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DURATION OF HIGH SCHOOL EDUCATION AND YOUTH LABOUR MARKET OUTCOMES: EVIDENCE FROM A POLICY EXPERIMENT IN GHANA

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Abstract: This paper estimates the effects of an additional year in senior high school (SHS) on early labour market outcomes in Ghana. Using data from a nationally representative household survey, we find that an additional year in SHS increases the likelihood of being employed and being employed in the formal sector but has no effect on the likelihood of being in paid employment. Additionally, we find that the effects are concentrated in female samples. Although the results constitute an important contribution to the debate on duration of SHS in Ghana, we caution that policy interventions should be based on more extensive evidence. © 2019 John Wiley & Sons, Ltd.

Keywords: senior high school; natural experiment; labour market; Ghana

1 INTRODUCTION

The role of education in economic development is a subject of long-standing research interest. At both micro-level and macro-level, several studies have sought to understand the relationship between education and economic growth (Mankiw, Romer, & Weil, 1992; Benhabib & Spiegel, 1994; Spiegel, 1994; Pritchett, 2001; Wolff,

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2001; Hanushek & Woessmann, 2012; Barro, 2013)[1] and a number of development outcomes including health, decision making, earnings, political participation and civic behaviour (Björklund & Moffitt, 1987; Campbell, 2006; Carneiro, Heckman, & Vytlacil, 2010; Foltz & Gajigo, 2012; Jensen & Lleras-Muney, 2012; Duflo, Dupas, & Kremer, 2015; Kuepié & Nordman, 2016).

In spite of the extensive literature on the education-development nexus, several major issues on the topic remain unresolved. One such pertinent issue is the design of appropriate educational systems to harness the power of education to transform lives and improve living standards. For example, the design of appropriate educational systems that suit the specific needs of countries and harness the human capital potential for economic advancement and improvement in living standards remains elusive for many developing countries. Critical aspects of educational systems such as structure, curriculum, financing and duration remain a subject of ongoing debate among researchers and policy makers in several developing countries.

In the case of Ghana, the setting of this paper, the structure of pre-university education has been a subject of intense policy debate since independence. The duration of high school education has been changed three times in the last 30 years, with the last change occurring in 2009. In 2007, as part of measures to improve student performance, Ghana increased the duration of senior high school (SHS) education by 1 year to make it 4 years. The 3-year SHS education system had been in place for 20 years. However, after 3 years of implementation, the 4-year SHS was abruptly reversed to the 3-year system following a change in government. Overall, the changes resulted in three cohorts of students who had 4 years of SHS education, while all other cohorts had 3 years of SHS.

These frequent changes have generated substantial public debate on the benefits and cost implications of SHS duration. An additional year of schooling may be associated with economic gains through knowledge acquisition. Shorter duration of high school education, on the contrary, may have negative consequences for cognitive development by compromising in-depth learning (Büttner & Thomsen, 2015) and promoting incentives for learners to opt for less demanding subjects (Meyer & Thomsen, 2013). Moreover, shorter duration of schooling may lead to increased workload that can have negative implications for learners' personality development (Thiel, Thomsen, & Büttner, 2014; Thomsen, 2015), weaker ability of learners to develop occupational preferences and eventually increase the level of insecurity among such school leavers (Meyer & Thomsen, 2013). On the other hand, longer duration may come with additional costs (higher expenditure on tuition, books, transportation, school infrastructure and extra tutors among others) not only to the government but also to households. In spite of the relevance of these issues for the design of pre-university education and the intensive public debate on them, there is little credible empirical evaluation of the duration of high school on labour market outcomes in developing countries.

This paper uses data from a nationally representative household survey to estimate the effect of an additional year of SHS education on labour market outcomes for individuals aged 15–30 years. We compare indicator variables for being employed, being employed in the formal sector and being in paid employment between those who completed 3 years of SHS and those who completed 4 years of SHS.

[1]In spite of strong theoretical link, the macro-level empirical literature on the effect of education on economic growth is mixed. While cross-country regressions show a clear positive correlation, results become more ambiguous using panel regressions with country fixed effects.

