

Formalizing the informal sector in Ghana

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Abstract

Informality has persisted in developing countries in spite of government interventions to get informal sector firms to formalize. In this paper, we conducted a randomized experiment to identify three possible interventions that can boost formalization in Ghana: 1) offering logistical support with the business registration process, 2) providing a fee waiver to cover the cost of business registration, and 3) providing information on the benefits of business registration. We find that providing logistical support for business registration increased business registrations rates by 7.2 percentage points but registration fee waivers and information on the benefits of business registration had no impact on formalization. The analysis suggests that the positive impact of the support intervention is driven by businesses owned by males, and businesses with better educated owners. We find no impact of the interventions on profits, exports, and employee growth but a moderate positive effect on asset growth. These findings suggest that greater decentralization of the business registration process by bringing it closer to the location of businesses will increase formalization. Insights from our qualitative study suggest that concerns about being made to pay taxes are a main factor behind the refusal of many businesses to take up the interventions. Tax authorities could pursue unregistered businesses more aggressively to dispel any perceived advantages of remaining an unregistered business.

1. Introduction

Governments in many developing countries have implemented a number of reforms to boost formalization of informal businesses in the last decade (Campos et al, 2023). This has been motivated by a number of reasons. First, when businesses register, they provide relevant information to the state which is useful for understanding the structure of the economy and helps governments better plan and target their interventions when necessary, as was the case during the COVID-19 pandemic in many developing countries. Secondly, formalization enhances government revenue mobilization efforts by broadening the tax base (Besley and Persson, 2013; Everest-Phillips, 2008; World Bank, 2009). Thirdly, formalization boosts economic growth through increased access to credit, skills upgrading, increased employment, improved productivity, increased efficiency through reduced misallocation, higher profits and increasing exports (Ulyssea, 2018).

In many countries, these reforms have not yielded the desired results (Berkel, 2025; Jessen & Kluge, 2021) and informality remains pervasive. In the case of Ghana, the setting of this study, recent data show that the formalization rates have reduced over the last decade (the percentage of formal businesses has decreased from 9.1% in 2014 to 7.7% in 2024 (GSS, 2025), in spite of a number of ongoing reforms to boost business registration. Existing literature identifies three main reasons for the persistence of informality. The first attributes informality to regulatory barriers to constrain informal firms from formalizing (Djankov et al., 2002, De Soto, 1989). The second suggests that informality is the result of rational choice to earn higher profits by avoiding the higher costs associated with complying with taxes and regulations (Levy, 2008). The third sees informality as a temporal survival strategy for low-skill individuals while they seek further opportunities in formal employment (Farrell, 2004).

In recent times, a limited number of randomized experiments have been conducted to understand the constraints to formalization in a number of different contexts. These studies have found that interventions that work in one context may not necessarily work in another. For instance, while Andrade et al. (2014), de Giorgi and Rahman (2013), and de Mel et al. (2012) find that information and reduction/waiver of registration costs do not increase the likelihood of formalization in Sri Lanka, Bangladesh and Brazil respectively, Benhassine et al, (2018) find that support services boost formalization rates in Benin, and Alcázar et al. (2010) and Jaramillo (2009) finds that in Lima, Peru, information and the reimbursement of direct costs lead about one-quarter of those treated to register at the municipal level.

In this paper, we conducted a randomized experiment involving almost 3000 informal Micro Small and Medium Enterprises (MSMEs) to test alternative strategies for boosting formalization in Ghana. One treatment group was offered logistical support with the business registration process but had to pay for the business registration. A second group received a fee waiver to cover the cost of business registration. A third group received education on the benefits of registering their businesses. All groups received information on the business registration process.

Using two rounds of survey data collected from these businesses, we find that providing logistical support for business registration increased formalization rates by 7.2 percentage points. However, providing information on the benefits of business registration and providing registration fee waivers had no impact on the formalization. Our heterogeneity analysis shows that positive impacts are driven by male-owned businesses and businesses that have better educated owners. We find no effect of the interventions on profits, exports, and employee growth, but a moderate positive effect on asset growth.

Our results suggest that in spite of recent reforms to ease the business registration process, transactions cost of registering a business remains a significant barrier to formalization. Business owners who took up the fee waiver and education intervention reported negative experiences from the registration process including lengthy queues, strenuous documentation requirements and the unfavourably high amount of time needed to complete the registration process. Moreover, insights from our qualitative analysis reveal more fundamental issues emanating from the framework for business registration. Like many developing countries, Ghana has taken the route of merging company registration with tax registration (Campos et al., 2023). In our qualitative analysis, recipients of interventions who did not take up the offer mentioned concerns about taxation as a primary reason for not taking up the intervention. This is in spite of the fact that those who took up our interventions and registered had not been contacted by the tax authorities at the time of the follow-up survey. Our findings raise questions about the effectiveness of the “one-stop-shop” approach to business registration and indicates that perhaps decoupling business registration from tax registration will help boost formalization.

Our paper contributes to a growing empirical literature that seeks to understand constraints to business registration in low-income countries. Within this strand of literature, a number of papers have sought to assess the relative importance of the three main motivations for informality. While earlier studies seem to show that tight regulations are a primary reason for informality (Levy 2008), recent studies have found little support as the main obstacle to formalization (Ulysea, 2020). By contrast, an increasing number of studies suggest that informal firms are largely “parasite firms” that rationally choose to remain informal to earn higher profits by not complying with regulatory requirements and tax obligations (Rocha et al., 2018; Ulysea, 2018). Other studies attribute the persistence of informality to the absence of demonstrable benefits among firms that formalize (Bertel 2025).

The paper is more closely related to a growing body of empirical studies employing experimental designs to test alternative interventions for boosting formalization. A number of studies have shown using randomized interventions that providing information and removing fees associated with registration have limited impact on formalization in a number of countries such as Bangladesh (de Giorgi & Rahman, 2013), Brazil (de Andrade et al., 2016), Colombia (Galiani et al., 2017) and Sri Lanka (De Mel et al., 2013). Other studies that document large impacts focus on municipal registration, for instance Alcázar et al. (2010) in Peru on interventions that offer extra benefits for formalizing (Benhassine et al., 2018). This paper is more closely related to Campos et al. (2023), who also offered costless business registration along with assistance to open bank accounts and

tax registration to small businesses in Malawi and found that providing assistance for a costless business registration process was highly successful in boosting registration. One major difference between this study and Campos et al (2023) is the differences in context. While business registration with national/municipal authorities and tax registration are separate processes in Malawi, business registration in Ghana is now tied to tax registration. This changes the relative costs and benefits of formalization for businesses. Another important contribution of the paper is the inclusion of a qualitative study that provides useful insights to explain the quantitative results. Findings from our qualitative study, which show that tax considerations are a major reason for the relatively low take-up of our interventions are consistent with their finding of very low take-up of assistance for tax registration.

The rest of the paper is structured as follows. Section 2 describes the process of registering a business in Ghana. Section 3 presents the study design, data collection methods and analytical framework employed in the paper. Section 4 presents the results showing the impact of the interventions on formalization and related outcomes. Section 5 discusses the results in the context of the findings from the qualitative study. Section 6 concludes the paper.

