Gendered trends in educational expansion, labour market dynamics, and wage returns in Ghana: Evidence from harmonised cross-sections

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Abstract

Since independence, Ghana's economy has been marked by GDP growth volatility, energy and fiscal crises, and most recently the COVID-19 pandemic, with occupational and sectoral shifts additionally characterising labour market dynamics. At the same time, educational attainment has grown rapidly underpinned by deliberate policies aimed at expanding access to quality education that aligns with labour market needs. However, there remains a gap in systematically mapping the labour market consequences of this educational expansion over time – particularly for women. Ghana has rich, nationally representative cross-sectional survey data, spanning over three decades. We stack and harmonise independent cross-sections to analyse educational attainment (between 1987 and 2022), labour market dynamics (2000 - 2022), and wage returns to education by gender (2006 - 2022). An additional and key contribution of our study is a critical reflection on the comparability of questionnaires and the possibility of inconsistencies in measurement arising from different survey designs.

Our findings point to an initial period of stagnation in educational attainment, followed by sustained improvements for both men and women. Nonetheless, gender disparities persist. Wage employment continues to favour men across all education levels, although its share of total employment has declined—more sharply for men than for women. Wage regressions indicate that returns to higher levels of education remain significantly positive for both genders, but have been declining over time. Moreover, a persistent gender wage gap remains. Taking stock of these dynamics comes at a crucial point in time when Ghana continues to advance free education policies at the senior secondary level, thereby expanding the supply of educated workers in the labour market.

1 Introduction

Educational attainment in Ghana has increased rapidly. One of the country's education policy goals is to provide quality and accessible education to all Ghanaians to meet the needs of the labour market (Ministry of Education, 2019). In particular, tracking progress in educational attainment alongside trends in labour market indicators can provide insights about the alignment of educational investments with labour market outcomes.

Our aim is therefore to take stock of how educational attainment has changed over time in response to education policy changes, specifically exploring relationships between education and gender differences in labour market outcomes, type of job and wages earned. Our focus on wage jobs in the final component of this paper is motivated in part by data limitations in earnings information and in part by a focus on a more 'stable' form of employment.[1]

By harmonising independent but nationally representative cross-sectional household surveys (the Ghana Living Standards Surveys; GLSSs), population and housing censuses (PHCs), a labour force survey (LFS) and the first year of the Annual Household Income and Expenditure Survey (AHIES), we analyse trends in educational attainment and labour market returns over time and by gender. This approach allows us to pinpoint aggregate shifts in outcomes as well as assess the comparability of survey data from different sources over time.

These datasets have been widely used explore education and labour market issues in Ghana. For example, Abekah-Nkrumah et al. (2019) and Boahen et al. (2021) use the 2012/13 GLSS 6 and the 2010 PHC, respectively, to study the effects of education duration reforms on labour market outcomes. Akyeampong (2009) draws on GLSS 5 (2006) to analyse primary school attendance, while Ackah et al. (2014) and Baah-Boateng et al. (2013) use the same round to estimate returns to education and examine female labour force participation, respectively.

Several studies also use the GLSSs to track trends over time. Boadi (2023) uses the most recent two rounds (2012/13 and 2016/17) to examine the gender wage gap and Gradín and Schotte (2020) use the latest 3 rounds (2006 inclusive) to analyse trends in earnings inequality. Earlier rounds have been used to examine, for example, education, poverty, and inequality in Ghana in the 1990s (Teal, 2001), private returns to schooling (Sackey, 2008) and determinants of unemployment (Baah-Boateng, 2013). Combining census and survey data, Baah-Boateng (2014) examines changes in occupational sex segregation from 1960 to 2010. Although these studies offer valuable insights across time, caution is needed when comparing results, as differences in survey design and labour market definitions may affect inter-temporal comparability.

Our study builds on this literature for Ghana along three dimensions. First, we extend the number of surveys that have been harmonised to consider educational expansion over an extended period. Second, we aim to enhance comparability of education and labour market measures over time, by computing them consistently and with a focus on data quality. Specifically, we reflect on the comparability of questionnaires and possibility of inconsistencies in measurement arising from different survey designs. Third, we consider the labour market returns to education, by gender, including some of the most recent post-pandemic evidence on

[1] The Ghana Statistical Service (GSS) defines vulnerable employment as being engaged in self-employment and/or contributing family work (Ghana Statistical Service, 2023). We acknowledge, however, that wage employment is not always preferable to self-employment and the latter can be a key driver of job creation.

wage returns. Our research questions are as follows:

1. What have been the gendered trends in educational attainment in Ghana?
2. What have been the trends in economic activity over time and how do trends differ for men and women?
3. How have the wage returns to education changed for male vs. female employees over time?

Although descriptive, this study highlights a number of crucial points. First, Ghana's education policies and reforms appear to have promoted educational attainment, and while progress has clearly been made in closing the education gender gap, disparities remain. Second, while wage and public sector employment continue to dominate among those with higher levels of education, a growing share of the workforce is engaged in non-wage employment, even as educational attainment increases. The overall decline in the share of wage jobs, which mirrors a decline in the share of public sector employment, suggests limited expansion of wage-paying jobs in the private sector to absorb the growing number of educated job seekers. As World Bank (2021) observes, with an estimated 10 million Ghanaians projected to enter the labour force over the next 15 years, the rate of job creation remains insufficient.

Our third key finding—that returns to education, particularly at the senior high and tertiary levels, have been declining—is therefore especially salient in a context where new labour market entrants are increasingly educated. While we do not make any causal claims (falling returns may partly reflect reduced selection bias in the context of expanding access), the decline may also signal other challenges. These include a potential deterioration in graduate quality, mismatches between qualifications and labour market demands, skill gaps among appropriately qualified graduates, or an oversupply of qualifications that are not in demand. Nonetheless, education at the senior high and tertiary levels continues to yield a wage premium, and one that is notably higher for women than for men. Despite this and being, on average, more educated than their male counterparts, wage-employed women continue to face persistent gender wage gaps.

The remainder of the paper proceeds as follows: in the next section, we briefly discuss Ghana's education system and relevant policy changes (Section 2.1). Thereafter, we speak to the country's macroeconomic context and labour market measures over time (Section 2.2). A description of our data and variable construction follows, with our methodological approach outlined thereafter (Section 3). Our results are presented in three parts. First part, we consider gendered trends in educational expansion alongside key education policy changes (Section 4.1). Next, we consider gendered trends in labour market indicators, occupation and industry shares and wage employment (Section 4.2). Here, we discuss which shifts may have been driven by inconsistencies in measurement, the broader economic context, and educational expansion. Finally, we consider the wage return to education over time (Section 4.3). In Section 5 we conclude.

2 Background and context

2.1 Education system and relevant policy changes

Ghana's education system has experienced several changes over the past four decades. Key goals of education strategies and reforms has been education for national development, improving equity in access (specifically girls' education), and improving quality (Ministry of Education, 2019). In the most recent strategic plan, the Ministry of Education additionally articulates a goal of meeting the needs of the labour market.

Before 1987, the education system followed a 17-year structure with six years of primary school, four years of middle school, and five years of secondary education. In 1987, Ghana introduced the New Educational Reform Programme (NERP), which reduced pre-tertiary education to 12 years (see e.g. Boahen et al., 2021): six years of primary school, three years of junior secondary school (JSS), and three years of senior high school (SHS). In 2007, SHS was briefly extended to four years but reverted to three by 2010 (see e.g. Abekah-Nkrumah et al., 2019). Additionally, formal kindergarten was introduced into the mainstream system, extending basic education from age 4 to 15. Today, Ghana's education system is organised into three levels: basic education (kindergarten to JHS), secondary education (SHS or vocational training), and tertiary education, which includes universities and other post-secondary institutions.

In addition to these reforms, Ghana has successively made public basic and secondary education free. Free primary education was first introduced in 1951 under the Accelerated Development Plan (ADP), which aimed to rapidly expand access. Free Compulsory Universal Basic Education (FCUBE) extended this to include JHS in 1996 (see Akyeampong, 2009, for a detailed review). Building on this, free secondary education was introduced in 2017, which eliminated tuition fees for all students attending public senior high schools (see e.g. Stenzel et al., 2024). These frequent changes have initiated considerable public debate about the costs and benefits of pre-tertiary education in Ghana.

Regarding tertiary level education, between 1993 and 1998 Ghana, together with the World Bank, embarked on its Tertiary Education Project (TEP). The project was designed to restructure and enhance the quality of the tertiary education sector, following a prolonged period of underfunding and decline (Girdwood, 1999). This project was considered only marginally successful. "Government spending on tertiary education actually declined by one-fifth of the former proportion of educational expenditure... Expansion of student numbers however was rapid (an 80% increase in enrolments over the duration of the project)" (p. ix Girdwood, 1999)

Until 1998, tertiary students studied for free. A cost-sharing policy was adopted in 1997, which pegged the government's share at 70%, while students, institutions, and philanthropists covered the remainder (Girdwood, 1999). Scholarships and a national loan scheme are available, and in 2025, Ghana's president Mahama announced The 'No-Academic-Fee' policy for all first-year students in public tertiary institutions (Ibrahim, 2025).

Table 1 summarises these policies and reforms, indicating which birth cohorts were likely to be first affected under the assumptions of entering primary school at age 6 and no grade repetition. For the TEP, we record the cohort first exposed as 'varied', since entrance to tertiary education may differ by exposure to the NERP and may occur later in life for some

individuals. To the best of our knowledge, this is the first study to think about descriptively mapping these policy changes inclusively rather than in isolation.

