



Does gender make a difference in the performance of a small business enterprise? Evidence from a household survey data from Ghana

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Abstract

Improving the performance of women-owned businesses promises to be an effective means of empowering women toward the realization of sustainable development goal five (5). While studies abound on the subject of gender and development, little scholarly attention has been paid to the gender performance gap in entrepreneurship. We analyse the gender performance gap in entrepreneurship using data from the Ghana Socioeconomic Panel Survey. Regression results revealed a performance disparity between male-owned and female-owned enterprises. Employing the Oaxaca–Blinder decomposition analysis, the performance disparity was found to be explained by observable and non-observable characteristics with the former accounting for 49–66% of the difference in gender performance in business. Among many things, we conclude that policies aimed at empowering women such as education, access to credit, and business support systems could reduce the gender performance gap in entrepreneurialships.

Keywords Decomposition · Gender · Performance gap · Ghana

Introduction

In recent years, scholars and policymakers alike have suggested entrepreneurship as one of the ways to address the increasing school-leaver unemployment in developing economies. Women entrepreneurs have been found to make a significant contribution

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to economic growth and poverty reduction in both low- and high-income countries (World Bank 2014; Coleman and Robb 2009). However, available evidence suggests that entrepreneurship is not a gender-neutral phenomenon. Although entrepreneurship is considered key to women's empowerment, comparatively, women entrepreneurs are often at a disadvantage (OECD 2013). Sustainable Development Goal five (5) envisions gender equality and decent work for all as one of the pathways through which countries may achieve sustainable growth. Thus, addressing the gender performance gap in entrepreneurship is one of the surest ways to achieve Goal five (5) of the sustainable development goals.

Although the literature is replete with gender development-related issues in several areas such as climate change adaptation (Arku and Arku 2010; Resurrección et al. 2019), governance and security (Goetz and Jenkins 2016; Bandyopadhyay 2000), violence (World Bank 2019), employment and poverty (Brajdić-Vuković et al. 2007; Stier and Lewin 2002; Kim et al. 2019), as well as wage gap in developing countries (inter alia Boahen and Opoku 2021; Yahmed 2018; Bhorat and Goga 2013; Fafchamps et al. 2009), only a few studies have focused on the gender performance gap in entrepreneurship (Bird and Sapp, 2004; Doering and Thébaud 2017).

Studies in high-income economies reveal profit disparities between male and female entrepreneurs (Bird and Sapp, 2004; Doering and Thébaud 2017). The underlying causes of the gender gap in entrepreneurship have been attributed to many factors. Different accounts have been offered to explain this gap. However, these accounts most of them from developed economy contexts often attribute the inequalities to some observable characteristics. For instance, the gender gap for entrepreneurs in the agricultural sector has been attributed to access to extension services (Manfre et al. 2013) and productive resources (Aguilar et al. 2015; Kilic et al. 2015). Understanding the gender performance gap in entrepreneurship is imperative, especially in developing economies where self-employment is considered high (Fields 2019). Despite the policy relevance of appreciating the gender inequalities in entrepreneurship, there is still relatively little evidence from developing economy contexts. The limited studies in developing countries are often ascribed to data unavailability (Munyegera and Precious 2018).

As indicated above, gender inequalities in entrepreneurship have received some scholarly attention. However, the understanding of the primary causes remains incomplete. For example, prior studies on the subject matter suggest that comparatively, sales of men-owned businesses are higher (Fairlie and Robb 2009; Bardasi et al. 2011; Brixiová and Kankoye 2015), and that, female-owned businesses have a higher likelihood of collapsing (Fairlie and Robb 2009) and are less likely to expand their working force (Shava and Rungani 2016; Gatewood et al. 2009). In Africa for instance, the average value added of businesses by women entrepreneurs has been suggested to be about 6% lower than that of firms by male entrepreneurs (Hallward-Driemeier 2013). Some of these studies have attributed the inequality in performance to inequality in start-up capital. They argue that female entrepreneurs are much less likely than men to obtain external finance from sources other than banks (Gatewood et al. 2003; Brush et al. 2003; Thebaud 2015; Ewens and Townsend 2019). It is further argued that this initial advantage translates into greater firm assets which make male firms compete in high-technology industries that have

high returns but demand high start-up capital (Lee and Marvel 2014). Thus, businesses of women entrepreneurs tend to be concentrated in low-productive sectors (Lee and Marvel 2014; Cirera and Qasim 2014).

Other studies which attempt to understand the gender performance disparity also argue that the gender gap in performance is attributable to the motherhood penalty. According to these studies, childrearing obligations force women to sort themselves into flexible start-ups often associated with lower growth potential (Jacobs and Gerson 2004; Correll et al. 2007; Thebaud 2015; Kacperczyk and Younkin 2019). Employing experimental design to address the possible unobserved characteristics in the gender inequalities in entrepreneurship equations, findings still show a disparity in the performance of female- versus male-owned enterprises (Thebaud 2015; Tinkler et al. 2015). Evidence from experimental data reveals that women are most likely to perform the same as men in an uncompetitive market, but they are less likely to perform like men in a competitive market (Gneezy et al. 2003).

We argue, therefore, that some inherent unobserved distinguishing characteristics between males and females may well impact their performance as entrepreneurs. For instance, women are mostly motivated by push factors rather than pull factors such as a desire for achievement, independence, and self-fulfilment (Moore and Buttner 1997). Some of these motivational factors such as a desire for achievement, independence, and self-fulfilment are unobservable characteristics that could impact the performance of female entrepreneurs in different ways. This suggests that the size of the observed gender gap in performance may be attributable to both observed and unobserved characteristics.

Against these considerations, we provide new evidence from a developing economy context on the gender performance gap in entrepreneurship. To estimate the performance gap in entrepreneurship, we take advantage of the rich information on demographic characteristics and business characteristics in the third wave of the Ghana Socio-Economic Panel Survey (GSPS) to decompose the performance gap into explained and unexplained. Employing data from the Ghanaian context is relevant in the sense that the country has the highest rate of women-owned businesses in the world at rate of 46.4% (Boakye 2019). However, about 80% of these businesses are unable to grow beyond the micro-level of business with reasons like credit constraints and access to technology (UN Africa Renewal 2006) often assigned to this situation. The female characteristic effect on the performance of women-owned businesses in the country has thus not been given attention. Such situation may impede efforts to attain the desired sustainable development goals in the country. We use Oaxaca decomposition to estimate the total performance gap and then classify the gaps into two parts; the explained (observable characteristics) and the unexplained (unobservable characteristics) parts. To achieve the aim of this study, the following research questions are addressed: (RQ1) Do characteristics of women entrepreneurs differ from the characteristics of their male counterparts? (RQ2) What are the characteristics that predict the performance of entrepreneurs? (RQ3) What proportion of the performance gap if any can be explained by observable characteristics? (RQ4a) Does the performance gap differ by location? And, (RQ4b) Does the performance gap differ by marital status?