2. Business Registration in Ghana

Registering a business with the Office of the Registrar of Companies (RoC)¹ is the key for formalizing a business in Ghana. There are five categories into which a business may be registered with the RoC: sole proprietorship, partnership, a company (which may be limited liability, unlimited liability, limited by shares or limited by guarantee), external company or a cooperative. For the purposes of this study, the focus is on sole proprietorship, which is almost exclusively used by the Micro, Small and Medium Enterprises (MSMEs) like those in this study. We also focused on sole proprietorship because it has the lowest/easiest requirement at the point of registration and annual renewal. Sole proprietorships are usually owned or run by single entrepreneur, and the business is not treated as a separate entity from the owner.

There are two distinct steps involved in registering a sole proprietorship business: obtaining a Tax Identification Number (TIN) and registering a business name. The two have been merged and are carried out at the premises of the RoC.

2.1 Obtaining a Tax Identification Number

A TIN is required by any person who is liable to pay tax or withhold tax at source. The process for obtaining the TIN requires registration with the Ghana Revenue Authority (GRA). Ordinarily, both individuals and business entities should have separate TINs. However, in the case of the sole proprietorship, the entrepreneur's TIN is sufficient for the registration of the business. The

¹ This office was previously known as the Registrar General Department

application for the TIN involves filling out a form which is available online². Upon the completion of the form, it has to be submitted to any office of the RoC along with a valid National Identity Card (also called the Ghana Card). Since April 2021, a new law requires that the Ghana Card replace the TIN. Consequently, individuals who already had a Ghana Card needed not register for a TIN but still need to visit the office of the GRA for the switch to be undertaken. The Ghana Card is issued by the National Identification Authority (NIA). However, to ease the process of registering a business, all these processes can now be undertaken at the RoC, and all forms are available online. Registering for the TIN requires no payment and the TIN may be obtained within five business days.

2.2 Registering the Business Name

The process starts with a search for availability of a desired business name. If the desired name is not available, the name must be modified or amended until a name that is not already registered or sufficiently different from an existing registered name is found. The applicant must then obtain and complete the prescribed application form. The form is available at the various offices of the RoC or can be downloaded from the RoC's website. After completion, it is submitted to the Business Names Registration Counter for verification and capturing. The form can also be completed and submitted online. When the form is approved, payment can then be made at an in-house bank at the office or online on the government of Ghana's online portal (ghana.gov.gh). At the time of the study the fee for registering a sole proprietor business was GHS 120 (\$7.70).

2.3 Recent reforms to ease the formalization process

In recent times, there have been a number of ongoing reforms to improve the business registration process. The regulations on the registration of business entities underwent a major revision in 2019 with the passing of the Companies Act 2019, Act 992. The reforms included the simplification of the registration process by allowing completion of several processes online. The RoC has also introduced an expedited service, which allows for completion of all the processes within one day at an additional fee of GHS 400 (\$25.80).

In spite of all these reforms, registering a business still remains challenging for many MSMEs. Besides the registration fee, transactions cost can be potentially high as each of the sixteen regions of Ghana has only one registration point, located in the regional capitals. In addition, the process still takes at least three days and typically requires business owners to spend substantial parts of multiple days going through the process. Furthermore, the completion of the form can be quite technical for relatively less educated entrepreneurs.

² <https://orc.gov.gh/index.php/forms-fees/forms>

In our baseline sample, we observe that majority of the businesses that were formalized had used the services of informal middlemen or agents who charge additional amounts averaging GHS 291 (\$18.77).

3. Data and Study Design

3.1 Obtaining a Sample of Informal Firms

The study targeted Micro, Small and Medium Enterprises (MSMEs) that form the bulk of business enterprises in Ghana. The study was restricted to two locations with the highest concentration of businesses in the Greater Accra region: Madina and Tema Community One. All the census enumeration areas (EAs) from these business hubs were obtained from Ghana Statistical Service (GSS). Secondly, a census of all businesses in these enumeration areas (including household enterprises) was conducted in the two hubs. The census covered businesses with fixed locations (stores, shops, demarcated spaces in market stores), semi-permanent locations (including those who sell at specific pavements by the roadside and in the market spaces who had been at those locations for more than six months) and commercial transport operations who operate within the EAs. Mobile individual businesses that roam in these areas to sell their wares or provide services in these areas were excluded. Commercial banks and other financial institutions located in these areas were also excluded. In addition, all residential spaces located in these EAs were interviewed to identify household enterprises without visibility, as well as invisible businesses that operate online. This methodology for identifying businesses was similar to that employed by the 2024 Ghana Integrated Business Establishment Survey (IBES), a census of all business establishments conducted by the GSS.

The baseline census conducted in April and May 2024 covered 3311 MSMEs. The survey collected information about business operations including the size (in terms of number of employees and total revenues), date of establishment, economic sector of the business, location (GPS), appreciation of the usefulness of registration, whether they have made any attempts to register in the past, why they are currently registered or not, etc. It also collected information about the business owners, including their sex, age, education, experience, as well as their contact details, any applications for government support services, sales and access to financial services.

Appendix Table 1 presents the baseline characteristics of the businesses. In all, 67.8% of the businesses were located in the Madina area, while 32.2% were from Tema Community One. In terms of age 55.7% of the businesses had been in operation for 10 years or more, while just under a quarter (24.2%) had been in operation for less than five (5) years. Three-quarters of all businesses were in retail and wholesale trading, while 10.3% and 14.7% were involved manufacturing/processing and services, respectively. Only eight (8) businesses were medium scale enterprises (30-99 employees) with 12.6% being small (6-29 employees) and 86.9% being Micro enterprises (up to five (5) workers). Most of the businesses (95%) are one-person owned with 5% being jointly owned. Majority of the businesses are owned by female (77%).

In total, 368 out of the 3311 businesses (11%) were registered with the RoC. The most common reason for not being registered with the RoC was that business owners felt that being registered with other entities (local assembly or business association) was enough (27.8%). Other common reasons given for not being registered were lack of knowledge about the requirements (23.2%) or the process (18.9%) or thinking that being registered is not beneficial (18.8%). As expected, there were statistically significant differences in characteristics of formal and informal businesses. Formal firms were more likely have male and better-educated owners, more likely to operate in the services sector, more likely to be small (rather than micro), jointly owned, have employees and paid employees. In addition, formal firms were more likely to have business accounts, have mobile money accounts, receive electronic payments, more likely to export and more profitable.

3.2 Experimental Design

Businesses that were already formalized were excluded from the randomized experiment. The remaining 2943 were first stratified by location (Madina or Tema Community One) and sector (trading, services or manufacturing). The businesses within each stratum were then randomly assigned to one of three treatment groups or a control group as follows: 633 businesses were assigned to receive education on the benefits of business registration with the RoC, 630 businesses were assigned to receive a fee waiver for registration with the RoC, 632 businesses were assigned to receive support with the business registration process, and 1048 were assigned to the control group.

