Women's microbusiness participation decisions and their effect on poverty in the Wolaita zone, southern Ethiopia

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Abstract

Purpose – Microbusinesses are better able to assist many disadvantaged groups in finding employment and breaking the cycle of poverty because they require less initial capital and employ a large number of poor people in developing economies. Women run and own the majority of micro-businesses in urban Ethiopia. This study aims to investigate women's microbusiness participation decisions and the effect on poverty in the Wolaita zone southern Ethiopia.

Design/methodology/approach – A cross-sectional study was carried out using a mixed-methods research approach. A total of 384 women who owned micro-businesses were chosen using a systematic random sampling technique, while 36 women were purposefully chosen for qualitative data analysis.

Data were gathered through survey questionnaires, in-depth interviews and focus group discussions. The collected data were analyzed by using a propensity score matching technique as well as contextual analysis.

Findings – The study discovered that women's participation in registered micro-businesses had a higher and more beneficial impact on their food, non-food and overall consumer spending than women's participation in unregistered microbusinesses, which helped to reduce poverty. Besides, overall women's participation in micro-business increased their decision-making power and enabled them to provide resources for their families food and non-food consumption, with registered micro-business participants reaping the greatest benefits.

Originality/value – This research focused on the effects of women's micro-entrepreneurship on poverty in low-income communities. Rather than providing food, clothing and/or other aid to women in disadvantaged communities, the authors asserted that assisting women and their micro-businesses allows them to be self-sufficient in terms of food and clothing as a long-term solution to poverty reduction. As a result, policymakers can use our findings to gain a better understanding of how women's micro-entrepreneurship affects poverty reduction, allowing them to develop more effective anti-poverty initiatives. This study's findings are novel and add to the body of knowledge in Ethiopia and the sub-Saharan African region.

Keywords Ethiopia, Poverty alleviation, Wolaita, Participation decision, Women-owned micro-business, The effect

Paper type Research paper

Introduction

The world's 736 million extremely impoverished people live on less than $1.90 per day, with sub-Saharan African (SSA) countries accounting for more than half (413 million) of the poorest people (Actor *et al.*, 2021). In 104 developing countries, 22% of the global population, or 1.3 billion people, live in multidimensional poverty, with SSA accounting for more than 80% of the world's multidimensional poor people (Khan *et al.*, 2020; Singh, 2022). Although poverty affects people of all genders, women have far fewer resources to combat it than men (Chen *et al.*, 2006). Worldwide, an estimated 380 million women live in poverty (United Nations, 2022). When women are impoverished, their rights are jeopardized (Szaboova, 2016).

According to economic development literature, Ethiopia has one of the world's highest rates of poverty (Bersisa and Heshmati, 2021). Based on the most recent country Household Income Consumption and Expenditure Survey, over 21 million Ethiopians (23.5%) lived in poverty in 2016, with women-headed family units accounting for 20.4% of rural and 16.3% of urban households (PDC, 2018). Poverty is more prevalent among Ethiopian women, who face unemployment, low income, low economic status and a lack of access to resources that can be used to generate income (Mulugeta, 2021). Poverty alleviation is inextricably linked to micro-entrepreneurship, which is especially important in developing countries where breadwinning is a critical issue (Macpherson *et al.*, 2021; Santos and Neumeyer, 2021).

Micro-business sectors account for more than three-quarters of all businesses worldwide and are regarded as a "true economic engine" (Bruton *et al.*, 2008; Costic, 2013). Recently, micro-business has been gaining a lot of attention from policymakers because of its ability to turn disadvantaged people into breadwinners and lift them from poverty. Several countries in SSA have launched development and poverty reduction programs that emphasize the promotion of micro-business as a crucial tool for alleviating poverty, particularly among the poorest urban residents (Liedholm and Mead, 2013). The contribution of the microenterprise sector to reducing women's poverty is seen as a sound development strategy. In this context, Sustainable Development Goal (SDG) 8(3) of Agenda 2030, to which Ethiopia subscribed, tapped the development of micro-businesses for the economic empowerment of women (Persaud and Dagher, 2021).

Women all over the world have established and run a diverse range of micro-businesses that contribute to their own and their countries' economic prosperity (Ayferam, 2015; Siringi, 2011). There were 557 million women-owned established and new businesses operating globally in 2020–2021, contributing to poverty alleviation efforts (Elam *et al.*, 2021). Women-owned businesses have a $3tn annual economic impact in the USA (Qasim, 2018). Women own and operate a sizable proportion of micro-businesses in many least-developed countries, and their businesses play an essential role in assisting in the improvement of their living conditions (Liedholm and Mead, 2013; Mezgebo *et al.*, 2017). Women own nearly 42.84% of micro-businesses in Indonesia, 77% of informal sector businesses in South Africa and 38% of micro-businesses in Uganda (Nwakanma, 2021; Statistics South Africa, 2017; Tambunan, 2019).