This study contributes to literature in four (4) ways. First, although there are studies on the differences in performance in male-owned and female-owned enterprises (see, *inter alia*, Gatewood et al. 2003; Brush et al. 2003; Fairlie and Robb 2009; Bardasi et al. 2011; Brixiová and Kangoye 2015; Canning et al. 2012; Thebaud 2015; Ewens and Townsend 2020), the focus of these studies has been to determine the size of the performance gap and the factors that contribute to the gap. This study does not only present the total size of the gap and the factors that contribute to the performance gap, but also presents the proportion of the gap that can be explained by observable characteristics (e.g., age, education, number of employees, age of business, etc.) and the part that is unexplained by observable characteristics. Second, despite the policy relevance of understanding gender inequalities in entrepreneurship, the developing economy context is under-researched on this subject. Several of the studies on this subject concentrate on the developed economy context. We provide empirical evidence from a developing economy context. The study modestly contributes to closing these literature gaps by investigating further the potential factors that drive gender inequalities in entrepreneurship. Third, while previous studies have concentrated on formal businesses in their analysis, we combine both formal and informal businesses in our analysis. This contribution is very important as a significant proportion of the enterprises in developing countries are informal businesses. Finally, the study adds to the literature by discussing the heterogeneity of the performance gap across sub-groups.

From the dataset, the estimated results show that the performance gap between male- and female-owned enterprises is partly due to differences in observable characteristics and partly due to unobserved characteristics. Our results indicate that the overall average gender performance gap is positive and significant. The findings suggest that a little over 50% of the overall gap in sales, sales per worker, profit, and profit per worker is explained by observable characteristics. A further analysis of the gender performance gap by sub-groups reveals a higher gender performance gap among rural entrepreneurs than urban entrepreneurs.

The rest of this study unfolds as follows. Section 2 presents a brief literature review. Section 3 presents the estimation strategy for the study. Section 4 describes the sources of data, defines key variables, and shows some relevant descriptive statistics. Section 5 discusses the empirical results and robustness checks to our estimation, while Sect. 6 provides a conclusion to the paper.

Brief literature review and theoretical framework

The importance of businesses especially small- and medium-sized enterprises (SMEs) has been documented over the years. Their significance comes in the area of job provision, income, a foundation for industrialization, fostering of entrepreneurship, and contribution to the GDP of an economy (Keskin et al. 2010; World Bank 2022). The prominence of SMEs is better appreciated in developing economies where SMEs dominate business activities (World Bank 2022). Consequently, as argued by Twum et al. (2021), promoting the growth and development of SMEs in developing countries is certainly one of the surest ways to

reduce unemployment, increase women empowerment, and get to the path of industrialization.

It is not surprising therefore that studies on the drivers of the performance of SMEs keep growing. Such studies have cut across many regions and continents (Rosli 2013; Ahinful et al. 2021; Ramdan et al. 2022; Lateef and Keikhosrokiani 2022). An emerging issue in the performance of a small business is the role of gender in this regard. Analyzing the gender factor effect on the performance of businesses is crucial for many reasons. Earlier studies have not paid much attention to the differences in gender characteristics that may affect business performance. Also, gender is key to the realization of Sustainable Development Goals, especially goals one and five. In developing countries, many small businesses fold up within the first 5 years; and finally, more women than men in businesses face many obstacles (Abor and Quartey 2010; Tambunan 2019; Hossain 2021).

Several studies have compared the success of female entrepreneurs with their male counterparts (Artz 2017). The findings of many of these studies suggest a relative underperformance of female entrepreneurs to their male counterparts (Artz 2017; Klapper and Parker 2011). In the last few decades, the gender disparities in entrepreneurial performance have, however, received some considerable level of attention from scholars and policymakers alike (Fairlie and Robb 2009; Bardasi et al. 2011; Brixiová and Kangoye 2015). Despite the level of attention given to this subject matter, there still exist gaps in the entrepreneurship literature as to the sources of the gendered disparities in entrepreneurial performance. For instance, relative to women, the performance of men-owned enterprises has been suggested to be higher (Fairlie and Robb 2009; Bardasi et al. 2011; Brixiová and Kangoye 2015). Also, Kiefer et al. (2022) found the mean annual log sales of female-owned firms to be 36.4% lower than the mean annual log sales of male-owned firms. Similarly, Khalife and Chalouhi (2013) found a gender difference of 47% in gross revenue and it is in favour of men. In the case of net returns, some studies have found the overall gender gap in performance of female-owned businesses to be 48.9% lower than their male counterparts in Rwanda (Munyegera and Precious 2018) and 50% for vegetable sellers in India (Delecourt and Ng 2021). Net return per worker for female-owned enterprises is also found to be 38.9% lower than their male counterparts (Munyegera and Precious 2018).

The disparities in entrepreneurial performance have in most cases been attributed to some observed characteristics. For instance, Ewens and Townsend (2020) argue that the inequalities in the performance gap are a result of an observed factor like lack of access to finance. Using data spanning from 1995 to 2011 on all registered businesses in the states of California and Massachusetts, Kacperczyk and Younkin (2019) attribute the male–female entrepreneurial performance gap to observed factors such as start-up orientation and gender investor preferences. While some studies (Gneezy et al. 2022) find the inequalities attributable to discrimination and difference in preference and human capital, some suggest that given the opportunity, men and women are likely to perform equally especially within an uncompetitive environment (Gneezy et al. 2003). Given the foregoing discussions, we argue that in as much as gendered inequalities in entrepreneurial

performance have been established in entrepreneurship literature, such inequalities may be attributable to both observed and unobserved factors.

Following this viewpoint, and the empirical literature reviewed above, we opine that the sources of the gendered inequalities in entrepreneurial performance have not been exhausted in the literature and that our understanding of it is incomplete. This study, therefore, contributes to the scholarly debate on gendered entrepreneurship. It further investigates the gender performance gap in entrepreneurship by utilizing data from a developing economy context, Ghana.

In doing so, the study situates itself within the empowerment approach to women empowerment. Empowerment could be “the mechanisms that individuals, organizations and communities gain to control over life and issues related to them in the economic, social, psychological and political aspect” (Ani et al. 2018). The empowerment approach argues that increasing the self-reliance of women is needed to influence desired changes to be seen at all levels including the policy, legislative, societal, economic, and other levels to their advantage. It therefore regards the need for building organizational skills and self-esteem as an important aspect of the empowerment approach (Muyoyeta 2007). This means that the performance of women-owned businesses could be influenced by some underlying observed and characteristics that when identified can inform policymakers for the right policy formulation toward the empowerment of women.

Estimation strategy

The empirical design can be done by stating the equation

$$P_i = \alpha + \delta F_i + \beta X_i + \varepsilon_i, \quad (1)$$

where P_i is performance outcomes of entrepreneur i which include (1) sales, (2) sales per worker, (3) profit, and (4) profit per worker. F_i is a dummy, indicating that the business owner is a female, X_i is a vector of other control variables that capture individual characteristics and business characteristics, and ε_i is the idiosyncratic error term. Also, α , δ and β are parameters to be estimated. We control for regional fixed effects in Eq. (1).

The above-mentioned outcome variables (P_i) are derived from three sets of information in the dataset. The information relied upon to estimate the outcome variables is sales in a typical month, profit in a typical month, and total workers working in the business enterprise. Sales per worker in a typical month are derived by dividing total sales in a typical month by the total number of workers working in the enterprise. Similarly, profit per worker in a typical month is also estimated by dividing the total profit in a typical month by the total number of workers working in the business enterprise.