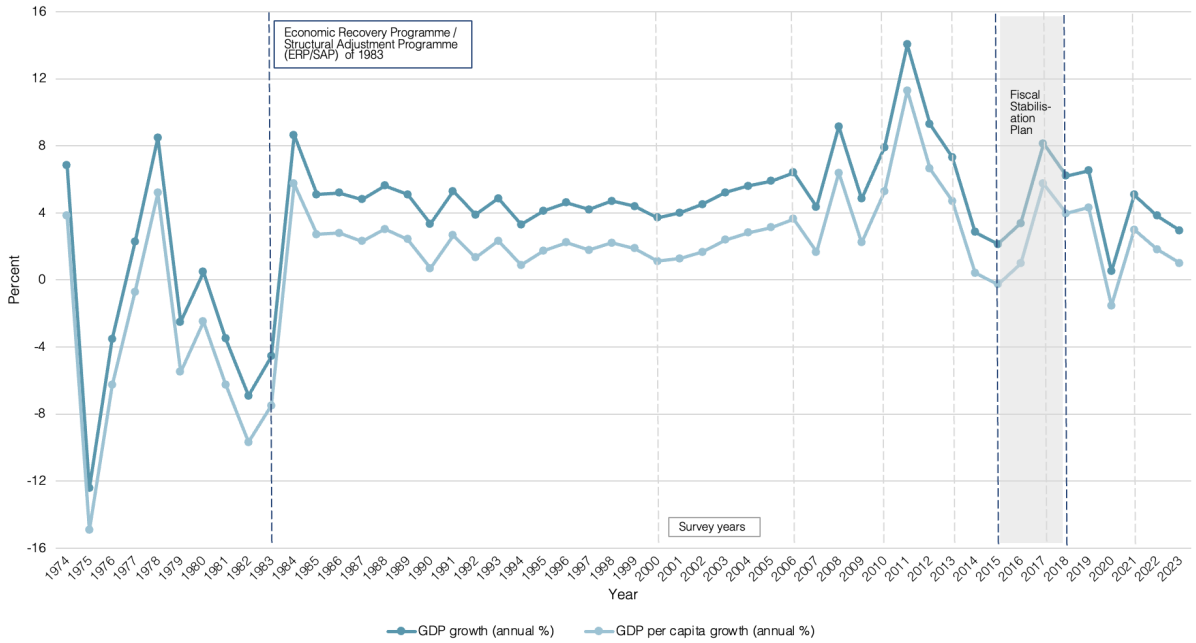
Table 1: Education policies and reforms in Ghana

Policy/reform	**Description**	**Year introduced**	**Cohort 1^{st} exposed**
Accelerated Development Plan (ADP)	**Free** primary education/universal primary education (UPE)	1951	1945
New Educational Reform Programme (NERP)	Reduction in **duration**: 7 years senior secondary to 3 years SHS	1987	1972
New Educational Reform Programme (NERP)	Reduction in **duration**: 4 years middle school to 3 years JHS	1987	1975
Tertiary Education Project (TEP)	**Restructuring** & quality enhancement	1993-1998	varied
Free Compulsory Universal Basic Education (FCUBE)	Extension of free primary to **free** JHS (& compulsory)	1996	1985
Free Compulsory Universal Basic Education (FCUBE)	Entirety of basic education free & compulsory	1996	1990
Free Senior High School	**Free** SHS	2017	2002

2.2 Macroeconomic context

Labour market trends are affected by the country's macroeconomic context. Figure 1 shows the annual growth rates of GDP and GDP per capita between 1974 and 2023. We highlight two key macroeconomic policies in the figure, namely the Economic Recovery Programme of 1983 and the Fiscal Stabilisation Plan of 2015, alongside dashed lines indicating key survey years.

Figure 1: Growth in GDP and GDP per capita over time

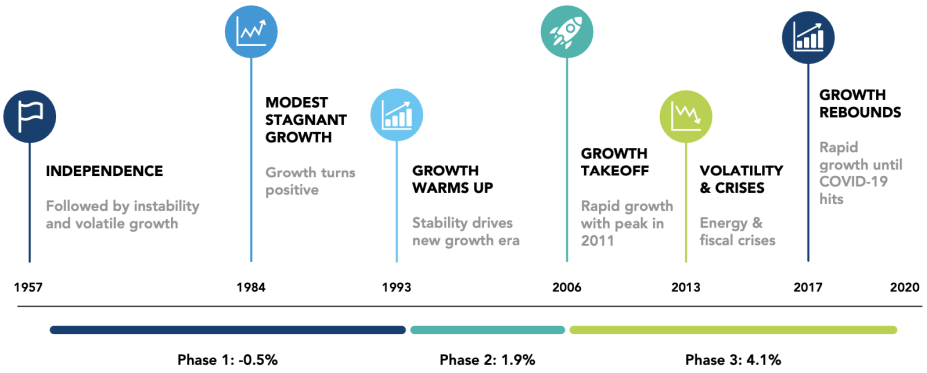


Source: World Bank World Development Indicators. Own annotations.

Figure 2 builds on this, highlighting that Ghana has experienced three distinctive periods of growth (World Bank, 2021), with the junctures 2006, 2013 and 2017 coinciding with rounds 5-7

of the GLSSs. The figure shows that following the implementation of the Economic Recovery Programme in 1983, there was less volatility in annual growth rates. Growth peaked in 2011, whereafter it plummeted until the introduction of the Fiscal Stabilisation Plan between 2015 and 2018. Growth then rebounded until the pandemic hit in 2020. Employment growth in Ghana has typically been slower than economic growth (Baah-Boateng, 2016) largely due to stronger growth in low labour absorbing sectors (e.g. oil and mining) and decline of high employment sectors (e.g. agriculture) (Baah-Boateng, 2017).

Figure 2: Ghana's growth phases



Source: World Bank (2021).

In this context of substantial economic transformation, alongside oil-based expansion, Gradín and Schotte (2020) analyse the role of the changing nature of occupational employment and wages in explaining the trend in earnings inequality from 2006 to 2017. They attribute an initial decline in earnings inequality (2006-2013, among paid employees and non-farm self-employed workers) to the fall in the skill premium that followed the expansion of education. Thereafter, earnings inequality increased (2013-2017) as the skill premium continued to fall, but at a slower pace.

2.3 The labour market

Reports prepared by the Ghana Statistical Service using the GLSSs, PHCs, and more recently the Annual Household Income and Expenditure Survey (AHEIS) speak to employment precarity, despite overall employment rates being high (Ghana Statistical Service, 2008, 2014, 2019, 2021, 2023). For example, in 2022, two-thirds of the currently employed were engaged in vulnerable employment (self-employment and/or contributing family work) (Ghana Statistical Service, 2023), with this share higher among women (roughly three quarters). The incidence of unemployment is found to increase with education and urban dwelling, but declining with age, confirming the vulnerability of youth to unemployment (Baah-Boateng, 2013).

Comparisons of (un)employment rates using GLSS reports (and other isolated studies) is, however, complicated by two definitional changes. First, between the fifth and sixth rounds of the GLSS, the Ghana Statistical Service changed from reporting the narrow definition of unemployment to a broad definition (see Ghana Statistical Service, 2008, 2014). This means that the reported unemployment rates taken directly from these reports are not comparable.

Second, from the seventh round of the GLSS, the Ghana Statistical Service adopted the 19th ICLS standards for labour statistics (Ghana Statistical Service, 2019). The 19th International Conference of Labour Statisticians (ICLS; in 2013) redefined the definition of employment to include work for pay or profit only, excluding own use production work[2]. This revised definition therefore narrowed the type of work defined as employment when compared to the 13th ICLS standards. This means that as the revision is adopted, labour market statistics may change for reasons purely related to the change in statistical definition. This is likely to be particularly prominent in African countries and for women, among whom own-use production work is typically higher (Gaddis et al., 2023). We therefore make an important contribution by harmonising the measurement of labour market statistics to be comparable over time.

Lastly, Baah-Boateng (2015) reflects on two key points salient to our study. A narrow definition of unemployment, which we use, is likely to understate the problem of unemployment by omitting discouraged work seekers. Second, a high degree of informality can disguise the extent of unemployment or under-employment. It is beyond the scope of this paper to consider broad unemployment and under-employment, but we acknowledge these two areas as key areas of expansion for research using our dataset, the Ghana Education and Labour Series (GELS), which we turn now to describe.

3 Data and methods

3.1 Data sources for the Ghana Education and Labour Series (GELS)

The Ghanaian Living Standards Survey (GLSS) is a nationally representative cross-sectional survey that collects detailed information on a variety of topics, including demographics, education, health, employment and time use, and migration. To date, there have been seven GLSS rounds (1987-1989, 1991, 1998, 2005, 2012/2013 and 2017). In 2015, the Ghana Statistical Service (GSS) ran a labour force survey to collect basic statistics on the labour force situation in Ghana. More recently, the GSS implemented the Annual Household Income and Expenditure Survey (AHIES), which collected quarterly panel data on expenditure, income and living conditions of households and individuals over a three-year period from January 2022 to December 2024. We stack these surveys, using only the first year of AHIES (pooling data from the four quarters) together with the public release 10% samples of three population and housing censuses (2000, 2010, 2021) to create a high-frequency, harmonised database of information on education and labour market activities spanning 1987-2022 (see Table 2).

3.2 Construction of key variables

In our analysis, we primarily rely on a highest level of education completed variable. We use the following categories: **less than primary** (including kindergarten and no formal schooling), **primary**, **lower secondary** (middle school or JHS), **upper secondary** (secondary, SHS, or technical and vocational secondary, some university but not completed), and **tertiary** (university or post-secondary technical education completed).

[2]This is instead captured under its own indicator.

Table 2: Source datasets for harmonisation: Ghana Education and Labour Series

Survey	**Survey year(s)**	Education (years)	Economic activity	Wages
GLSS 1	1987-88	Harmonised	-	-
GLSS 2	1988-89	Harmonised	-	-
GLSS 3	1991-92	Harmonised	-	-
GLSS 4	1998-99	-	-	-
Census	2000	-	Harmonised[a]	-
GLSS 5	2005-06	Harmonised	Harmonised	Harmonised
Census	2010	Harmonised	Harmonised	-
GLSS 6	2012-13	Harmonised	Harmonised	Harmonised
LFS	2015	Harmonised	Harmonised	Harmonised
GLSS 7	2016-17	Harmonised	Harmonised	Harmonised
Census	2021	Harmonised	Harmonised	-
AHIES	2022	Harmonised	Harmonised	Harmonised

[a] Occupation categories not compatible with harmonisation in 2000.

We also compute a years of education variable that is consistent and comparable across the datasets.[3] The changes in the structure and duration of education in Ghana described above, however, present a complexity in this regard. To address this, we identify which school system each birth cohort was most likely to have attended school, and assign equivalent years of education based on highest grade completed. In this exercise, we assume that children start school at age 6 and progress through the schooling system without grade repetition.

Our focus on labour market outcomes requires that we use comparable measures of current[4] economic activity over time. Differences in the question wording and level of detail captured in the surveys means that it was only possible to harmonise a comparable current economic activity variable between 2000 and 2021. Specifically we use the narrow definition of unemployment and the 13th ICLS standards.[5] This is the definition used throughout the paper as it ensures we can maximise the number of time points.

Wages are only available in the most recent three rounds of the GLSS (5-7), in the LFS and in AHIES. In GLSS 5 and 6, information on payment received was collected for self-employed individuals, but not in the final round (GLSS 7).[6] Similarly, in the 2015 LFS wage information was only collected for those in paid work. For this reason we only consider wages of those classified as employees or wage/salaried workers. Weekly wages were computed based on the earnings period provided for payments for main work in the past 7 days (i.e. if monthly wages are reported we divide this by 4). Hourly wages divide the weekly amount by the number of hours worked in the past 7 days.