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We find that the duration of SHS affects early labour market outcomes. Individuals who completed 4 years of SHS are 5.6 percentage points more likely to be employed in the last 7 days and 5.3 percentage points more likely to be employed in the last 12 months compared with those who had 3 years of SHS. They are also 1.6 percentage points more likely to be employed in the formal sector in the last 12 months. However, we find no statistically significant effect on the probability of being in paid employment. Additionally, we break our sample into male and female and find that the positive effects on being employed and being employed in the formal sector are concentrated in the female sample.

Our paper contributes to the literature on education and labour market outcomes. Although several previous studies have estimated the effect of primary and junior high school enrolment on cognition and related outcomes (Ozier, 2018), very few studies have focused on the effects of secondary education on labour market outcomes, with Duflo, Dupas and Kremer (2017) and Oyelere (2010) being some of the few exceptions. Duflo et al. (2017) estimated the effect of offering a scholarship to attend SHS in Ghana and find that those who received these scholarships were more likely to report positive earnings and earned more. Oyelere (2010) uses the implementation and withdrawal of free primary school education to estimate very low returns to schooling in Nigeria.

Our paper is more closely related to studies that focus on the returns to high school education. Much of the existing evidence on the effect of high school education comes from additional instructional time within the same school day and compulsory schooling laws in advanced countries (Card & Krueger, 1992; Card, 1999; Pischke, 2007; Bellei, 2009). These studies generally show a strong positive correlation between duration of secondary education and school achievement and earnings. The duration of secondary education has received very little attention. Recent evidence on the effects of shorter duration of secondary education has come from reforms in Canada and Germany. The evidence shows that reducing the duration of secondary education by 1 year significantly negatively affect academic performance at secondary school level and the university level (Krashinsky, 2014; Thomsen, 2015).

Our paper differs from these previous papers in three important respects. First, our study is based on an arguably exogenous source of variation in the duration of secondary education resulting from a nationwide policy change, which allows us to identify the causal effect of duration of secondary schooling on labour market outcomes. Although Thomsen (2015) and Krashinsky (2014) also use plausibly exogenous variation from educational reforms to identify causal effect of variation of years of schooling, both studies were based on shortening the duration, while ours is based on lengthening the duration. Secondly, while previous papers identified the effect of changes that affected some particular students or parts of a country, our study focuses on a nationwide change in the educational system. The general equilibrium effects of such changes that are national in nature are likely to be different from changes that affect only segments of the population. Finally, while much of the existing evidence in this area comes from Organisation for Economic Cooperation and Development (OECD) countries, ours is from a sub-Saharan African country. This is important because the education systems in OECD countries are quite different from sub-Saharan African countries like Ghana in terms of availability of resources, quality of educational infrastructure and constraints. Thus, findings from such settings such as the OECD may not be applicable to developing country settings.

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The rest of the paper is structured as follows. Section 2 provides relevant institutional detail of Ghana's education system. Section 3 describes the data sources and empirical strategy. Section 4 presents the results of the paper. Section 5 presents the discussion and policy implications of the results, and Section 6 concludes the paper.

2 REFORMS IN GHANA'S EDUCATION SYSTEM

Ghana's educational system has gone through many reforms since independence in 1957. Prior to 1987, the educational system largely followed a 6-4-7-3 structure [6 years primary education, 4 years middle school education, 7 years secondary school (i.e. 5 years ordinary-level and 2 years advanced-level) and 3 years university education]. A major education reform in Ghana in 1987 changed the structure to a 6-3-3-4 format (6 years of primary education, 3 years of junior high school, 3 years of SHS and 4 years of university education). This change in policy was due to the high cost to government for having a 10-year pre-secondary education and the higher age (minimum 26 years) at which middle school graduates completed the undergraduate degree (McWilliam & Kwamena-Po, 1975; Addae-Mensah, 2000; Yusif & Ofori-Abebrese, 2017).

After 20 years of the 6-3-3-4 education system (1987 to 2007), the structure was changed to 6-3-4-4, increasing the duration of secondary education to 4 years. The change was prompted by poor performance at the SHS level and the overall need to improve the quality of education at all levels.[2] However, following a change in government in 2009 and just after 3 years of implementation of the 6-3-4-4 structure, it was changed by the new government back to 6-3-3-4. Overall, the changes resulted in three cohorts of students who had 4 years of SHS education, with all other cohorts having 3 years of SHS. The recent changes in the duration of SHS education provide an arguably exogenous change in the duration of high school education. It is important to note that the recent change in the structure left the curriculum unchanged.