The vector of explanatory variables (X_i) capture characteristics of the business owners and business enterprises. Business owner characteristics that are captured in vector X_i include; age, years of education, literacy of the business owner, marital status, location of the business owner (i.e., urban/rural), head of household, religion,

and ethnic group. Business characteristics include; the age of the business, the total number of employees, total numbers of hours worked in a typical day, the total number of days worked in a month, the value of total assets, and a dummy indicating whether the person accessed loan in the past year and a dummy showing whether the business is registered or not registered.

To estimate Eq. (1), the OLS is basically used. However, the challenge in using OLS to estimate Eq. (1) is the possibility of endogenous selection into entrepreneurship. The selection of women into entrepreneurship may differ from men as earlier studies have suggested (Hisrich and Brush 1985; Stokes et al. 1995). These studies have found the selection of women into entrepreneurship to be highly dependent on push factors rather than pull factors. In the case of a different selection process for men and women, then the coefficient δ is likely to be biased if one fails to control for all the variables that influence this endogenous selection. However, pull factors such as a desire for achievement, independence, and self-fulfilment are unobserved variables and, therefore, are difficult to control in the performance equation. Failing to control for all those variables means that δ also captures systematic differences between male and female entrepreneurs. Thus, the coefficient δ cannot be interpreted as a difference in the performance gap between female- and male-owned businesses. To address this situation, experimental or quasi-experiment design can be used. However, an alternative methodology is to use decomposition to separate the overall performance gap into the part that can be explained by observable characteristics and the unexplained part. To achieve this, the study adopts Oaxaca and Blinder's (1973) decomposition techniques; a methodology that can divide the overall performance gap into coefficients and characteristics. The rest of the explanation in this section provides a detailed explanation of the model for the study.

To compute the performance gap, we use the decomposition framework developed by Oaxaca (1973) and Blinder (1973). We follow the approach presented in Fortin (2008), so that the decomposition would not be sensitive to the choice of the reference group. In his approach, the reference structure in Eq. (1) is obtained from a pooled regression for both male and female-owned businesses, so that the male advantage would be equivalent to the female disadvantage for the reference structure in Eq. (1) that would be obtained from the pooled regression. Before we estimate the Oaxaca decomposition, we first estimate Eq. (1) for the performance of male-owned businesses and female-owned businesses which is given as

$$P_{if} = \alpha_f + \beta_f X_{if} + \varepsilon_{if} \quad (2a)$$

$$P_{im} = \alpha_m + \beta_m X_{im} + \varepsilon_{im}, \quad (2b)$$

where the subscripts f and m represent females and males, respectively.

We assume that ε_{if} and ε_{im} have a zero conditional mean, and therefore, the ordinary least square estimates are unbiased. This assumption suggests that the total performance gap can be decomposed into terms based on observables and differences in estimated coefficients. With the assumption that the distribution of the error terms in Eqs. (2a) and (2b) is the same, the decomposition can be performed since the same distribution of the error terms suggests an identical selection bias for both men

and women. Under this assumption, the mean performance gap between males and females can be represented as

$$\overline{\ln P}_m - \overline{\ln P}_f = (\overline{X}'_m - \overline{X}'_f) \hat{\beta}_p + \overline{X}'_m (\hat{\beta}_m - \hat{\beta}_p) + \overline{X}'_f (\hat{\beta}_p - \hat{\beta}_f). \quad (3)$$

The first term on the right-hand side of the equation captures the performance gap based on observable characteristics, and the last term represents the sum of male-owned business advantage and female-owned business disadvantage in the treatment of the characteristics. The second term in Eq. (3) is the unexplained part of the performance gap between male-owned and female-owned businesses. This part captures unobserved characteristics, such as the desire for achievement, independence, and self-fulfilment.

Data and descriptive statistics

Information on business owners and business characteristics is retrieved from the third wave of the Ghana Socioeconomic Panel Survey (GSPS). The survey was conducted in 2017/2018 across all the ten regions in the country. Information on business owners and the characteristics of their businesses was taken from the dataset. In the case of characteristics of business owners, we retrieved information on gender, age, years of schooling, literacy, and a dummy indicating whether the business owner is head of the household, ethnicity, religion, marital status, and urbanity of the community of residence. In the case of business characteristics, we retrieved information on the age of business, the total number of employees working in the enterprise, average hours the business operates in a typical day, number of days the business operates in a typical month, loan accessibility, and a dummy indicating whether the business is registered or not. Table 1 provides descriptive statistics of the demographic characteristics of the business owners and the characteristics of the business enterprises. Columns (1) present characteristics of both the business owner and the characteristics of business for male enterprise. Similarly, column (2) presents characteristics of both the business owner and the characteristics of the business for female enterprises.

The total observations used in the analysis are 1,889, and out of this figure, 734 are men and the remaining are women. The data suggest that there are more female entrepreneurs than male entrepreneurs. This high proportion of female entrepreneurs can be explained by the gender inequality in wage employment whereby more men find themselves in wage employment than self-employment (Boahen and Opoku 2021). Evidence from Table 1 suggests a very small difference in the ages of female entrepreneurs and that of male entrepreneurs. The average age of female entrepreneurs is 45.56 years and that of male entrepreneurs is 46.41 years. The table suggests that female entrepreneurs are less likely to marry than their male counterparts. These differences may partly be due to the difficulty in combining household chores and business operations. In the Ghanaian context, because married women are expected to perform the household chores, businesses of female-owned enterprises are likely to suffer and may eventually collapse and this may explain why

Table 1 Descriptive characteristics

	(1) Men (mean)	(2) Women (mean)
Demographic characteristics		
Age in years (mean)	46.41	45.56
1 if Married	0.74	0.62
1 if head of household	0.96	0.41
Ethnicity(1 if Akan)	0.48	0.53
Religion (1 if Christian)	0.75	0.83
1 if live in urban community	0.43	0.46
Literacy	0.63	0.36
Years of education	8.22	6.73
Business characteristics		
Age of business	11.83	9.14
Number of days worked in a typical month	20.75	20.42
Average hours worked in a typical day	8.23	7.92
Total workers of the enterprise	3.60	2.72
value of total asset of the enterprise	3515.94	438.49
1 if have accessed loan in the past year	0.11	0.10
1 if business is registered	0.29	0.12
Type of business enterprise		
1 if business is classified under food enterprise	0.12	0.21
1 if business is under wholesale and retailing	0.30	0.63
1 if business is under service	0.42	0.12
1 if business deals in general enterprise	0.13	0.03
N	734	1,155

Source: Author's calculations based on the third wave of the Ghana Socioeconomic Panel Survey

women entrepreneurs are less likely to marry. The table reveals that Akan women are more likely to be entrepreneurs than their male counterparts. Similarly, Christian women are more likely to be entrepreneurs than their men. Evidence from the table further reveals that 43% of male entrepreneurs live in urban communities and that of women is slightly higher (i.e., 46%). In general, male entrepreneurs have a better education than their female counterparts. The average years of schooling for men who owned a business enterprise are 8.22 and that of women is 6.73.