We identify outliers in wages if the respondent's studentised residual from an OLS log earnings regression (with independent variables including gender, region, years of education, age, age-squared, occupation, year and interactions of year with region and gender) is greater than 3 (in absolute value).

[3] It is not possible to compute years of educational attainment from GLSS 4 (1998) nor comparable years from the 2000 PHC.

[4] As defined by the past 7 days rather than the past 12 months (usual economic activity).

[5] This includes own-use production work in the definition of employment.

[6] Note that our wage measures will not be comparable to Gradín and Schotte (2020), who use an imputation/re-weighting approach to get non-farm self employed wages in 2016/17.

3.3 Methods

To explore the expansion of educational attainment and gender disparities, we illustrate trends in years of education and the highest level of completed education across birth cohorts and cross sections (Section 4.1). Thereafter, we profile labour market dynamics across time (Section 4.2), considering potential measurement inconsistencies and the economic context at the time of the survey, alongside educational expansion. Lastly, we direct attention to the profile of wage employment and the wage return to education (Section 4.3). For this latter component, we apply an adapted Mincer equation to explore the wage return to education in Ghana in the years for which we have reliable wage information. We estimate the equation separately for each year. This equation can be specified as follows:

$$\ln(w_i) = \beta_0 + \sum_{j=1}^{4} \beta_{1j} \cdot edlevel_{ij} + \beta_5 \cdot female_i + \beta_6 \cdot x_i + \beta_7 \cdot x_i^2 + \gamma \cdot X_i + \varepsilon_i, \qquad (1)$$

where: w_i is the earnings of individual i, $edlevel_{ij}$ reflects level (j) of completed schooling (less than primary completed, primary, JHS, SHS and tertiary respectively), x_i is years of labour market experience (proxied by age), X_i is a vector of control variables including region, industry, occupation, marital status, and urban/rural locality, and ε_i is the error term. β_1 - β_4 represent the return to an additional level of completed education relative to the base category (JHS). We restrict our sample to respondents between 15 and 64 years, with non-missing wage information, thus restricting to those in wage employment only.

Note that because this estimation strategy does not allow us to say anything causal, educational expansion could also shift selection bias in returns to education estimates. This means that there is a possibility to observe declining returns as education expands.

Increased educational attainment could work toward decreasing the gender wage gap if, for example, rising female education levels increase women's access to higher-paying jobs and boost their bargaining power in the labour market. More education may also better equip females to enter professions and industries that traditionally male-dominated, where wages are often higher. One would therefore anticipate that an increasing share of the wage gap will be explained by observable characteristics, such as educational attainment.

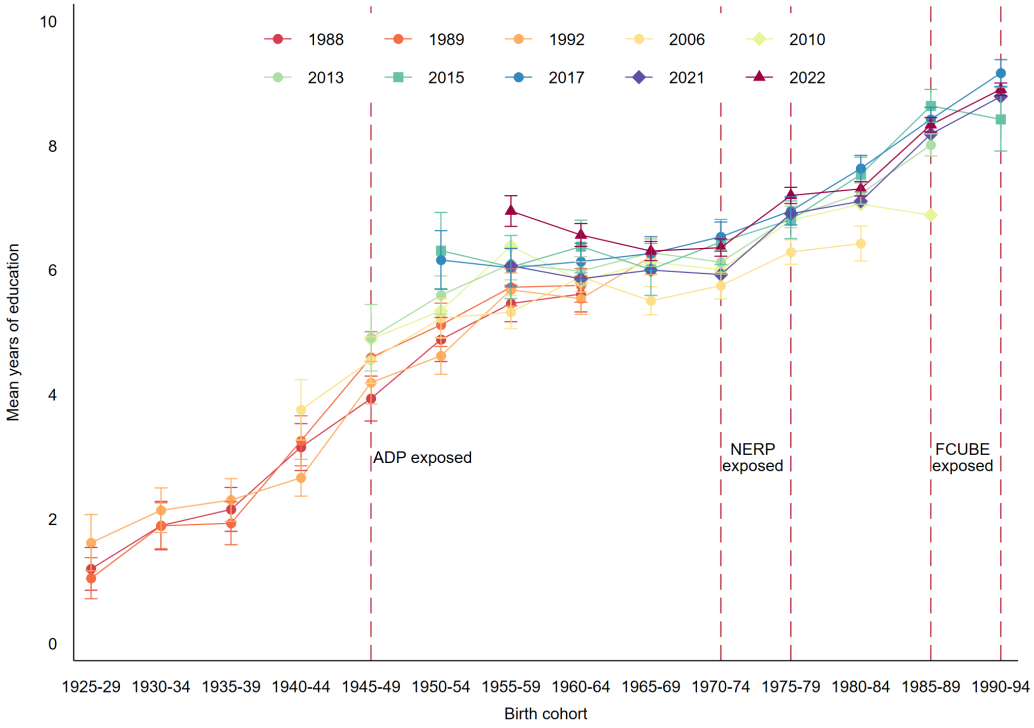
Oaxaca Blinder decomposition (Blinder, 1973; Oaxaca, 1973) is a counterfactual technique that decomposes a gap in some measure between two groups into an explained and unexplained component. For our final consideration of wage returns to education, we use Oaxaca-Blinder decompositions to decompose the gender wage gap into components explained by observable characteristics in our data, and the components that remain unexplained. This latter component includes potential forms of discrimination but also the return to characteristics that we cannot quantify in our data. For example, if wage employment is less flexible, part of the gender employment gap may reflect women selecting out of this form of employment due to care responsibilities. We use the same covariates in our decompositions as in equation 1, but we exclude occupation and industry.

4 Trends in attainment and labour market dynamics

4.1 Education policies and the expansion of attainment, 1988-2022

Figure 3 maps average educational attainment by birth cohorts for respondents aged 25[7]-65 in each survey year. The figure confirms the comparability of our years of education measure for 5-year birth cohorts[8] from the different surveys (some of the noise arises due to age heaping and disappears if cohorts are constructed differently).

Figure 3: Average education by birth cohort and survey (ages 25-65)



Source: GLSS 1-3, 5-7, AHIES (survey weighted), PHC 2010, 2021.
Vertical lines represent those cohorts likely to be first affected by education reforms if grade 1 enrolment happened at age 6 and there was no grade repetition. I.e. ADP (1945 cohort); NERP (1972 and 1975 cohorts); FCUBE (1985 and 1990 cohorts).

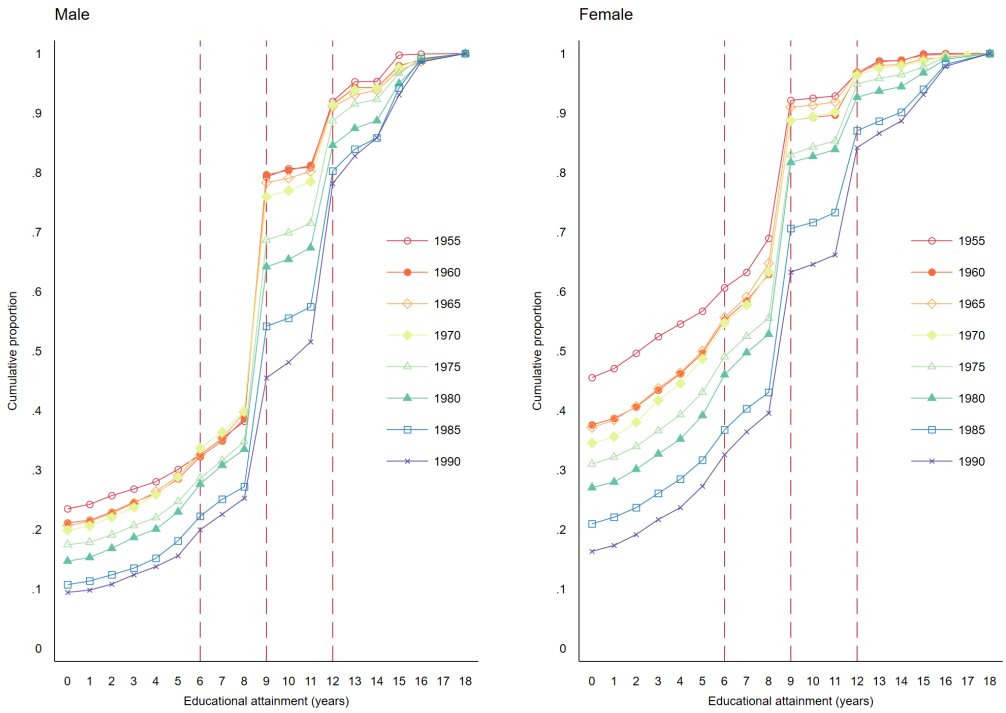
The figure highlights a period of stagnation in educational attainment for individuals born roughly between 1955 and 1974. Educational attainment increases again for those born from the 1975-1979 cohort – the first cohorts experiencing the 1987 educational reforms[9] – and after.

It appears that there may be potential differences in mortality by education level among older cohorts – average years of education is higher in these cohorts in later survey years. In the following cumulative density functions (CDFs), we therefore restrict age to 25-54, and omit the AHIES (2022) survey.

[7] Likely to have completed education and training.
[8] We group cohorts into 5-year bands, being careful to group cohorts that were likely to be educated under the same educational systems.
[9] Because the reform was implemented for those entering JHS in 1987, the first cohort to enter JHS under the new system was the group that entered primary school in 1981 i.e. those born in 1975.

The CDFs in Figure 4 shows that gains in educational attainment have been more substantial for women resulting in a decreasing gender gap, but that gender parity has not yet been reached. While the share of women with six years of education or less (i.e. completed primary or less; first vertical line) fell from just above 50% for the 1955-59 cohorts to roughly 30% for the 1990-94 cohorts, this is roughly the same as the share of men that had six years or less in the oldest cohorts (1955-59).