3 METHODOLOGY

3.1 Data

The paper uses data from the sixth round of the Ghana Living Standards Survey (GLSS) conducted from September 2012 to September 2013. The GLSS is a nationally representative household survey that collects information for the measurement of poverty and other socio-economic and demographic indicators. Among other variables, the GLSS collects detailed information on all household members including demographic information, education and educational history, employment and time use, and household assets. The sample is restricted to the youth (i.e. individuals aged 15–30 years). This restriction means our analysis compares cohorts from the 4-year group with only 3-year cohorts who attended SHS before the introduction of the reforms.[3] Our sample is also

[2]For example, according to the West African Examination Council (WAEC) official results released in 2017, 28.25 per cent of 133 235 who sat for the West African Senior Senior Certificate Examination (WASSCE) English language had credit pass (grades A1 to C6), while for Core Mathematics and Integrated Science, 25.45 per cent of 133 134 and 24.03 per cent of 132 943 had credit pass, respectively.

[3]The cohorts of students with 3 years after the reversal of the 4-year policy had not completed SHS at the time of the survey.

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restricted to only those whose highest level of education completed is SHS and who have not completed any post-secondary education. This is because those who had 4 years of SHS and continued to further their education were still in school at the time the survey was conducted. Our main independent variable—an indicator for attending SHS for 4 years—is derived from two variables in the education module of the GLSS: the highest level of education completed and highest grade completed at that level.

3.2 Empirical Strategy

The paper exploits the natural experiment created by the introduction of the 4-year SHS and the subsequent reversal to the 3-year system and compare the labour market outcomes of individuals who were exposed to different durations of SHS education. Our identification strategy compares cohorts of the 4-year system with cohorts of the 3-year system who attended SHS before the reform. Using this natural experiment, we estimate the following equation:

$$y_{ic} = \alpha + \theta_1 SHS4_c + X'_{ic}\beta + \varepsilon_{ic} \quad (1)$$

where i is individual and c is birth cohort, $SHS4$ is an indicator variable that takes the value 1 if an individual attended SHS for 4 years and 0 otherwise, X is a vector of control variables (age, sex, marital status, household size, religion, ethnicity, region of residence and indicator for residing in an urban area) and ε_{ic} is the idiosyncratic error term. The main outcome variables are indicator variables for (i) being employed, (ii) being in paid employment and (iii) being employed in the formal sector. We use the following question from the survey to determine whether an individual is in paid employment 'Has (NAME) received or will (NAME) receive money for this work?' An individual who responds 'yes, has received payment' or 'yes will receive payment' is classified as being in paid employment. An individual was classified as being in formal sector employment if the response to the question 'In what sector was (NAME) mainly working?' was any of the following: civil service, other public service, parastatals, non-governmental organisations, international organisation/diplomatic mission and formal private sector.

The different outcome measures capture differences in the quality of the labour market outcome. The first outcome variable—being employed—captures whether an individual is economically active. We consider this to be the basic outcome. Paid employment includes both formal and informal sector employment. Formal sector employment is considered a superior outcome. We expect that the strongest impact of an additional year in SHS would be on paid employment rather than on formal sector employment. This is because the formal sector in Ghana is very small and competitive to the extent that high school education, irrespective of the duration, is usually not considered sufficient qualification.

In each case, the dependent variable is measured over a 7-day duration and a 12-month duration. We run Probit regressions and compute the marginal effects. We account for the complex survey structure by using the *svy* suite in STATA. Following previous literature in this area (Büttner & Thomsen, 2015), we estimate Equation (1) for the overall sample and then separately for male and female samples.

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4 RESULTS

4.1 Descriptive Statistics

Table 1 presents descriptive statistics of the sample used for the analysis. The descriptive information is first presented for the overall sample and then by the duration of SHS. The sample is made up of 2264 individuals. Just under 69 per cent of the sample attended SHS for 3 years. Those who attended SHS for 4 years are 2.3 years younger. The 4-year SHS group is also slightly more likely to be male, less likely to be married, less likely to be household heads and tend to belong to bigger households. Consistent with Ghana's population, the entire sample and those who went to SHS for 4 years are more likely to be

