian labor law provides for maternity leave entitlement, only 30 percent of women employees reported access, compared to 57 percent in South Africa.[8] Paternity leave is also an entitlement in South Africa (not in Ghana), and roughly half of male employees replied "Yes" to the question regarding this benefit.

Commented [1]: Nthabiseng: You indicated that paternity leave was began only in 2020. I am puzzled by so many men saying that they are entitled to it in the surveys. Are we missing something?

We have presented the estimates of the mean values of the factors potentially enabling access to nonwage benefits—written contract, permanent status, and unionized workplace or union membership—in Table 2, below the list of benefits for each country and year. Comparisons between the countries reveal that fewer than half of all employees in Ghana have written contracts, compared to around 80 percent in South Africa. Despite this stark difference, a significantly larger proportion of employees in Ghana report that their jobs are permanent (87 versus 61 percent in 2022). The absence of a written contract does not preclude the perception that the job is permanent for a sizable proportion of Ghanaian employees. Unionization levels (although unionized workplace and union membership are not strictly comparable measures) in the two countries are more similar than the presence of written contracts or permanent jobs.

[8] It is important to note that maternity leave entitlement is fully paid in Ghana and not in South Africa, unless employees request (partial) income support through UIF.

In fact, in 2013, the unionization measures showed a value of 31 percent in both countries. However, since then, we estimate that the share of workers in unionized workplaces rose to 38 percent in Ghana, while the share of workers who belonged to a union remained steady in South Africa.[9]

Turning to the question of gender disparities in the enabling factors behind nonwage benefits, the Ghanaian picture is mixed. There is no statistically significant gender gap in unionization. However, we find a significant female disadvantage in having permanent jobs in 2013 and 2022, and a female advantage in the incidence of written contracts in 2017 and 2022. In South Africa, the picture is clearer, pointing to a female disadvantage. Men are found to have a greater frequency of unionization and permanent jobs across all years. For written contracts, the incidence was higher for men than women in 2013, while the roles were reversed in 2022, with no significant gender gap observed in 2017.

In summary, our examination of the average values suggests that the incidence of gender gaps in nonwage benefits and their enabling factors is not, in general, substantial in Ghana. At the same time, it appears to be so in South Africa. However, we should probe further to assess the roles of the enabling factors in shaping the access to each type of nonwage benefit and the potential gender biases that may exist in the role of each enabling factor. In this section, we begin our analysis using simple models to describe the data (without implying causality) and undertake a more comprehensive multivariate analysis later.

We use logistic models of the following type for each country:

$$y_i = \alpha + \beta_1 F_i + \beta_2 X_{i1} + \beta_3 X_{i2} + \beta_4 X_{i3} + \beta_5 (F_i X_{i1}) + \beta_6 (F_i X_{i2}) + \beta_7 (F_i X_{i3}) + \beta_8 P_1 + \beta_9 P_2 + u_i, \quad (1)$$

with $i = 1,2,..,N$, and N representing the number of employees in the country. The dependent variable is a dummy variable that indicates the receipt of a nonwage benefit (except maternity leave in Ghana) for person i. As independent variables, we have dummies that indicate whether the person is a woman (F_i), has a written contract (X_{i1}), a permanent job (X_{i2}), and is unionized (X_{i3}). In addition, our model also includes potential interaction effects (captured by parameters β_5 through β_7) between gender and each of

[9] Our unionization estimates for Ghana in 2017 and 2022 are imputed estimates (as noted in the Notes to Table ##) because the Ghanaian surveys dropped the question regarding unions that were included in the previous waves of the GLSS. Estimates by the ILO of trade union density and collective bargaining coverage rate for Ghana are 17 and 37 percent in 2019 (https://ilostat.ilo.org/methods/concepts-and-definitions/description-industrial-relations-data/#elementor-toc__heading-anchor-1). Trade union density is estimated from administrative data and a number of sources are used to arrive at the collective bargaining coverage rate. The ILO estimates for South Africa are based on the same source as ours, the LFS, and have values of 29 and 30 percent in 2019 for trade union density and collective bargaining coverage rate. Most relevant to our discussion here is that the measures for South Africa shows very little change since 2013, while the collective bargaining coverage rate for Ghana shows a rising trend. Our estimates, anchored as they are on the ILO benchmark reflects this trend. We believe that, in principle, the percentage of employees in unionized workplaces is much closer to the collective bargaining rate than to trade union density.

the enabling factors. Because we noted shifts in some recipiency rates across the years, we also include fixed effects for the periods, as represented by P_1 and P_2. The intercept term is represented by α, and we assume that the error term, u_i, is independent of the regressors and has the standard logistic distribution. Since there is no paternity leave in Ghana, the maternity leave model for Ghana takes the following form:

$$y_i = \alpha + \beta_2 X_{i1} + \beta_3 X_{i2} + \beta_4 X_{i3} + \beta_7 P_1 + \beta_8 P_2 + u_i \quad (2)$$

with $i = 1,2,..,N_w$, and N_w representing the number of women employees in Ghana.

The model for each country and benefit was estimated by pooling observations from all three years, leading to a total of ten different models. Since that represents a large number of estimates to report, we include the details in Appendix A3 and focus on the main results here. Let us first consider the results of testing for the significance of the parameter estimates in the models (Table 3).

Table 3 Results from testing the significance of parameter estimates in nonwage benefit models, by country, 2013-2022

	Significant at 5% level?									
	Ghana					**South Africa**				
	Pension	Medical	Holiday	Sick Leave	Natal leave	Pension	Medical	Holiday	Sick Leave	Natal leave
Intercept	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Female	No	No	Yes	Yes		Yes	Yes	Yes	Yes	Yes
Written contract	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Permanent job	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Union	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Female * WritContract	No	Yes	No	Yes		No	No	Yes	Yes	Yes
Female * Permanent	Yes	Yes	No	No		Yes	Yes	No	No	Yes
Female *Union	Yes	Yes	No	No		Yes	Yes	Yes	No	Yes
Year 2017	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Year 2022	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The results reported are based on *t*-tests of the parameters shown in equations (1) and (2) in the text. The degrees of freedom for the tests were 2416 and 31348 for Ghana and South Africa, respectively. Survey design features (cluster and stratum) are accounted for in the tests.

Each of the enabling factors we described before—written contract, permanent job, and unionization—is statistically significant in the incidence of every nonwage benefit in both countries. We find that the gender of the employee is statistically significant in accessing holiday and sick leave in Ghana. In contrast, gender is significant for every nonwage benefit in South Africa, consistent with our earlier findings regarding the statistical significance of gender differences in the average rates of recipiency. The interaction of gender with the characteristics of the employment relationship conveys a mixed picture, as the significance of the interaction terms appears to vary across benefits and characteristics. For Ghana, all

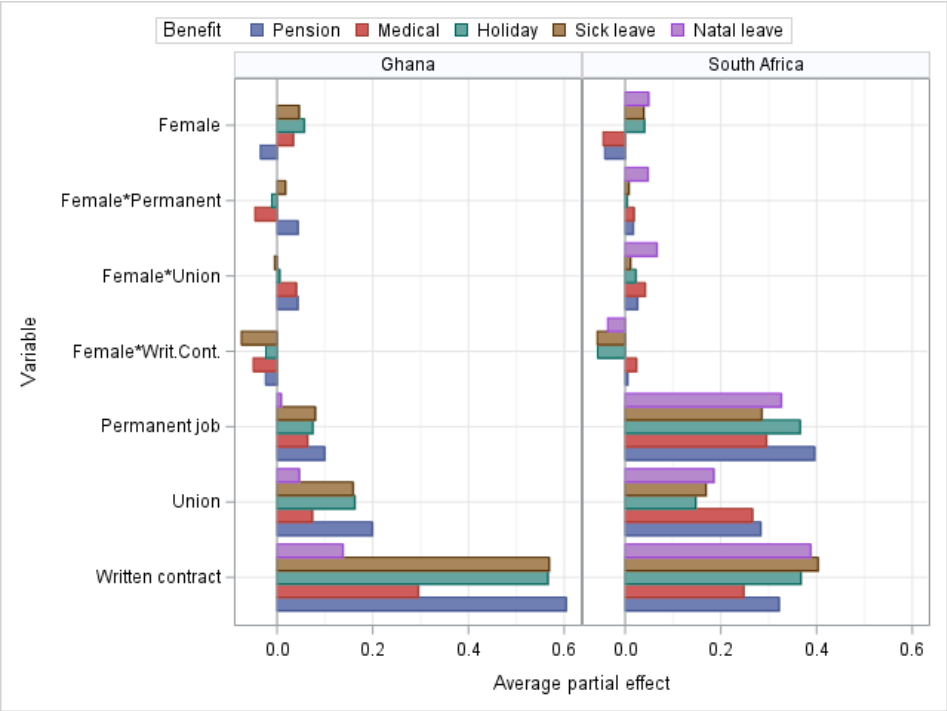
interaction terms are significant for medical benefits, while none are significant for paid holidays. Interaction terms with union and permanent jobs are significant for medical benefits, while only the interaction term with a written contract is significant for sick leave benefits. In South Africa, the probability of receiving all benefits except sick leave is significantly affected by the interaction between gender and union membership. The interactions of gender with the two other enabling factors, permanent job and written contract, were also found to exert a statistically significant impact on three out of the five benefits considered here. Pension and medical benefits equations turned out to have insignificant coefficients for the interaction with written contract, while the same result held for the interaction with permanent job in the equations for holiday and sick leave entitlement.

Apart from the statistical significance of the parameters, we also need to consider their sign and size to assess their economic importance. Since the estimated parameters of the dummy variables from the logit model are not directly comparable, we computed the average partial effects (APE) of the parameters in each model. Since the partial effects of binary independent variables are expressed in terms of their impact on the probability of the recipiency of a benefit, they fall between 0 and 1, and, therefore, can be compared against each other. The APE of the dummy variable X_k is computed as:

$$APE_k = \frac{1}{N}\left[G\left(\hat{\alpha} + \hat{\beta}_1 X_{1i} + \hat{\beta}_2 X_{2i} + \cdots + \hat{\beta}_k\right) - G\left(\hat{\alpha} + \hat{\beta}_1 X_{i1} + \hat{\beta}_2 X_{i2} + \cdots + \hat{\beta}_{k-1} X_{ik-1}\right)\right], \quad (3)$$

where $X_1, X_2, \ldots, X_{k-1}$ are the other regressors in the model, $\hat{\beta}_1, \hat{\beta}_2, \ldots, \hat{\beta}_k$ are the estimated parameters of the k regressors, $\hat{\alpha}$ is the estimated intercept, $G(.)$ is the cumulative logistic function, and $i = 1,2, \ldots, N$ represent the individuals included in the model. We depict the estimated average partial effects in Figure 1.

Figure 1 Average partial effects of the binary independent variables in nonwage benefit models by country, 2013-2022



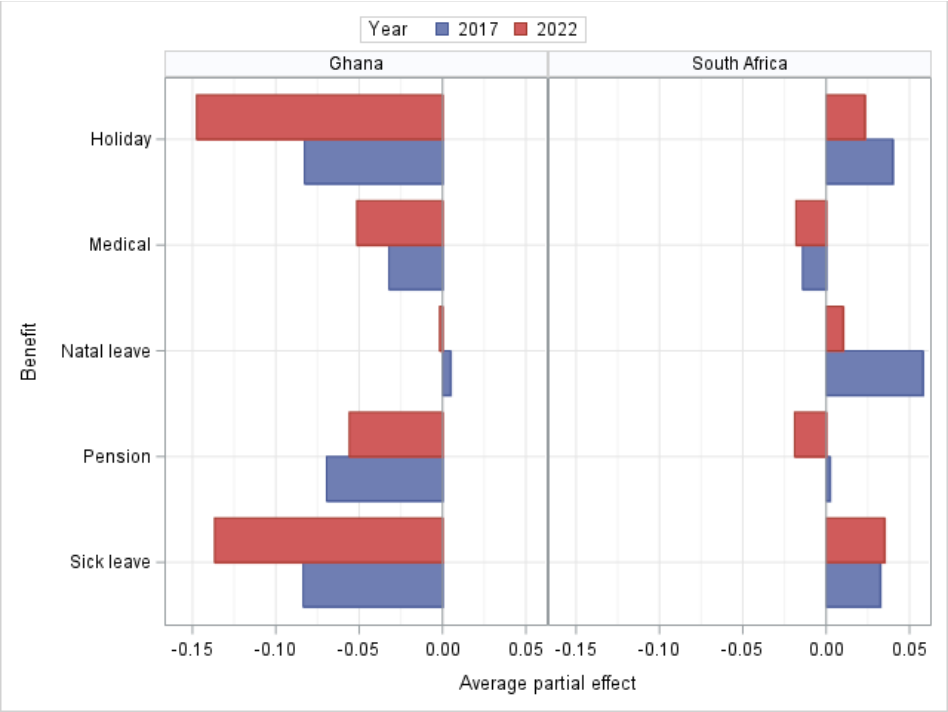
Characteristics of the employment relation, all of which were found to be statistically significant in all models, have a considerable positive impact on the probability of entitlement to nonwage benefits. Among the characteristics, a written contract carries substantially more weight than unionization, followed by a permanent job, in the benefit equations for Ghana. However, in South Africa, the relative importance of permanent jobs and unionization compared to written contracts is higher than in Ghana. Indeed, the partial effect of a permanent job is larger than that of written contracts in accounting for the probability of entitlement to pension and medical benefits. Unionization is also shown to have relatively (relative, that is, to written contracts and permanent jobs) sizeable partial effects in South Africa. Although the levels of unionization are roughly comparable in the two countries, the partial effects in South Africa are notably higher for all benefits, suggesting the greater efficacy of the union facilitation effect in that country. We further investigate the relationship between the incidence of nonwage benefits and employment relations in the next section.