Figure 4: Rising educational attainment: CDFs by gender and 5-year birth cohorts (ages 25-54)

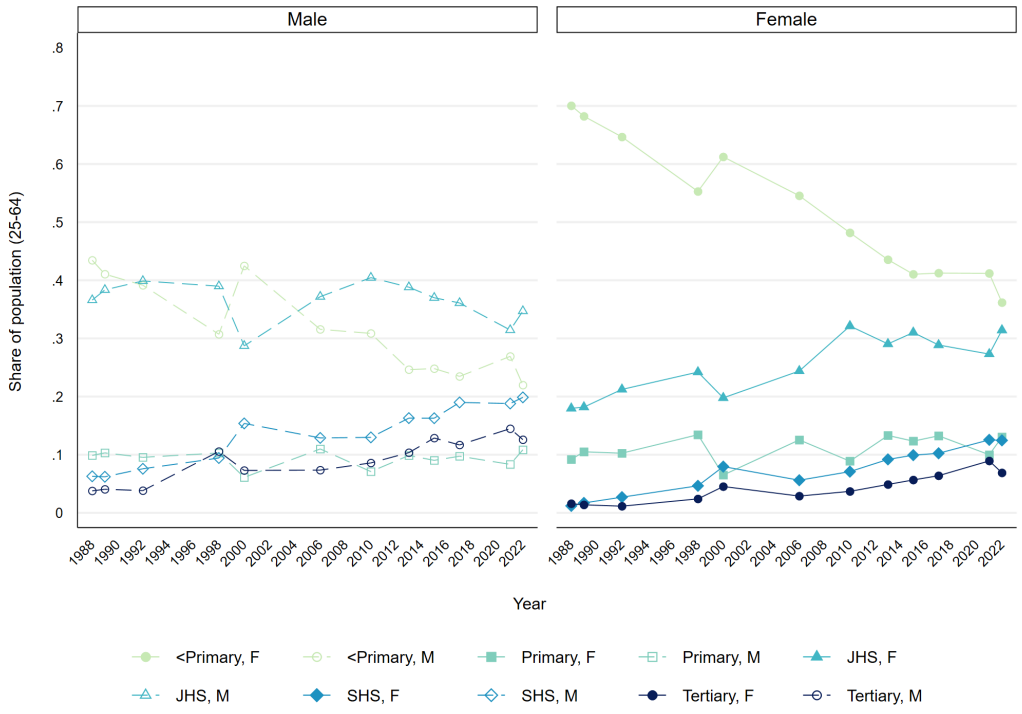


Source: GLSS 1-3, 5-7 (survey weighted), PHC 2010, 2021.
Lines are drawn at 6 years of completed education (primary), 9 years (JHS) and 12 years (SHS).

Figure 5 shows levels of educational attainment in the population over time, reinforcing that women's attainment remains below that of mens. Even though there has been convergence in the shares of men and women with less than primary and primary, at all higher levels (lower secondary and above) the share of women who complete remains lower than the share of men. For both genders we observe an increasing share with tertiary, SHS and JHS levels of education.

From a policy perspective, it is interesting to note that the increasing attainment shift for the 1975-79 cohorts for women (at lower years of education) was greater than the corresponding shift for men, suggesting that the NERP may have been important in encouraging women's educational attainment. A substantial attainment shift occurs for both genders between 1980 and 1990-94 as well. This may be a lagged effect of the NERP, or may reflect increased attainment following FCUBE, particularly the expansion to free JHS. If enrolment age was strictly enforced, FCUBE would have affected, from grade 1, those born in 1990 and free JHS for those born in 1985. However, delayed enrolment (see e.g. Boahen et al., 2021) means that earlier cohorts will likely have been affected too.

Figure 5: Highest completed education level by gender (ages 25-64)



Source: GLSS 1-7, LFS, AHIES (survey weighted), PHC 2000, 2010, 2021.

4.2 Education, employment and wages, 2000-2022

Table 3 profiles economic activity and education attainment across the cross-sections for which we are able to harmonise labour market information (sample sizes shown in Table A1 in the appendix). A number of relevant observations emerge, pointing to both progress and persistent gaps in gendered access to economic opportunity. We highlight key findings, moving down the panels in the table, mentioning potential measurement issues where relevant. In the following section we disaggregate some of the trends from this section by education level, to obtain a more nuanced understanding of trends in the composition of employment, industries and occupations.

Labour force participation (LFP) is high throughout the period under study, with male LFP unsurprisingly exceeding female LFP throughout. The employment-to-population ratio also follows a gendered pattern, with male rates higher than female across all years. This ratio peaked in 2013, likely reflecting the momentum of preceding economic growth. The notable decline in LFP in 2021 coincides with the economic disruption caused by the COVID-19 pandemic: according to a World Bank report, approximately 40% of businesses closed during the first wave, with 16% remaining closed even after restrictions were eased (World Bank, 2021). The drop in LFP participation in 2021 appears to have been particularly pronounced for women.

Although unemployment has generally remained low for both men and women, there has been fluctuation over time. It was highest in 2010 at 10% for both male and female labour force participants, but we suspect this may owe to question phrasing differences in the 2010 PHC.[10]

[10]'Unemployed' category was a single response item in 2000 but broken up into several more detailed questions

Table 3: Mean characteristics (ages 15-64) by cross-section

	2000		2006		2010		2013		2015		2017		2021		2022	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Econ activity																
LFP	.78	.75	.74	.71	.74	.72	.79	.75	.8	.73	.76	.74	.67	.57	.72	.69
Empl to pop	.7	.67	.71	.69	.7	.68	.78	.73	.75	.69	.74	.71	.62	.53	.7	.67
Unempl rate	.1	.1	.03	.03	.05	.06	.01	.02	.06	.05	.03	.04	.07	.08	.02	.03
Empl rate	.9	.9	.97	.97	.95	.94	.99	.98	.94	.95	.97	.96	.93	.92	.98	.97
Share empl in																
selfemployed-agri	-	-	.78	.56	-	-	.71	.51	.58	.35	.67	.44	-	-	.66	.42
Pvt sec inf	.79	.89	.15	.06	.81	.91	.18	.07	-	-	-	-	.75	.83	.77	.84
Wage work	.23	.1	.28	.09	.26	.12	.31	.12	.28	.14	.31	.14	.33	.2	.27	.14
Public sec	.09	.05	.09	.03	.08	.05	.08	.05	.09	.07	.09	.05	.1	.08	.08	.05
Wages																
Monthly wage	-	-	224	158	-	-	450	335	517	378	476	311	-	-	428	280
Weekly wage	-	-	60	40	-	-	113	84	129	94	119	78	-	-	107	70
Wk no outliers	-	-	48	36	-	-	97	67	117	95	114	76	-	-	93	65
Hourly wage	-	-	1.33	1.06	-	-	2.66	2.16	4.76	4.02	4.5	3.04	-	-	3.81	2.19
Missing wage	-	-	.01	.01	-	-	.14	.15	.16	.17	.03	.05	-	-	.02	.02
Education																
< Primary	.38	.54	.3	.47	.28	.41	.23	.36	.23	.35	.25	.37	.23	.33	.2	.29
Primary	.1	.09	.17	.17	.13	.13	.17	.18	.15	.16	.14	.16	.15	.15	.17	.17
Lower sec (JHS)	.32	.24	.35	.27	.38	.33	.36	.3	.35	.31	.33	.28	.33	.31	.34	.33
Upper sec (SHS)	.14	.08	.12	.07	.14	.09	.17	.11	.18	.13	.2	.13	.19	.14	.21	.16
Tertiary	.06	.04	.05	.02	.07	.03	.08	.04	.1	.05	.09	.06	.1	.07	.08	.05
Avg years	-	-	7.01	5.24	7.6	6.04	7.96	6.34	8.4	6.72	8.57	6.96	8.58	7.21	8.76	7.54
Other																
Avg age	32	32	32	33	32	32	33	33	34	34	33	33	32	33	32	33
Avg birth year	1968	1968	1973	1973	1978	1978	1980	1980	1981	1981	1984	1983	1989	1988	1990	1989

Source: GLSS 5-7, LFS, AHIES (survey weighted), PHC 2000, 2010, 2021.
Note: Real wages for those in wage employment only. All wages are in real (2010) Ghanaian Cedis. Wages from 2005/6 have been adjusted for the re-denomination of the Cedi in 2007, by dividing the reported values by 10,000. The share missing wages is for those wage employed only. The share exposed to FCUBE is for those experiencing free JHS. Sample sizes shown in Table A1 in the appendix.

Unemployment again rose in 2015, during the energy and fiscal crises (Figures 1 and 2), and increased once more in 2021 during the pandemic. This is expected given widespread labour market disruptions, despite the drop in LFP.

Turning to the composition of employment (second panel), a substantial share of workers were self-employed in agriculture in 2006. However, this share has steadily declined, reflecting structural shifts in the economy. Anomalies in 2015 may be linked either to the economic downturn or to survey design. Specifically, the LFS did not collect economic activity data for household members absent at the time of the interview, who made up about 16% of eligible (age>=15) members. In the PHCs, the self-employment category is not disaggregated by agricultural vs. non-agricultural activity.

Measurement inconsistencies also arise in the measurement of informal private sector work. The GLSS 2006 and 2013 stand out as outliers, likely due to a skip pattern that limited the sectoral question to only paid employees, domestic employees, and apprentices. Additionally, in 2015 and 2017, informality vs. formality of private sector work was not recorded. Excluding these years, it is apparent that informality is pervasive. More than three quarters of employment is informal, with women disproportionately affected. Over 80% of women's work is in the private informal sector.

in later years. It is possible that this nuance led to different response patterns in 2000.

Men are also consistently more likely to be in wage employment than women – about twice as likely in most years (27% vs. 14% in 2022), with the exception of 2006 (28% vs. 9%; a three-fold difference). In 2021, the wage employment share rose, possibly due to the pandemic-induced exit of workers in more precarious, informal employment. Public sector employment also favours men, though the gender gap here is narrower (8% vs. 5% in 2021). It's important to note that the employment categories are not mutually exclusive: self-employed agricultural work may be formal or informal, and wage employment spans both private informal and public sector jobs. The formal private sector, while not detailed in this table, accounts for a small share overall.

Considering wage employees (wages panel), real earnings rose substantially between 2006 and 2013 for both males and females, likely reflecting, in part, improvements in minimum wage over this period (Gradín & Schotte, 2020). Wage growth appears to have continued in 2015 despite adverse economic conditions. However, small sample sizes here may be misrepresenting the story. The smaller sample size in 2015 may relate to absentee members, as mentioned earlier. If absent members are more likely to be employed and particularly wage employed, this would bias estimates in 2015. Together with missing information in 2015[11] the reliability of these estimates may be affected. For these reasons, when we focus our analysis on wages we do not include 2015. We provide a more detailed discussion of wages, and the gender gap that is evident, when we disaggregate by education level.

While some of these shifts in labour market indicators clearly reflect either measurement differences or the economic context at the time, other changes, particularly by gender – and how they relate to the growth in educational attainment under recent policies – are less clear. The panel on education reinforces the expansion of attainment shown visually in previous section, with slight differences owing to the inclusion of younger ages. The share of women with less than primary has almost halved over the two decades (38% to 20%) and the share with SHS has doubled (8% to 16%). The highest share of working age population have completed JHS – approximately one third in 2022. Although there has been no meaningful shift in the share of males with JHS, the share has increased substantially for females, up from a quarter in 2000. Increased participation of women in wage employment seems to coincide with a rise in JHS and SHS shares. Tertiary education shares remain low (<10%), but have been rising steadily over time for both genders. Additionally, given the age restriction in this table, some individuals in later years may still be enrolled, potentially understating final attainment. The gender gap in years of education reduces by half a year from approx 1.77 years in 2006 to 1.22 years in 2022.