On average, male-owned enterprises have been operational for longer years than female-owned enterprises. It can be seen from the table that the average age of male-owned enterprises is 11.83 years and that of females is 9.14 years. Tables 1 stills reveals that businesses owned by men have greater assets than those owned by women and male-owned enterprises have higher employees than female-owned enterprises. On a typical day, businesses owned by men operate slightly longer hours than businesses owned by women. Similarly, businesses owned by women operate fewer days in a month compared to businesses owned by men. Male-owned

Table 2 Descriptive statistics of outcome variables categorize into different sectors

	Food enterprise (1)	Trade (2)	Service (3)	General enterprise (4)	All (5)
Total sales in a typical month					
Male	1460.77	6179.28	1326.85	1424.98	2799.32
Female	869.11	912.21	557.87	1435.97	875.28
Sales per worker (in a typical month)					
Male	375.74	2916.64	419.26	400.58	1160.68
Female	313.65	395.56	210.40	479.14	357.56
Total profit					
Male	818.25	986.16	750.70	725.99	812.65
Female	340.38	298.81	292.66	523.43	313.31
Profit per worker (in a typical month)					
Male	216.66	434.50	225.92	192.43	280.33
Female	118.95	130.41	103.83	166.99	125.46
N	(92)[242]	(225)[735]	(318)[142]	(99)[36]	(734)[1155]

Note: (.)[...] are sample sizes for men and women, respectively

Source: Author's calculations based on the third wave of the Ghana Socioeconomic Panel Survey

enterprises are more likely to be registered compared to female-owned enterprises. In terms of accessing loans in the previous year, the table reveals some slight differences between male-owned businesses and female-owned businesses attempting to secure a loan for the business. Male entrepreneurs prefer to operate businesses that are significantly different from businesses established by female entrepreneurs. For example, whereas 30% (63%) of male (female) enterprises are into wholesale and retailing, 42% (12%) are into services.

Table 2 gives the distribution of performance of female- and male-owned businesses across sectors. We categorize the enterprises into four main sectors, namely; food and beverage, trade, service, and general enterprises. In general, the table suggests that male-owned businesses do better than female-owned businesses. For example, the average sales in a typical month of male-owned businesses are GH¢2799.32¹ and that of female-owned businesses is GH¢875.28. The table shows that male-owned enterprises dominate female-owned enterprises in the other outcome variables, namely; sales per worker in a typical month, profit in a typical month and profit per worker in a typical month. Male-owned enterprises operating in the trade, service, and food and beverage sectors perform better than female-owned businesses operating within the same sector. However, female-owned businesses that operate in the general enterprise do better in sales than male-owned businesses operating in the same sector, but in terms of profit, male-owned businesses in general enterprises still perform better than female-owned businesses. Furthermore,

¹ The Dollar-to-Cedi exchange rate at the time of the survey was \$1 = GH¢4.27, and therefore, average sales in a typical month for men is \$655.58 and that of women is \$204.98.

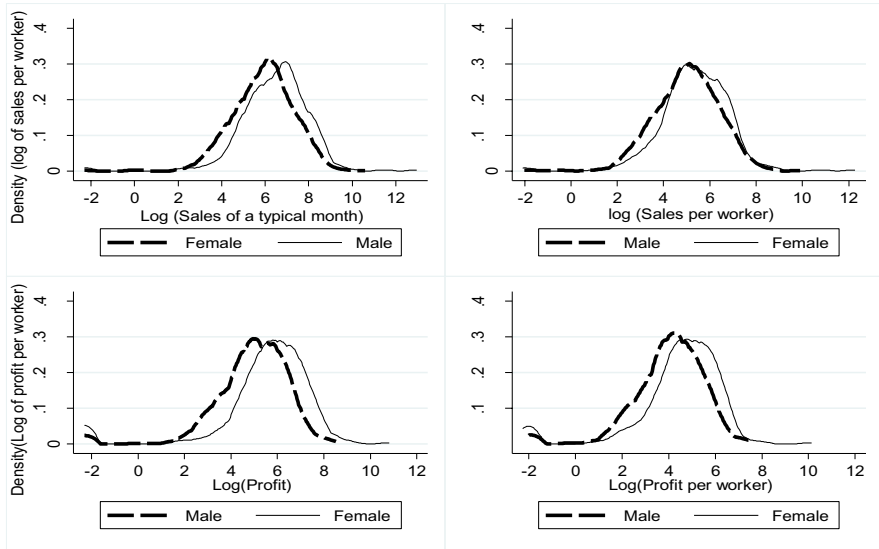


Fig. 1 Distribution of sales and profit by gender. Source: 3rd wave of Ghana Socioeconomic Panel Survey

there is a fewer proportion of males in the food and beverage sector. Traditionally, Ghanaian men see the food and beverage sector as a sector for women and this possibly explains why there are only a few men in the food and beverage sector.

Figure 1 suggests a gender gap between sales of male- and female-owned enterprises. The kernel densities for the two sales variables suggest a sales gap between male- and female-owned enterprises. Similar to sales, a similar trend is observed for profit, but the gender gap regarding profit in a typical month seems to be slightly smaller than sales. A regression model would formally be used to test all these observations.

Results

Presentations and discussion of results

(a) Determinants of performance of business enterprise

To understand the factors that affect the performance of male-owned and female-owned businesses, we estimate Eq. 2(a) and 2(b) in Sect. 2 using OLS estimates. Table 3 presents the results of the determinants of performance of the male-owned business enterprise and Table 4 presents the determinants of performance of the female-owned business enterprise.

Columns (1)–(4) in Tables 3 and 4 show results for the four outcomes used to represent the performance of a business enterprise. From the tables, there is no significant relationship between the performance and the age of the business owner.

Table 3 Factors that determine the performance of male-owned enterprise

Variables	(1)	(2)	(3)	(4)
	Log sales	Log sales per worker	Log profit	Log profit per worker
Age	0.0153 (0.0359)	0.0089 (0.0354)	0.0337 (0.0576)	0.0293 (0.0478)
Age squared	- 0.0003 (0.0003)	- 0.0002 (0.0003)	- 0.0006 (0.0006)	- 0.0005 (0.0005)
Marital status (1 if married)	- 0.0016 (0.2321)	- 0.1097 (0.2272)	0.0436 (0.2569)	- 0.1213 (0.2253)
Household head (1 if head of household)	0.5500** (0.2429)	0.5824** (0.2453)	0.9212 (0.5571)	0.8664* (0.4927)
Ethnic group (1 if Akan)	- 0.1812 (0.1771)	- 0.1409 (0.1599)	0.3508 (0.2482)	0.2814 (0.2061)
Religion (1 if Christian)	- 0.0652 (0.2127)	- 0.1256 (0.2096)	0.0812 (0.3063)	- 0.0351 (0.2729)
Locality (1 if urban)	0.2669* (0.1524)	0.2490* (0.1489)	0.2035 (0.2126)	0.1801 (0.1848)
Literacy (1 if literate)	0.0987 (0.1885)	0.1191 (0.1917)	- 0.4290 (0.2966)	- 0.2816 (0.2673)
Years of education	0.0503*** (0.0172)	0.0488*** (0.0161)	0.0263 (0.0219)	0.0295* (0.0173)
Years of business	0.0199*** (0.0059)	0.0200*** (0.0055)	0.0186* (0.0109)	0.0197** (0.0091)
Days worked in a typical month	0.0204** (0.0100)	0.0186** (0.0093)	0.0091 (0.0138)	0.0089 (0.0117)
Hours worked in a typical day	0.0598*** (0.0222)	0.0606*** (0.0207)	0.0653* (0.0359)	0.0628** (0.0311)
Total workers	0.0734*** (0.0257)	- 0.0837*** (0.0210)	- 0.0312 (0.0819)	- 0.1482** (0.0594)
Value of business asset	0.0000* (0.0000)	0.0000* (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)
Credit (1 if accessed credit)	0.1938 (0.2242)	0.2538 (0.2246)	- 0.1314 (0.3641)	- 0.0585 (0.3041)
Business registration (1 if business is registered)	0.3304 (0.2015)	0.3261 (0.2008)	0.3273 (0.2064)	0.3262* (0.1855)
Business type (1 if trade)	0.3182** (0.1591)	0.2593* (0.1554)	- 0.1217 (0.2288)	- 0.1871 (0.1971)
Business type (1 if food or beverage enterprise)	0.1856 (0.2787)	0.0960 (0.2437)	0.6090** (0.3006)	0.4197 (0.2646)
Business type (1 if general enterprise)	0.2179 (0.2991)	0.1762 (0.2986)	0.3498 (0.4672)	0.2499 (0.4182)
Constant	2.8784*** (0.9043)	2.5833*** (0.8873)	3.1464* (1.7336)	2.6827* (1.3951)
Observations	734	734	734	734
R-squared	0.1868	0.1810	0.1375	0.1694