Turning to the gender-related variables, let us first consider South Africa, where the female dummy was statistically significant for all benefits. For pension and medical coverage, the partial effect is actually negative, although the magnitude involved is rather small, at roughly 0.05. On the other hand, the partial effect is positive for holiday, sick leave, and, not surprisingly, for natal leave. In a similar vein, we observe a positive impact for holiday and sick leave benefits in Ghana as well; as noted before, the female dummy was significant only for these two benefits in the Ghanaian equations. Once again, the size of the positive effect in both countries is relatively small, ranging from 0.04 to 0.06.

The interaction terms reveal some interesting results for both countries, although the size of the effects is relatively small. In Ghana, being a female with a written contract lowers the probability of receiving medical and sick leave benefits, the only instances where the interaction terms are statistically significant in Ghana. We found a similar result for the benefits for which the interaction term is statistically significant in South Africa as well: holiday, sick leave, and natal leave benefits. All these represent cases where the female and written contracts were positive and significant. Regarding the interaction with permanent job, pension, and medical coverage, the only benefits for which we found statistically significant estimates in Ghana show conflicting results: the interaction term is positive for pension and negative for medical benefits.

In contrast, in South Africa, the interaction term is unambiguously positive for all benefits. Finally, as Owusu-Afriyie (2025) also notes, we find that unionization favors women in accessing certain benefits in Ghana. The interaction term is statistically significant and positive for pension and medical benefits (around 0.04). A stronger impact is detected for South Africa: We find a positive effect for all benefits (between 0.02 and 0.07), except sick leave in Ghana and pension benefits in South Africa, where the interaction term is statistically insignificant.

Figure 2 Average partial effects of year dummies on nonwage benefits, by country, 2013-2022



As we noted earlier, we included fixed effects in the model in the form of dummies for the last two years of our study, 2017 and 2022. Due to the changes in the characteristics of employment relations that can be observed in the mean values, especially for Ghana, it is interesting to examine the size of the change in benefit incidence after controlling for changes in employment characteristics (Figure 2). In Ghana, there was a change in the gender composition of employees, as the female share increased from 31 to 37 percent between 2013 and 2022, whereas it remained nearly stagnant in South Africa at around 45 percent. As reported in Table 3, the year dummies were statistically significant in all equations, except for the maternity benefit equation in Ghana. The estimated partial effects indicate a concerning decline in accessing all benefits (except maternity benefits) in Ghana since 2013. For South Africa, however, there has been improvement over the period, except for medical coverage.

Deprivation in employment quality

Employment quality deprivation index

We consider the ensemble of characteristics related to the employment relationship and nonwage benefits of the employee to describe their quality of employment. Recent research (Brummund, Mann, & Rodriguez-Castelan, 2018; Huneeus, Landerretche, Puentes & Selman, 2015; Huneeus, Landerretche, & Puentes, 2012) has followed the approach underpinning the Multidimensional Poverty Index (MPI) of the United Nations (UNDP 2024).

However, an important difference is that the job quality indices assign a value of 1 to an indicator of quality if the value of the indicator for the individual is deemed favorable to their job quality (e.g., having a written contract will be coded as 1). In the MPI approach, the idea is to capture disadvantage, and hence, for example, not having access to electricity will be coded as 1. The choice of either method is perhaps similar to the choice of describing a cup as half-full or half-empty. We choose the half-empty description because it focuses on the generally inadequate levels of nonwage benefits and the desirable characteristics of the employment relationship in both countries. Our index is therefore like an air quality index—higher values indicate lower quality.

The set of nonwage benefits and characteristics of the employment relation constitutes two dimensions of our index, which we weigh equally (one-half each). In the dimension of access to nonwage benefits, we have five indicators, and we assign them equal weights, so that each carries a weight of 0.5/5, or approximately one-tenth, in the index. We also weigh the three indicators of employment-relation characteristics equally. Accordingly, each indicator in this dimension has a weight of 0.5/3 or, approximately, one-sixth in the index. Each nonwage benefit indicator takes a value of 1 if the person lacks that benefit (e.g., pension coverage) and zero otherwise. Similarly, each indicator of employment relation (e.g., permanent job) is assigned a value of 1 if the employee does not have that feature as part of their employment relation and a value of 0 if they do.

With these indicators and weights, we calculate a job-quality deprivation score for each employee. As with the MPI logic, we consider an employee to be lacking a sufficient quality of employment if they are deficient in at least one of the dimensions. That is, we consider people with values equal to or greater than 0.5 as deprived in their job quality. The score for each employee, denoted as s_i, would range between 0 if they had access to all nonwage benefits and favorable employment relations, and 1 if they had access to none. We also identify thresholds for various degrees of job-quality deprivation, ranging from none to severe.

If the person lacked only a nonwage benefit and a desirable employment relation, their deprivation score would be $\frac{1}{3.75} \approx 0.27$. We consider persons with scores below that threshold as not deprived of their job quality. For persons with values equal to or above the no-deprivation (0.27) and below the deprivation thresholds (0.5), we assume that their quality of employment is vulnerable. To characterize moderate and severe job-quality deprivation, we consider an employee with only one nonwage benefit and one desirable employment relation. Such a person would register a deprivation score of approximately 0.73. We classify those with values equal to or above 0.5 and less than 0.73 as facing moderate job-quality deprivation. Finally, those with values above 0.73 are considered to be facing severe deprivation.[10]

Using standard notation (Alkire and Foster, 2011)[11], we can express the headcount ratio (H) for the multidimensional job-quality deprivation as:

$$H = \frac{q}{n} \tag{3}$$

where q is the number of multidimensionally deprived employees and n is the total number of employees. The intensity of deprivation in job quality is simply the average value of the deprivation score among those with job-quality deprivation:

$$A = \frac{1}{q}\sum_{i=1}^{q} s_i, \tag{4}$$

where A is the intensity of deprivation. The employment-quality deprivation index (EDI) is the product of the headcount ratio and intensity of deprivation:

$$EDI = HA \tag{6}$$

Alternatively, the following formula is helpful to decompose the index into its constituent indicators:

$$EDI = \sum_{j=1}^{8} c_j h_j, \tag{5}$$

[10] The cutoff values will be different for men in Ghana because there are potentially only four, instead of five, nonwage benefits available to them. Hence, the weight of each nonwage benefit in the deprivation score will be $0.5/4 \approx 0.125$. Therefore, the cutoff for no deprivation is 0.29 and the threshold for severe deprivation is 0.71.

[11] See also the 2024 MPI Technical Note, available at: https://hdr.undp.org/sites/default/files/publications/additional-files/2024-10/2024_gMPI_TechnicalNote_1.pdf

where c_j is the weight of each indicator in the index, and h_j is the so-called censored headcount ratio for indicator j, i.e., the share of people who are multidimensionally deprived and deprived in indicator j in the total number of employees.

South Africa and Ghana have values of 0.025 and 0.113, respectively, in the UN's multidimensional poverty index, according to the latest report (OPHI and UNDP, 2024). People in South Africa are almost five times as well off as their Ghanaian counterparts in multidimensional poverty. We found that the gap in EDI, the index of employment-quality deprivation, is sizeable but much less so. The estimated values of the index for employees in South Africa and Ghana are 0.334 and 0.484 (Table 4). Of the two factors that enter into the index (see equation (5) above), the gap in the headcount ratio is far more important than the difference in the intensity of deprivation in accounting for the higher index value in Ghana. Roughly, six out of 10 employees in Ghana are experiencing poor job quality, compared to four out of 10 in South Africa. However, the two countries are similar in terms of the intensity of deprivation experienced by employees, with values of 80 and 82 in Ghana and South Africa, respectively. On average, those with poor job quality in both countries are deprived of about 80 percent of the indicators that enter into the EDI. Since we have eight indicators in our index, this translates into a bleak situation for employees with poor job quality. On average, the majority of employees in Ghana (61 percent) and a substantial minority of South African employees (41 percent) have access to only one nonwage benefit or one favorable employment relation.

Table 4 Employment quality deprivation index (EDI) and its components by country and gender (based on pooling data from 2013, 2017, and 2022)

	Men	Women	All
EDI (value)			
Ghana	0.491	0.470	0.484
South Africa	0.322	0.349	0.334
Headcount ratio (percent)			
Ghana	62	59	61
South Africa	39	43	41
Intensity of deprivation (percent)			
Ghana	80	80	80
South Africa	82	81	82

Note: The sample sizes for Ghana and South Africa were, respectively, 13,533 and 181,023 employees aged 15 or more.

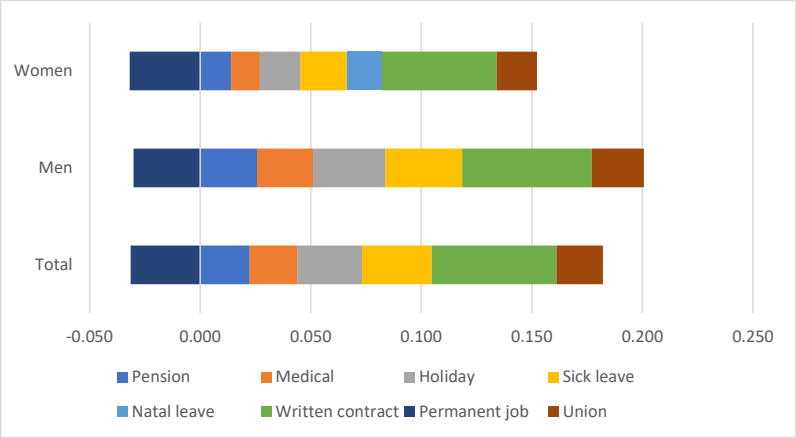
Do women and men fare differently in the two countries? Taking all male and female employees together, the answer is "no" because the gender differences are not substantial. They are practically absent in the intensity of deprivation. Interestingly, women fare better than men in Ghana in terms of the headcount ratio, whereas the opposite holds for South Africa. In both instances, the gap is approximately four

percentage points or less, indicating that if we randomly select 100 male and female employees from the two countries, the difference in the number of men and women with poor job quality will be approximately four percentage points.[12] The gender gap in the incidence of poor job quality translates into a higher value of EDI for men relative to women in Ghana and a higher value of EDI for women compared to men in South Africa. As we would expect from the relatively small gender differences in the incidence of poor job quality and the lack of differences in the intensity of deprivation, the gender gaps in EDI are pretty small.

We can dissect the intercountry gap in the EDI by examining the contribution made by each indicator to the difference in the EDI. As noted above, equation (5) is the tool for the decomposition. We construct the gaps for total employees and men using all indicators except access to natal leave. The rationale is that paternity leave is available only in South Africa, and including that in the decomposition may bias the results. However, because women in both countries have access to maternity leave, we include that indicator in breaking down the difference in the EDI between Ghanaian and South African women. Accordingly, in the decompositions for total and male employees, we weigh each nonwage benefit by 0.5/4 or 0.125. For the decomposition analysis for women, the weights attached to nonwage benefits are 0.5/5 or 0.100 each. Since the EDI for Ghana is higher than that of South Africa, we present results of subtracting the South African values from their Ghanaian counterparts for better visualization of results (Figure 3).

[12] We note that the gender difference is statistically significant in both countries at the 5% level of significance. [REPORT T-STAT]

Figure 3 Decomposition of the gap in the EDI between Ghana and South Africa into gaps in the individual indicators, by gender (based on pooled data from 2013, 2017, and 2022)



Note: The gap in the EDI is computed by subtracting the South African value from the Ghanaian value. We estimated that the gaps for all, men, and women were, respectively, 0.151, 0.171, and 0.120. The decomposition allows us to express each gap (e.g., between women in Ghana and South Africa) as the sum of the gaps in the contributions made by individual indicators. For example, the gap in the contribution made by written contracts (shaded in green) to the gap in the EDI between women in Ghana and South Africa was 0.052.

As shown by equation (5), the contribution of a component is its censored headcount ratio multiplied by its weight. Since the weights applied to each indicator are the same in both countries, the difference in the size of a component's contribution reflects the difference in the censored headcount ratios. For example, the higher contribution of the pension component in Ghana indicates that the share of employees lacking pension coverage and experiencing poor job quality in the total number of employees in Ghana is higher than in South Africa. Indeed, this is true for all nonwage benefits, particularly so in the entitlements regarding holiday and sick leave benefits. However, the gap in the contribution of nonwage benefits between women is smaller than the gap between men (0.082 vs. 0.118; numbers not shown in the figure).

The contribution of employment relations to the intercountry gap is smaller than that of nonwage benefits for both men and women, at 0.052 and 0.038, respectively. As we have already seen (Table 2), the proportion of employees without a written contract in the total number of employees is substantially higher in Ghana than in South Africa, and the converse holds for the proportion without a permanent job. The result is that the Ghanaian advantage in terms of permanent employment reduces the gap in EDI (hence its negative sign in the figure) between Ghana and South Africa. On the other hand, Ghana's disadvantage in written contracts enhances the gap with South Africa in EDI (hence its positive sign in

the figure). The contributions of these two components offset each other considerably and reduce the overall contribution of employment relations to the EDI gap between the countries.

Our estimates from the pooled data showed that the share of employees lacking union coverage was higher in South Africa than in Ghana (70 vs. 65 percent). Despite this, the contribution of the union component to the EDI was higher in Ghana than in South Africa (hence the positive sign of the gap in contribution as shown in the figure). The outcome is explicable once we recognize that the difference between the two countries in the union indicator is much smaller than in the indicators of written contracts or permanent jobs. A small difference, coupled with the much higher incidence of job-quality deprivation in Ghana, led to a higher contribution of the union indicator in Ghana than in South Africa. We can interpret this as indicating a higher share of employees in Ghana lacking union protection and experiencing job-quality deprivation compared to South Africa.[13]

Table 5 Percent of employees with poor job quality lacking nonwage benefits and favorable employment relations by type of benefit, relation, and gender (based on pooling data from 2013, 2017, and 2022)

	Nonwage benefits					Employment relation		
	Pension	**Medical**	**Holiday**	**Sick leave**	**Natal leave**	**Written contract**	**Permanent job**	**Union**
Ghana								
Total	95	96	91	89	N.A.	87	27	86
Men	95	96	93	90	N.A.	87	25	84
Women	95	95	88	87	91	85	30	90
South Africa								
Total	97	99	78	70	89	46	86	97
Men	97	99	79	71	91	48	86	96
Women	98	99	77	70	87	44	86	97

Note: The number of observations for Ghana and South Africa was, respectively, 7,783 and 77,136 employees aged 15 or more who were job-quality deprived.