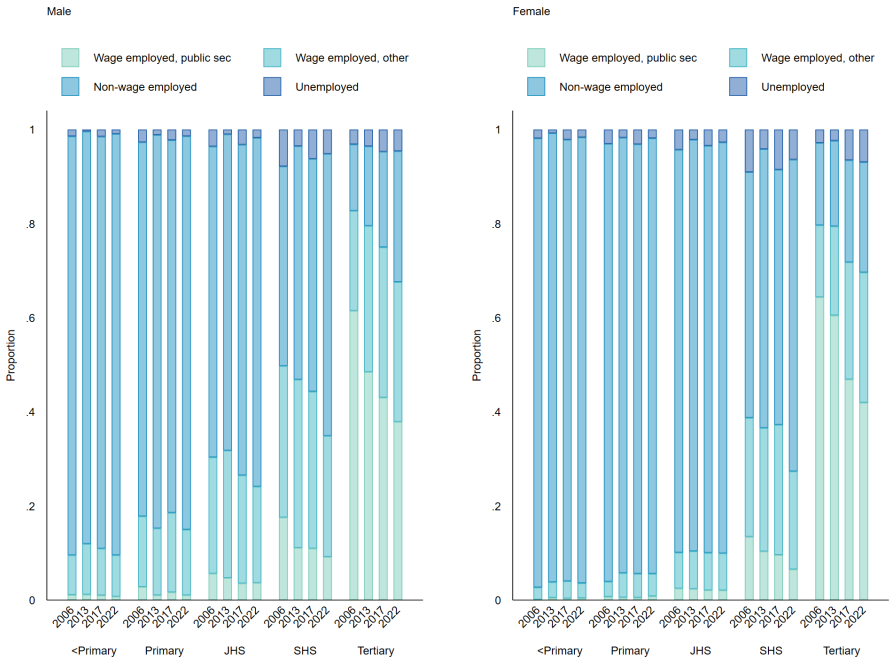
Lastly, structural shifts in the economy also shape changes in labour market indicators. In Ghana, there has been a decline in the agricultural industry, particularly for female workers offset by growth in services and moderate growth in construction, the latter being driven solely by male workers (Table A2 in the appendix shows these shifts in the industry and occupation compositions of the employed, by gender). The decline in agricultural industry is reflected in the decline in share of occupations in skilled agriculture. Similarly, growth in the services industry is mirrored by growth in service and sales occupations, particularly among female workers (11% vs. 38% in 2022).

[11] Higher rates of missing wage info in 2013 and 2015 may owe to the fact that wages were asked in Questions 22 and 28 of the economic activity modules respectively vs. Question 8 in 2006.

4.2.1 Disaggregating by education level

Considering employment by education level (Figure 6), one observes a higher incidence of unemployment at higher levels of education. This likely reflects the nature of employment measurement; that is, including own production work, which may be more prevalent among individuals with lower education. Indeed, self-employment in agriculture is more prevalent at lower levels of education (not shown here).

Figure 6: Unemployment, employment, and wage employment by education level and gender



Source: Source: GLSS 5-7, AHIES (survey weighted)

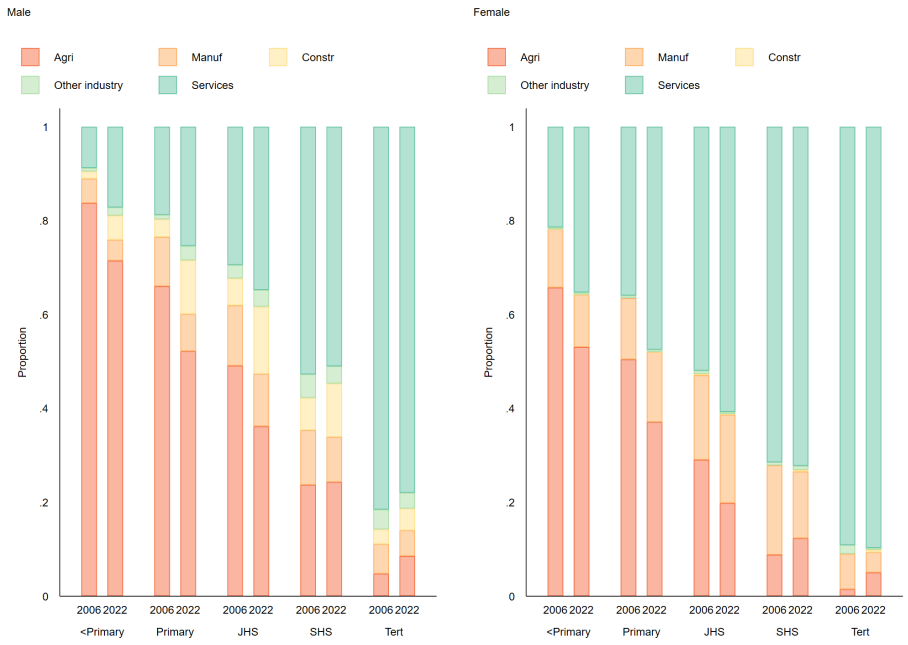
In the context of declining share of wage employment[12], higher unemployment levels among the more educated could reflect a preference for wage employment rather than self-employment. That said, some of the decline in wage employment has indeed been offset by a rise in non-wage employment. Given that education has been expanding among the higher education levels, this is an interesting development, and not ideal if it speaks to over supply of educated workers relative to jobs available. The decline in wage employment, especially among those with SHS and tertiary education, appears directly related to a falling share of public sector employment among the wage employed. This is suggestive that growth in educational attainment has not translated to growth in private sector wage employment.

Regarding gender, the largest gender gap in wage employment occurs at lower levels of education. Importantly, if wage employment is less flexible, part of the gender employment gap may reflect women selecting out of this form of employment due to care responsibilities. It is important to reflect that when we hone in on wage employment in the coming sections, we lose a large share of women who have low education levels.

[12]Note that even though this figure shows a consistent decline, Table 3 shows spike in 2021, perhaps owing to lower self employment during the pandemic.

A disaggregation of industry by education level reflects that employment becomes increasingly concentrated in the services industry at higher levels of education (Figure 7). Those with the lowest levels of education are predominantly in the agricultural industry, followed by the manufacturing industry. It is interesting that there has not been much change in industry shares for those with SHS and tertiary education, even as the share of workers with these levels has grown, and as the share of wage employment has declined. The changes observed overall in industry relate to the lower education categories. That is, predominantly the decrease in agriculture offset by an increase in services.

Figure 7: Industry shares of the employed by gender and education level, 2006 vs. 2022



Source: GLSS 5 & AHIES (survey weighted).

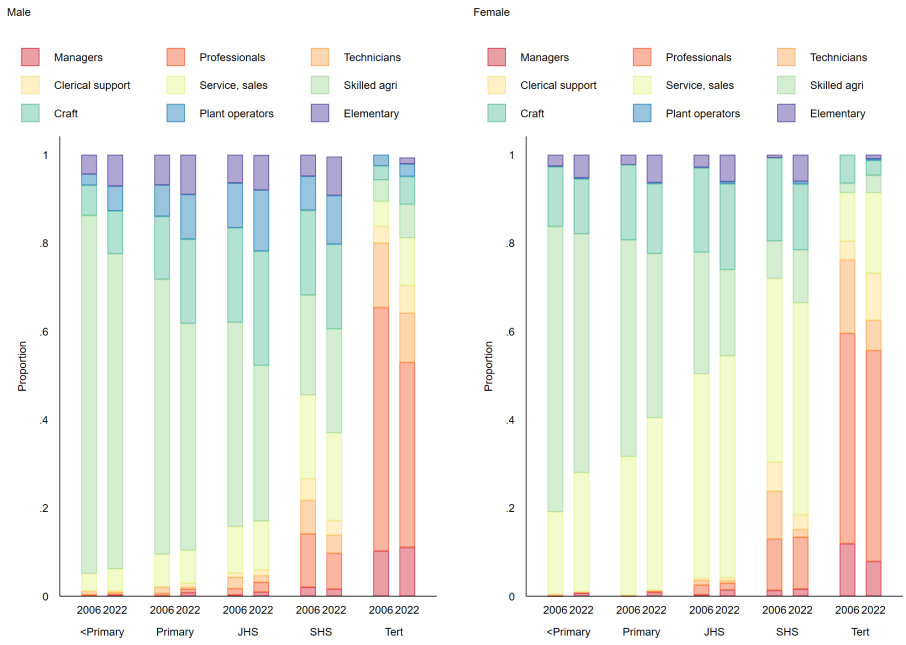
On the other hand, Figure 8 shows that there have been shifts in the occupation shares among those in the top two education categories. Linking to the increase in non-wage employment, we see an increase in the share in elementary and plant occupations, offset with a decline in professionals and technicians, although managers, professionals and technicians remain the dominant occupations among tertiary educated individuals (<50%).

The occupation profile of the wage employed (Figure A2 in the appendix) looks somewhat different, however. While managers, professionals and technicians remain the dominant occupations among tertiary educated individuals, a larger share of employees with upper secondary, and to a lesser extent lower secondary, fall into these occupations as compared to all those employed. Plant operators become a dominant occupation among wage employed males at all levels below tertiary, and elementary occupations are much more predominant among the wage employed, especially at lower education levels and for female employees.

While an overarching narrative in Ghana has been the decline in agriculture and related occupations, this appears to have had limited effect on the occupation distribution of the wage employed. Additionally, the occupational shifts at the top of the education distribution have

been counter to what one may expect as education levels rise (i.e. decline in professionals, managers and technicians), and thus likely reflect the falling share of public sector employment. In the following section, we hone in on wage employment and examine wages, the wage return to education, and the gender wage gap in more detail.

Figure 8: Occupation shares of the employed by gender and education level, 2006 vs. 2022



Source: GLSS 5 & AHIES (survey weighted).

4.3 The evolution of wage returns to education

Table 4 shows weekly real earnings (2010 Cedis) by education level and gender. In all periods, tertiary education attracts a wage premium for both genders. A majority (but declining share over time - 75% to 55%) of tertiary educated wage employees work in the public sector, which may contribute to this premium.