Table 1. Descriptive statistics

	Full sample	3-year SHS	4-year SHS	*p*-value
Age (in years)	23.2	23.9	21.6	0.000
Sex = male	54.2%	53.6%	55.8%	0.320
Marital status = never married	82.5%	76.6%	95.2%	0.000
Head of household	20.1%	25.3%	8.7%	0.000
Household size	5.2	4.9	5.7	0.000
Household wealth index				
Poorest	15.2%	15.2%	15.2%	
Poorer	14.1%	14.6%	13.0%	
Middle	16.7%	17.9%	14.0%	0.037
Richer	21.6%	21.7%	21.3%	
Richest	32.5%	30.7%	36.5%	
Religion = Christian	81.3%	79.5%	85.3%	0.001
Ethnicity				
Akan	49.4%	47.5%	53.6%	
Ga-Dangme	6.3%	6.6%	5.5%	
Ewe	12.2%	12.2%	12.2%	0.077
Mole-Dagbani	17.7%	18.8%	15.6%	
Other	14.4%	15.0%	13.2%	
Residence = urban	65.3%	66.6%	62.4%	0.052
Region of residence				
Western	11.0%	12.1%	8.7%	
Central	8.6%	8.1%	9.8%	
Greater Accra	18.4%	20.7%	13.5%	
Volta	7.0%	6.2%	8.8%	
Eastern	8.5%	8.8%	7.9%	0.000
Ashanti	16.8%	15.0%	20.6%	
Brong Ahafo	8.7%	7.2%	11.8%	
Northern	7.8%	7.8%	7.9%	
Upper East	7.6%	8.2%	6.2%	
Upper West	5.7%	6.0%	4.9%	
Employed in last 7 days	53.6%	55.6%	49.2%	0.005
Employed in the last 12 months	59.9%	62.1%	55.1%	0.002
In paid employment last 7 days	35.6%	41.0%	24.0%	0.000
In paid employment last 12 months	2.8%	2.7%	2.9%	0.750
In formal employment last 7 days	14.4%	17.1%	8.4%	0.000
In formal employment last 12 months	1.3%	1.3%	1.4%	0.827
Observations	2264	1551	713	

SHS, senior high school.

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Christians. The two groups are quite similar in terms of ethnic background and residence in rural or urban areas.

In terms of the outcomes, those who had 4 years of SHS are more likely to be employed in the last 7 days and the last 12 months and more likely to be in paid employment in the last 12 months but less likely to be in paid employment in the last 7 days.

4.2 Effects of the Duration of Senior High School on Labour Market Outcomes

Table 2 presents the effect of the duration of SHS on the probability of being employed. Each column reports the results of a separate regression. We present results for the full sample and separately for male and female samples. We report marginal effects from a Probit regression model. All regressions control for religion, ethnicity, dummy for residing in an urban area and geographic region of residence.

Table 2. Effects of duration of high school education on employment outcomes

	Employed in the last 7 days			Employed in the last 12 months		
	(1)	(2)	(3)	(4)	(5)	(6)
Variables	Full sample	Male samples	Female samples	Full sample	Male samples	Female samples
Duration of	0.056**	0.038	0.085**	0.053**	0.043	0.066
SHS = 4 years	(0.025)	(0.029)	(0.041)	(0.025)	(0.031)	(0.043)
Age	0.100*	0.064	0.154**	0.158***	0.162***	0.167**
	(0.052)	(0.064)	(0.074)	(0.051)	(0.062)	(0.073)
Age squared	−0.001	−0.001	−0.002	−0.003**	−0.003**	−0.003
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
Individual is head	0.315***	0.343***	0.179**	0.303***	0.326***	0.192**
of household	(0.047)	(0.051)	(0.081)	(0.047)	(0.048)	(0.082)
Individual is never	−0.049	−0.188***	0.035	−0.094***	−0.239***	−0.019
married	(0.036)	(0.057)	(0.048)	(0.036)	(0.054)	(0.047)
Household size	−0.006	0.000	−0.019**	−0.002	0.003	−0.013*
	(0.005)	(0.006)	(0.007)	(0.005)	(0.006)	(0.007)
Household wealth	0.026	0.152***	−0.104*	0.034	0.139**	−0.079
quintile: 2nd	(0.043)	(0.057)	(0.057)	(0.044)	(0.063)	(0.058)
Household wealth	0.191***	0.248***	0.131**	0.164***	0.232***	0.091
quintile: 3rd	(0.044)	(0.051)	(0.064)	(0.041)	(0.058)	(0.061)
Household wealth	0.068*	0.146***	−0.016	0.061	0.110*	0.012
quintile: 4th	(0.038)	(0.051)	(0.057)	(0.044)	(0.067)	(0.056)
Household wealth	0.208***	0.268***	0.142***	0.169***	0.212***	0.119**
quintile: 5th	(0.036)	(0.052)	(0.053)	(0.041)	(0.061)	(0.053)
Observations	2236	1210	1026	2236	1210	1024