Women's micro-business participation in Ethiopia is regarded as a necessity issue because it arose from their need for relief from poverty and economic hardship (Felzensztein and Gimmon, 2021). According to the NPC (2016), approximately 6.62 million Ethiopian women were employed in micro and small businesses (MSEs) during the first phase of the Growth and Transformation Plan (GTP I: 2010–2015). During this time, they also saved 2.82bn birrs (US$74.422m) and obtained nearly 2bn birrs in credit for a variety of business ventures. However, the effectiveness of the MSE Development policy can be assessed by examining how it affects participants' economic security and attempts to combat poverty. In Ethiopia, more than 60% of women in the MSE segment run micro-businesses (Abagissa, 2013), but their impact on the local economy has not been studied. As a result, the effect of micro-business on poverty in Ethiopia in general, and in the study area in particular, is unknown. As a result, policymakers lack a comprehensive and accurate understanding of women's participation in micro-business and its impact on poverty.

Scholars such as Alene (2020), Dagne (2017) and Mulatu and Prasad (2019) investigated the factors influencing the performance of women-owned businesses in Ethiopia and other countries, but they concentrated on business performance factors rather than the well-being dimension of business women. Other researchers, such as Arul Paramanandam and Packirisamy (2015); Goltz *et al.* (2015); Esayas and Tolossa (2015); Mezgebo *et al.* (2017); Samwel (2014) investigated the critical role of micro and small businesses in generating employment opportunities, but they did not address the issue of women's well-being and poverty by using poverty measures such as food and non-food expenditures. Further studies, including Admasu (2016); Agenssa and Premanandam (2021); Tadesse *et al.* (2021); Araya and Teka (2011), have been conducted to investigate the impact of women's participation in MSEs on household poverty. However, these investigations focused on household poverty rather than individual's poverty within a household, and they failed to account for the diversity and heterogeneity of micro and small businesses.

Furthermore, some of these studies were descriptive, with no evidence of how women's participation in MSEs affected poverty in both empirical and non-empirical contexts (Agenssa and Premanandam, 2021), whereas others are solely qualitative (Admasu, 2016). A mixed method approach used in this study was intended to improve the scientific rigor of the results. Even though MSEs differ in terms of labor and paid-up capital, we observed that the heterogeneity of these firms was overlooked in all of the academic research cited in the preceding section. Our study aims to fill these research gaps by investigating women's microbusiness participation decisions and their effects on poverty in the Wolaiata zone of southern Ethiopia. As a result, this study adds to the body of knowledge on women's micro-entrepreneurship in the context of poverty in the development process, with a focus on developing countries. The article's remaining sections discuss the following topics: a

literature review, methods and materials, results and discussion, policy implications and the study's limitations.

Literature review

This section delves deeper into the relationship between gender, micro-business and poverty in developing economies.

Women's micro-entrepreneurship: a stepping stone for eradicating poverty

Poverty is caused by unemployment, a lack of nutritious food and safe drinking water, adequate housing, medical care and educational opportunities which causes illness and death of millions of people (Amorós and Cristi, 2011). Micro-businesses have been recognized for their ability to generate income, create jobs and alleviate poverty (Engida *et al.*, 2017; Moyi, 2013). Micro-business entails looking for an untapped and financially rewarding opportunity to engage in earning activity to help with financial and other needs (Carton *et al.*, 1998). Micro-businesses involve earning money while also contributing to poverty reduction (Al-Lamki *et al.*, 2016). These micro-businesses can be the foundation for capital formation, job creation, balanced regional development, gross domestic product and per capita income growth, backward and forward linkages, community development and wealth creation (Bruton *et al.*, 2008; Felzensztein and Gimmon, 2021).

Substantial results have been achieved in several countries by using micro-business to assist the poor in raising their standard of living. For example, China has successfully transformed its economy from severely underdeveloped to the world's second-largest by using micro-entrepreneurship as an economic engine (Ding and Li, 2015; Li *et al.*, 2003). Ethiopia's emerging market desperately needs these micro-businesses (Bessie, 2022). Scholars have recently debated how women's participation in micro-business affects income generation and, ultimately, poverty alleviation. Women's participation in micro-business directly contributes to poverty reduction by increasing their income. It may aid women by increasing their earnings, increasing their wealth and allowing them to pay for necessities such as food, clothing, health care and education (Tadesse *et al.*, 2021). Women's ability to generate income and make decisions both within and outside of the family is one of the most highly valued benefits of their participation in the microbusiness sector in developing countries such as Ethiopia (Mezgebo *et al.*, 2017).