Across all levels of education, real weekly wages were highest in 2017 (of the periods for which we have reliable data). At lower levels of education, in several cases males are earning more than or close to double their female counterparts, on average, per week. For example, in 2022, women with primary education were earning just 41% of the weekly wage of men with primary education (31.2 Cedis per week vs. 78.6). Strikingly, in all years, female employees with completed SHS earn less than males with lower levels of education. These findings hold in 2013, 2017 and 2022 even after accounting for the fact that females work fewer hours per week.

In that regard, while females typically work fewer hours than men, the gap is larger at lower levels of education. In 2022, women with less than primary education were working almost 20 hours less per week on average, whereas women with tertiary education were working just one hour less than their male counterparts per week, on average (at the median, hours worked are identical at 40 hours per week).

Table 4: Summary statistics for wages and hours worked: 2006, 2013, 2017 and 2022

		2006		2013		2017		2022	
		Male	Female	Male	Female	Male	Female	Male	Female
<Primary	Weekly wage	24.89	13.64	59.69	26.33	76.64	31.78	59.90	30.74
	Hours worked	47.40	43.60	48.90	41.95	41.99	33.83	41.82	36.31
	Median hours	48.00	40.00	48.00	42.00	42.00	35.00	42.00	35.00
	Hourly wage	0.69	0.43	1.53	0.85	3.02	1.73	1.80	1.25
	N	164	88	354	226	416	268	1038	564
Primary	Weekly wage	26.54	15.17	62.54	27.49	95.70	37.43	78.56	32.14
	Hours worked	48.02	40.41	51.01	45.54	42.25	37.16	41.06	37.30
	Median hours	48.00	40.00	49.00	48.00	42.00	40.00	40.00	36.00
	Hourly wage	0.77	0.42	1.47	0.89	3.61	1.53	2.44	1.23
	N	107	36	268	123	287	109	854	321
JHS	Weekly wage	34.75	21.93	83.74	40.89	93.28	48.97	79.71	42.53
	Hours worked	51.43	43.36	52.56	48.79	43.51	41.38	42.14	38.94
	Median hours	50.00	40.00	50.00	48.00	44.00	40.00	42.00	40.00
	Hourly wage	0.79	0.70	1.90	1.01	3.45	3.07	2.41	1.54
	N	562	158	1033	302	899	272	2462	928
SHS	Weekly wage	49.98	33.32	89.57	57.48	104.28	62.09	79.55	46.44
	Hours worked	47.54	45.46	50.46	48.24	42.03	41.02	42.25	40.85
	Median hours	48.00	42.00	48.00	48.00	40.00	40.00	40.00	40.00
	Hourly wage	1.17	0.85	2.09	1.42	3.87	1.88	2.37	1.35
	N	307	131	674	314	807	382	2219	1224
Tertiary	Weekly wage	102.02	79.32	174.39	141.79	186.78	159.03	160.24	137.15
	Hours worked	43.25	41.43	43.66	42.18	36.45	37.17	38.22	37.41
	Median hours	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00
	Hourly wage	2.41	2.21	4.55	3.99	8.12	5.84	4.73	3.93
	N	276	131	616	356	627	333	1734	1042
Total N (column)		1109	413	2271	1007	2229	982	6088	2855

Source: GLSS 5-7, AHIES (survey weighted).
Note: Real (2010 Ghanaian Cedis) wages for those in wage employment only. Wages from 2005/6 have been adjusted for the re-denomination of the Cedi in 2007, by dividing the reported values by 10,000. Mean hourly wages reflect the mean of individuals' hourly wages not the mean weekly wage divided by mean hours worked.

Dividing weekly wages by hours worked provides us with a measure of hourly wage. Differences in the distribution of hours worked motivate our decision to use hourly wage in the regressions that follow. While this approach narrows the observed gender wage gap, it does not eliminate it – women continue to earn less per hour than men across the entire period. Next, we explore the evolution of wage returns to these education levels, using the log of hourly wage in cents (i.e. multiplied by 100). This is to avoid negative log values from hourly wages greater than zero but less than one.

Given differential selection into wage jobs by gender, we begin by exploring the relationship between wage employment and education in a multivariate setting. Table A3 in the appendix shows OLS regression output for the probability wage employment, separately by each year (2006, 2013, 2017 and 2022, respectively). Results confirm that education is a strong predictor of being in wage employment. In 2006, a man with a tertiary education was 50 percentage points more likely to be in wage employment than a man with a JHS level education, on average. This reduced to 42 percentage points by 2022, but it is clear that a tertiary education is advantageous. Being in wage employment is also positively associated with living in an urban area, age, and never being married.

Strikingly, women are consistently less likely than men to be in wage employment at every education level. For example, in 2006, women with a tertiary education were 6 percentage points less likely to be in wage employment than a man with JHS. However, the gender gap

has narrowed over time, suggesting that educational expansion has helped to reduce gender disparities in access to wage work. By 2022, women with tertiary education are more likely than men with tertiary to be in wage employment – a potential sign that the gains from women's educational advancement are translating into improved labour market outcomes, particularly where wage employment is a preferred or more secure form of work.

When occupation and industry controls are introduced, the estimated wage-employment return to education diminishes, implying that part of education's advantage lies in opening access to wage-intensive sectors and roles. Similarly, the shrinking coefficient on the female variable suggests that occupational and sectoral sorting continues to shape gendered access to wage employment.

Table 5 shows the evolution of hourly-wage returns to education levels separately by year. In the final four columns we show how the coefficients on education level change when industry and occupation controls are added. In general, results highlight that there is a significant wage premium to JHS relative to lower levels (considering columns 1-4), even after controlling for a variety of factors including region, marital status, age (to proxy experience), working in the public sector and living in an urban area. Specifically, those with less than primary earn close to 25% less than individuals with JHS over the period. SHS and tertiary levels, on the other hand, offer a substantial premium relative to JHS, but this has declined over time. Specifically, in 2006 tertiary-educated employees earned 100% more than those with a JHS and those with SHS earned 32% more. By 2022 this had dropped to 75% and 7% respectively.

Table 5: Log of hourly wage regression output: 2006, 2013, 2017 and 2022

	No occupation & industry controls				**With occupation & industry controls**			
	(1) 2006	(2) 2013	(3) 2017	(4) 2022	(5) 2006	(6) 2013	(7) 2017	(8) 2022
Age	0.018	0.036***	0.073***	0.077***	0.020	0.041***	0.068***	0.063***
	(0.013)	(0.009)	(0.010)	(0.005)	(0.012)	(0.009)	(0.009)	(0.005)
Age^2	-0.000	-0.000***	-0.001***	-0.001***	-0.000	-0.000***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Female	-0.223***	-0.400***	-0.407***	-0.378***	-0.231***	-0.274***	-0.326***	-0.232***
	(0.042)	(0.030)	(0.034)	(0.018)	(0.043)	(0.031)	(0.034)	(0.018)
Education (base: JHS)								
< Primary	-0.282***	-0.237***	-0.106**	-0.242***	-0.249***	-0.201***	-0.140***	-0.217***
	(0.060)	(0.045)	(0.052)	(0.029)	(0.060)	(0.044)	(0.051)	(0.027)
Primary	-0.155**	-0.131**	-0.015	0.009	-0.089	-0.133***	-0.029	-0.012
	(0.071)	(0.052)	(0.058)	(0.031)	(0.069)	(0.050)	(0.055)	(0.028)
SHS	0.320***	0.168***	0.162***	0.070***	0.247***	0.153***	0.068	0.068***
	(0.048)	(0.036)	(0.041)	(0.022)	(0.050)	(0.036)	(0.042)	(0.021)
Tertiary	1.006***	0.979***	0.844***	0.752***	0.800***	0.828***	0.594***	0.565***
	(0.056)	(0.041)	(0.048)	(0.025)	(0.064)	(0.047)	(0.054)	(0.027)
Currently married	0.211***	0.206***	0.141***	0.190***	0.222***	0.151***	0.122***	0.162***
	(0.054)	(0.036)	(0.041)	(0.023)	(0.053)	(0.035)	(0.039)	(0.022)
Never married	0.107	0.045	-0.069	0.029	0.156**	0.002	-0.075	0.021
	(0.080)	(0.059)	(0.070)	(0.040)	(0.078)	(0.057)	(0.067)	(0.037)
Urban	-0.058	-0.035	-0.087**	-0.081***	-0.007	0.059*	-0.016	-0.001
	(0.044)	(0.034)	(0.035)	(0.020)	(0.044)	(0.034)	(0.034)	(0.019)
Public sector	0.296***	0.309***	0.318***	0.317***	0.256***	0.309***	0.295***	0.343***
Constant	3.391***	4.156***	3.723***	3.276***	3.908***	4.655***	5.304***	4.388***
	(0.231)	(0.164)	(0.182)	(0.099)	(0.255)	(0.322)	(0.475)	(0.166)
Region controls	y	y	y	y	y	y	y	y
Observations	1,951	4,253	4,400	12,386	1,951	4,253	4,400	12,386
R-squared	0.359	0.322	0.236	0.272	0.401	0.385	0.311	0.371

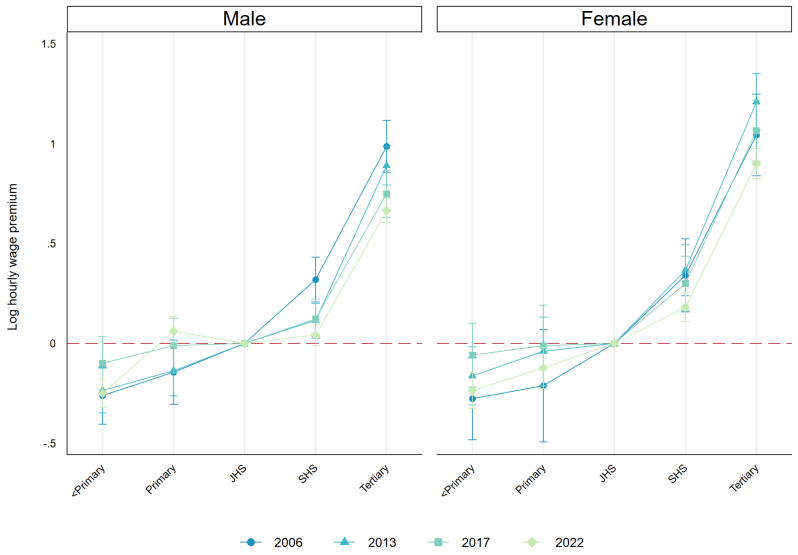
Source: GLSS 5-7, AHIES (survey weighted).
Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All regressions include controls for occupation, industry and region, which are not shown here. Columns 5-7 include controls for occupation and industry. Base category for marital status is never married.