The type of job-quality deprivation faced by those with poor job quality also requires attention. Consider the case of nonwage benefits. In both countries, the absence of pension and medical coverage is nearly universal among employees facing job-quality deprivation (Table 5). Regarding pensions, the legal provision regarding mandatory coverage has not benefited those encountering job-quality deprivation

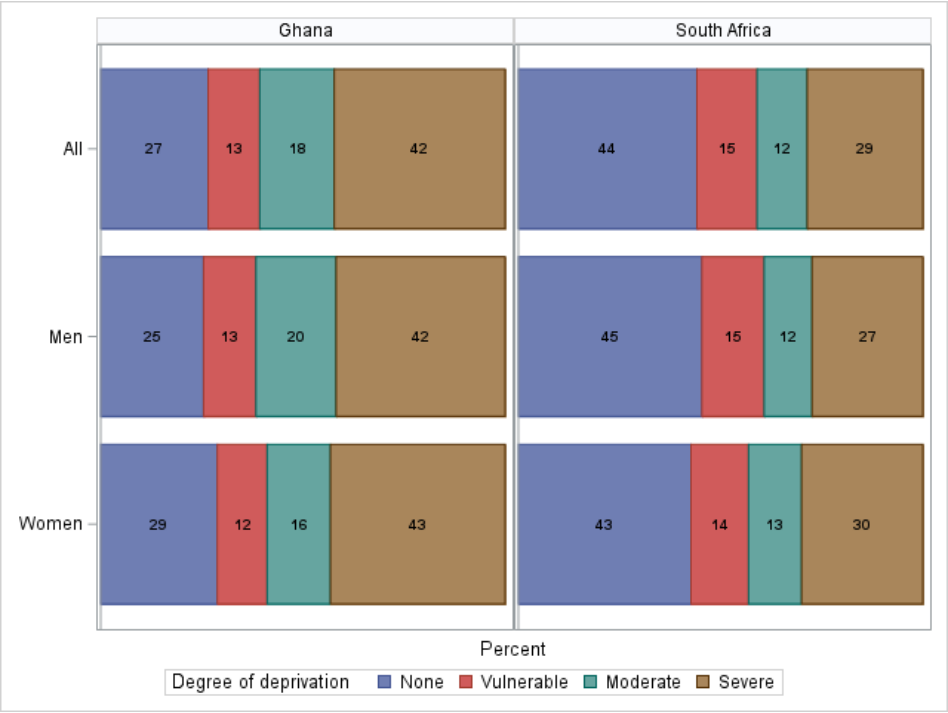
[13] Let U indicate the share of employees without union coverage. We can express this as the weighted average of the share of employees without union coverage in two groups: those without and with job-quality deprivation, represented, respectively, by the subscripts np and p: $U = U_{np}(1 - P) + U_p P$, where P is the proportion of employees with job-quality deprivation. The second term on the RHS of the equation represents the censored headcount ratio referred to earlier, which is larger in Ghana than in South Africa. We can infer from the equation that this result can come about when a small difference in U_p is overwhelmed by a much larger difference in P between the two countries.

(approximately 60 percent of all Ghanaian employees). Somewhat lower levels are observed for the lack of holiday and sick leave benefits. For these two benefits, the deficiency in South Africa is notably lower than in Ghana, especially for sick leave. As noted earlier, there is no mandated paternity leave in Ghana, whereas in South Africa, such a provision exists. Comparing women with poor job quality in the two countries showed that, even with mandatory provisions, almost 90 percent do not report any entitlement to maternity leave.

Turning to the set of employment relations, we find that job-quality deprived persons experience a greater absence of union protection in South Africa than in Ghana. This is probably a reflection of the higher levels of unionization in Ghana. The prevalence of permanent jobs and written contracts demonstrates a clear contrast between the two countries. The majority of Ghanaians do not have a written contract and consider their job permanent. In South Africa, the majority have a written contract, reflecting perhaps widespread compliance with the legal requirement, and do not have a permanent contract. Since the overwhelming share of Ghanaians do not have a written contract, their presumption of a permanent contract is based on individual perception or verbal assurance from their employers. In contrast, those not having a permanent job in South Africa are, in most instances, describing the terms of their written contract. Therefore, it is reasonable to assume that some unknown amount of the EDI in Ghana is influenced by unobservable factors related to individual perception and implicit contracts, which in turn affect the cross-country comparisons.

An implication that emerges from Table 5 is that a substantial share of employees with poor job quality is likely to be deficient according to almost all the indicators, except for written contracts in South Africa and presumed permanent employment in Ghana. Accordingly, we would expect the incidence of severe level of deprivation, i.e., a deprivation score greater than 0.73, to be quite sizeable relative to a moderate level (scores equal to or above 0.5 and less than 0.73). This intuition is confirmed in our estimates of the distribution of employees by the degree of job-quality deprivation, ranging from none to severe (Figure 4).

Figure 4 Distribution of employees by country, gender, and degree of employment-quality deprivation (percent) (based on pooling data from 2013, 2017, and 2022)



We find that the majority (around 70%) of those with poor job quality suffer from a severe degree of deprivation, i.e., they do not have even one nonwage benefit and one favorable employment relation. Only a minority of job-quality deprived individuals face a moderate degree of deprivation. Similarly, among those above the job-quality deprivation threshold, the workers who face some vulnerability in terms of employment quality constitute a relatively small proportion of the non-deprived. Thus, there is a stark polarization in the distribution of employment quality, as the largest shares of employees belong to either the severe deprivation category or the no deprivation category. In both countries, the proportion of employees in the intermediate ranges of the deprivation score (vulnerable or moderate deprivation) is significantly smaller than that of those with severe or no deprivation.

The degree and direction of polarization are different in the two countries. In Ghana, the largest share of employees is found in jobs with severe job-quality deprivation (42 percent), while in South Africa, the largest share (44 percent) is in the category of those with no job-quality deprivation. Yet, it should be noted that even in South Africa, the majority of employees are vulnerable to deprivation or deprived. The

gender imbalance in the share of employees with no job-quality deprivation in the total number of employees also differs across countries. In Ghana, the share is higher among women than men (29 versus 25 percent), while the opposite situation is found in South Africa (43 versus 45 percent). However, on the whole, gender disparity in the distribution of job quality may be considered minimal in both countries.

An empirical model of employment quality deprivation

Clearly, we expect the degree of deprivation in employment quality to vary according to job characteristics and individual characteristics. We employ a multivariate statistical framework to summarize these relationships. Since our dependent variable is distributed between 0 and 1, the standard OLS model is not our first choice. Beta regression models are used to model dependent variables distributed in the $\{0,1\}$ interval, but they require, in principle, that the limits of the interval should not be included. Examination of the distribution of deprivation score (s) in our data showed that about 20 percent of observations are concentrated at 0 and 1 in both countries. A variety of nonlinear models could be employed; we chose one that is frequently used, namely, the fractional logit model (Papke and Wooldridge, 1996).

Our conditional expectation function takes the form,

$$E(s_i|\mathbf{x}_i\boldsymbol{\beta}) = G(\mathbf{x}_i\boldsymbol{\beta}) = \frac{1}{[1+\exp(-\mathbf{x}_i\boldsymbol{\beta})]} \quad (4)$$

where $\mathbf{x}$ is the row vector of job and individual characteristics, $\boldsymbol{\beta}$ the corresponding column vector of unknown parameters to be estimated, and i refers to the i^{th} employee in the sample. We include a female dummy, a married dummy that takes a value of 1 if the person is married, a dummy for living with children under 6 years of age, and a dummy for living with children six or older and younger than 13 in $\mathbf{x}$. The presence of young children may pose challenges for employees with caregiving responsibilities in the workplace, as they must balance care and employment obligations. The balancing acts may result in perceived or actual shortfalls in performance or subservience to the employer, which, in turn, can affect entitlements to nonwage benefits and favorable employment relations, especially in environments where compliance with mandatory provisions is weak. Moreover, the presence of young children may constrain or inform occupational and sectoral choices, as individuals may prioritize employment arrangements that facilitate the reconciliation of paid work and caregiving responsibilities. These constrained choices, in turn, can shape their job quality deprivation scores. We also believe that these constraints may affect men and women differently. Hence, the dummies for the presence of children are interacted with the female dummy.

Other personal characteristics are age (including age squared) and years of education. Major occupations[14] are coded into three skill levels according to the ILO convention: high-skilled, medium-skilled, and low-skilled. Dummies are included for the first two levels. Industries[15] are grouped into six major categories based on their standard classification: Primary, Secondary, Trade and Transportation, Business and Financial Services, Public and Social Services, and Other Services (including Private Households). We include dummies for all, except Trade and transportation. We also include a dummy for public sector employment. Finally, to capture potential intercept shifts over the years, we include dummies for the years 2017 and 2022, respectively. The combination of dummies implies that our base group for comparison is the group of single men living in households without children under 13 years old, possessing an elementary skill level, employed in the Trade and transportation industry, and the private sector in 2013.

Table 6 Estimation results of the model of deprivation score, by country (using pooled data from 2013, 2017, and 2022)

	Ghana		**South Africa**	
	Estimate	SE	Estimate	SE
Intercept	4.293*	0.1522	3.854*	0.0525
Female	0.002	0.0418	-0.037*	0.0108
Married	-0.244*	0.0321	-0.261*	0.0083
Child<6yrs	0.058	0.0366	0.030*	0.0121
Child 7-12yrs	0.031	0.0365	-0.017	0.0124
Fem. X Child<6yrs	0.013	0.0552	0.048*	0.0166
Fem. X Child 7-12yrs.	0.080	0.0575	0.111*	0.0170
Semi-skilled	-0.090*	0.0463	-0.378*	0.0106
High-skilled	-0.542*	0.0575	-0.905*	0.0118
Indus.-Primary	-0.059	0.0536	-0.542*	0.0153
Indus.-Secondary	-0.076	0.0418	-0.028*	0.0116
Indus.-Bus. Fin Services	-0.659*	0.0517	-0.161*	0.0116
Indus.-Pub.&Soc Services	-0.450*	0.0489	0.086*	0.0151

[14] We segregate the International Standard Classification of Occupations (ISCO)-08-unit group of occupations present in the data into three skill levels: 1. High-skilled (Legislators/managers, Professionals, Technicians and associate professionals); 2. Medium-skilled (Clerical support workers, Service/sales workers, Skilled agric/fishery workers, Craft and related trades workers, Plant machine operators and assemblers), and 3. Low-skilled (Elementary occupations). While ISCO-08 occupation variable was directly present in AHIES 2022 and GLSS 2017, it had to be constructed in GLSS 2013 from the 4-digit occupation code variable. For South Africa, the occupation variable in QLFS was adjusted from ISCO-88 to ISCO-08.

[15] We segregated the 1-digidt level International Standard Industrial Classification of All Economic Activities, Revision 4 (ISIC Rev.4) into six broad industry groups. While we had direct questions on 1-digit main industry groups in AHIES 2022 and GLSS 2017, we constructed it for GLSS 2013 from the question on industry with ISIC 4-digit industry codes. For South Africa, we use the 3-digit industry code variable in QLFS to construct the 1-digit level ISCIS categories, which in turn was segregated into the six broad industry groups.

	Ghana		South Africa	
	Estimate	SE	Estimate	SE
Indus-Other Services	-0.054	0.0509	1.098*	0.0152
Public employee	-0.996*	0.0389	-1.114*	0.0140
Age	-0.093*	0.0077	-0.080*	0.0026
Age squared	0.001*	0.0001	0.001*	0.0000
Years of education	-0.116*	0.0053	-0.128*	0.0016
Year 2017	-0.110*	0.0312	-0.030*	0.0087
Year 2022	0.004	0.0337	0.016	0.0097
Mean deprivation score	0.560		0.441	
Observations	13432	13432	179863	179863

Note: * denotes significance at the 5% level. The following abbreviations are used: "Fem." for female, "Indus." for industry, "Bus. & Fin." for Business and financial, and "Pub. &Soc." for Public and social.

Our estimates of **β** were derived using a pseudo- or quasi-likelihood method. The covariance matrix of the parameter estimates was obtained via an empirical or "sandwich" estimator, which is asymptotically consistent (Table 6).[16] Considering gender first, we can observe that the conditional effect differs significantly from the unconditional averages (Table 7 below). The latter showed that, on average, women had a lower deprivation score than men in Ghana, while the opposite was true in South Africa. We now find that the conditional estimates reveal a contrary pattern, and the parameter is statistically significant only in South Africa.

The dummy for the presence of children under 6 years indicates that they can contribute to a higher deprivation score. But the coefficient is not significant in Ghana. The presence of older children is not significant in both countries; however, when this dummy is interacted with gender, the effect is positive (i.e., it contributes to worsening job quality for women) in both countries and is statistically significant in South Africa. Interaction of children under 6 years with gender also has the same sign but is, again, significant only in South Africa. This implies that presence of children younger than 13 years worsens job quality for women in South Africa, with no such statistically significant effect in Ghana. We speculate that the difference in the results may be due to the differential constraints placed on employees living in households with children. Because South Africa does not provide any information to identify the parents of young children, we chose to proxy for the constraints of caregiving by using the presence-of-children variables in both countries to produce reasonably comparable estimates. However, it may be the case among employees in South Africa that the presence of young children affects them, irrespective of whether they are parents, because they often shoulder caregiving responsibilities. On the other hand, this may not be the case in Ghana either because employees from households with young children might not

[16] Details on the estimation are available upon request from the authors.

be facing the same degree of challenge, as many of them may not be parents or have other caregivers at home (e.g., a relative or paid help).