All interventions were delivered personally to each business through a visit by a trained research assistant who visited the premises of the business to explain the intervention by following a prepared script (Appendix 2 contains a copy of scripts). What was common with all interventions was the provision of information on the requirements and procedures for registering a business with the RoC.

3.2.1 The Education intervention

This intervention provided information on the benefits of registering a business with the RoC. For this intervention, trained Research Assistants (RA) made phone calls to assigned businesses to arrange a visit to administer the intervention. Like the other two interventions, the RA starts by introducing himself/herself, making reference to the visit of the team during the baseline data collection, and asking the business owner to confirm the details. After confirming that indeed the business was informal, the RA provided information on the procedure for registering a business, including the required documents. The RA then proceeded to provide information on some of the benefits of being a registered business. These include better access to financial support from financial institutions, increased likelihood of receiving support from non-governmental organizations that provide various forms of support to small businesses, better access to government support programs for businesses, being a requirement for obtaining financial and other

forms of support from government agencies such as the Ghana Enterprises Agency, MASLOC, Ghana Export Promotion Authority etc³, being eligible to obtain contracts from and do business with government institutions, clout and recognition from government and other businesses, are more likely to enter exports markets compared to their unregistered counterparts. The business owner was given the opportunity to ask questions before checking whether the business planned to go ahead to register.

3.2.2 The Fee Waiver Intervention

This intervention waived the registration fees for registering with the RoC for sampled businesses. For this intervention, after identification and explanation of the requirements and procedures for registration to the business, the RA went ahead to inform that business that the project was offering to pay the cost of registration for them as long as they register by December 2024. The deadline was subsequently extended to February 2025. Businesses were told that the intervention was only paying the registration fee but the owner(s) had to go to any office of the RoC to follow the procedure described above. When they get to the point where they are required to make the payment, they notify the RA, and then the project makes the payment on their behalf. An arrangement had been made with the RoC so that when recipients of this intervention were at the offices of the RoC, and their business names had been confirmed, the RA would make the payment for the registration fees on behalf of the business. Businesses under this intervention who did not immediately accept the offer received calls every month to remind them about the offer until the expiration of the validity period.

3.2.3 The Registration Support Intervention

This intervention supported businesses with the processes and procedures for registration. For this intervention, after identification and explanation of the requirements and procedures for registration to the business, the RA informed the business that the project is offering them free assistance in completing the registrations, submitting to the office of the RoC and picking up the certificate on their behalf to deliver it to the business premises when ready. Business owners were told that they had to pay the registration fee of GHC 120 (\$ 7.74). Businesses under this intervention were also given up to December 2024 (subsequently extended to February 2025) to accept the offer. Businesses could accept the offer immediately or at any time within the eligibility period. When the businesses accepted, the RA visited their premises with the required forms to assist them with the completion of the form and obtain the necessary documentation that was subsequently submitted to the office of the RoC. For this intervention also, businesses under this

³For example, during the Covid-19 pandemic, government support for businesses were mainly for registered businesses.

intervention who did not immediately accept the offer received calls every month to remind them about the offer until the expiration of the validity period.

3.2.4 Balance on Baseline Characteristics and Attrition

Table 1 presents the baseline summary statistics for the three treatment groups and the control group. The last column of the table presents an F-test of test of differences in each characteristic across the four groups. The F-test reports the F-statistic from a regression of dummies for each of the treatment groups (the control group is omitted and serves as the reference group) on each characteristic. The table shows that the groups are balanced at the baseline.

In the overall sample, businesses are on average a little over 12 years old. Most businesses are sole proprietorships, and this is typical of Micro, Small, and Medium Scale Enterprises (MSMEs) in Ghana. Majority of the businesses are a small-scale, with more than half of all businesses having no employees and a little over a third being micro enterprises (with 1-5 workers). Many businesses are involved in trading (75 percent), with about 11 percent being involved in manufacturing or processing. The export of business products is not very common in the sample; on average, businesses report exporting approximately 1 percent of their sales. The average monthly profit of businesses is quite low, with about 80 percent of businesses having profits ranging from less than GHS1000 (\$64.52) to between GHS 1000 and GHS 2999 (\$193.48). About 30 percent of businesses have a bank account, and these are mostly registered under the personal name of the business owner, suggesting that the small-scale nature of these businesses leads to the merging of the personal finances of the owner and the finances of the business. While a little under a third of businesses have ever received a loan, about two-thirds of businesses use mobile money as a form of payment. Asset ownership among the sample is a little over 50 percent, and this is concentrated within less expensive assets, such as a mobile phone. About 40 percent of businesses do not own any assets. Credit use is quite common in the sample; about 40 percent of businesses received inputs on credit, while about half made sales on credit. Table 1 also shows that business owners are approximately 45 years old and mostly female, while nearly two-thirds of business owners are married. Education is fairly low amongst business owners, with more than half of the sample educated up to the Junior High or Middle school level.

The endline data collection took place from March to April 2025. At endline, we completed interviews with 69 percent of respondents. While the overall attrition rate appears much higher than similar studies, this was expected given that our study included businesses without permanent locations. Crucially, Table A2 finds no evidence of differential attrition rates across the treatment group. The most common reasons for attrition were “business could not be located” 20%, “business refused to be interviewed” 3%, “Business no longer in existence/folded up” 3% or other reasons 6%.

3.3 Estimation

To estimate the impact of the various interventions on formalization rates, we estimate the following equation at the firm level:

$$Formalized_{i,t=1} = \alpha_0 + \alpha_1 educ_i + \alpha_2 waiver_i + \alpha_3 support_i + X'_{i,t=0} \theta + \varepsilon_{i,t=1}$$

Where $Formalized_{i,t=1}$ is the measure of formalization which is an indicator that the business i was registered with the RoC at the endline, and $educ$, $waiver$, and $support$ are indicator variables for the business i being assigned to the education, fee waiver and support interventions respectively, X is a vector of business and owner characteristics measured at the baseline, $\varepsilon_{i,t=1}$ is the error term and α_1 , α_2 and α_3 are the intent-to-treat effect of the education, fee waiver and support interventions respectively while θ is a vector of parameters to be estimated.

We also estimate the impact of the interventions on business financial performance including profits, sales and access to financial services measured at the end line.

4. Results

4.1 Endline Measurements and Graphical Evidence

I start with an illustration of the main outcome at the end of the intervention. Figure 1 presents the distribution of the main outcome variable (formalization or business registration with the RoC) as observed at endline. Baseline indicator is not displaced because none of the businesses was formalized. From the graph, it can be observed that at the endline, businesses that received the interventions were more likely to be formalized compared to businesses in the control group. Examining the specific treatment arm, the graph shows that formal registration is highest among businesses that received support with registration, followed by those that received a fee waiver to subsidize the financial cost of registration. Businesses that received education about the registration process experienced the lowest fraction of registrations. The formalization rates are statistically significant among the businesses that received the support intervention. The next section formally assesses the impact of the intervention on business registration and other outcomes.