Wages are also positively associated with age, reflecting returns to experience, and there appears to be an increasing (albeit slightly) return to public sector employment, from a 30% premium in 2006 to 32% in 2022. In 2017 and 2022, living in an urban area is negatively correlated with higher wages, but this effect is likely biased by the omission of occupation, since lower paying occupations (elementary and plant operators) appear to earn more in rural areas than urban areas. Once occupations are taken into account, this counter-intuitive result disappears (columns 5-8).

Gender differences are stark. Female wage workers consistently earn less than their male counterparts, with the gender wage gap ranging from 22% in 2006 and 2022 to a peak of 38% in 2017. When occupation and industry are included (columns 5–8), the returns to education – especially at the tertiary level – are attenuated, again underscoring the role of occupational sorting. The narrowing of the gender coefficient in these specifications similarly points to gendered segregation across occupations and industries.

Overall, results suggest that as education levels among the wage employed have risen, returns have fallen. Moreover, the gender wage gap has not improved. In fact, if occupational sorting is considered a key component of wage determination, the gender wage gap appears to have worsened over time. Notably, even though the premium to SHS and tertiary is higher for females than males, this is not enough to offset broader structural disadvantages. Figure 9 confirms that the education premium is higher for women across all levels, even after accounting for the roles of age, marital status, region, public sector employment, urban location and region. This relationship holds when occupation and industry are included as controls. However, these higher marginal returns exist within a labour market where women remain under-represented in wage jobs, suggesting a persistent and possibly deepening gendered segmentation in the returns to education.

Figure 9: Wage returns to education by gender



Source: GLSS 5-7, AHIES (survey weighted). Average marginal effect of education level (JHS base) computed from an OLS regression on log of hourly wage (in cents) on education level, age, marital status, region, public sector employment, urban location and region, separately by gender.

Next, we explore the gender wage gap using Oaxaca-Blinder decompositions. This is particularly interesting in this context of a declining gender gap in educational attainment, a declining gender gap in the share of workers who are wage employed, and declining premiums to higher levels of education, which are however higher for females than males.

4.3.1 The gender wage gap

Table 6 shows gender gaps in hourly wages over time. Columns 1-4 do not include education level as a control, but it is introduced in columns 5-8 to illustrate how the explained and unexplained components change with its inclusion. We omit industry and occupation controls, since part of the gendered story appears to about differential sorting into industries and occupations. This is an important part of the story we wish to preserve, rather than absorb into the explained portion of the gap.

Table 6: Oaxaca-Blinder decomposition on hourly wage: 2006, 2013, 2017 and 2022

	No education level controls				**With education level controls**			
	(1) 2006	(2) 2013	(3) 2017	(4) 2022	(5) 2006	(6) 2013	(7) 2017	(8) 2022
Male	4.307***	4.995***	5.341***	5.118***	4.307***	4.995***	5.341***	5.118***
	(0.027)	(0.023)	(0.026)	(0.013)	(0.027)	(0.023)	(0.026)	(0.013)
Female	4.087***	4.624***	4.928***	4.740***	4.087***	4.624***	4.928***	4.740***
	(0.044)	(0.033)	(0.036)	(0.020)	(0.044)	(0.033)	(0.035)	(0.019)
Difference	0.220***	0.372***	0.412***	0.378***	0.220***	0.372***	0.412***	0.378***
	(0.052)	(0.041)	(0.044)	(0.024)	(0.052)	(0.040)	(0.043)	(0.023)
Explained	-0.003	-0.009	0.024	0.029***	-0.005	-0.028	0.006	0.001
	(0.025)	(0.019)	(0.020)	(0.010)	(0.034)	(0.023)	(0.022)	(0.012)
Unexplained	0.222***	0.381***	0.389***	0.349***	0.224***	0.400***	0.407***	0.378***
	(0.046)	(0.040)	(0.042)	(0.023)	(0.044)	(0.037)	(0.040)	(0.021)
Observations	1,960	4,254	4,400	12,386	1,960	4,254	4,400	12,386

Source: GLSS 5-7, AHIES (survey weighted).

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All regressions include controls for age, region, public sector and urban location, which are not shown here. Columns 5-7 include a categorical education variable for highest level completed, which is omitted in columns 1-4.

Before including controls for education level (columns 1-4), the explained component of the gap only became statistically significant in 2022 (although explaining just 8% of the gap). The negative explained components in earlier years signal that the gap would be even larger if males and females had the same characteristics that we control for (namely age, age^2, urban location, marital status, region, and public sector employment). Put differently, the unexplained component dominates throughout the period, reaching 92% in 2022. Overall, these findings show that women do not have levels of these characteristics that are associated with lower wage outcomes.

Strikingly, when controls for education level are added, the unexplained component increases (0.35 in 2006 to 0.38 in 2022) and the explained component falls. This suggests that despite the fact that women are more educated than men, wages are higher for men. Because the better-educated group are earning less, this translates into a larger unexplained component than explained. This points to persistent structural or discriminatory factors that undermine women's returns in the labour market. Overall, while gender gaps in educational attainment

have narrowed and women's women's access to wage employment has improved, this has not closed the wage gap. Thus to date, educational expansion alone has not been sufficient to achieve gender equity in labour market outcomes.

5 Conclusion

This paper set out to analyse labour market dynamics in a period of rapid educational expansion in Ghana, with a focus on gender differences. With an estimated 10 million Ghanaians projected to enter the labour force over the next 15 years, taking stock of education, job creation and gender gaps is particularly salient. Ghana also continues to advance free education policies at the senior secondary level, thereby continuing to expand the supply of educated workers in the labour market.

Specifically, we take stock of how educational attainment has changed over time in response to education policy changes and explore the relationship between education and labour market outcomes, type of employment, and wages earned – with a focus on gender. Measuring labour market indicators over time gives us a sense of how educational investments are being rewarded in the labour market. Key to this latter component of the analysis is a thorough harmonisation of information from independent surveys over time. Here, we reflect on the comparability of questionnaires, information gathered, and possibility of inconsistencies in measurement arising from different survey designs.

We show that Ghana's commitment to expanding access to education through deliberate policies appears to have contributed to improved educational attainment and a narrowing gender gap in schooling. Evidence from labour market indicators suggests that despite rising education levels, wage employment as a share of total employment is declining, and real wages have fallen across the education distribution. This may reflect, in part, economic downturns following the COVID-19 pandemic, but the returns to education, particularly at the senior high school (SHS) and tertiary levels, have also declined. Although this may raise concerns about potential skills mismatches and deteriorating graduate quality, it could simply reflect changing selection bias as education has expanded. Nonetheless, trends are troubling, as they could diminish private incentives to invest in education, which may both reflect and further contribute to quality concerns. Although SHS and tertiary education continue to offer relatively higher wage premiums for women compared to men, gender disparities in employment outcomes and earnings remain, potentially reflecting cultural factors, discrimination, and/or unobserved factors that we cannot account for in the decompositions.

The labour market's capacity to absorb increasingly educated cohorts – as the country continues to expand access to SHS and tertiary education – remains uncertain, underscoring the need for more regular and comprehensive labour market data collection. In particular, the lack of information on non-wage employment returns limits our understanding of the full scope of education's value. Moving forward, it is essential to monitor not only access and equity in education but also the quality and economic relevance of learning, to ensure that Ghana's education policies translate into inclusive and sustainable labour market outcomes.

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Appendix A

Table A1: Observations in summary statistics (ages 15-64) by cross-section

	2000		2006		2010		2013		2015		2017		2021		2022	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Econ activity																
LFP	494146	516981	9387	10553	674052	732256	18252	20749	3799	4901	15241	16965	910458	945893	52989	62769
(Un)empl	383786	385846	6855	7503	496205	526667	14587	15880	3014	3582	11791	12750	607680	540788	39405	44525
Share empl in																
Selfemployed-agri	0	0	4757	6512	0	0	10317	13629	1844	2696	7574	10277	0	0	24324	32273
Pvt secinformal	346107	345358	6630	7282	471128	495094	14402	15650	55	105	6	7	566917	497735	38740	43482
Wage empl	346107	345358	6630	7282	469846	493481	14402	15650	2855	3421	11500	12380	566917	497735	38740	43482
Public sec	346107	345358	6630	7282	471128	495094	14402	15650	2855	3421	11500	12380	566917	497735	38740	43482
Wages																
Real wage mnth/wk	0	0	1664	608	0	0	3244	1444	736	454	3395	1537	0	0	9656	4967
Excl outliers	0	0	1515	586	0	0	3184	1423	727	451	3348	1528	0	0	9386	4850
Real wage hr	0	0	1615	577	0	0	3134	1375	730	452	3119	1389	0	0	8596	4193
Education																
Level	494146	516981	9391	10558	674052	732256	18226	20729	4712	5715	15182	16900	912866	948494	52936	62732
Years	0	0	9391	10558	674052	732256	18226	20729	4710	5713	15181	16900	910478	946367	52798	62603
Other																
Age	494146	516981	9600	10798	674052	732256	18481	21075	4716	5719	15517	17331	913765	949107	52989	62769
Birth yr	494146	516981	9600	10798	674052	732256	18481	21075	4716	5719	15517	17331	913765	949107	52989	62769

Source: GLSS 5-7, LFS, AHIES (survey weighted), PHC 2000, 2010, 2021.