Table 3 (continued)

Note: Standard errors clustered at the district level in parenthesis. *P* values: * < 0.05; ** < 0.01; *** < 0.001

Service is a reference group of industry type. All the estimations control for regional fixed effects

Source: Third wave of Ghana Socioeconomic Panel Survey

The coefficients of age and age squared are not statistically significant. Similarly, compared to unmarried business owners, there is no difference in the performance of businesses that have their owners married. On the contrary, being a household head has a negative effect on businesses owned by men but there is no such effect on female-owned business enterprises. In the Ghanaian culture, men are more likely to be heads of household with the responsibility of catering for the family. Consequently, those who own a business are expected to ensure the business does well to help in meeting the needs of the family. It is therefore not surprising that there is a significant relationship between household heads and the performance of male-owned businesses. Also, there is some evidence that years of education affect the performance of businesses owned by both men and women. However, the findings from the tables indicate no relationship between literacy and performance.

This finding could be attributed to the nature of questions (basic algebra/arithmetic and reading exercises) for the survey used to measure literacy. Thus, most business owners are more likely to be able to pass the literacy test by reading and solving simple arithmetic, but may not have acquired enough literacy for owning and managing a business hence the insignificant effect of literacy on firm performance. In this light, the finding should be explained with caution. However, combining years of education and the positive coefficient of literacy suggests that the ability to read, write, and do some basic arithmetic contributes to the performance of businesses. Both religion and ethnic group of business owner does not affect the performance of the business, but the location of the business has a strong effect on business performance. The results show that the effect of female-owned businesses located in urban communities is slightly higher than their male counterparts.

In the case of business characteristics, the age of business has a positive correlation with business performance. The effect is seen to be slightly higher for male-owned businesses than female-owned businesses. This result is not surprising as small businesses in Ghana are often managed by the proprietors, and therefore, the long years the business has been in operation, the more experienced the proprietors become in the management of their business. The results further reveal that the longer the hours worked in a typical day, the higher the profit for both male- and female-owned enterprises. The effect is seen to be stronger for the male-owned enterprise. On the contrary, the number of days worked in a typical month does not affect the performance of female-owned businesses, but there is some evidence that male-owned businesses that operate more days in a month have higher sales than their counterparts that operate lesser days in a month. However, in terms of profit, there is no such relationship. There is also a positive relationship between total workers and total sales for both men and women. However, business with more workers has a greater likelihood of having lower sale per worker and profit per worker. These

Table 4 Factors that determine the performance of female-owned enterprise

VARIABLES	(1)	(2)	(3)	(4)
	Log sales	Log sales per worker	Log profit	Log profit per worker
Age	0.0185 (0.0307)	0.0182 (0.0298)	0.0194 (0.0327)	0.0210 (0.0305)
Age squared	- 0.0004 (0.0003)	- 0.0004 (0.0003)	- 0.0004 (0.0003)	- 0.0004 (0.0003)
Married (1 if married)	- 0.0434 (0.1234)	- 0.0439 (0.1208)	- 0.0109 (0.1389)	- 0.0144 (0.1331)
Household head (1 if head of household)	- 0.0143 (0.1453)	- 0.0126 (0.1401)	0.2224 (0.1727)	0.1865 (0.1615)
Ethnic group (1 if Akan)	0.3048** (0.1206)	0.3052** (0.1172)	0.0904 (0.1206)	0.1015 (0.1125)
Religion (1 if Christian)	0.1381 (0.1791)	0.1410 (0.1692)	- 0.0879 (0.1882)	- 0.0699 (0.1728)
Locality (1 if urban)	0.5851*** (0.1430)	0.5718*** (0.1450)	0.6240*** (0.1475)	0.6211*** (0.1389)
Literacy (1 if literacy)	- 0.0269 (0.1185)	- 0.0309 (0.1161)	0.0164 (0.1606)	0.0048 (0.1516)
Years of education	0.0268* (0.0136)	0.0283** (0.0136)	0.0358* (0.0209)	0.0359* (0.0192)
Years of business	0.0178*** (0.0059)	0.0175*** (0.0060)	0.0132** (0.0058)	0.0130** (0.0057)
Days worked in a typical month	0.0108 (0.0083)	0.0101 (0.0079)	- 0.0041 (0.0083)	- 0.0027 (0.0079)
Hours worked in a typical day	0.0388** (0.0187)	0.0406** (0.0180)	0.0465** (0.0216)	0.0473** (0.0199)
Total workers	0.0884** (0.0366)	- 0.1803*** (0.0329)	0.1995*** (0.0373)	- 0.0801** (0.0348)
Value of business asset	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)
Credit (1 if accessed credit)	0.4117** (0.1632)	0.4140** (0.1648)	0.5264*** (0.1609)	0.4981*** (0.1615)
Business registration (1 if business is registered)	0.2500* (0.1324)	0.2500* (0.1310)	0.3383* (0.1895)	0.3168* (0.1812)
Business type (1 if trade)	0.5326*** (0.1216)	0.5057*** (0.1204)	0.0862 (0.1588)	0.0843 (0.1497)
Business type (1 if food or beverage enterprise)	0.7091*** (0.1782)	0.6725*** (0.1793)	0.4393*** (0.1602)	0.4093** (0.1579)
Business type (1 if general enterprise)	0.6929** (0.3029)	0.6578** (0.3019)	0.7061** (0.2956)	0.6485** (0.2927)
Constant	3.7235*** (0.7775)	3.5743*** (0.7570)	3.0364*** (0.8017)	2.8433*** (0.7494)
Observations	1,135	1,135	1,135	1,135
R-squared	0.1841	0.2003	0.1514	0.1369

Table 4 (continued)

Note: Standard errors clustered at the district level in parenthesis. *P* values: * <0.05 ; ** <0.01 ; *** <0.001 . A service is a reference group of industry type. All the estimations control for regional fixed effects

Source: In the third wave of the Ghana Socioeconomic Panel Survey

results show that the average performance of a worker in a business with a smaller workforce is higher than the average performance of employees in a business with a larger workforce. This may be due to inefficient supervision and monitoring that may be associated with a larger workforce. As expected, both business registration and credit accessibility have a positive effect on the performance of female-owned enterprises, but surprisingly, there is no such effect on male-owned enterprises.