Figure 1 here

Table 1 here

4.3 Results and Discussion

4.2.1 Main Treatment Effects

Table 2 presents results on the effects of the interventions on formalization. Column 1 presents regression results without covariates while Column 2 presents regression results that control for age, size and type of business, gender, education and marital status of business owner, all at baseline. In line with the graphical evidence earlier presented, the results in the table show that businesses that received the interventions were more likely to be formalized at endline compared to their counterparts that received no intervention. From Column 1, it can be observed that formalization is highest among businesses receiving registration support. These businesses are 6.1 percentage points more likely to be formalized, and this is significant at 1 percent. Those receiving a fee waiver to subsidize the cost of registration are 2.8 percentage points more likely to register, while there is no impact observed for the education intervention. The effect sizes increase slightly when controls are added, and formalization is only seen for businesses that received the support intervention. These businesses are 7.2 percentage points more likely to register.

Table 2 here

Next, we present an analysis of the effect of the interventions on the business owners' knowledge about the registration process and the cost of registration. The results in Table 3 show that while none of the specific interventions had any impact on whether businesses knew about the procedure for registering with the Office of the Registrar, we observe a reduction in knowledge about the cost of registration. Businesses that received support to get formalized are 6.4 percentage points less likely to know about the cost of registration.

Table 3 here

Table 4 presents the results of the effects of the interventions on three financial outcomes: increase in average monthly profits between baseline and endline, exports of sales, and loan taking. Columns (2), (4) and (6) present results for regression specifications with controls. Generally, the estimates in the table do not show a significant effect of the interventions on monthly profit increases and sales exports. This might be because the interventions were implemented over a short period, and these outcomes are much more likely to manifest after a longer duration. On the other hand, businesses that received the fee waiver intervention are 5.4 percentage points more likely to report that they have ever taken a loan.

Table 4 here

We also examine whether the interventions had any impact on the growth of a business as measured by the increase in the number of assets owned by a business and the number of employees, between

baseline and endline. The results in Table 5 show a positive and moderately significant effect of the treatment on asset growth. Businesses that received the support intervention are 2.3 percentage points more likely to experience an increase in the number of assets owned by the business at the end of the intervention.

Table 5 here

4.3.2 Heterogeneity Analysis

In this subsection, we report treatment effects by gender and education of the business owner, and the sector of the business for the main outcome of formalization. Tables 6,7, and 8 show results of a specification similar to the one in Column (2) of Table 2, where the different treatment arms are interacted with a set of gender, education, and business sector categories. The results in Table 6 show that male business owners are primarily driving the observed positive effect of the support intervention on formalization. The support intervention significantly increased the likelihood of formalization for male business owners by 16.9 percentage points, relative to the baseline group (males in the control group). The effect on females is also positive but not statistically significant.

Table 6 here

In Table 7, it can be observed that highly educated business owners are most impacted by the interventions. Across all the specific treatment arms, business owners who have been educated up to the tertiary level are more likely to have their businesses formalized at endline. Highly educated business owners who received the education and fee waiver interventions are 15.9 and 19.6 percentage points more likely to register their businesses respectively. Among those who received the support intervention, the impact is larger and is also evident in the other education categories. Business owners educated up to the secondary and tertiary levels are 10 percentage points and 44.3 percentage points, respectively, more likely to formalize their businesses.

Table 7 here

Lastly, we examine whether there are any differential treatment effects based on the sector in which a business operates. For the education and fee waiver interventions, Table 8 shows that businesses operating in the services sector are 5.4 percentage points more likely to be registered, although this effect is moderate. For the support intervention, businesses operating in all sectors are likely to be registered, although the impact is larger for businesses in trading, followed by services.

Table 8 here

The overall results in this section show that providing small and medium-scale enterprises with hands-on registration support has the most impact in increasing formalization among informal firms. The duration of the interventions does not allow for observing effects that are of a longer-term and more strategic nature, such as profits, exports, and employee growth. I, however, found a positive but moderate impact of the support intervention on asset growth. The heterogeneity analysis also shows some differential impacts of these interventions. Male business owners receiving the support intervention are more likely to register their businesses, while no impact is observed for females. Additionally, business owners with higher levels of education are likely to take advantage of the interventions and formalize their businesses. It is interesting to note that although overall impacts were not observed for the education and fee waiver interventions, the heterogeneity analysis showed that highly educated business owners who received those specific treatment interventions were more likely to register their businesses, and these impacts are strong and large in magnitude. Moreover, businesses in the services and trading sectors are more likely to be formalized at endline.

5. Discussion and Insights from Qualitative Study

The findings show that of the three interventions, the support was the most effective at boosting business registration. Even though the support intervention significantly improve formalization rates, the take-up rate is still quite low but consistent with other studies that demonstrate similarly low take-up rates from similar interventions (Benhassine et al., 2018). The education and fee waiver interventions did not have statistically significant impact on business registration. This is consistent with existing literature that shows that providing information or removing direct costs of registration has no impact on formalization of informal firms in a number of low-income countries (Ulyssea, 2020).

Given that the interventions were aligned with the reasons given by businesses at baseline for not registering, the low take-up of the interventions was still surprising. To get a better insight into the reasons for the low take, in-depth interviews (IDIs) were conducted with carefully chosen study participants. A total of 24 individual interviews were held. The participants were drawn from business owners who had received the three interventions as well as participants in the control group. For those in the various treatment groups, two participants who took up the intervention and two participants who did not take up the intervention were included. For the control group, 8 respondents were also included. These IDIs were conducted in May 2026, after completion of the analysis of the quantitative results.

The most commonly cited reason by businesses who did not take up the intervention was fear of taxation. This was mentioned by participants across all three interventions as well as the control group. Below are some specific quotes from some participants:

Many people fear taxation. There is a perception that once your name is in the government system, you will be hunted for taxes. That fear is a big deterrent. [35-year-old male, Education support]

We pay income tax, but not all of us in this market pay income tax. This is because we have our names with the government, and they don't. So, if your name gets to the government, then it means you will have to pay, but if your name is not in the system, then it means you don't pay for anything. Because of that, we don't like to register. As soon as they search for your name on the computer, they will find it. You sell the same product to somebody; they might even be getting a better market than you, but since their name is not in the system, they don't pay. They have things easy while you're making payments all the time. [55-year-old female, Fee waiver]

I was aware of it (the support). But I didn't want to do it (register) because when I need help in my business, I wouldn't get any from you after I had registered my business. I knew registering my business comes with payment of taxes, and I also know that I wouldn't get any help in case of any future disaster like a fire outbreak or something. [40-year-old male, Registration support]

This is largely consistent with findings in the literature that suggest that informality is largely the result of rational economic choice by business owners (Ulyseas, 2020). In spite of this fear, all those who had registered their businesses indicated that the GRA is yet to visit their offices. Many business owners are well-informed about the benefits of registration.