Table A2: Industry and occupation shares of the employed (ages 15-64) by cross-section

	2000		2006		2010		2013		2015		2017		2021		2022	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Industry																
Agriculture	.53	.51	.57	.5	.44	.37	.47	.41	.41	.29	.41	.35	.38	.31	.42	.32
Manufacturing	.1	.11	.09	.14	.09	.13	.08	.1	.09	.18	.08	.17	.07	.09	.08	.14
Construction	.05	.01	.04	0	.06	0	.07	0	.07	0	.09	0	.09	.01	.1	0
Other industry	.03	.01	.02	.01	.02	.01	.04	.01	.02	.01	.03	.01	.03	0	.03	.01
Services	.29	.35	.27	.35	.38	.49	.35	.48	.4	.52	.39	.47	.43	.59	.37	.53
N	346107	345358	6596	7260	471128	495094	14401	15650	2797	3311	11435	12300	566917	497735	38208	42758
Occupation																
Managers	-	-	.01	0	.03	.02	.02	.01	.02	.01	.02	.01	.02	.01	.02	.01
Professionals	-	-	.05	.02	.07	.04	.07	.04	.1	.07	.08	.05	.08	.07	.07	.05
Technicians	-	-	.03	.01	.03	.01	.03	.01	.04	.01	.03	.01	.02	.01	.03	.01
Clerical support	-	-	.01	.01	.02	.01	.01	.01	.02	.02	.02	.01	.02	.02	.02	.01
Service, sales	-	-	.09	.28	.1	.32	.11	.38	.13	.38	.12	.32	.12	.4	.11	.38
Skilled agri	-	-	.55	.49	.44	.37	.46	.41	.36	.25	.39	.34	.37	.3	.41	.32
Craft	-	-	.14	.16	.17	.14	.14	.11	.17	.2	.17	.2	.22	.13	.18	.15
Plant operators	-	-	.06	0	.1	.01	.09	0	.08	0	.11	.01	.11	0	.1	0
Elementary	-	-	.05	.02	.04	.08	.06	.04	.07	.05	.05	.05	.04	.05	.07	.06
N	0	0	6500	7251	471128	495094	14402	15648	2800	3316	11435	12300	566917	497735	36858	40939

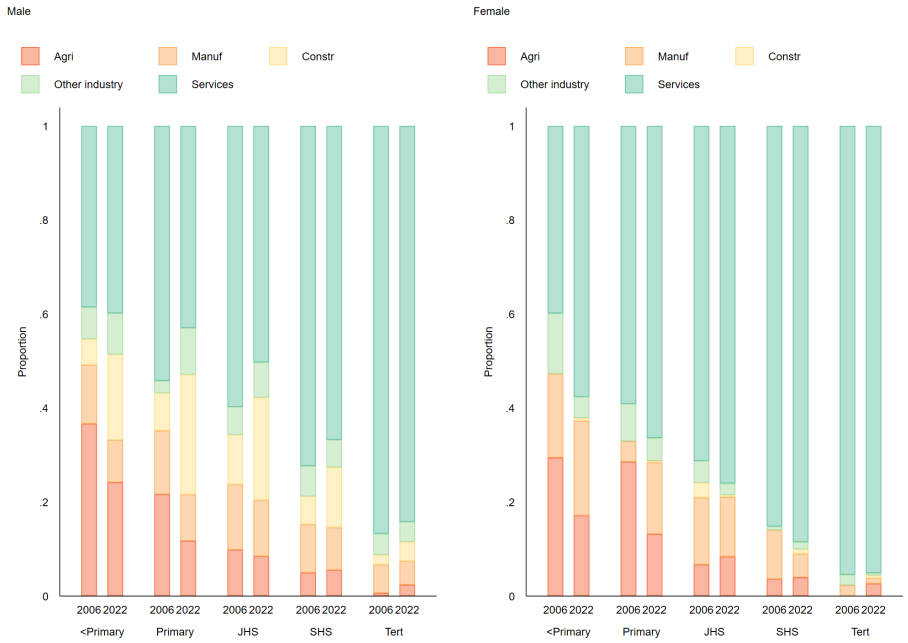
Source: GLSS 5-7 (survey weighted), PHC 2000, 2010, 2021.
Note: Occupation not at a nuanced enough level in 2000 to harmonise with ISCO-08. Other industry includes mining and quarrying; electricity, gas and water supply. Some occupation names have been shortened. Sample sizes shown in Table A1 in the appendix.

Table A3: Probability of wage employment: 2006, 2013, 2017 and 2022

	No occupation & industry controls				With occupation & industry controls			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	2006	2013	2017	2022	2006	2013	2017	2022
Age	0.009***	0.012***	0.011***	0.012***	0.005***	0.005***	0.006***	0.008***
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Age^2	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Female	-0.213***	-0.228***	-0.182***	-0.161***	-0.132***	-0.133***	-0.119***	-0.131***
	(0.010)	(0.007)	(0.008)	(0.004)	(0.009)	(0.006)	(0.008)	(0.004)
< Primary	-0.137***	-0.122***	-0.109***	-0.094***	-0.061***	-0.037***	-0.044***	-0.051***
	(0.010)	(0.008)	(0.009)	(0.005)	(0.008)	(0.007)	(0.008)	(0.005)
Primary	-0.096***	-0.113***	-0.055***	-0.055***	-0.059***	-0.054***	-0.035***	-0.039***
	(0.013)	(0.009)	(0.011)	(0.006)	(0.010)	(0.008)	(0.010)	(0.005)
SHS	0.161***	0.124***	0.181***	0.121***	0.045***	0.053***	0.085***	0.053***
	(0.014)	(0.009)	(0.010)	(0.005)	(0.011)	(0.008)	(0.009)	(0.005)
Teritary	0.507***	0.448***	0.474***	0.423***	0.074***	0.130***	0.151***	0.116***
	(0.018)	(0.011)	(0.013)	(0.007)	(0.017)	(0.011)	(0.013)	(0.007)
Female#<Primary	0.139***	0.124***	0.098***	0.081***	0.077***	0.052***	0.055***	0.062***
	(0.013)	(0.010)	(0.012)	(0.007)	(0.011)	(0.009)	(0.010)	(0.006)
Female#Primary	0.075***	0.104***	0.039***	0.044***	0.061***	0.052***	0.039***	0.041***
	(0.018)	(0.012)	(0.015)	(0.008)	(0.014)	(0.011)	(0.013)	(0.007)
Female#SHS	0.089***	0.100***	0.104***	0.079***	0.068***	0.065***	0.070***	0.061***
	(0.022)	(0.013)	(0.015)	(0.008)	(0.018)	(0.012)	(0.013)	(0.007)
Female#Tertiary	0.153***	0.210***	0.158***	0.191***	0.127***	0.097***	0.095***	0.148***
	(0.030)	(0.018)	(0.020)	(0.010)	(0.025)	(0.016)	(0.018)	(0.009)
Currently married	-0.041***	-0.013*	-0.003	-0.014***	-0.017**	-0.017***	-0.015**	-0.020***
	(0.009)	(0.007)	(0.007)	(0.004)	(0.008)	(0.006)	(0.006)	(0.004)
Formerly married	-0.019	0.015	-0.012	-0.023***	0.000	0.001	-0.020**	-0.030***
	(0.013)	(0.009)	(0.010)	(0.006)	(0.010)	(0.008)	(0.009)	(0.005)
Urban	0.121***	0.113***	0.087***	0.091***	0.046***	0.029***	0.017***	0.033***
	(0.007)	(0.005)	(0.005)	(0.003)	(0.006)	(0.004)	(0.005)	(0.003)
Armed Forces						0.040	0.131	0.071*
						(0.067)	(0.109)	(0.040)
Managers					-0.117***	-0.390***	-0.155***	-0.328***
					(0.029)	(0.016)	(0.018)	(0.010)
Technicians					-0.116***	-0.190***	-0.184***	-0.126***
					(0.019)	(0.015)	(0.016)	(0.010)
Clerical support					0.007	0.026	-0.078***	-0.133***
					(0.027)	(0.017)	(0.018)	(0.010)
Service & sales					-0.651***	-0.587***	-0.537***	-0.561***
					(0.015)	(0.010)	(0.011)	(0.006)
Skilled agri					-0.703***	-0.593***	-0.558***	-0.653***
					(0.022)	(0.017)	(0.018)	(0.009)
Craft					-0.643***	-0.593***	-0.603***	-0.627***
					(0.017)	(0.012)	(0.013)	(0.007)
Plant & machine					-0.088***	-0.166***	-0.189***	-0.319***
					(0.019)	(0.013)	(0.014)	(0.008)
Elementary					-0.193***	-0.291***	-0.429***	-0.391***
					(0.020)	(0.013)	(0.014)	(0.008)
Manufacturing					0.001	0.101***	0.111***	0.016**
					(0.017)	(0.015)	(0.017)	(0.008)
Construction					0.201***	0.226***	0.188***	0.027***
					(0.022)	(0.017)	(0.018)	(0.009)
Other industry					0.179***	0.246***	0.228***	0.111***
					(0.023)	(0.017)	(0.021)	(0.011)
Services					0.046***	0.125***	0.139***	0.038***
					(0.016)	(0.014)	(0.015)	(0.007)
Constant	0.157***	0.079***	0.029	0.004	0.752***	0.605***	0.535***	0.626***
	(0.029)	(0.020)	(0.023)	(0.013)	(0.032)	(0.024)	(0.027)	(0.015)
Region controls	y	y	y	y	y	y	y	y
Observations	13,695	30,033	23,639	77,264	13,695	30,033	23,639	77,264
R-squared	0.315	0.308	0.277	0.256	0.546	0.486	0.441	0.401

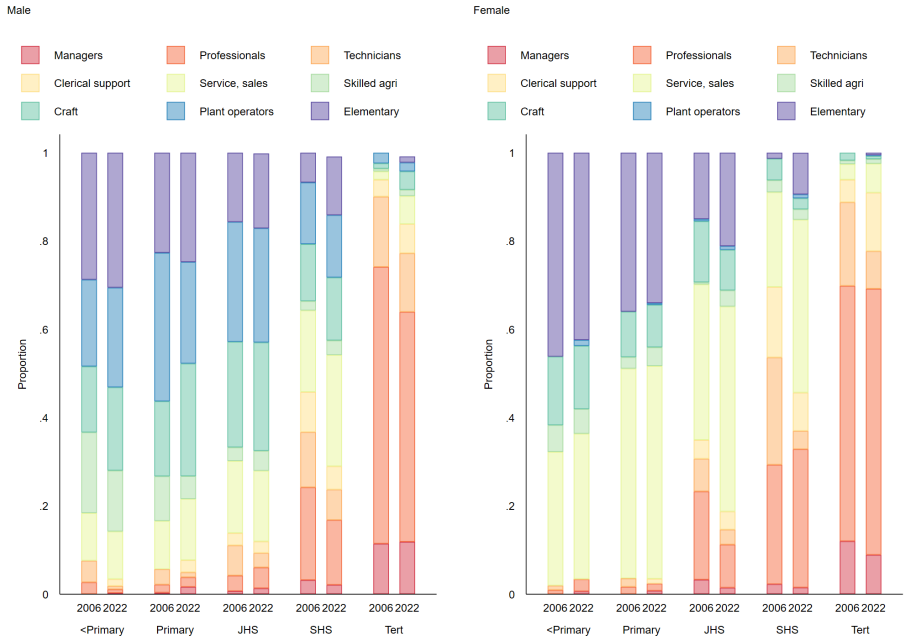
Source: GLSS 5-7, AHIES (survey weighted).
Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All regressions include controls for occupation, industry and region, which are not shown here. Columns 5-7 include controls for occupation and industry. The base category for occupations is professionals and for industry it is agriculture.

Figure A1: Industry shares of the wage employed by gender and education level, 2006 vs. 2022



Source: GLSS 5 & AHIES (survey weighted). Restricted to those in wage employment.

Figure A2: Occupation shares of the wage employed by gender and education level, 2006 vs. 2022



Source: GLSS 5 & AHIES (survey weighted).
Restricted to those in wage employment. Figure A1 in the appendix shows industry shifts for the wage employed.