The other two individual-level characteristics in the model — age and years of education — have statistically significant negative coefficients in both countries, indicating that older and better-educated employees tend to have, on average, lower levels of job-quality deprivation. This is consistent with the unconditional estimates (Table 7) for both countries: the average deprivation score is highest among the 15–24 age group and declines with age before rising again for individuals aged 66 and above. Similarity between unconditional and conditional estimates holds for years of education as well, showing a decrease in average deprivation in both countries as years of education increase from 0–6 (upto primary) to 13–22 (any university/college). Turning to job characteristics, we find that occupation dummies exhibit significant negative coefficients, implying that employees with higher skill levels are likely to have lower values of the deprivation score. We find a similar pattern in unconditional estimates: the average deprivation score is the highest among low-skilled followed by medium skilled and the lowest for high-skilled occupations (Table 7).

The second job-related variable in the model is the industry in which the employee is employed. Here too, the signs of the coefficients are the same—negative—in both countries for Primary, Secondary, and Business and financial services industries. (Base group is Trade, transportation, etc., industry). Statistical significance is another matter. For South Africa, significance is observed for all three, but in Ghana, it holds only for the Business and financial services industry. The case of the remaining two industries, Public and Social Services, and Other Services, is mixed, with negative coefficients in Ghana and positive coefficients in South Africa. Interestingly, the conditional estimates are consistent with the unconditional estimates for Ghana because the latter displays a lower average deprivation score than the base industry. The positive coefficient for the South African Other services industry mirrors the higher unconditional average deprivation score in this industry compared to the base industry. However, there is no such consistency between the unconditional and conditional estimates for the Public and social services because the unconditional estimate for the latter are much lower than that of the base industry.

Perhaps the explanation lies in the differential job quality experienced by those in the public and private sectors of the Public and social services industry. There is considerable public sector employment in this industry in both countries. As noted, the public employee dummy is the third job-related feature we consider in the model. For both countries, the negative coefficient on the public-employee dummy is the largest in size among all the dummy variables in the model for each country, and it is statistically significant. However, the positive coefficient for the South African Public and social services industry

Commented [2]: This may not be totally true because in Ghana:
About 70% of employees from hh with children 7-12 are parents, and
75% are parents in case of presence of children 0-6

2. only about 5% are other relatives

3. Ther is hardly any change in occ_g or ind_g across parental status , for eg: majority still belong to medium-skilled occ irrespective of their parental status[though I understand that the effect we see is after controlling for occ and ind]

I will think more on what could be a good hypothesis for this finding.

Commented [3R2]:

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may indicate that those employed in the private sector segment of this industry in South Africa may face poorer job quality than those in the base industry. At the same time, this may not be the case in Ghana.

Table 7 Deprivation score (mean values), by sub-group and country (using pooled data from 2013, 2017, and 2022)

		Ghana		South Africa	
Variables	**Sub-group**	Estimate	SE	Estimate	SE
Gender	Men	0.564	0.0059	0.434	0.0016
	Women	0.557	0.0079	0.451	0.0016
Age group	15-24	0.758	0.0068	0.616	0.0031
	25-35	0.557	0.0071	0.475	0.0019
	36-50	0.503	0.0082	0.401	0.0017
	51-65	0.453	0.0107	0.374	0.0025
Education group	0-6 years	0.778	0.0077	0.670	0.0027
	7 to 9 years	0.729	0.0065	0.615	0.0029
	10-12 years	0.572	0.0069	0.451	0.0015
	13 to 22 years	0.272	0.0062	0.228	0.0018
Marital status	Not married	0.644	0.0054	0.515	0.0016
	Married	0.475	0.0071	0.368	0.0016
Presence of children 0-6	No	0.558	0.0070	0.434	0.0015
	Yes	0.567	0.0067	0.457	0.0021
Presence of children 7-12	No	0.557	0.0065	0.440	0.0015
	Yes	0.571	0.0070	0.447	0.0021
Female* children 0-6	No	0.560	0.006	0.433	0.0013
	Yes	0.571	0.010	0.486	0.0025
Female* children 7-12	No	0.557	0.006	0.436	0.0013
	Yes	0.591	0.011	0.476	0.0025
Industry	Primary	0.733	0.0137	0.451	0.0045
	Secondary	0.678	0.0096	0.449	0.0025
	Trade, transport, hospitality	0.707	0.0064	0.481	0.0022
	Business & financial services	0.402	0.0132	0.365	0.0021
	Public & Social Services	0.288	0.0059	0.230	0.0020
	Other Services & Households	0.632	0.0114	0.770	0.0025
Occupation	High-skilled	0.298	0.0065	0.245	0.0014
	Medium-skilled	0.665	0.0052	0.456	0.0019
	Low-skilled	0.732	0.0110	0.649	0.0018
Sector	Public	0.243	0.0059	0.212	0.0020
	Private	0.671	0.0057	0.499	0.0014
	Other	0.428	0.0254	0.574	0.0065

		Ghana		South Africa	
Variables	**Sub-group**	Estimate	SE	Estimate	SE
Year	2013	0.579	0.0093	0.449	0.0023
	2017	0.557	0.0091	0.438	0.0020
	2022	0.551	0.0103	0.440	0.0023

Note: We present linearized standard errors that account for the survey design.

Apart from the sign and statistical significance, a fuller picture also requires us to consider directly the impact of the independent variables in the model on the deprivation score in terms of their size. We estimated average partial effects (APE) for the dummy independent variables using the formula described earlier (equation 3). For the continuous variables in the model, we multiply the estimated coefficients by a scale factor equal to:

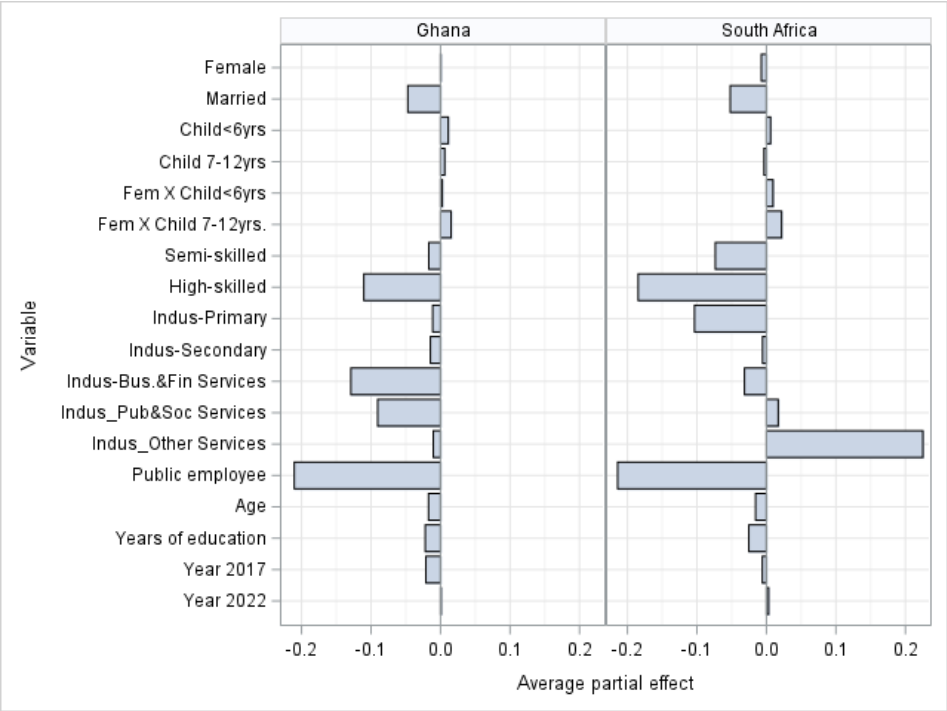
$$\frac{1}{n}\sum_{i=1}^{n} g(\mathbf{x_i}\boldsymbol{\beta}),$$

where

$$g(\mathbf{x_i}\boldsymbol{\beta}) = \frac{e^{(\mathbf{x_i}\boldsymbol{\beta})}}{[1+e^{(\mathbf{x_i}\boldsymbol{\beta})}]^2},$$

i.e., the sample average of the densities of the logistic distribution, to obtain the APEs.

Figure 5 Average partial effects of the regressors in the deprivation score model, by country (based on pooled data from 2013, 2017, and 2022)



For both countries, variables related to gender and the presence of children appear to have only a negligible conditional impact on the deprivation score (Figure 5). Being married, on average, seems to reduce deprivation score by around 0.05. Relative to the mean values of the deprivation score in Ghana and South Africa, 0.56 and 0.41, this represents a nontrivial reduction. Among the other personal characteristics, years of education have the highest impact, with coefficients of -0.02 (Ghana) and -0.03 (South Africa). Thus, obtaining an additional four years of education (say, attending college) would, holding other things in the model constant, likely result in a reduction of 0.08 (Ghana) or 0.12 (South Africa) in the deprivation score. The APEs associated with age (including the impact of age squared) are approximately -0.02 in Ghana and South Africa. It is remarkable how close the partial effects for marital status, age, and years of education are across countries in our model, which features a parsimonious set of regressors (e.g., ignoring racial/ethnic or regional divisions).

Among the job characteristics, a large impact is associated with public sector employment, with an APE of -0.21 in both countries. The coefficient reflects the central importance of the public sector as an oasis

of “decent” jobs in the formal sector. The government accounts for 21 percent of all wage employment and 26 percent of all female employees in South Africa. In Ghana, the shares are higher: 27 percent of all employees and 32 percent of women’s wage employment. In contrast, men’s shares of public sector jobs are 24 and 17 percent in Ghana and South Africa. The higher share of women employed in the public sector is a crucial factor in ameliorating the gap in job-quality deprivation.

A similar job-quality enhancing role is played by high-skill occupations, which show an APE of -0.11 and -0.18 (relative to elementary occupations, other things being equal) in Ghana and South Africa. They account for 33 and 35 percent of all wage employment in Ghana and South Africa. Similar to public employment, the share of all women employees in high-skill occupations is higher than that of men in South Africa (42 vs. 30 percent) and Ghana (38 vs. 31 percent). Employment in these occupations is mainly in the formal sector and displays low levels of job-quality deprivation. The observed lack of gender disparity in the overall EDI receives a considerable impetus from the gender pattern of employment in high-skill occupations.

The APEs of the industry of employment display notable cross-country variation. An industry that shows a significant job-quality premium (a 0.13 lower deprivation score on average, relative to the Trade, transportation, etc., industry) in Ghana is Business and Financial Services. An equal proportion of men and women employees (10 percent each) are in this industry. Economic activities grouped under the industry of Public and Social Services also have a sizable negative APE in Ghana (-0.09). Unlike Business and financial services, this industry absorbs women at a much higher rate: 40 percent of all women employees are in this industry as compared to 22 percent of all male employees.

In South Africa, the only industry demonstrating a sizable job quality premium is the Primary industry, which employs about 10 percent of all wage employees. A higher proportion of men than women are engaged in this industry (12% vs. 5%). On the other hand, the industry' Other services' reveals a strong job quality penalty, with an APE of 0.23. It should be noted that this value is slightly larger than the APE of public sector employment (-0.21). A much greater share of women than men are engaged in the set of activities in the industry (22 vs. 7 percent). Thus, the industry APEs in South Africa (unlike in Ghana) strongly favors men over women in job quality and is perhaps the most salient contributor to the admittedly small (but statistically significant) gender gap in EDI.

Job segregation and deprivation scores

The key importance of occupation and industry in terms of their partial effects on the deprivation warrants a closer look. We know that the average deprivation for men or women is a function of the distribution of deprivation scores across industry-occupation groups and the distribution of people across the same

groups. We have also seen (Table 7) that while there is no economically significant gender gap, there is a notable gap in deprivation score between Ghana and South Africa. What we would like to know is the relative contribution of the two factors, the gaps in deprivation score within industry-occupation groups, and the distribution of employees across these industry-occupation groups, in shaping the overall gap in deprivation score. We may describe these two factors as contributions from intragroup disparities and differences in the composition of employment. For brevity, we will refer to them below as "intragroup" and "composition" effects. Since we have six industry groups and three skill groups, there is a total of 18 groups for each gender in a country. Our estimates show that there is considerable variation between men and women and between countries in deprivation scores and employment mix.

Table 8 Employment shares and average deprivation scores, by country, gender, and industry-occupation group (based on pooled data from 2013, 2017, and 2022)

		South Africa				Ghana			
		Men		Women		Men		Women	
Industry x Occupation		Share (%)	Deprivation	Share (%)	Deprivatio	Share (%)	Deprivatio	Share (%)	Deprivatior
Primary	High	1	0.16	1	0.18	1	0.31	0	0.29
	Semi	4	0.29	1	0.30	8	0.71	3	0.78
	Low	6	0.56	4	0.62	4	0.82	4	0.84
Secondary	High	7	0.31	5	0.29	2	0.31	1	0.31
	Semi	14	0.49	2	0.42	16	0.71	7	0.73
	Low	6	0.60	4	0.55	5	0.76	4	0.69
Trade,Trans.,etc.	High	5	0.30	5	0.29	2	0.39	1	0.51
	Semi	14	0.56	10	0.48	23	0.71	23	0.76
	Low	4	0.57	5	0.53	2	0.71	2	0.77
Bus&Fin Serv	High	8	0.28	9	0.30	4	0.30	3	0.28
	Semi	8	0.42	3	0.37	5	0.45	5	0.48
	Low	2	0.56	3	0.47	1	0.55	1	0.60
Pub&Soc Serv	High	8	0.15	19	0.17	16	0.25	28	0.28
	Semi	4	0.16	5	0.45	4	0.29	7	0.45
	Low	1	0.34	4	0.48	1	0.34	2	0.42
Other Serv	High	1	0.36	1	0.38	3	0.48	2	0.43
	Semi	1	0.60	1	0.69	3	0.65	5	0.76
	Low	5	0.83	19	0.82	1	0.77	3	0.79
All		**100**	**0.43**	**100**	**0.45**		**0.56**	**100**	**0.56**

To mention some of the highlights of the patterns displayed in Table 8, let us first consider the concentration of employment. A handful of groups, not more than 5 out of 18, comfortably account for the numerical majority of jobs for both men and women in the two countries. Turning to gender segregation, we observe that the top two groups for women are low-skilled workers in Other Services and high-skilled workers in Public & Social Services in South Africa. For South African men, the top two groups are those of semi-skilled workers in Secondary and Trade, Transport, etc. industries. Notably, the two top groups for women register the highest and lowest deprivation scores, while for men, the two groups have similar deprivation scores.