The two tables revealed that compared to service, total sales of businesses operating in the trade industry are higher, but in terms of profit, there is no significant difference between the two industries. Interestingly, female-owned enterprises operating in either the food and beverage industry or general enterprise have higher sales and profits than their counterparts in the service industry. However, the total sales and profit of male-owned businesses operating in either the food and beverage industry or general enterprise are not different for male-owned businesses in the service industry.

(b) The performance gap between male-owned versus female-owned enterprise

The results presented in Table 3 and 4 indicate that the factors that contribute to the performance of male-owned enterprises are systematically different from female-owned enterprises. To better understand the total gap in performance between male- and female-owned enterprises, we employ Oaxaca decomposition to estimate the performance gap. Oaxaca decomposition aids us to estimate the proportion of the performance gap that can be explained by differences in observable characteristics and the proportion of the gap that is attributed to unobserved characteristics.

Columns labelled (1)–(4) of Table 5 show the results of all the four outcome variables used to represent performance. The first two rows present the results of the significance test for the overall estimated gap in performance between male- and female-owned enterprises. The subsequent two rows present a significance test of the gap that is explained by observable characteristics and the last two rows present a significance test of the gap that cannot be explained by observable characteristics. Under variables column, rows (1), (3), and (5) show the coefficient of the total gap, explained gap, and an unexplained gap with their respective robust standard errors in parenthesis clustered at the district level. The “Unexplained” row indicates the portion of the gap that is due to differences in coefficient values between male- and female-owned enterprises.

As displayed in Table 5, the regression results reveal a performance gap between male- and female-owned enterprises. The result indicates that male-owned enterprises are more likely to perform better than female-owned enterprises. The gap for all the four outcome variables used to represent the performance of a business

Table 5 Decomposition of gender productivity gap

Variables	(1)	(2)	(3)	(4)
	Log sales	Log sales per worker	Log profit	Log profit per worker
Difference	0.5415*** (0.0596)	0.3454*** (0.0686)	0.6148*** (0.1024)	0.4497*** (0.0826)
Explained	0.3579*** (0.0608)	0.1891*** (0.0583)	0.3778*** (0.1050)	0.2215*** (0.0762)
Unexplained	0.1836** (0.0742)	0.1563** (0.0757)	0.2369** (0.1146)	0.2282** (0.1020)
Observations	1,889	1,889	1,889	1,889

Notes: Bootstrapped standard errors in parentheses below. *P* values: * < 0.05; ** < 0.01; *** < 0.001. The results are expressed in logarithmic scale. To obtain the difference in percentage points: $(\exp(\text{wg})-1) \times 100$ or $(\exp(\text{rg})-1) \times 100$. Where *wg* is the overall gap for each of the four outcome variables and *rg* is for the explained gap. Similarly, the unexplained gap can also be converted into percentage points

Source: Third wave of Ghana Socioeconomic Panel Survey

enterprise is positive and significant at a 1% significance level. Our results indicate that observable characteristics can explain approximately 66.09%² of the total gap in sales. Similarly, 54.75% of the total gap in sales per worker can also be explained by observable. Concerning profit, observable characteristics explain 61.45% and 49.26% of profit and profit per worker, respectively. The overall average in gender gap is highest for profit (84.93 percentage points)³ and lowest for sales per worker (41.26 percentage points). Results in Table 5 suggest that the gender performance gap in entrepreneurship is due to differences in both observables' and non-observables' characteristics.

Thus, policies to improve female endowments such as education, access to credit, location of business, and barriers to entering into a particular industry may reduce the gender performance gap in entrepreneurship. However, such policies alone cannot eradicate the gender performance gap, since a significant proportion of the gap is also due to unobservable characteristics. Therefore, while using policies to bridge the observable characteristics between males and females, there should be policies to address the gap in pull factors such as a desire for achievement, independence, and self-fulfilment which may go a long way to minimize the performance gap that is attributed to differences in unobservable characteristics.

(c) Performance gap decomposition across locality and marital status

The performance gap between male- and female-owned enterprises may not be homogeneous across different sub-groups for several reasons: for instance, the responsibilities of married women may significantly differ from men as childrearing

² The percentage difference for the explained component is obtained by: $\frac{\text{explainedgap}}{\text{Totalgap}} \times 100$.

³ $(\exp(0.499)-1) \times 100$.

Table 6 Gender decomposition of productivity gap by marital status

Variable	(1) Total Learning gap	(2) Welch's t-statistics	(3) Part due to differences in observables	(4) Welch's t-statistics
Log (sales)				
Married	0.57***(0.0896)	0.89	0.52***(0.0898)	0.40
Unmarried	0.42***(0.1484)		0.44***(0.1554)	
Log (sales per worker)				
Married	0.34***(0.0770)	0.03	0.28***(0.0803)	0.54
Unmarried	0.34***(0.1506)		0.38***(0.1506)	
Log (profit)				
Married	0.66***(0.1036)	0.77	0.57***(0.1024)	0.23
Unmarried	0.49***(0.1979)		0.51****(0.1952)	
Log (profit per worker)				
Married	0.45***(0.1123)		0.38***(0.1097)	0.64
Unmarried	0.47***(0.1663)	0.08	0.50***(0.1654)	

Notes: Unmarried include never married, divorced, or widow/widower. Bootstrapped standard errors in parentheses below. *P* values: * < 0.05; ** < 0.01; *** < 0.001. Welch's t-statistics is 5% or 10% significant if $|t| > 1.96$ or $|t| > 1.61$, respectively. The Welch's statistics is highlighted when the significance level is at most 10%

Source: Third wave of Ghana Socioeconomic Panel Survey

and household chores are seen as the primary responsibility of married women in the Ghanaian culture. This means, compared to their male counterparts, female-owned businesses are likely to suffer when the owner enters into marriage. However, such a disadvantage is unlikely to exist for unmarried female proprietors. Thus, one expects the gender performance gap to be higher among married proprietors than unmarried proprietors. More so, the performance gap may differ across locations. Many rural communities in the country have traditions that work against women's productivity, but such traditions are non-existent or minimized in urban Ghana. Thus, the gender performance gap is expected to be larger in rural Ghana than in urban Ghana. Due to the above explanations, our study focus on only these two sub-groups. We employ Welch t-statistics to test the equality of the gender performance gap across these two sub-groups.