Reported coefficients are marginal effects computed from a Probit regression model. Robust standard errors are in brackets. The omitted category for duration of SHS is those with duration of SHS 3 years. The omitted category for marriage is currently married. The omitted category of household wealth quintile is the 1st (poorest quintile). All regressions control for religion, ethnicity, dummy for residing in an urban area and region of residence. SHS, senior high school.
*Statistically significant at 10 per cent level.
**Statistically significant at 5 per cent level.
***Statistically significant at 1 per cent level.

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Overall, Table 2 shows that those who attended SHS for 4 years were more likely to be employed. Columns 1 and 4 show that those with 4 years of high school were 5.6 percentage points more likely to be employed in the last 7 days and 5.3 percentage points more likely to be employed in the last 12 months. Both are statistically significant at 5 per cent level. Interestingly, the effects are stronger for female samples than for male samples. For female samples, those with 4 years of high school were 8.5 percentage points more likely to be employed in the last 7 days and 6.6 percentage points more likely to be employed in the last 12 months although the latter estimate is not statistically significant. The corresponding estimates for male samples are 3.8 percentage points and 4.3 percentage points, respectively.

Table 3 presents the results on the effect of duration of SHS on the likelihood of being in paid employment. The results show that attending SHS for 4 years had no significant effect on the likelihood of being in paid employment even though the coefficients are positive. This is the case for both the pooled sample and the male and female samples.

Table 3. Effects of duration of high school education on paid employment

	Paid employment in last 7 days			Paid employment in last 12 months		
	(1)	(2)	(3)	(4)	(5)	(6)
Variables	Full sample	Male samples	Female samples	Full sample	Male samples	Female samples
Duration of	0.013	0.015	0.011	0.009	0.025	−0.003
SHS = 4 years	(0.010)	(0.027)	(0.040)	(0.024)	(0.015)	(0.013)
Age	0.038**	0.133**	0.232***	0.174***	0.095***	0.014
	(0.016)	(0.060)	(0.067)	(0.046)	(0.035)	(0.022)
Age squared	−0.001**	−0.002*	−0.004***	−0.003***	−0.002***	−0.000
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)
Individual is head	0.011	0.458***	0.153*	0.332***	0.042*	0.019
of household	(0.012)	(0.066)	(0.084)	(0.057)	(0.024)	(0.022)
Individual is never	−0.015	−0.069	−0.015	−0.069**	0.009	−0.025
married	(0.013)	(0.056)	(0.045)	(0.031)	(0.014)	(0.017)
Household size	0.001	−0.004	−0.028***	−0.015***	0.002	0.003
	(0.001)	(0.006)	(0.008)	(0.005)	(0.002)	(0.002)
Household wealth	0.010	0.128**	−0.075	0.031	0.007	0.009
quintile: 2nd	(0.031)	(0.051)	(0.049)	(0.037)	(0.050)	(0.029)
Household wealth	−0.020	0.156***	0.093	0.132***	−0.015	−0.019
quintile: 3rd	(0.024)	(0.047)	(0.058)	(0.039)	(0.038)	(0.022)
Household wealth	−0.034	0.125***	0.020	0.077**	−0.042	−0.029
quintile: 4th	(0.025)	(0.041)	(0.054)	(0.034)	(0.040)	(0.019)
Household wealth	−0.029	0.223***	0.101**	0.168***	−0.039	−0.020
quintile: 5th	(0.024)	(0.049)	(0.050)	(0.034)	(0.041)	(0.020)
Observations	2236	1210	1024	2236	1055	1055

Reported coefficients are marginal effects computed from a Probit regression model. Robust standard errors are in brackets. The omitted category for duration of SHS is those with duration of SHS 3 years. The omitted category for marriage is currently married. The omitted category of household wealth quintile is the 1st (poorest quintile). All regressions controls for religion, ethnicity, dummy for residing in an urban area and region of residence. SHS, senior high school.