In Ghana, the two top groups among women are high-skilled workers in Public & Social Services, and semi-skilled workers in Trade, Transport, etc. Similar to the pattern among South African women, these two groups have wildly divergent deprivation scores. Among Ghanaian men, the top group is semi-skilled workers in Trade, Transport, etc. industries. At the same time, the second place is tied between the high-skilled in Public & Social Services and semi-skilled in the Secondary industry. While semi-skilled workers have relatively high deprivation scores, the high-skilled in Public & Social Services have the lowest average deprivation score.

Comparisons between the two countries show some notable differences. A much larger proportion of women wage workers are employed as low-skilled workers in the Other Services industry in South Africa than in Ghana. On the other hand, the share of high-skilled women employed in the Public & Social Services industry is markedly higher in Ghana than in South Africa. For men, we observe a substantially higher share of semi-skilled workers in Trade, Transport, etc. in Ghana than in South Africa. A similar pattern is also observable for the shares of high-skilled men in Public & Social Services in the two countries.

The observed variations in employment shares of men and women are consistent with a large body of literature that has studied segmentation in labor markets along the axes of gender, race, and ethnicity in sub-Saharan Africa, mostly in connection with earnings inequality (add citations and references).[17] Our focus here is to understand the interactions between the distribution of employment shares and intragroup disparities in job quality. To make the idea concrete, let us consider the gap in the average deprivation score between men ($\bar{s}_m$) and women ($\bar{s}_f$) in a given country. The average deprivation score for each gender is a weighted average of the deprivation scores of the industry-occupation groups of that gender, with the shares of each industry-occupation group in the total employment of that gender serving as weights. Using this definition, we can express the gender gap in deprivation score as:

$$\bar{s}_m - \bar{s}_f = \sum_{i=1}^{k} s_{im} l_{im} - \sum_{i=1}^{k} s_{if} l_{im} \tag{5}$$

where $k = 18$, i.e., the number of industry-occupation groups, s_i the deprivation score of the i^{th} group and, l_i the share of the group in total employment. We use the subscripts m and f to denote men and women, respectively. We separate the difference in the mean values on the LHS of the equation (D) into the intragroup (IG) and composition (C) effects using the following formula:

[17]For example, Barr and Oduro (2002) find, based on their analysis of the fifth wave of the Ghanaian Manufacturing Enterprise Survey, that after controlling for relevant characteristics, individuals in the Other Akan group earn significantly more than individuals from the Asante, Fante, and Ewe ethnicities.

$$\bar{s}_m - \bar{s}_f = D = IG + C = \sum_{i=1}^{k} (s_{im} - s_{if})\,\bar{l}_i + \sum_{i=1}^{k} (l_{im} - l_{if})\bar{s}_i, \quad (6)$$

where $\bar{l}_i = (l_{im} + l_{if})/2$ and $\bar{s}_i = (s_{im} + s_{if})/2$. The decomposition expressed here is a purely accounting exercise.[18] We may, in fact, expect the share of employment and deprivation score to be subject to common causal forces. For example, sorting of women workers into "female jobs" would operate along with gender discrimination that leads to poor employment quality. However, the decomposition would help us gain a rough picture of the orders of magnitude of the two effects. To be clear, we can also use the same formula to decompose differences between Ghanaian and South African men as well as between Ghanaian and South African women. The results of the decomposition are shown in (Table 9).

Table 9 Decomposition of the gender gaps and country gaps in average deprivation score (based on pooled data from 2013, 2017, and 2022)

		Difference (D)	Intragroup (IG)	Composition (C)
Gender gap	Ghana	0.007	-0.038	0.046
	South Africa	-0.017	0.001	-0.018
Country gap	Men	-0.130	-0.138	0.007
	Women	-0.105	-0.128	0.022

Note: The difference (D) reported for the gender gap is obtained by subtracting the female average deprivation score from the male average deprivation score. Similarly, the country gap D is calculated by deducting the Ghanaian average from the South African average deprivation score. A higher deprivation score indicates lower job quality and vice versa. The decomposition technique expresses the D value as the sum of the values reported under IG and C. Note that the summation is approximate because of rounding.

Considering the gender gaps in Ghana first, we see that men have a slightly higher deprivation score (0.007) than women. It appears that this is the result of two opposing forces. The intragroup effect is in favor of men (-0.038), i.e., it lowers men's average deprivation score relative to women. In contrast, the composition effect benefits women (0.046). Since the size of this effect is slightly larger than the intragroup effect, the net result is a negligible gap in the average deprivation score between men and women. The estimates for the gender gap in South Africa suggest a different dynamic: the intragroup component is quite small and virtually all of the gender gap is due to the composition effect. The decomposition exercise thus reveals that the gender parity in job-quality deprivation is the result of a balance between the composition and intragroup effects that is different across countries.

Turning to the intercountry differences, we find that the intragroup effect dominates over the composition effect. Practically, this indicates a significantly larger role played by the fact that Ghanaian employees,

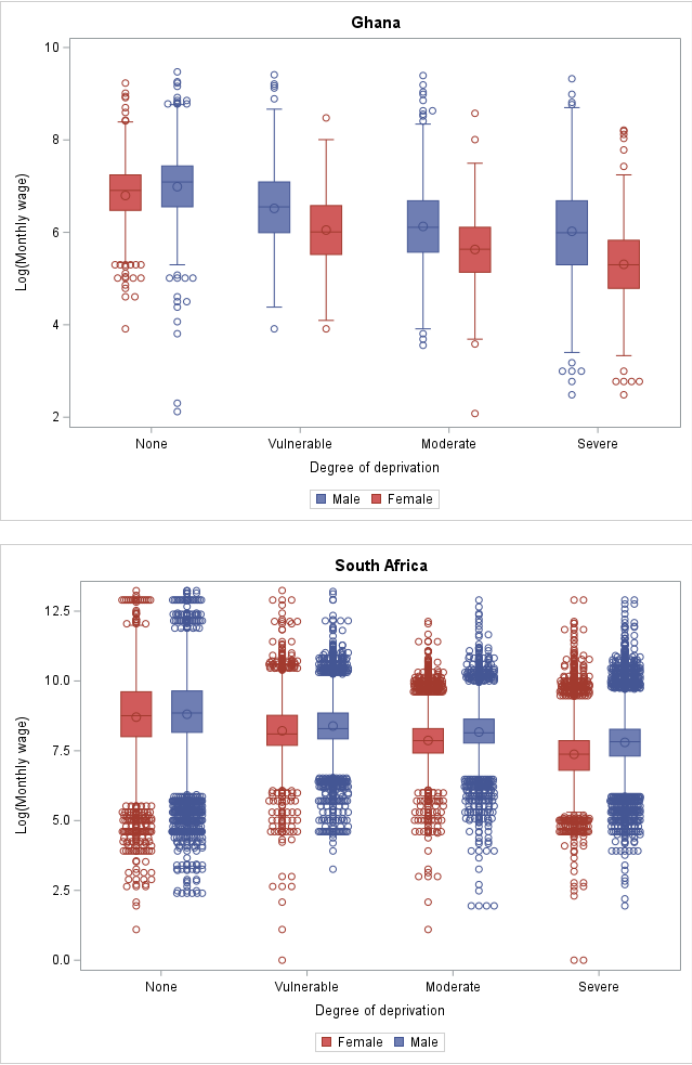
[18] If $x = yz$, then, $x_m - x_f \approx \bar{z}(y_m - y_f) + \bar{y}(z_m - z_f)$, where m and f may represent two groups or two points in time.

both men and women, rank below their South African counterparts in job quality. Only a small proportion of the intercountry gap is accounted for by the composition effect, i.e., differences in how people are distributed over the industry-occupation groups. However, the composition effect is larger in accounting for the intercountry gap between women than men. Our estimate for the contribution of this effect to the gap between women is 0.022, suggesting that it lowers the average deprivation score of Ghanaian women relative to South African women. Perhaps, this reflects the notably higher share of public sector employment (with low values of deprivation score) and lower share of the Other Services industry (with high values of deprivation score) in Ghana compared to South Africa.

Wages and job-quality deprivation

The proxies we used in our analysis for characterizing employment relations, written contracts, contract duration (permanent job), and unionization, were found to have statistically significant and sizeable positive impacts on accessing nonwage benefits. We hypothesize that they would also have a stimulatory effect on wages. However, the interaction terms of these employment relation dummies with a female dummy presented a complex picture in our models. In several instances, their estimated coefficients turned out to be statistically insignificant. Further, in some cases, they were negative and statistically significant, except for the female interaction term with union, which was mostly significant and, when significant, always positive. A common thread across all the coefficients for the interaction terms was that the average partial effects were relatively small, compared to the employment relation dummies. In this section, we aim to quantify the impact of the employment relations on the average level of wages, and particularly, the gender wage gap.

Figure 6 Logarithm of monthly wage (nominal, national currency) and degree of job-quality deprivation, by country and sex, 2017

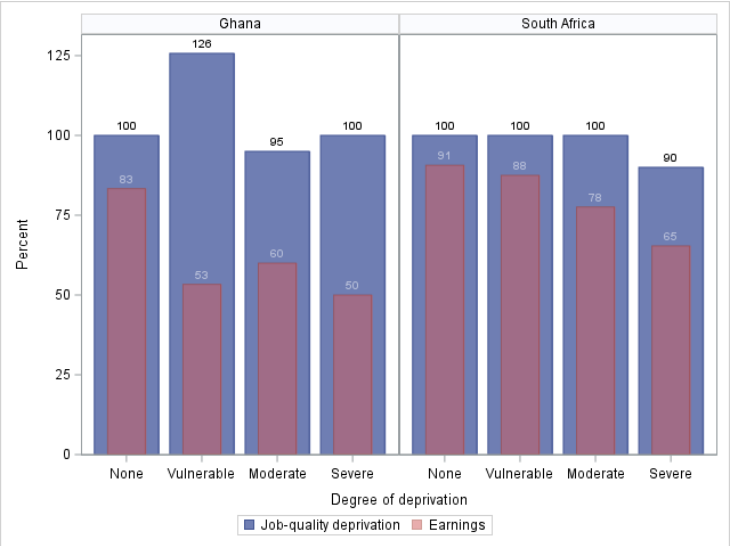


Note: Each box represents values that fall between the 25th and 75th percentiles of the log wage. The median and mean values are shown by the horizontal line and marker, respectively. The whiskers that extend from the box represent the upper (lower) end, indicating a value equal to 1.5 times the 75th (25th) percentile value. Values that fall outside these limits, outliers, are shown as circles, and their number has been limited to prevent overlap. The number of observations for men and women in Ghana was 3519 and 1665, while for South Africa, they were 32607 and 29518.

Before we turn to regression analysis, it is helpful to begin by considering the general pattern we observe in the data for 2017 regarding the relationship between the degree of job quality deprivation and wages (Figure 6). Considering the distribution for Ghana first, we can observe a downward shift in the boxes for women's wages as we move from no deprivation to severe deprivation. Women with no job quality deprivation appear to have a 25th percentile wage value that lies above the 75th percentile of the wage for those with a moderate degree of job quality deprivation. Among men in Ghana too, boxes containing the 25th to 75th percentile values of the wage drift downward as job-quality deprivation increases. A clear negative relationship is evident between the degree of job-quality deprivation and wages for both men and women in Ghana.

In South Africa, we can observe a similar relationship. However, the picture is somewhat muddled because of the higher degree of dispersion of wages at each level of job-quality deprivation. The box of the wage distribution for women and men with severe job-quality deprivation shows no overlap with the box for their counterparts with no job-quality deprivation. This pattern holds in Ghana as well, although, unlike South Africa, there is little overlap at the bottom of the distributions. Our estimates also show that the boxes, which contain the p25 and p75 values as well as the mean and median values, generally tend to shift down with rising job-quality deprivation. Another feature of the distributions is the higher wages for men than women at all levels of job-quality deprivation—the blue boxes are positioned higher than the red boxes in Figure 6. In Figure 7, we explicitly compare the gender wage gap and the gender gap in the job-quality deprivation score.

Figure 7 Ratios of female-to-male median values of wages and degree of job-quality deprivation, by country, 2017



The South African case is clear-cut. We find no gender disparity in the deprivation score at all levels of job-quality deprivation except when it is severe. The female-to-male ratio of 90 percent in that category is the result of a ratio of 0.9 to 1, which indicates that the average female in that category has one nonwage benefit compared to the average male, who has not even a single nonwage benefit (Each nonwage benefit has a weight of 0.1 in the deprivation score for South Africa). Neither has access to any favorable employment relations. The declining female-to-male wage ratio from "None" to "Severe" suggests that the gender wage gap increases with job-quality deprivation.