A number of other businesses were also wary of the annual renewal once they register the first time:

If you register now, it means you have to renew it annually, which is why I have not registered. [55-year-old female, Fee waiver]

If we register the business, it means we have to renew it every year. So, there are some people who, when they make these calculations and find that it won't benefit the business or get any profit, then they won't register it. If he/she does the calculations and realizes that the business won't grow in the way they expect it, they won't register. Because as soon as you have registered, you have to renew every year, and this worries us a lot. We don't like to have debts. [51-year-old female, Education support]

Businesses who had registered their businesses without the support intervention had negative experiences with the registration processes. Businesses complained about long queues, distance to the RoC office for the registration and complicated procedures and requirements:

It was stressful because it took a lot of time. When I picked up the forms, I did not get help initially. The security man on duty helped me a bit, but later directed me to someone else. That person took basic details from my Ghana Card, my TIN, and my residential address.

I also had to finalize the name of the business. I suggested “Alice Glory Enterprise,” but naming took a lot of time.” [37-year-old female, Fee Waiver]

As I gave out the documents, he asked whether I had a TIN, but I did not have one. So, I was asked to go to the GRA office to obtain it, but there are no GRA offices around. Unless I look for a GRA office elsewhere. However, he took my Ghana card and entered it into the system to retrieve my TIN before he was able to complete the registration. It means without the TIN, you cannot complete the registration. [A37-year-old female, Fee Waiver]

These challenges reflect in the suggestions for improving the process of business registration. The key suggestions included making the process fully digital so that it requires no visit to the offices of the RoC, continuous public education campaigns by the RoC, decentralizing the registration process by setting up more offices.

To make it better, the processes should be digitalized. As of now, everything is done online. For instance, the Ghana police and nursing forms are all done online. So, the online platforms are useful and would save us time and stress from going to their offices. [25-year-old female, Fee Waiver, Madina]

I think it will be easy if people can do it on their phones. Because some people are educated. I think that will help me not lock my shop the whole time to join a queue. That will also reduce the queue. So, if there is a means to do it on my phone, I think I can do that. And with the step, they can give us education on television or any other platform, I don't need to close my shop. By sitting here, I can do it. So, I needed to join a queue to register. And if I can make payment too with my Mobile Money, I think that will even prevent money from going into the wrong hands. [46-year-old female, Education support]

They should work on their timing. I could have made sales with all the time I wasted there. It will be better if officials came to our homes or workplaces to handle the process. So, if all these are included, it would help to improve the business registration. [37-year-old female, Fee Waiver]

The Registrar General should have more branches to make the process more accessible. They should improve accessibility to people by opening more offices. [35-year-old male, Education support]

Even though the results did not find strong positive impact of formalization, the qualitative interviews revealed that some of the businesses are already enjoying the benefits of the registration.

I think I am enjoying the benefits of the registration. Absolutely. I now have a current account with GT Bank, and all customer payments go through it. The bank has even contacted me about taking a loan. I am already enjoying the benefits. So, it is actually helping. [35-year-old male, Education support]

A friend of my cousin also advised me to register my business because, according to him, the minister of trade can allocate an amount of money to businesses, but I will not get any since my business is not registered. Also, sometimes when you urgently need money and you go to the bank for a loan, they ask whether or not your business has been registered. [65-year-old female, Registration support]

As small businesses, we used to take loans from the banks, so if you have registered your company, it's even easier for them to access a loan for you. So, as I have registered when I send it to the bank that I need the loan, they have the hope that I have registered my business, so they don't fear to give me what I need. [38-year-old female, Fee waiver]

Aside from the loan, I think it gives your business recognition. Because the registration gives your business credibility and official status. [35-year-old male, Education support]

Also, when you are about to travel outside, you are required to register your business. [1-year-old female, Education support]

I also realized that if you want to be a good citizen, you have to register your company. I am also someone who travels a lot, so it would be very embarrassing if I went for a visa interview and I was asked whether or not I had registered a company, and I hadn't done it. As a grown-up woman like me, it would be embarrassing if I didn't register my business. [65-year-old female, Registration support]

When you want to travel out of the country, they need to know that you have a registered company here in Ghana, that you have workers that you work with, and that you will come back when you go. So, I had it in mind to do the registration. [49-year-old male, Registration support]

It helps when travelling, in emergencies (accidents), and in many other situations. It is beneficial. If something happens at the market, like an accident, being registered helps. [43-year-old female, Education support]

6. Conclusions

Like other developing countries, informality remains pervasive in Ghana in spite of several reforms to ease the process of business registration. Understanding the reasons is crucial for designing effective policies to address it.

This paper implemented randomized interventions to identify constraints to formalization among MSMEs in two municipalities in Ghana. It tests three different interventions: fee waivers to cover the cost of registering their businesses with the RoC, educating business owners on the benefits of registering the businesses and providing assistance with the registration process. Our results show that the support intervention increased formalization rate by 7.2 percentage points but the fee

waiver and education interventions had no statistically significant impact on formalization. This suggests that transaction costs associated with the business registration is a significant barrier to formalization and mobile registration within the premises of businesses would have boost business registration in Ghana.

These findings suggest that if the RoC wants to increase the rate of formalization, it should focus more on making the process easily accessible, for example, by sending officers to the premises of businesses to offer to register them at a fee. Although sensitization is a popular policy intervention, our findings suggest that on its own, it may increase formalization to the desired level unless it is combined with making the processes simple and more accessible to the small businesses.

To address concerns about tax implications of formalization, policymakers may need to consider decoupling the tax registration from the business registration. However, this was not tested in this study and additional studies may be required in this direction. In addition, tax authorities should pursue unregistered business owners more aggressively (than registered businesses) to help remove any perceived competitive advantage of unregistered businesses.

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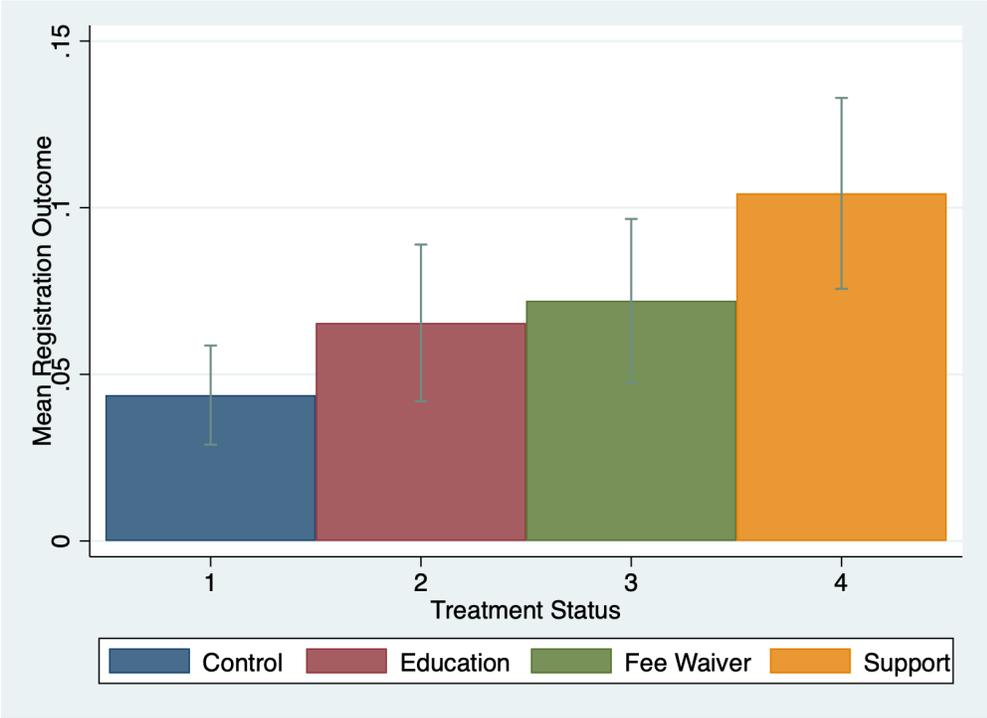
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Figure 1: Distribution of the Fraction of Businesses with Registration



Notes: This figure uses the endline data and plots distributions for both treatment and control groups. The outcome, registration with the Office of the Registrar, is an indicator equal to one if a business reports being registered and zero otherwise. Treatment is an indicator equal to one if a business received the intervention at baseline.