*Statistically significant at 10 per cent level.

**Statistically significant at 5 per cent level.

***Statistically significant at 1 per cent level.

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Finally, Table 4 presents the results on the effect of the duration of SHS on the likelihood of being in formal sector employment. The results are somewhat mixed. Duration of high school has no effect on the probability of being employed in the formal sector in the last 7 days (columns 1–3). Indeed, the coefficients across the full sample and by gender have counter-intuitive signs even though none is statistically significant. However, columns 4–6 show that those who attended SHS for 4 years were slightly more likely to be in formal sector employment. The coefficient from the full sample (column 4) shows that those who attended SHS for 4 years are 1.6 percentage points more likely to be in formal employment in the last 12 months. This is significant at 10 per cent. The results in columns 5 and 6 suggest that the returns to 4 years of SHS education is significant for female samples but not for male samples. While there is no statistically significant effect of duration of SHS for male samples (coefficient of 0.004, not statistically significant), female samples with 4 years of high school are 2.4 percentage points more likely to be in formal sector employment, and this is statistically significant at 10 per cent.

Table 4. Effects of duration of high school education on formal employment

	Formal employment in last 7 days			Formal employment in last 12 months		
	Full sample	Male samples	Female samples	Full sample	Male samples	Female samples
Variables	(1)	(2)	(3)	(4)	(5)	(6)
Duration of	−0.025	−0.039	−0.013	0.016*	0.004	0.024*
SHS = 4 years	(0.025)	(0.039)	(0.029)	(0.009)	(0.008)	(0.014)
Age	0.151***	0.110*	0.232***	0.036**	0.012	0.045*
	(0.044)	(0.062)	(0.056)	(0.016)	(0.015)	(0.023)
Age squared	−0.003***	−0.002	−0.005***	−0.001**	−0.000	−0.001*
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)
Individual is head of	0.083**	0.101**	0.016	0.010	0.021	0.015
household	(0.035)	(0.049)	(0.047)	(0.009)	(0.019)	(0.017)
Individual is never	0.021	0.022	0.021	−0.001	−0.000	−0.007
married	(0.023)	(0.038)	(0.030)	(0.009)	(0.014)	(0.019)
Household size	−0.011***	−0.009	−0.015**	−0.000	0.000	−0.000
	(0.004)	(0.007)	(0.006)	(0.001)	(0.001)	(0.002)
Household wealth	0.085**	0.135***	0.038	−0.001	−0.003	0.011
quintile: 2nd	(0.034)	(0.046)	(0.046)	(0.029)	(0.018)	(0.042)
Household wealth	0.071**	0.068*	0.060	−0.034	−0.016	−0.037
quintile: 3rd	(0.034)	(0.038)	(0.054)	(0.026)	(0.013)	(0.036)
Household wealth	0.051*	0.077**	0.010	−0.038	−0.016	−0.043
quintile: 4th	(0.030)	(0.038)	(0.042)	(0.027)	(0.011)	(0.038)
Household wealth	0.042	0.094**	−0.024	−0.033	−0.004	−0.046
quintile: 5th	(0.030)	(0.038)	(0.037)	(0.027)	(0.012)	(0.039)
Observations	2236	1210	1024	2221	1218	898

Reported coefficients are marginal effects computed from a Probit regression model. Robust standard errors are in brackets. The omitted category for duration of SHS is those with duration of SHS 3 years. The omitted category for marriage is currently married. The omitted category of household wealth quintile is the 1st (poorest quintile). All regressions controls for religion, ethnicity, dummy for being residing in an urban area and region of residence. SHS, senior high school.
*Statistically significant at 10 per cent level.
**Statistically significant at 5 per cent level.
***Statistically significant at 1 per cent level.

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Besides our main variable of interest, we find that age has significant and positive influence on employment, paid employment and formal sector employment. This is across almost all specifications. However, the effect of age is non-linear as the coefficient on the square of age is negative and statistically significant in most specifications.

Additionally, the results in most specifications suggest that individuals who are household heads have better prospects in the labour market across most specifications. Household size is a significant predictor of employment in some specifications. In those specifications, individuals in larger households are less likely to be employed, be in paid employment or be in formal sector employment.