A similar picture regarding the gender wage gap emerges for Ghana as well, except for the transition from the "Vulnerable" to the "Moderate" category of job-quality deprivation, in which the gender gap narrows slightly. In terms of the gender disparity in job-quality deprivation, we find none in the highest and lowest levels of deprivation. The other two categories require some elaboration.

For the moderate level of deprivation, the female-to-male ratio of 95 percent is approximately the ratio of 0.63 to 0.67. Now, to be in the moderate level category, the deprivation score has to be equal to or greater than 0.5. It may be recalled that each nonwage benefit for women in Ghana has a weight of approximately 0.10 and each employment relation a weight of 0.167. Therefore, we can interpret the value of 0.63 for women as reflecting the absence of two favorable employment relations plus three nonwage benefit

(0.30+0.33). Similarly, for men in the same category, the value of 0.67 reflects the absence of all nonwage benefits plus one favorable employment relation (0.50+0.17).

We can interpret the female-to-male ratio of 126 percent (approximately 0.37/0.29*100) in the "Vulnerable" category in a similar manner, using the deprivation score threshold for belonging to that category (values equal to or above the no-deprivation value of 0.27 for women and 0.29 for men, and below the deprivation threshold of 0.5) and the weights attached to the components of the deprivation score. Accordingly, the average male in this category lacks one favorable employment relation and one nonwage benefit. In contrast, the average female in this category does not have entitlement to one favorable employment relation and two nonwage benefits. In short, compared to men, the women in this category lack two nonwage benefits instead of one.

[Regression analysis of the gender wage gap, with a focus on quantifying the contribution of employment relations to the gap and accounting for the intercountry difference in the gender gap (Ghana has a much higher gender wage gap than South Africa. Compare simple Oaxaca-Blinder decompositions to models accounting for selection bias)….TO BE WRITTEN]

Conclusion

[TO BE WRITTEN….]

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Appendix

A1 Data: Ghana

Data Sources/Overview of the Surveys

We use data from the Ghana Living Standards Survey (GLSS) and the Annual Household Income and Expenditure Survey (AHIES) to construct employment quality (and deprivation) index and to examine the relationship between employment quality and earnings (wages). The GLSS is a nationally representative survey that the Ghana Statistical Service (GSS) has conducted since 1987. We use the two most recent samples, GLSS 6 and 7, corresponding to the years 2012 to 2013, and 2016 to 2017, respectively[19]. Further, we use AHIES 2022, which is a nationally representative panel survey conducted by the GSS quarterly. We use only the data for Q1 2022. The AHIES survey is almost identical to the GLSS 7 survey, particularly with respect to the variables of interest. Therefore, the data we use include three survey waves: 6 and 7 corresponding to GLSS and wave 8 corresponding to AHIES 2022. Table A1.1 provides basic information about each survey wave.

Table A1.1: Summary Description of Surveys

Survey	Wave no.	Years	Number of Households	Number of Observations
GLSS 6	6	2012-13	16,772	43,267
GLSS 7	7	2016-17	14,009	36,225
AHIES 2022	8	2022	10,755	31,421

Note: observations for people younger than 15 years old have been excluded.

Description of Employment Variables

For the purposes of this study, a person is considered employed if they answer yes to either the employment status question or the temporary absence from employment question, as defined in Table A2, below. Much of the analysis of employment quality focuses on those who are employed for wages. Whether or not a person is employed for wages is determined by their job status. We also consider those who are self-employed, which is similarly defined based on job status. The precise definitions used are listed in the table below.

[19] Results in this study will generally be presented as corresponding to the latter year of each sample.

Table A1.2: Employment variables

Variable	Wave	Source	Question Text	Note
Employment status	8	s4aq28	"INTERVIEWER CHECK: IS THERE A "YES" RESPONSE IN ONE OF THE FF QUESTIONS? 1, 4, 7, 11, 15, 19, 22 or 25"	These questions cover different types of employment.
Employment status	7	s4aq21	"INTERVIEWER: IS THERE A"YES" RESPONSE IN QUESTIONS 2, 4, 6, 9, 12, 15, 17 or 19?"	These questions cover different types of employment.
Employment status	6	s4aq1	"Did (NAME) do any work for pay, profit, family gain or did (NAME) produce anything for barter or home use during the last 7 days even if it was for only one hour?"	
Temporary absence from employment status	8	s4aq29	"Even though [NAME] did not do any activities in the past seven days, does [NAME] have a work for wage, salary, commission or any payment in cash or in kind for someone who is not a member of [NAME's] household that [NAME] will return to?"	
Temporary absence from employment status	7	s4aq31	"INTERVIEWER CHECK: IS THERE A"YES" RESPONSE IN QUESTIONS 22, 23, 25, 27, 28, 29 OR 30?"	These questions cover temporary absences from employment, and activities like hunting and gathering or producing things for barter or sale, whether or not the person themselves considers this "employment."
Temporary absence from Employment status	6	s4aq3	"Was (NAME) temporarily absent from work in the last 7 days or did (NAME) have a job, business, or other economic or farming activity that he/she will definitely return to?"	
Wage employment status	8	s4aq46	"What is [NAME's] status in this job?"	Considered wage employed if status was paid, domestic, or casual.
Wage employment status	7	s4aq36	"	"
Wage employment status	6	s4aq20	"What was the status of (NAME) in this job?"	Considered wage employed if status was paid, domestic, or casual.

The estimated proportions of people in wage employment, as well as the corresponding number of observations, can be found in the table below.

Table A1.3: Wage Employment by Gender and Survey Wave

	Overall		Men		Women	
Wave	**Mean (SE)**	**N (Freq)**	**Mean (SE)**	**N (Freq)**	**Mean (SE)**	**N (Freq)**
GLSS 6	0.17 (0.01)	42,644 (15,929,764)	0.25 (0.01)	19,901 (7,375,594)	0.10 (0.00)	22,743 (8,554,170)
GLSS 7	0.19 (0.01)	35,344 (17,149,002)	0.27 (0.01)	16,480 (8,030,228)	0.11 (0.01)	18,864 (9,118,775)
AHIES 2022	0.16 (0.01)	29,642 (17,844,130)	0.22 (0.01)	13,560 (8,031,700)	0.11 (0.00)	16,082 (9,812,430)

Description of Employment Quality/Deprivation Variables

The following table shows the variables used in the construction of the employment quality index.

Table A1.4: Variables used in the Employment Quality/Deprivation Index

Variable	Wave	Source	Question Text	Note
Pension	8	s4aq51	Is [NAME] entitled to any social security benefits in this job?	
	7	s4aq41	”	
	6	s4aq28	Will (NAME) receive a retirement benefit/pension?	
Paid vacation	8	s4aq49	“In this job, is (NAME) entitled to paid holidays/leave?	
	7	s4aq39	”	
	6	s4aq26	“In this job, is (NAME) entitled to paid holidays?”	
Paid sick leave / Paid maternal leave	8	s4aq50	Is (NAME) entitled to paid sick leave and/or maternity leave on this job?	
	7	s4aq40	”	

	6	s4aq27	”	
Subsidized medical care	8	s4aq53	Is [NAME] entitled to free or subsidized medical care in this job?	
	7	s4aq43	”	
	6	s4aq29	Entitled to subsidized medical care	
Written contract	8	s4aq47	"Does [NAME] have a contract/agreement (written or verbal) or letter of appointment for this job?	
	7	s4aq37	”	
	6	s4aq24	When (NAME) started this work was there a contract?	
Union available	7 and 8			Imputed (see below under Imputations)
	6	s4aq25	Trade union available at workplace	
Permanent job	8	s4aq45	Is the work you do permanent or temporary?	
	7	s4aq52	Is the work you do permanent or temporary?	
	6			Imputed (see below under Imputations)

Earnings

Monthly wages are calculated as follows. The monthly wage includes all cash payments, including bonuses, commission, allowances, and the like, as well as the monetary value of in-kind payments. Only earnings from the main job are included. For AHIES 2022, the number of hours worked per day is available from section 4C, question 1; this is used to calculate the number of hours worked per week, which is multiplied by four to obtain the monthly wage. For those reporting wages daily, we use the number of days worked per week, which is available in section 4A in separate questions for each type of worker. The daily wage is multiplied by the number of days per week, which is multiplied by four. For wage intervals greater than one month, the reported wage is divided appropriately to yield a monthly wage. A reported monthly wage

is used without modification. GLSS 7 is the same, except that there is no data about the number of days worked per week, so for people reporting their wages on a daily basis we estimate the number of days worked as the number of weekly hours divided by eight, rounded up, capped at 7. GLSS 6 includes questions about the number of weeks worked in the last year, once in section A and once in section E. We use the first if it is available, falling back to the second otherwise. No wages are reported hourly. However, we use hours worked per week in order to estimate the number of days worked per week for those reporting daily wages, using the same method as in GLSS 7. There are two questions for hours per week: in section A the number of hours in the last week is reported, and in section E is the usual number of hours per week. As with the number of weeks per year, the section A response is used if available, falling back to the section E response if not. Whereas for GLSS 7 and AHIES 2022 we assume 48 weeks per year (i.e., 4 weeks per month), for GLSS 6 we use the reported number of weeks worked per year to adjust all reported wages except those reported annually. Thus, daily wages are converted to monthly by multiplying by the estimated days per week and reported weeks per year and dividing by twelve. Weekly wages are converted by multiplying by reported weeks per year and dividing by twelve. Monthly wages are adjusted by multiplying by reported weeks per year and dividing by 52. Quarterly wages are converted by dividing by three, multiplying by reported weeks per year and dividing by 52. Annual wages are divided by twelve. This method of adjustment helps account for seasonal work, so that those who work only part of the year are accounted for by diminishing their monthly wages accordingly. Real monthly wages are calculated from the nominal values by using the World Bank CPI deflator linked series for Ghana, FP.CPI.TOTL. Nominal values are multiplied by the 2022 deflator and divided by the deflator for the latter year of the survey wave.

Imputations

Union available at workplace

Union availability data is unavailable in the 2017 and 2022 samples. We therefore imputed union availability for those years. The imputation is calibrated based on reasonable estimates of aggregate union availability for those years, which is based on known aggregate figures for union membership and union contract coverage. These latter figures are from ILOSTAT, the statistics service of the International Labour Organization.

The imputed union membership variable for 2017 and 2022 is based on a logit model predicting union membership for 2006 and 2013. The model is based on the following independent variables: gender, age group, education group, urban or rural, sector group, industry group, occupation group, social security eligibility, paid sick leave or maternal leave eligibility, and eligibility for subsidized medical care. A lasso is used to reduce this list of variables and all of their pairwise interactions to a final set of 77 dummy

variables, which constitute the set of independent variables used by the logit model. The age groups are 15-24, 25-35, 36-50, 51-65, and 66+. There are three sector groups: Government sector, Parastatals, and International Organization / Diplomatic Mission form the first grouping; the private sector constitutes the second; and NGOs, Cooperatives, and "Other" form the third. Tables specifying the construction of the industry, occupation, and education groups are provided below.

For 2006, industry data is provided as ISCO 3.1 codes. These are mapped to ISIC 4 codes via a data crosswalk. For 2013, industry data is provided as ISIC 4 codes. For 2017 and 2022 the Main Industry is provided. The model was fit with both 2006 and 2013 data. Imputation was carried out by producing predicted probabilities for 2017 and 2022 and using Bernoulli selection to randomly assign a binary value based on that predicted probability. The predicted probabilities are adjusted based on external benchmarks. Specifically, benchmark union availability rates are inferred from aggregate union membership and aggregate union contract coverage figures from ILOSTAT. Per ILOSTAT data, the proportion of workers covered by a collective bargaining agreement increased by 22% (from 31.8% to 39.1%) from 2013 to 2017. The trade union membership density increased by 12.3%, from 15.5% to 17.4%, during that time. Those two variables form bands which contain the union availability rate. The union availability rate has both a level and rate of change somewhere between those two. We therefore assume that its rate of change for 2013-2017 is the average of those two rates of change, which is a 17.6% increase. Our GLSS 5 union availability rate is 38.8% and GLSS 6 is 31.2%. Applying the 17.6% increase yields a union availability rate of 36.7% for 2017.

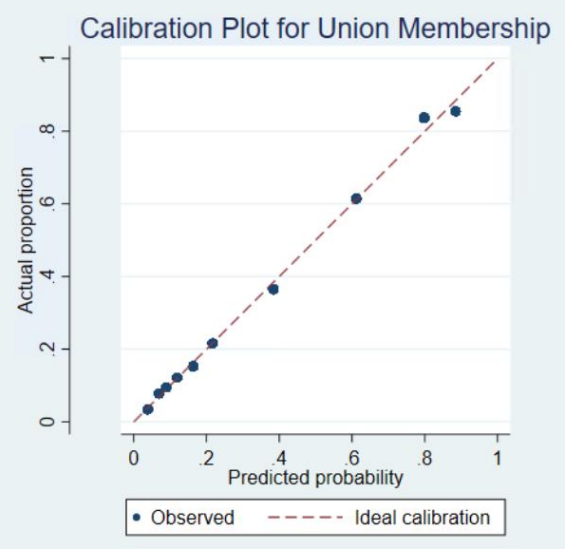
Up-to-date union statistics are also lacking for AHIES 2022. The last available data are for 2019 and 2020. Those ILOSTAT statistics show a small decrease in unionization. However, it is likely that there was a large change in 2020 and 2021 due to COVID. Lacking relevant data, we establish the benchmark union availability rate for 2022 at a 3% decrease, at 35.6%.

Exponential scaling (rather than linear scaling) is used in order to preserve the shape of the distribution, while not producing probability values greater than 1. An exponent of 0.80 results in an aggregate union availability level near the benchmark level of 36.7% for 2017. This scaling adjusts the probability distribution with minimal distortion. The same exponential scaling factor yields acceptable results for 2022, with aggregate figures approximating the benchmark level of 35.6%.