Table 1: Baseline Characteristics and Balance of Covariates (By Treatment Arm)

	Control	Educatio n	Fee Waiver	Support	F-test
Observations	1,048	633	630	632	
Panel A: Business Characteristics					
<i>Location</i>					
Madina	0.63	0.69	0.69	0.69	3.38***
<i>Age of business (years)</i>	12.85	12.64	12.14	12.18	0.93
<i>Sole proprietorship</i>	0.95	0.96	0.97	0.95	1.48
<i>Size of business</i>					
No workers	0.60	0.60	0.63	0.62	0.74
Micro (1-5 workers)	0.35	0.36	0.32	0.32	1.17
Small (6-29 workers)	0.05	0.04	0.05	0.05	0.44
Medium (30+ workers)	0.00	0.00	0.00	0.00	0.64
<i>Sector</i>					
Manufacturing/Processing	0.11	0.11	0.11	0.11	0.04
Service	0.13	0.13	0.13	0.13	0.01
Trading	0.75	0.76	0.76	0.76	0.04
Other	0.00	0.00	0.00	0.00	0.02
<i>Export of sales</i>	0.00	0.01	0.01	0.00	1.57
<i>Average monthly total sales (GHS)</i>	12235.1 6	11774.26	11404.49	11825.0 6	0.31
<i>Average monthly profit (GHS)</i>					
Less than GHS1000	0.41	0.39	0.42	0.39	0.53
GHS 1000 – GHS 2999	0.39	0.39	0.38	0.37	0.14
GHS 3000 – GHS 4999	0.14	0.15	0.15	0.16	0.54
GHS 5000 – GHS 6999	0.04	0.05	0.03	0.05	0.89
GHS 7000 – GHS 8999	0.02	0.02	0.01	0.01	0.51
GHS 9000 – GHS 10999	0.01	0.01	0.00	0.01	0.53
GHS 11000+	0.00	0.00	0.00	0.00	1.64
<i>Business has bank account</i>	0.28	0.31	0.31	0.29	1.16
<i>Name bank account is registered in</i>					
Business name	0.04	0.04	0.04	0.03	0.34
Personal name	0.93	0.93	0.94	0.96	0.47
Family member's name	0.02	0.02	0.03	0.02	0.16
Other	0.01	0.01	0.00	0.00	1.13

Business ever had a loan	0.26	0.30	0.28	0.29	1.37
Business uses mobile money	0.68	0.68	0.69	0.70	0.15
<i>Assets of Business</i>					
Phone	0.54	0.55	0.56	0.57	0.64
Computer	0.01	0.01	0.01	0.01	0.75
Point of Sale (POS) device	0.00	0.00	0.00	0.00	1.22
Vehicle	0.04	0.04	0.04	0.04	0.02
Tricycle/motorbike/other transportation equipment	0.01	0.01	0.01	0.00	0.96
None	0.44	0.42	0.40	0.40	1.16
Other	0.01	0.01	0.02	0.01	2.46*
Business received inputs on credit	0.43	0.39	0.40	0.41	1.17
Business made sales on credit	0.50	0.44	0.46	0.46	1.80
Panel B: Owner Characteristics					
Age (years)	45.59	44.83	45.10	44.23	1.92
Female	0.80	0.80	0.78	0.80	0.21
<i>Marital Status</i>					
Single	0.15	0.19	0.17	0.17	0.21
Married	0.62	0.57	0.60	0.60	1.29
Divorce/separated/widowed	0.21	0.22	0.21	0.20	1.27
Cohabiting	0.02	0.02	0.03	0.02	0.31
<i>Highest level of education</i>					
No formal education	0.15	0.16	0.15	0.14	0.60
Primary	0.12	0.09	0.11	0.10	0.17
Junior High/Middle	0.39	0.41	0.43	0.45	1.54
Secondary	0.26	0.27	0.25	0.25	1.54
Tertiary	0.07	0.07	0.06	0.05	0.18

F test report F-statistic from regressions of each row variable on the treatment groups dummies with control group as reference category. *, ** and *** denote significant at the 1%, 5%, and 10% levels, respectively.

Table 2: Treatment Effects After Intervention – Business Registration

	Registered with RGD (1)	Registered with RGD (2)
<i>Treatment</i>		
Education	0.022 (0.015)	0.015 (0.015)
Fee waiver	0.028* (0.015)	0.019 (0.015)
Support	0.061*** (0.015)	0.072*** (0.015)
Controls	No	Yes
Observations	2,030	1,919

This table presents regressions of the treatment on the dependent variables using the endline data. The specific treatment arm is a dummy variable equal to 1 if the business received the intervention at baseline. For column 2, regressions include controls for the age, size and type of business, age, gender, education and marital status of business owner, all at baseline. Standard errors are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3: Treatment Effects After Intervention – Self Reported Knowledge of Registration Process and Cost

	Process (1)	Process (2)	Cost (3)	Cost (4)
<i>Treatment</i>				
Education	-0.003 (0.013)	0.001 (0.013)	-0.019 (0.015)	-0.015 (0.016)
Fee waiver	-0.012 (0.013)	-0.010 (0.013)	-0.010 (0.015)	-0.005 (0.016)
Support	0.003 (0.013)	-0.002 (0.013)	-0.060*** (0.015)	-0.064*** (0.015)
Controls	No	Yes	No	Yes
Observations	2,030	1,919	1,886	1,783

This table presents regressions of the treatment on the dependent variables using the endline data. The specific treatment arm is a dummy variable equal to 1 if the business received the intervention at baseline. For columns 2 and 4, regressions include controls for the age, size and type of business, age, gender, education and marital status of business owner, all at baseline. Standard errors are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 4: Treatment Effects After Intervention – Profits, Exports and Loans