Household wealth is also another significant predictor of employment in most specifications. In those specifications, individuals from wealthier households are more likely to be employed, be in paid employment and be in formal sector employment. In addition, marital status is found not to have any clear impact on being employed, being in paid employment and being employed in the formal sector.

5 DISCUSSION AND POLICY IMPLICATIONS

The paper used dataset comprising 2264 individuals aged 15–30 years to investigate the duration of SHS education on youth labour market outcomes in Ghana. The results suggest that spending an additional year in SHS is associated with a marginally higher probability of being employed and being employed in the formal sector. However, the additional year has no effect on the probability of being in paid employment. Taken together, our results provide suggestive but not a clear and consistent labour market advantage of an additional year in SHS among this sample. Our findings are largely consistent with existing evidence that shows that more years of schooling lead to better labour market outcomes (Stiglitz, Sen, & Fitoussi, 2009). However, the mechanisms at play in this context may be slightly different. As already indicated, an extra year may lead to the acquisition of knowledge and experience, which can eventually enhance the employability of an individual. These attributes are likely to negatively affect the labour market outcomes of individuals completing SHS in 3 years. As earlier discussed, the negative implications of shortened duration of secondary education may result in compromising in-depth learning (Büttner & Thomsen, 2015), the possibility that learners will opt for less demanding subjects (Meyer & Thomsen, 2013), inability of learners to develop occupational preferences (Meyer & Thomsen, 2013) and increased workload that can have negative implications for learners' personality development (Thiel, Thomsen, & Büttner, 2014) and consequently their employability.

Our findings could also be explained by differences in the likelihood of enrolling in further education between the two groups. This could happen if the 3-year cohorts feel they needed additional education to compete in the labour market. To investigate this, we regress the indicator for 'belonging to the 4-year SHS group' on an indicator for 'enrolling in post-secondary education'. The results, presented in Table A1, show that the 4-year cohorts are significantly less likely to enrol in post-secondary education. While this finding indicates that differential selection into post-secondary education could explain our findings, perhaps, it also indicates that individuals from the 3-year cohort acknowledge the advantage of the additional year in SHS in the labour market.

Perhaps more interesting is the finding that the effect of 4 years of SHS seem to be significant mainly in the case of female respondents. In other words, the extra year spent

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in SHS is more beneficial for female samples in the sample compared with male samples. The gender differences in employment and earnings have been widely documented and generally attributed to socially constructed gender segregated roles (Figart, 1997; Jacobsen, 1999; Ransom & Oaxaca, 2005; Kercheval et al., 2013). While these differentials also exist in Ghana, there is no obvious explanation of why the additional year of SHS should be more beneficial to women compared with men. It is important to emphasise that these findings have essentially short-term effects that merit further research as additional data for examining the longer term effects of the policy become available.

Overall, the findings of the current paper make an important contribution to the existing policy debate on the duration of SHS education in Ghana. The results could be indicative that the 4 years of SHS may better prepare adolescents for entry into the labour market than the 3 years. A major question however is whether evidence in the current paper is enough to conclude that the 4 years of SHS education is better than the 3 years. It is important to emphasise that the duration of SHS education has implications for outcomes other than employment, for example, current and future academic performance, personal development and health. In addition, the returns to the extra year of investment in secondary education (in the current paper, a higher probability of being employed) should be examined in the context of the additional cost incurred in securing such returns.

To shed more light on the results, we conducted additional analysis of our data to understand the mechanisms of the effects. One common feature of labour markets in developing countries is higher underemployment (Michaelowa & Waller, 2003). Differential underemployment rates between the two groups could affect our findings. We investigate this by a regression with underemployment as an outcome variable and all the covariates from our main specifications. We use the GSS (2016) time-related underemployment and classify an individual as underemployed if he or she is currently employed, worked less than 40 hours and expressed a desire to do additional hours or additional jobs. The results are reported in Table A2. The results show that the duration of SHS has no effect on the probability of being underemployed in both full sample and the disaggregated sample by gender. This suggests that underemployment does not explain our main findings.