Statistical tests were conducted to verify the quality of the imputed union dummy for 2017 and 2022. First a calibration plot was produced for 2013, which was in the training set. This method divides the data into bins based on the predicted probability of union availability. With each bin, the mean predicted probability

is compared to the actual mean of the union availability variable. Plotting the relationship shows a very close in-sample fit between the actual and predicted data.

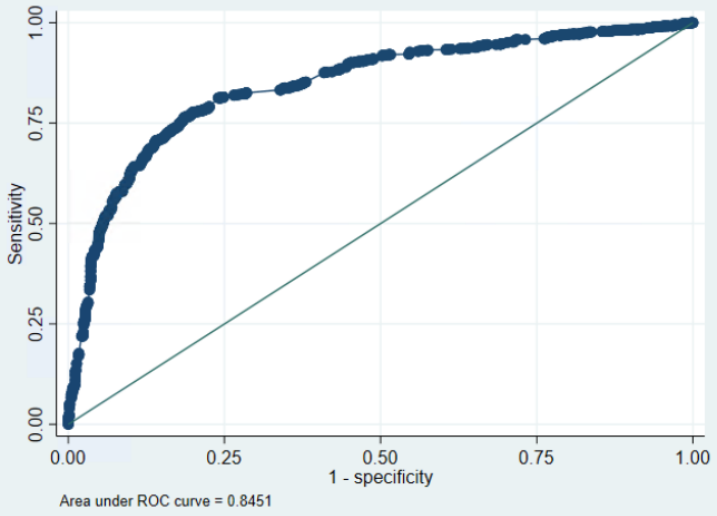
Figure A1: Calibration Plot for Union Membership



We also validated that the imputation model could be fit on data from both 2006 and 2013. To do this, we measured the correlation between predictions based on models trained only on 2006 data and only on 2013 data. The predicted probabilities of union availability for 2006 have a 0.90 correlation, and for 2013 they have a 0.93 correlation.

Given this high reliability of models trained on only one year, we also validated the imputation model by making outsample predictions with these models. The predictions are evaluated against true data using the Area under ROC curve, or AROC. The ROC curve, plotted below, shows the balance of true positives (vertical axis) and true negatives (horizontal axis) as the threshold value of the prediction is decreased from 1 to 0 (following the curve from bottom-left to top-right). The model trained on 2006 data obtains an AROC of 0.80 when predicting data for 2013, and the model trained on 2013 data obtains an AROC of 0.85 when predicting data for 2006. Scores of this magnitude are generally regarded as indicating a strong predictor.

Figure A2: ROC Curve for Union Imputation Model Outsample Predictions

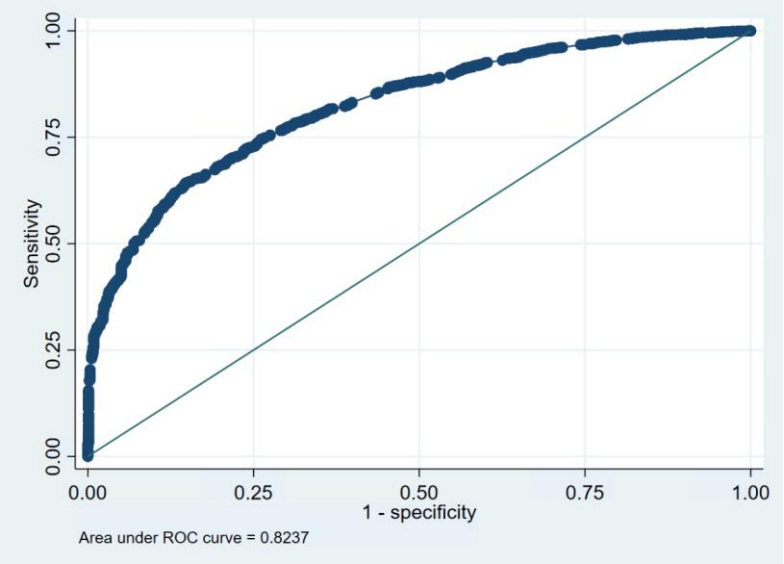


Permanent Job

Data about whether jobs were permanent or temporary is available for 2017 and 2022. We impute this information for 2006 and 2013 using a similar technique to the union imputation. Unlike with union membership, there are no known aggregate figures to calibrate the imputation to. The imputed permanent employment variable for 2006 and 2013 is based on a logit model predicting permanent employment for 2017 and 2022. The model is based on the following independent variables: gender, age group, education group, urban or rural, sector group, industry group, occupation group, social security eligibility, paid sick leave or maternal leave eligibility, eligibility for subsidized medical care, and the interval at which wages are paid. Other than the pay interval, this list of variables is identical to those used for the union imputation. The grouping variables are as described in the section on union imputation. A lasso procedure is used to reduce the list of variables as follows. Starting with this list of variables and all of their pairwise interactions, we run three lassos: one on just the 2017 data, one on the 2022 data, and one on the pooled data from both samples. The final set of 115 dummy variables is the list of variables (or interactions) which appeared in at least two of the resulting three variable lists. This list cross-validates as well as the (longer) list resulting from any single lasso, and better than the intersection of all three lists.

This list is then the set of independent variables used by the logit model. The model was fit with both 2017 and 2022 data. Imputation was carried out by producing predicted probabilities for 2006 and 2013 and using Bernoulli selection to randomly assign a binary value based on that predicted probability.

Statistical tests were conducted to verify the quality of the imputed permanent job dummy. Permanent job imputations were produced using models trained only the 2017 data and only the 2022 data for testing purposes. Each of these models was then used to predict the permanent job dummy in the other year with available data, yielding 2017-on-22 predictions and 2022-on-17 predictions. These predictions are evaluated against true data using the AROC. The ROC curve for 2022-on-17 is plotted below; it shows an AROC of 0.82. The model trained on 2017 data obtains an AROC of 0.81 when predicting data for 2022. Scores of this magnitude are generally regarded as indicating a strong predictor.



Wage Imputation

Because around 16% of wage-employed workers are missing wage data for 2013, wages were imputed for all wage-employed workers that were missing them. Log real wages are imputed using predictive mean matching, choosing randomly among five nearest neighbors. The independent variables used for the matching are region, urban/rural dummy, gender, age, age squared, the wage-employment dummy, the industry groupings, occupation groupings, and education groupings. Only a single imputation is produced. Since these singly-imputed wages will not produce valid standard errors, they are used only for

descriptive statistics, not inference. After imputation, a small number of wage-employed records remain without wage values; in most cases this is because of missing education data. After the imputed log real wage is produced, real wages and nominal wages are calculated from the log real wages.

Industry Classification

We segregated the 1-digit level International Standard Industrial Classification of All Economic Activities, Revision 4 (ISIC Rev.4) into six major categories based on their standard classification: Primary, Secondary, Trade and Transportation, Business and Financial Services, Public and Social Services, and Other Services (including Private Households). While we had direct questions on 1-digit main industry groups in AHIES 2022 and GLSS 2017, we constructed it for GLSS 2013 from the question on industry with ISIC 4-digit industry codes (Table A1.5).

Table A1.5: ISIC Industry Codes, Main Industry Categories, and Industry Groups

ISIC4 Code Range	Main Industry	Industry Group
111-399	1. Agriculture, forestry and fishing	Primary
500-999	2. Mining and quarrying	Primary
1000-3399	3. Manufacturing	Secondary
3500-3599	1. Electricity, gas, stream and air conditioning supply	Secondary
3600-3999	2. Water supply; sewerage, waste management and remediation activities	Secondary
4100-4399	3. Construction	Secondary
4500-4799	4. Wholesale and retail; repair of motor vehicles and motorcycles	Trade, transport, hospitality
4900-5399	5. Transportation and storage	Trade, transport, hospitality
5500-5699	6. Accommodation and food service activities	Trade, transport, hospitality
5800-6399	7. Information and communication	Business & financial services
6400-6699	8. Financial and insurance activities	Business & financial services
6800-6899	9. Real estate activities	Business & financial services
6900-7599	10. Professional, scientific and technical activities	Business & financial services
7700-8299	11. Administrative and support service activities	Business & financial services
8400-8499	12. Public administration and defense; compulsory social security	Public & Social Services
8500-8599	13. Education	Public & Social Services

ISIC4 Code Range	Main Industry	Industry Group
8600-8899	14. Human health and social work activities	Public & Social Services
9000-9399	15. Arts, entertainment and recreation	Other Services & Households
9400-9699	16. Other service activities	Other Services & Households
9700-9899	17. Activities of households as employers; undifferentiated goods - and services - producing activities of households for own use	Other Services & Households
9900-9999	18. Activities of extraterritorial organizations and bodies	Other Services & Households

Occupation Classification

We segregate the International Standard Classification of Occupations (ISCO)-08-unit group of occupations present in the data into three skill levels (Table A1.6). While ISCO-08 occupation variable was directly present in AHIES 2022 and GLSS 2017, it had to be constructed in GLSS 2013 from the 4-digit occupation code variable.

Table A1.6: Occupation Codes, Main Occupation Categories, and Occupation Groupings

ISCO Code (2012)	Main Occupation	Occupation Group
1111-1999	Legislators/managers	High-Skilled
2000-2999	Professionals	High-Skilled
3000-3999	Technicians and associate professionals	High-Skilled
4000-4999	Clerical support workers	Medium-Skilled
5000-5999	Service/sales workers	Medium-Skilled
6000-6999	Skilled agric/fishery workers	Medium-Skilled
7000-7999	Craft and related trades workers	Medium-Skilled
8000-8999	Plant machine operators and assemblers	Medium-Skilled
9000-9999	Elementary occupations	Low-skilled
110,310	Other Occupations	Low-skilled

Education

In Table A1.7, we detail the mapping of education variables to the number of years of education and the corresponding education groups. The mapping for education is complex. In general, where Highest Level is provided, it is used instead of Highest Grade Completed. The set of values for both Highest Grade

Completed and Highest Level Attained vary from year to year. Their mapping is mostly consistent between years; exceptions have been noted in parentheses.

Table A1.7: Coding and Mapping for Education Data

Highest Grade Completed	Highest Level Attained	Estimated Years	Education Group
None, Pre-school/Kindergarten	-	0	0-6 years
Primary 1-6	-	1-6	0-6 years
JSS1/JHS1, Middle School 1, Secondary 1	-	7	7 to 9 years
JSS2/JHS2, Middle School 2, Secondary 2	-	8	7 to 9 years
JSS3/JHS3, Middle School 3, Secondary 3	BECE	9	7 to 9 years
SSS1/SHS1, Middle School 4, Secondary 4	MSLC	10	10-12 years
SSS2/SHS2, Secondary 5, Vocational/Commercial, Technical training	GCE 'O' Level, Vocational/Commercial	11	10-12 years
SSS3/SHS3, Lower 6	SSCE, WASSCE	12	10-12 years
SHS4, Upper 6, Year One	GCE 'A' Level	13	13 to 21 years
Year Two	-	14	13 to 21 years
Teacher Training, Nursing, Polytechnic, Year Three	Teacher Training Certificate, Technical/Professional Certificate, Technical/Professional Diploma, Post Secondary Diploma, HND	15	13 to 21 years
University, Other Tertiary (2006), Year Four	Bachelor	16	13 to 21 years
Year Five	Masters, Post Graduate (2013, only if highest grade is not 'other tertiary')	18	13 to 21 years
Year Six and Above	Doctorate, Post Graduate (2013, only if highest grade is 'other tertiary')	22	13 to 21 years

Information about the *sources* for education, industry, and occupation data are provided in Table A1.8 below.

Table A1.8: Education, Industry, and Occupation Data Sources

Variable	Wave	Source	Question Text
Highest grade completed	All	s2aq2	What is the highest grade completed at that level?
Highest level attained	All	s2aq3	What was the highest educational qualification attained?

Variable	Wave	Source	Question Text
Main industry	8	4aq41a1	During the past 7 days what kind of goods and services or industry is this work connected with?
Main industry	7	s4aq34	During the past 7 days what kind of goods and services or industry is this work connected with?
Industry code	6	s4aq7	What kind of goods, services or industry is this work connected with?
Main occupation	8	s4aq40a1	If [NAME] worked in the past 7 days, what kind of work did (NAME) mainly do?
Main occupation	7	s4aq33a	If [NAME] worked in the past 7 days, what kind of work did (NAME) mainly do?
Occupation code	6	s4aq6	During the last 7 days, what were the main tasks and duties in the job (NAME) spent most of his/her time on? i.e. describe the main job/task (NAME) was performing e.g. carrying bricks; mixing baking flour; harvesting maize; etc.

A2 Data: South Africa

Data Sources/Overview of the Surveys

We use data from the Labor Market Dynamics (LMD) series from Statistics South Africa (Stats SA) and the Post Apartheid Labor Market Series (PALMS) version 3.3 from DataFirst at the University of Cape Town. While in this paper we focus on three years: 2013, 2017, and 2022 in the interests of a comparative analysis with Ghana, we have developed a database for all years from 2008 to 2022 for future studies; all of the data for these years from both series comes from the Quarterly Labor Force Survey (QLFS). The QLFS is a household-based sample survey conducted by Stats SA. LMD is the annual public microdata set composed by Stats SA from QLFS data. For LMD we use data from the years 2008 to 2022. PALMS is a stacked cross-sectional dataset composed from several surveys covering 1994 to 2019. However, for PALMS we only use data from the years 2008 to 2019, all of which comes from QLFS. As far as our study is concerned, PALMS data is effectively identical to the LMD data, but with improved weights and multiply imputed earnings data. PALMS is, however, missing data for a number of the questions from the QLFS; these are merged in from LMD. Since PALMS stops after Q1 2019, and PALMS earnings data stops after 2017, data for subsequent quarters and years is appended from LMD.