	Profit Growth (1)	Profit Growth (2)	Exports (3)	Exports (4)	Loan (5)	Loan (6)
<i>Treatment</i>						
Education	0.002 (0.029)	0.008 (0.030)	0.001 (0.009)	0.002 (0.010)	0.005 (0.028)	0.006 (0.029)
Fee waiver	0.002 (0.029)	0.009 (0.030)	-0.011 (0.009)	-0.009 (0.010)	0.048* (0.028)	0.054* (0.029)
Support	-0.014 (0.029)	-0.001 (0.030)	0.001 (0.009)	0.002 (0.010)	0.035 (0.028)	0.038 (0.029)
Controls	No	Yes	No	Yes	No	Yes
Observations	2,030	1,919	1,886	1,783	2,030	1,919

This table presents regressions of the treatment on the dependent variables using the endline data. The outcome “Profit” is an indicator equal to 1 for whether the business experienced an increase in average profits between baseline and endline. The specific treatment arm is a dummy variable equal to 1 if the business received the intervention at baseline. For columns 2,4 and 6, regressions include controls for the age, size and type of business, age, gender, education and marital status of business owner, all at baseline. Standard errors are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 5: Treatment Effects After Intervention – Business Growth

	Asset growth (1)	Asset growth (2)	Employee growth (3)	Employee growth (4)
<i>Treatment</i>				
Education	0.008 (0.014)	0.012 (0.013)	0.020 (0.026)	0.025 (0.027)
Fee waiver	0.010 (0.014)	0.009 (0.013)	0.009 (0.026)	0.013 (0.027)
Support	0.013 (0.014)	0.023* (0.013)	-0.031 (0.026)	-0.014 (0.026)
Controls	No	Yes	No	Yes
Observations	2,030	1,919	2,030	1,919

This table presents regressions of the treatment on the dependent variables using the endline data. The dependent variable is an indicator equal to 1 for whether a business experience an increase in the number of assets or employees between baseline and endline, and zero otherwise. The specific treatment arm is a dummy variable equal to 1 if the business received the intervention at baseline. For columns 2 and 4, regressions include controls for the age, size and type of business, age, gender, education and marital status of business owner, all at baseline. Standard errors are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 6: Heterogenous Treatment Effects After Intervention – Business Registration (By Gender)

	Registered with RGD (1)
<i>Treatment</i>	
Education x Male	-0.001 (0.024)
Education x Female	0.017 (0.032)
Fee waiver x Male	-0.002 (0.024)
Fee waiver x Female	0.036 (0.031)
Support x Male	0.169*** (0.031)
Support x Female	0.030 (0.024)
Controls	Yes
Observations	1,919

This table presents a regression of the treatment on the dependent variables using the endline data. The specific treatment arm is a dummy variable equal to 1 if the business received the intervention at baseline. The regression includes controls for the age, size and type of business, age, gender, education and marital status of business owner, all at baseline. Standard errors are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 7: Heterogeneous Treatment Effects After Intervention – Business Registration (By Education)

	Registered with RGD (1)
<i>Treatment</i>	
Education x None	0.025 (0.038)
Education x Primary	0.010 (0.046)
Education x Junior High/Middle	0.021 (0.029)
Education x Secondary	0.012 (0.033)
Education x Tertiary	0.159*** (0.051)
Fee waiver x None	-0.007 (0.038)
Fee waiver x Primary	0.016 (0.042)
Fee waiver x Junior High/Middle	0.030 (0.030)
Fee waiver x Secondary	0.014 (0.034)
Fee waiver x Tertiary	0.196*** (0.050)
Support x None	0.072* (0.038)
Support x Primary	0.022 (0.043)
Support x Junior High/Middle	0.054* (0.029)
Support x Secondary	0.100*** (0.033)
Support x Tertiary	0.443*** (0.072)
Controls	Yes
Observations	1,919

This table presents a regression of the treatment on the dependent variables using the endline data. The specific treatment arm is a dummy variable equal to 1 if the business received the intervention at baseline. The regression includes controls for the age, size and type of business, age, gender, education and marital status of business owner, all at baseline. Standard errors are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 8: Heterogeneous Treatment Effects After Intervention – Business Registration (By Business Sector)

	Registered with RGD (1)
<i>Treatment</i>	
Education x Manufacturing/Processing	0.036 (0.044)
Education x Trading	0.025 (0.041)
Education x Service	0.054* (0.029)
Fee Waiver x Manufacturing/Processing	0.038 (0.044)
Fee Waiver x Trading	0.040 (0.043)
Fee Waiver x Service	0.054* (0.029)
Support x Manufacturing/Processing	0.079* (0.043)
Support x Trading	0.237*** (0.043)
Support x Service	0.088*** (0.029)
Controls	Yes
Observations	1,919

This table presents a regression of the treatment on the dependent variables using the endline data. The specific treatment arm is a dummy variable equal to 1 if the business received the intervention at baseline. The regression includes controls for the age, size, and type of business, age, gender, education, and marital status of the business owner, all at baseline. Standard errors are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Appendix

Table A1: Differences between formal and informal businesses

	Full sample	Formal	Informal	P-value
OWNER CHARACTERISTICS				
Age group of business owner				0.76
15-24 years	1.90%	1.10%	2.00%	
25-34 years	16.90%	16.00%	17.00%	
35-44 years	29.70%	31.80%	29.40%	
45-54 years	30.30%	29.10%	30.50%	
55-64 years	15.70%	16.00%	15.70%	
65+ years	5.50%	6.00%	5.40%	
Sex				<0.001
Male	23.00%	41.80%	20.70%	
Female	77.00%	58.20%	79.30%	
Marital status				<0.001
Single	16.30%	13.30%	16.70%	
Married	61.80%	76.60%	60.00%	
Divorce/separated/widowed	19.60%	9.00%	20.90%	
Cohabiting	2.00%	0.50%	2.10%	
Refused	0.30%	0.50%	0.30%	
Level of education completed				<0.001
No formal education	13.30%	2.20%	14.70%	
Primary	9.70%	2.40%	10.60%	
JSS/JHS/Middle	38.40%	18.80%	40.80%	
SSS/SHS/ O Level/A level/Technical	27.00%	41.30%	25.20%	
Tertiary	9.30%	32.30%	6.50%	
Refused	2.40%	3.00%	2.30%	
BUSINESS CHARACTERISTICS				
Business age groups				0.2
<5 years	24.20%	25.00%	24.10%	
5-9 years	20.10%	24.20%	19.60%	
10-14 years	18.00%	17.00%	18.10%	
15-19 years	10.40%	8.20%	10.70%	
20+ years	27.30%	25.50%	27.50%	
Nature of business				<0.001
Processing/manufacturing	10.30%	5.60%	10.90%	
Services	14.60%	24.90%	13.40%	
Trade	75.00%	69.50%	75.70%	
Business size				0.02