6 CONCLUSION

The paper set out to examine the effect of the duration of SHS education on employment status among a nationally representative sample of youth aged 15 to 24 years. The results suggest that those who attended SHS for 4 years are more likely to be employed (i.e. either in paid or formal employment). More importantly, the results suggest that the returns to 4 years of SHS education is significant for female samples compared with male samples. Although the results of the paper may be indicative of structural challenges (duration and responsiveness) in the SHS educational system that needs to be addressed, it is important to caution that the current results may not be enough to conclude that the 4-year SHS duration is better than the 3 years. There will therefore be the need for additional evidence on the comparative returns of the 4 and 3 years of SHS education on other outcomes such as current and future academic performance and health and personal development over time. This caveat notwithstanding, it is equally important to emphasise that the results of the paper constitute an important contribution to the debate on the duration of SHS education and opens up avenues for examining the effect of SHS duration on other equally important outcomes.

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A. APPENDIX

Table A1. Effects of duration of high school education on post-secondary education

	Outcome: had any post-secondary education		
Variables	Full sample	Male samples	Female samples
Duration of SHS = 4 years	−0.079***	−0.069**	−0.095***
	(0.023)	(0.028)	(0.033)
Age	0.134***	0.127***	0.163***
	(0.033)	(0.043)	(0.051)
Age squared	−0.003***	−0.003***	−0.003***
	(0.001)	(0.001)	(0.001)
Individual is head of household	−0.034	−0.031	−0.076**
	(0.024)	(0.032)	(0.035)
Individual is never married	0.101***	0.112***	0.056*
	(0.015)	(0.020)	(0.032)
Household size	−0.003	0.002	−0.009
	(0.004)	(0.005)	(0.007)
Household wealth quintile: 2nd	−0.041	−0.038	−0.028
	(0.033)	(0.042)	(0.045)
Household wealth quintile: 3rd	−0.071**	−0.048	−0.081*
	(0.031)	(0.040)	(0.042)
Household wealth quintile: 4th	−0.038	−0.011	−0.048
	(0.032)	(0.044)	(0.042)
Household wealth quintile: 5th	−0.024	−0.009	−0.020
	(0.034)	(0.041)	(0.045)
Observations	2218	1116	1006

Reported coefficients are marginal effects computed from a Probit regression model. Robust standard errors are in brackets. The omitted category for duration of SHS is those with duration of SHS 3 years. The omitted category for marriage is currently married. The omitted category of household wealth quintile is the 1st (poorest quintile). All regressions control for religion, ethnicity, dummy for residing in an urban area and region of residence. SHS, senior high school.
*Statistically significant at 10 per cent level.
**Statistically significant at 5 per cent level.
***Statistically significant at 1 per cent level.

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Table A2. Effects of duration of high school education on underemployment

	Underemployment in the last 7 days		
Variables	Full sample	Male samples	Female samples
Duration of SHS = 4 years	0.008	0.013	0.006
	(0.008)	(0.011)	(0.010)
Age	0.031**	0.056**	0.017
	(0.016)	(0.029)	(0.018)
Age squared	−0.001**	−0.001**	−0.000
	(0.000)	(0.001)	(0.000)
Individual is head of household	0.014	0.035	0.009
	(0.012)	(0.023)	(0.014)
Individual is never married	−0.013	−0.009	−0.017
	(0.012)	(0.015)	(0.023)
Household size	−0.002	−0.006**	−0.001
	(0.002)	(0.003)	(0.001)
Household wealth quintile: 2nd	0.023*	−0.013	0.058***
	(0.014)	(0.013)	(0.022)
Household wealth quintile: 3rd	0.007	−0.004	0.016**
	(0.008)	(0.016)	(0.007)
Household wealth quintile: 4th	0.017*	0.022	0.018*
	(0.010)	(0.019)	(0.009)
Household wealth quintile: 5th	0.017**	0.004	0.028***
	(0.009)	(0.015)	(0.010)
Observations	2110	902	1135

Reported coefficients are marginal effects computed from a Probit regression model. Robust standard errors are in brackets. The omitted category for duration of SHS is those with duration of SHS 3 years. The omitted category for marriage is currently married. The omitted category of household wealth quintile is the 1st (poorest quintile). All regressions control for religion, ethnicity, dummy for being residing in an urban area and region of residence. SHS, senior high school.
*Statistically significant at 10 per cent level.
**Statistically significant at 5 per cent level.
***Statistically significant at 1 per cent level.

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