Commented [AS5]: @Ajit: Is it okay to present details for all years or should we just limit to the relevant years? I will edit accordingly in the next iteration.

Table A2.1: Summary Description of Surveys

Survey Year	Number of Households	Number of Observations
2008	49,206	255,157
2009	47,329	244,830
2010	44,590	235,983

Survey Year	Number of Households	Number of Observations
2011	45,070	230,178
2012	45,992	235,912
2013	46,459	239,476
2014	45,415	234,907
2015	40,784	197,851
2016	39,878	191,221
2017	39,427	191,020
2018	39,102	190,551
2019	38,632	188,623
2020	20,874	146,475
2021	26,316	127,968
2022	35,342	165,780
Total	**604,416**	**3,075,932**

Note: Observations for people younger than 15 years old have been excluded. **

Description of Employment Variables

A person is considered employed if they responded to QLFS question 4.5 indicating that they work for someone else for pay, are an employer, or are an own-account worker (with no employees). In the first case, the person is considered wage employed, and in the latter two cases, they are considered self-employed. Those who answer that they help without pay in a household business are not considered to be employed.

The question reads: “In the job/business, that you had during the last week (Monday to Sunday) were you…” and the possible answers are as follows: - 1 = Working for someone else for pay? (Including paid domestic workers, gardeners or security guards) Payment in cash or in kind (e.g. food, accommodation). Option 1 includes all employees: Full-time, part-time, casual work and piecework. - 2 = An employer (employing one or more paid employees)? - 3 = Own-account worker (not employing any employees)? - 4 = Helping without pay in a household business?

The estimated proportions of wage employment of the employed for each year, as well as the corresponding number of observations, can be found in the table below. Note that observations (N) and frequency (Freq.) reflect the total number of data points rather than positive cases.

Table A2.2: Wage Employment by Gender and Survey Wave

	Overall	**Men**	**Women**

Survey year	Mean (SD)	N (Freq.)	Mean (SD)	N (Freq.)	Mean (SD)	N (Freq.)
2008	0.849 (0.358)	98,786 (14,785,116)	0.846 (0.361)	53,269 (8,360,954)	0.852 (0.355)	45,517 (6,424,162)
2009	0.853 (0.354)	90,039 (14,388,665)	0.843 (0.364)	47,725 (8,078,506)	0.866 (0.340)	42,314 (6,310,159)
2010	0.850 (0.357)	82,083 (14,024,725)	0.839 (0.368)	43,494 (7,932,565)	0.865 (0.342)	38,589 (6,092,160)
2011	0.850 (0.357)	80,400 (14,321,998)	0.836 (0.370)	42,574 (8,060,705)	0.867 (0.339)	37,826 (6,261,293)
2012	0.852 (0.355)	83,518 (14,690,910)	0.832 (0.374)	44,672 (8,275,745)	0.877 (0.328)	38,846 (6,415,165)
2013	0.857 (0.350)	86,418 (15,177,677)	0.840 (0.367)	45,764 (8,472,241)	0.879 (0.326)	40,654 (6,705,436)
2014	0.864 (0.342)	84,873 (15,504,444)	0.844 (0.362)	44,681 (8,681,112)	0.890 (0.313)	40,192 (6,823,332)
2015	0.859 (0.348)	76,071 (16,100,957)	0.838 (0.369)	41,210 (9,028,974)	0.886 (0.317)	34,861 (7,071,983)
2016	0.853 (0.354)	72,517 (16,112,559)	0.830 (0.376)	39,402 (9,076,365)	0.882 (0.322)	33,115 (7,036,194)
2017	0.853 (0.355)	73,120 (16,488,239)	0.833 (0.373)	39,274 (9,214,053)	0.878 (0.328)	33,846 (7,274,186)
2018	0.849 (0.358)	72,751 (16,706,387)	0.824 (0.381)	38,942 (9,351,561)	0.881 (0.323)	33,809 (7,354,826)
2019	0.841 (0.366)	70,687 (16,563,578)	0.815 (0.388)	37,950 (9,296,442)	0.874 (0.332)	32,737 (7,267,136)
2020	0.839 (0.368)	48,981 (15,148,105)	0.811 (0.392)	25,779 (8,516,124)	0.874 (0.332)	23,202 (6,631,981)
2021	0.837 (0.370)	39,370 (14,770,776)	0.809 (0.393)	20,548 (8,358,306)	0.873 (0.333)	18,822 (6,412,470)
2022	0.836 (0.370)	53,722 (15,632,420)	0.806 (0.395)	28,488 (8,774,766)	0.875 (0.331)	25,234 (6,857,654)
Total	**0.849 (0.358)**	**1,113,336 (230,400,000)**	**0.829 (0.376)**	**593,772 (129,500,000)**	**0.875 (0.331)**	**519,564 (100,900,000)**

Description of Employment Quality (and Deprivation) Variables

The following table shows the variables used in the construction of the employment quality index.

Table A2.3: Variables used in the Employment Quality/Deprivation Index

Variable	QLFS Question Number	QLFS Question Text	Note
Pension	4.6	Does your employer contribute to any pension/retirement fund for you?	
Paid vacation	4.7	Are you entitled to any paid vacation leave?	
Paid sick leave	4.7b (1)	Are you entitled to any paid sick leave?	Not available 2008-2010.
Natal leave	4.7b (2)	Are you entitled to any maternity / paternity leave?	Not available 2008-2010.
Unemployment Insurance	4.8	Does your employer pay UIF contributions for you?	
Subsidized medical care	4.9	Are you entitled to medical aid benefits from your employer?	
Written contract	4.11	Are you employed on the basis of a written contract?	Not available 2008-2010.
Permanent contract	4.12 (2)	Is the contract/agreement of a permanent nature?	
Union membership	4.12b	Are you a member of a trade union or other workers' organisations?	

Industry and Occupation

We use the 3-digit industry code variable in QLFS to construct the 21 ICIS v4 sections, which in turn are segregated into the six broad industry groups. The occupation variable in QLFS was mapped from 4-digit ISCO-88 codes to the ten major groups of ISCO-08. These ten major groups are further coalesced into four skill level groupings: high skill, medium skill, low skill, and armed forces / not employed elsewhere (NEC).

Earnings

Wages are missing in the LMD data for a significant share of employees. There is also a "refused" category of the categorical wage variable which we treat as missing. StatsSA, which produces LMD, imputed categorical responses for most missing and refused earnings data for the period 2010-2012Q2, and all missing and refused earnings data for 2021 and 2022. StatsSA provides no way to distinguish real data from imputed data for these years. For this reason, it is impossible to produce valid standard errors for any inference using wage data from those years, since they cannot account for imputation error. For those years, any standard errors reported on an equation involving wages should be assumed to be underestimated. Data from 2012Q3 through 2020 is provided by LMD unimputed. Over those years, the refusal/nonresponse rate rises from about 11% in 2013 to about 23% in 2020. For this reason, for all workers, we impute wages where they are missing, refused, or outliers.

The method of imputation closely follows that used by Kerr and Wittenberg (2019) in constructing the PALMS dataset. First, outliers are identified as log wage values more than 5 studentized standard

deviations above or below a linear model prediction. The linear model uses OLS to predict log real wages from the estimated years of education, age, age squared, major occupation grouping, and the intersection of gender and year and the intersection of race and year. Outlier earnings, as well as refused or other invalid categorical earnings responses, are all set to missing pre-imputation.

The imputation procedure followed a monotone sequence using chained equations. The monotone missing pattern is such that no record has a rand earnings amount without a categorical response. As it happens, there are very few records which have a non-refused categorical response and no rand amount reported. Categorical earnings bands were imputed first using an ordered logit model conditional on province, gender, education group, population group, age and age squared, employment status, and industry and occupation groups. Real earnings were then imputed using predictive mean matching with ten nearest neighbors, conditional on imputed earnings category, gender and education group. Ten imputed categorical earnings and ten imputed real earnings values were generated for each observation, stratified by year. Following imputation, values from the first imputation were extracted for use in analysis. Imputed real earnings were converted back to nominal values using the CPI. The years for which StatsSA imputed earnings data do not have multiply imputed earnings data, but for 2012Q3 through 2019, the complete set of imputations is used in calculating standard errors.

A3 Parameter estimates of nonwage benefit models

The estimates reported below are from the logistic model of the recipiency of each nonwage benefit in each country. Since there are five nonwage benefits in our study, 10 separate models were estimated. Pooled data from 2013, 2017 and 2022 were used in estimation.

	Ghana				South Africa			
	Estimate	SE	t Value	Pr > |t|	Estimate	SE	t Value	Pr > |t|
Pension coverage								
Intercept	-3.739	0.144	-26.050	<.0001	-4.644	0.070	-66.780	<.0001
Female	-0.370	0.228	-1.620	0.105	-0.356	0.103	-3.460	0.001
Written contract	3.796	0.104	36.680	<.0001	2.540	0.069	37.100	<.0001
Permanent job	1.015	0.129	7.860	<.0001	2.581	0.032	80.420	<.0001
Union	1.738	0.090	19.410	<.0001	2.065	0.030	69.900	<.0001
Female*Writ.Cont.	-0.261	0.174	-1.500	0.133	0.039	0.101	0.380	0.702
Female*Permanent	0.457	0.198	2.310	0.021	0.136	0.044	3.080	0.002
Female*Union	0.449	0.143	3.150	0.002	0.211	0.041	5.190	<.0001
Year 2017	-0.739	0.117	-6.310	<.0001	0.019	0.025	0.740	0.461
Year 2022	-0.597	0.126	-4.740	<.0001	-0.158	0.029	-5.550	<.0001
Medical coverage								
Intercept	-3.024	0.127	-23.840	<.0001	-5.520	0.112	-49.320	<.0001
Female	0.248	0.171	1.450	0.147	-0.350	0.161	-2.170	0.030

	Ghana				South Africa			
	Estimate	SE	t Value	Pr > |t|	Estimate	SE	t Value	Pr > |t|
Written contract	2.106	0.099	21.220	<.0001	2.366	0.114	20.740	<.0001
Permanent job	0.504	0.114	4.420	<.0001	2.410	0.043	55.510	<.0001
Union	0.527	0.084	6.290	<.0001	1.673	0.024	68.740	<.0001
Female*Writ.Cont.	-0.390	0.167	-2.340	0.019	0.175	0.166	1.050	0.292
Female*Permanent	-0.356	0.172	-2.070	0.038	0.136	0.062	2.190	0.029
Female*Union	0.287	0.125	2.290	0.022	0.303	0.033	9.170	<.0001
Year 2017	-0.244	0.098	-2.480	0.013	-0.107	0.023	-4.580	<.0001
Year 2022	-0.395	0.097	-4.060	<.0001	-0.138	0.026	-5.240	<.0001
Paid holiday								
Intercept	-2.311	0.116	-19.960	<.0001	-2.687	0.037	-72.730	<.0001
Female	0.429	0.160	2.680	0.008	0.332	0.043	7.640	<.0001
Written contract	2.962	0.085	34.910	<.0001	2.205	0.036	61.260	<.0001
Permanent job	0.562	0.113	5.000	<.0001	2.112	0.027	79.610	<.0001
Union	1.081	0.081	13.430	<.0001	1.174	0.039	30.480	<.0001
Female*Writ.Cont.	-0.181	0.124	-1.460	0.144	-0.477	0.047	-10.120	<.0001
Female*Permanent	-0.084	0.178	-0.470	0.639	0.031	0.034	0.900	0.367
Female*Union	0.040	0.131	0.300	0.763	0.182	0.052	3.510	0.000
Year 2017	-0.636	0.099	-6.410	<.0001	0.331	0.026	12.860	<.0001
Year 2022	-1.152	0.112	-10.270	<.0001	0.191	0.030	6.460	<.0001
Sick leave								
Intercept	-2.129	0.120	-17.700	<.0001	-2.548	0.037	-68.720	<.0001
Female	0.324	0.154	2.110	0.035	0.362	0.042	8.660	<.0001
Written contract	2.871	0.081	35.320	<.0001	2.556	0.035	73.000	<.0001
Permanent job	0.559	0.101	5.520	<.0001	1.989	0.029	67.870	<.0001
Union	0.992	0.088	11.220	<.0001	1.623	0.051	31.820	<.0001
Female*Writ.Cont.	-0.562	0.128	-4.380	<.0001	-0.555	0.045	-12.240	<.0001
Female*Permanent	0.122	0.161	0.760	0.450	0.070	0.037	1.880	0.060
Female*Union	-0.038	0.136	-0.280	0.782	0.102	0.067	1.530	0.125
Year 2017	-0.597	0.099	-6.050	<.0001	0.305	0.029	10.710	<.0001
Year 2022	-0.990	0.110	-9.030	<.0001	0.330	0.031	10.560	<.0001
Natal leave*								
Intercept	-2.281	0.153	-14.910	<.0001	-3.676	0.050	-73.000	<.0001
Female					0.353	0.061	5.810	<.0001
Written contract	1.868	0.110	16.970	<.0001	2.401	0.050	48.270	<.0001
Permanent job	0.380	0.125	3.040	0.002	1.809	0.026	69.730	<.0001
Union	0.979	0.101	9.680	<.0001	1.250	0.027	45.720	<.0001
Female*Writ.Cont.					-0.264	0.063	-4.200	<.0001
Female*Permanent					0.335	0.034	9.890	<.0001
Female*Union					0.484	0.043	11.270	<.0001
Year 2017	-0.107	0.132	-0.810	0.418	0.422	0.025	16.800	<.0001
Year 2022	-0.494	0.135	-3.670	0.000	0.073	0.027	2.690	0.007

Note: The degrees of freedom for the hypothesis tests in Ghana and South Africa were 2416 and 31348. Survey design features (cluster and stratum) are accounted for in the tests.

*Because there is no paternity leave in Ghana, the natal leave model for Ghana was estimated only for women.