Table 6 provides estimates of the gender performance gap across the marital status. Column (1) presents the results of the average total performance gap and column (3) shows the part that is due to differences in unobservable characteristics. Columns (2) and (4) provide Welch's t-statistics which are used to test the equality of the gap between two related sub-groups. The results in column (1) of Table 6 show that the gender performance gap in entrepreneurship is positive and significant for both married and unmarried entrepreneurs. From the table, apart from profit per worker, the gender gap is larger for unmarried entrepreneurs, the rest of the performance indicators show a wider gender gap for married entrepreneurs. For example, while the average gender gap for married entrepreneurs is 0.57, 0.34, and 0.66 log

Table 7 Gender decomposition of productivity gap by locality

Variable	(1) Total learning gap	(2) Welch's t-statistics	(3) Part due to differences in observables	(4) Welch's t-statistics
Log (sales)				
Urban	0.42***(0.0984)	1.81*	0.46***(0.9913)	1.37
Rural	0.66***(0.0826)		0.64***(0.0858)	
Log (sales per worker)				
Urban	0.20**(0.0856)	2.07*	0.24***(0.0891)	1.74*
Rural	0.47***(0.0952)		0.45***(0.0865)	
Log (profit)				
Urban	0.73***(0.1246)	1.16	0.47***(0.1453)	1.18
Rural	0.32*(0.1701)		0.69***(0.1181)	
Log (profit per worker)				
Urban	0.33**(0.1312)	1.40	0.28**(0.1308)	1.44
Rural	0.58***(0.1278)		0.55***(0.1306)	

Notes: Bootstrapped standard errors in parentheses below. *P* values: * < 0.05; ** < 0.01; *** < 0.001. Welch's t-statistics is 5% or 10% significant if $|t| > 1.96$ or $|t| > 1.61$, respectively. The Welch's t-statistics is bolded when the significance level is at most 10%

Source: Third wave of Ghana Socioeconomic Panel Survey

points for total sales, sales per worker, and profit, respectively, the gap is 0.42, 0.34, and 0.49 for unmarried entrepreneurs for the same outcome variables. However, Welch's t-statistic in columns (2) and (4) is not significant.

Table 7 presents the gender performance gap across the location. The results indicate a significant gender gap for the four outcome variables. The table further reveals that the gender performance gap is larger in rural communities than in urban communities. This is not surprising as rural communities may have customary practices that may affect women entrepreneurs. The Welch t-statistics in column (2) indicate that the gender gap in sales is significant across localities, but the gender gap in profit is insignificant across the locality. For example, the overall average gender gap in sales between male- and female-owned enterprise is 0.42 (0.66) for enterprises in urban (rural) and the Welch statistics is 1.81 which is significant at the 10% significance level. The Welch statistics for the part that is due to difference in observables is only significant for sales per worker but insignificant for the rest of the variables. These results point to some evidence of a gender performance gap across locations (i.e., urban vs. rural).

Robustness checks

In this section, we provide several robustness checks on the results regarding the performance gap that are presented in Sect. 5.1 for five considerations, including (i) trimming data so that any outliers in the baseline estimates are removed, (ii) adding

several covariates to the baseline estimates, (iii) limiting the sample to entrepreneurs who spent not less than 8 h a day and 15 days a week managing the business, (iv) regressing on businesses whose owners are responsible in the running of the business, and (v) matching females with similar propensity scores as males based on observable characteristics and then use it to estimate the overall gender performance gap.

First, we assess whether our results presented in Sect. 5.1 is being driven by outliers in the dataset that we used. In doing this, we excluded all the observations forming the first percentile of sales and profits and those observations that are higher than the 99th percentile for the same variables and then re-estimated the baseline model using our new sample. Table 1A presents the results. The overall pattern is consistent with our baseline specification (Table 5) both in point estimates and in the test of significance for the overall gender performance gap.

Second, as a further check of the robustness of our results, we added several covariates to our baseline model. The motive for this robustness check is to test the ignorability assumption that underlines the basic Oaxaca–Blinder decomposition. This assumption is weaker than the traditional OLS mean independence assumption. Ignorability simply means that the distribution of the unobservable conditional on the observables is the same in all models provided that the observables have been fully accounted for in the estimation. Thus, ignorability means that changes in the distribution of observables will not affect changes in the distribution of unobservables. Given data availability and the possibility that those variables may likely contribute to the gender performance gap, we added the following covariates to our baseline model; a dummy indicating that a child with at most 5 years old lives in the household, a dummy indicating that a person with age 70 years and above lives in the household, a dummy showing whether both couples lives in the same household, and dummy for the years of education of the person with the highest level of education in the household. The rationale for adding the first two variables is that an older person and an infant in the household may affect the productivity of women as they may have to spend time taking care of these individuals. However, there is also the possibility that an older person in the household may assist young women in taking care of the infants in the household which would therefore make their presents improve the productivity of women. The last two dummies which are also added to the baseline model are likely to capture some productivity transfers to the entrepreneurs. Entrepreneurs living with their spouses may benefit from suggestions and other help that may improve the performance of the business. Similarly, human capital development theory indicates that education improves once productivity. More so, education has positive externalities, and therefore, entrepreneurs living in households with educated people are likely to be affected by these positive externalities in education which may improve their productivity. The results presented in Table 2A in the appendix are similar to that of the baseline estimates (Table 5). While the total gender performance gap for the baseline estimate in Table 5 is 0.5415 for log sales, it slightly increased to 0.5443 when these additional control variables are added to the baseline model. A similar trend is observed in all the other variables apart from log sales per worker where the performance gap (0.5483) seems to be significantly larger than the baseline estimate (0.3454). The explained and unexplained results in the baseline estimate are similar to that of Table 2A apart from the explained gap for log sales

per worker where the results in Table 2A are larger than the baseline estimate. The result suggests that our baseline model satisfies the ignorability assumption in decomposition analysis.

Third, businesses that operate more hours in a day and more days in a week are most likely to be more effective than those businesses that operate fewer hours and fewer days in a month. However, businesses of women are likely to operate fewer hours than men, since women in Ghana are traditionally seen to take care of the household and this may affect the performance gap. Therefore, we re-estimate our baseline model by restricting the sample to businesses that operate not less than 8 h a day and 15 days a week. In doing this, our sample size was significantly reduced to 919 observations. Our results presented in Table 3A still shows that there is an overall gender performance gap in entrepreneurship. Apart from the explained part of log profit and log profit per worker which is not significant in Table 3A but significant in the baseline estimates, the significance of the rest of the estimates is similar to that of the baseline estimate.

Fourth, in most cases, small-scale enterprises and start-up businesses in which the owner is strongly involved in the day-to-day running of the business are most likely to perform better than those businesses that are managed by an employee. We, therefore, test the gender gap in entrepreneurship by re-estimating our baseline model by limiting the sample size to only businesses in which the owner is responsible for the running of the business. In doing this, the sample size was significantly reduced to 1,028. Table 4A presents the result obtained for limiting the sample to businesses in that the owner is responsible for running the enterprise. The results indicate an overall gender performance gap in favour of men. The overall gender performance gap obtained in Table 4A is slightly higher than the baseline estimate. The significance of the unexplained gap is consistent with the baseline results, and apart from the log profit per worker which is insignificant for the explained gap, the significance of the other variables is consistent with the baseline results (Table 5).