Micro(<5 workers)	86.90%	82.30%	88.00%	
Small(6-29 workers)	12.60%	17.40%	11.50%	
Medium (>30 workers)	0.50%	0.30%	0.50%	
Nature of ownership				<0.001
One person	94.90%	88.90%	95.70%	
Joint ownership	5.10%	11.10%	4.30%	
Business site				<0.001
Improvised site on public spaces	21.30%	6.00%	23.30%	
Permanent or semi-permanent sites in public spaces	22.20%	32.60%	20.90%	
Improvised or traveling site in a market place	12.30%	1.60%	13.70%	
Site that is part of a permanent market	32.90%	43.80%	31.50%	
At your residence without special installations	3.00%	1.60%	3.20%	
At your residence with special installations	2.10%	3.50%	2.00%	
Commercial site (grocery, hardware, etc)	2.10%	7.60%	1.40%	
Others	4.00%	3.30%	4.10%	
Have employees (now or in the past)				<0.001
Yes	47.70%	81.30%	43.50%	
No	52.30%	18.80%	56.50%	
Wage/salary employees (excluding interns)				<0.001
Yes	31.60%	61.20%	24.70%	
No	68.40%	38.80%	75.30%	
Do you have a business bank account?				<0.001
Yes	33.90%	69.80%	29.40%	
No	66.10%	30.20%	70.60%	
In whose name is the account registered?				<0.001
Business name	15.60%	55.30%	3.80%	
Personal name	82.50%	44.00%	93.90%	
Family member's name	1.80%	0.40%	2.20%	
Other	0.20%	0.40%	0.10%	
Does the business have a mobile money (Momo) account?				<0.001
Yes	71.80%	82.50%	68.60%	
No	28.20%	17.50%	31.40%	
Electronic payment				<0.001
No	66.10%	30.20%	70.60%	

Yes	33.90%	69.80%	29.40%	
Have you ever had a loan?				0.41
Yes	27.90%	26.10%	28.10%	
No	72.10%	73.90%	71.90%	
Source of loan				<0.001
Bank	18.80%	35.40%	16.90%	
savings & loan	48.00%	32.30%	49.80%	
microfinance institution	23.50%	24.00%	23.40%	
Government org	0.40%	1.00%	0.40%	
mobile money	1.30%	1.00%	1.30%	
mobile lender	3.50%	1.00%	3.70%	
family & friends	3.70%	3.10%	3.70%	
Other	0.90%	2.10%	0.70%	
Cellphone				<0.001
No	43.50%	34.50%	44.70%	
Yes	56.50%	65.50%	55.30%	
Computer				<0.001
No	97.40%	85.30%	98.90%	
Yes	2.60%	14.70%	1.10%	
Credit card				<0.001
No	99.80%	98.60%	100.00%	
Yes	0.20%	1.40%	<1%	
Vehicle/tricycle				<0.001
No	94.80%	83.40%	96.30%	
Yes	5.20%	16.60%	3.70%	
Proportion of sales exported				0.005
sales not exported	99.20%	98.00%	99.40%	
a share of sales exported	0.80%	2.00%	0.60%	
How much profit do you make in a month on average?				<0.001
Less than GHS1000	38.20%	22.00%	40.20%	
GHS 1000 - GHS 2999	37.90%	34.80%	38.30%	
GHS 3000 - GHS 4999	15.50%	20.10%	14.90%	
GHS 5000 - GHS 6999	5.20%	12.80%	4.20%	
GHS 7000 - GHS 8999	1.80%	5.40%	1.40%	
GHS 9000 - GHS 10999	1.10%	2.70%	0.90%	
GHS 11000+	0.40%	2.20%	0.20%	
N	3313	368	2943	

Table A2: Attrition at Endline by Treatment Arm

	Total	Control	Education	Difference (p-value)	Fee waiver	Difference (p-value)	Support	Difference (p-value)
<i>Endline Survey Status:</i>								
Completed survey	0.69 (0.46)	0.70 (0.46)	0.68 (0.47)	-0.021 (0.023)	0.68 (0.47)	-0.015 (0.023)	0.70 (0.46)	0.000 (0.023)
Business could not be located	0.19 (0.33)	0.20 (0.35)	0.19 (0.33)	-0.024 (0.017)	0.19 (0.33)	-0.021 (0.017)	0.18 (0.31)	-0.037** (0.017)
Business has folded up or stopped operating	0.03 (0.17)	0.02 (0.14)	0.03 (0.18)	0.011 (0.008)	0.03 (0.17)	0.009 (0.008)	0.03 (0.18)	0.014 (0.009)
Business refused to be interviewed	0.04 (0.18)	0.03 (0.16)	0.04 (0.19)	0.012 (0.009)	0.04 (0.20)	0.017* (0.009)	0.04 (0.20)	0.015* (0.009)
Other	0.06 (0.24)	0.06 (0.24)	0.06 (0.24)	-0.000 (0.012)	0.06 (0.23)	-0.005 (0.012)	0.06 (0.23)	-0.007 (0.012)
Business ID not found at endline	0.06 (0.24)	0.05 (0.21)	0.07 (0.26)	0.023* (0.012)	0.06 (0.24)	0.014 (0.012)	0.06 (0.24)	0.014 (0.012)
N		1048	633		630		632	

Notes: This table uses the endline data and presents the means, standard deviations (in parentheses) and the difference in means between the treatment and control groups. *** p<0.01, ** p<0.05, * p<0.1

Table A3: Participants' information

No.	Location	Type of participant	Age	Sex	Educational level	Business Registration
1	Madina	fee waiver	37	Female	JSS/JHS/Middle	Registered
2	Madina	Education	35	Male	Tertiary	Registered
3	Madina	Control	49	Female	Primary	Not Registered
4	Madina	Education	43	Female	JSS/JHS/Middle	Registered
5	Madina	Education	44	Female	No formal education	Not Registered
6	Madina	fee waiver	53	Female	SSS/SHS/ O Level/A level/Technical	Not Registered
7	Madina	Registration support	42	Female	Primary	Registered
8	Madina	fee waiver	45	Female	SSS/SHS/ O Level/A level/Technical	Not Registered
9	Madina	Education	46	Female	SSS/SHS/ O Level/A level/Technical	Not Registered
10	Madina	fee waiver	35	Female	SSS/SHS/ O Level/A level/Technical	Not Registered
11	Madina	fee waiver	30	Male	No formal education	Registered
12	Tema	Registration support	65	Female	SSS/SHS/ O Level/A level/Technical	Registered
13	Tema	Education	51	Female	JSS/JHS/Middle	Not Registered

14	Tema	Registration support	48	Female	SSS/SHS/ O Level/A level/Technical	Not Registered
15	Tema	fee waiver	38	Female	JSS/JHS/Middle	Registered
16	Tema	Education	49	Male	JSS/JHS/Middle	Not Registered
17	Tema	Registration support	49	Male	JSS/JHS/Middle	Registered
18	Tema	fee waiver	55	Female	SSS/SHS/ O Level/A level/Technical	Not Registered
19	Tema	Education	53	Female	SSS/SHS/ O Level/A level/Technical	Not Registered
20	Tema	Registration support	40	Male	JSS/JHS/Middle	Not Registered
21	Tema	Control	58	Male	JSS/JHS/Middle	Not Registered
22	Madina	Control	47	Female	SSS/SHS/ O Level/A level/Technical	Not Registered
23	Tema	Control	37	Male	Tertiary	Registered
24	Tema	Registration support	59	Male	JSS/JHS/Middle	Registered

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