Finally, we estimate the overall gender performance gap using the propensity score matching method (PSM). This method of estimation involves a two-stage procedure. In the first stage, the propensity scores of performance between male and female-owned businesses are estimated using either logit or probit. In the second stage, we match male-owned businesses that have similar propensity scores with female-owned businesses and then estimate the average treatment effect of the treated (ATT). In this way, we can compare the performance of male-owned businesses that have similar observable characteristics with female-owned businesses. Table 5A presents the results of the overall performance gap using four different matching methods. Irrespective of the type of matching procedure adopted, the results in Table 5A are consistent with the finding obtained in the baseline estimates (Table 5).

Conclusion

In this study, we investigated the gender performance gap in entrepreneurship and then demonstrated that the performance gap in male-owned and female-owned enterprises is due to both observable characteristics and unobservable characteristics. Our

results indicate that the overall average gender performance gap is positive and significant. The findings suggest a little over 50% of the overall performance gap to be from observable characteristics. In general, we found differences in observable characteristics as the greatest cause of the gender performance gap in entrepreneurship. However, a significant proportion of the performance gap is due to unobserved characteristics. Further analysis of the gender performance gap by sub-groups reveals a higher gender performance gap among urban entrepreneurs than rural entrepreneurs. Also, the gender performance gap for enterprises owned by married entrepreneurs is found not to be statistically different from enterprises owned by unmarried entrepreneurs.

Our finding is consistent with previous studies that have found sales of female-owned enterprises to lag behind sales of male-owned enterprises (Fairlie and Robb 2009; Bardasi et al. 2011; Khalife and Chalouhi 2013; Brixiová and Kangoye 2015; Munyegera and Precious 2018). Also, it is found that sales of female-own businesses lag behind that of male-owned businesses by 47 percentage points. This finding is similar to evidence by Khalife and Chalouhi (2013) who found that annual sales of female-owned businesses constitute 47% of annual sales of their male counterparts. Our estimate shows that the profit of female-owned businesses constitutes 67 percentage points of male-owned business and this figure is slightly higher than the findings by Munyegera and Precious (2018) and Delecourt and Ng (2021) who found that profit of female-owned enterprises constitutes 51.1% and 50% of their male counterpart, respectively. The gender performance gap in entrepreneurship is dependent on both observable characteristics and unobserved characteristics of the business owner and manager. However, several of the empirical studies ignore the effect of unobservable characteristics on the performance gap and hence overestimate the size of the gender performance gap. This study, by contrast, decomposes the gender performance gap into two parts and showed the relative importance of unobserved characteristics on the total gender performance gap.

Critically, our findings suggest some evidence of the marriage penalty for female-owned entrepreneurs. For example, while the gender gap in sales for married entrepreneurs is 76.83%, it is 52.20% for unmarried entrepreneurs. This finding is consistent with studies that have found the motherhood penalty as one of the major problems that work against female entrepreneurs (Jacobs and Gerson 2004; Correll et al. 2007; Thebaud 2015; Kacperczyk and Younkin 2019). From the decomposition results, it can be inferred that marriage increases women's responsibilities in the house, since household chores and childrearing are seen as women's primary obligations and this affects the performance of women entrepreneurs. Studies that have found motherhood penalty against women assert that the motherhood penalty forces women to sort themselves into businesses that have more flexibility but lower growth potential. In a similar study in Rwanda, Munyegera and Precious (2018) found differential time allocation in managing the enterprise as a cause of the gap in business performance; however, they were unable to explain the cause of this differential gap in time allocation. Our study fills this gap by showing that the source of the differential gap in time allocation is marriage penalty.

Our results have important policy implications. Findings in this study will contribute to Ghana's efforts to achieve two key sustainable development goals. Since a

greater proportion of women than men in Ghana are self-employed and the majority of these self-employed workers are considered to be in vulnerable employment, policies that seek to reduce the performance gap would help Ghana toward achieving SDG 1 (poverty eradication) and SDG 5 (gender equality). Findings suggest that sensitization policies concerning the role of women in the household may help in reducing the gender performance gap in entrepreneurship. Possible ways to reduce the marriage penalty include the promotion and adaptation of technologies into domestic work and the provision of access to social care services like childcare services. This may reduce the time married women spend on domestic work and childcare and this would therefore give them the leverage to spend more time on their businesses. Moreover, policies to improve female endowments such as education, access to credit, location of business, and barriers to entering into a particular industry may reduce the gender performance gap in entrepreneurship. However, such policies alone cannot eradicate the gender performance gap, since a significant proportion of the gap is also due to unobservable characteristics. Therefore, while using policies to bridge the observable characteristics between males and females, there should be policies to address the gap in pull factors such as a desire for achievement, independence and self-fulfilment and this may go a long way to minimizing the performance gap that is attributed to differences in unobservable characteristics. The activities of many of the women centered groups, NGOs, and organizations or other women affirmative groups that seek to imbue in women the need for achievement and actualization can be directed toward this area. The results drive to home the need for policymakers to address some of the entrenched negative cultural practices in rural Ghana that are inimical to females.

Findings from this study open up attractive opportunities for future research. First, while our study provides evidence of the gender performance gap for all business enterprises, it does not shed any light on performance across different sectors. Future research could, therefore, profitably explore the gender gaps in entrepreneurship businesses across sectors as the sector-specific analysis would help to provide solutions to sectors where the gender gaps are severe. Second, future studies may look into gender performance gaps in start-up businesses and the performance gap of mature businesses as the current study lumps all businesses together. Third, it is important to understand the trend of the gender performance gap and see whether the performance gap is reducing, increasing, or constant. Future studies that have long-term longitudinal data may explore this by analysing the trend of the performance gap in Ghana and the factors that contribute to the closing or widening of the gender performance gap. Future studies, for example, may investigate and assess businesses and sectors where female-owned enterprises perform better. Such studies may provide empirical evidence to policymakers on the type of businesses and sectors that women should be encouraged to move-in while addressing the challenges in the other sectors and businesses that they are not doing well.

The study has some limitations. The first limitation is that the dataset we used for our analysis lacks some important variables that prior studies have found to contribute to the inequalities in the performance of male-owned and female-owned enterprises. For example, there is no information on start-up capital, and therefore, we were unable to control for this important variable which is observable. The

researchers are of the view that if such an important variable were controlled in their regression framework, the overall gap and the unexplained gap reported in this study could be different. The second limitation of the study is that the data from the Ghana Socioeconomic Panel Survey (GSPS), including the main outcome variables, used for the study are self-reported. This may cause some potential bias if the errors in reporting sales and profits are not randomly distributed across individual observations or if the errors in reporting sales by female entrepreneurs are systematically different from males. In case of any systematic bias in reporting sales and profit of men and women, then the gender gap estimated in this study may be different from the actual gender gap in the country.

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Data availability The datasets analyzed during the current study are available in the Yale Economic Growth Center, and the web link for the dataset is <https://yale.app.box.com/s/ww9pqfb1lf9bvwhtocs51ixd7v4qpv2s>

Declarations

Ethical approval This article does not contain any studies with human participants performed by any of the authors.

Compliance with ethical standards

Conflict of interest The corresponding author, Emmanuel Adu Boahen, declares that there is no conflict of interest in his contribution to the study.

Paul Adjei Kwakw declares that there is no conflict of interest for his contribution to the study and Justice Boateng Dankwah also declares that there is no conflict of interest for his contribution to the study.

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