Ethiopia's Government has worked hard to improve women's economic circumstances and increase their participation in economic activities such as micro-sized businesses; as a result, women have begun to benefit from their participation in these businesses (NPC, 2016). Poverty and unemployment have become major forces for women in urban Ethiopia, driving them to participate in micro-enterprise. Women's market participation differs from men's in both degree and structure. This is due to the strong bonds that Ethiopian women have with their domestic roles and economic positions (Admasu, 2016; Mulugeta, 2021).

Previous research has found that a variety of economic and demographic factors influence women's decisions to participate in micro business. These include the operator's age (Akehurst *et al.*, 2012; Abagissa, 2013), educational attainment (Esayas and Tolossa, 2015; Liu *et al.*, 2021), spousal support (Mezgebo *et al.*, 2017), credit availability (Geleta, 2016), savings (Abagissa, 2013), other income source availability (Rahman, 2010), the paid employment status of household member (s) (Chaudhry *et al.*, 2019), the number of days and hours women work for their business (Zacharias *et al.*, 2014) and prior entrepreneurial experience (Habte *et al.*, 2017). These factors have a significant impact on women's microbusiness participation, which is strongly linked to poverty reduction in developing countries such as Ethiopia (Appendix 2 provides the definitions for these variables).

Material and methods

This section describes the study area, the research approach and design, the sampling strategy and size, data description and the method of data analysis.

Background of the study area

Wolaita zone is one of 14 zones that comprise Ethiopia's Southern Nations, Nationalities and Peoples Region (SNNPR) which is located 378 kilometers south of Ethiopia's capital, Addis Ababa. According to the Central Statistical Authority, the zone's estimated population is 2,096,492, with 1,034,265 males and 1,062,227 females. The urban population of the Wolaita zone is 516,170 (262,194 males and 253,976 females) and the three study towns, Sodo, Areka and Boditi, have a total household population of 297,569 people (153,192 males and 144,377 females). Approximately 59% of the zonal population is of working age. The urban population is growing at a rate of 4.8% per year and the average size of a household in a town is 4.8 people (WZFEDD, 2018). Figure 1 depicts a map of the area of investigation.

Women account for more than half of the zonal population (50.66%) and a substantial portion of them are economically active, working in different income-generating activities, including micro and small businesses. The study towns are the main hubs for micro-business
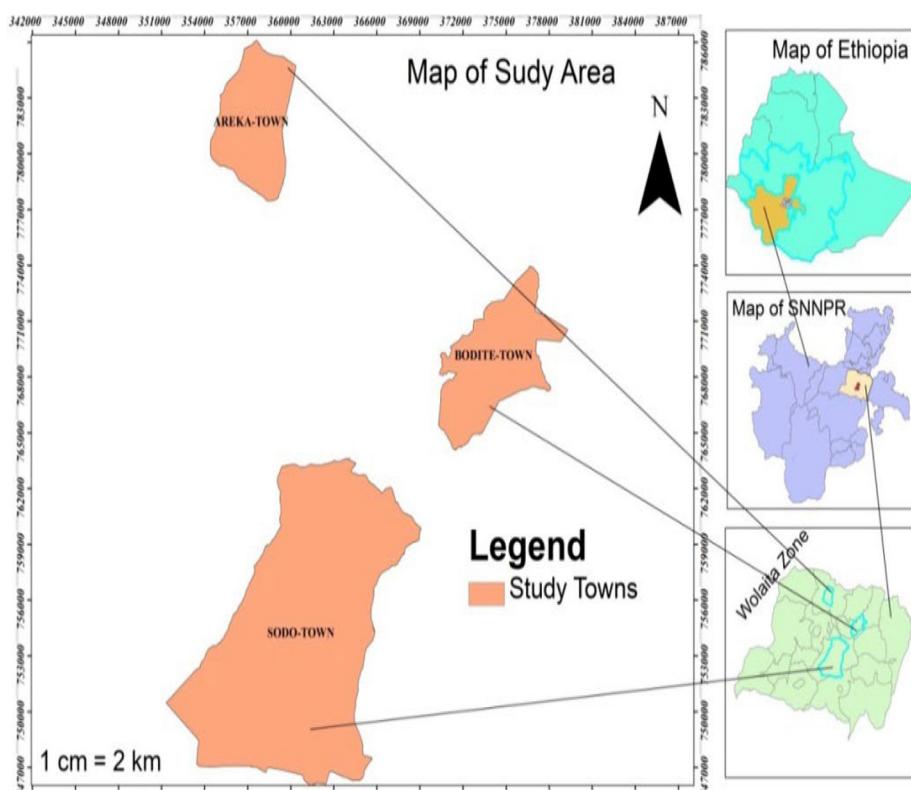

Source: WZFED (2022)

Figure 1.
The research area map

operations. According to WZFEDD (2018), between 2012 and 2016, 4,550 women in Wolaita zone established and operated micro-businesses, with 1,338 (29.41%) working in services, 986 (21.67%) in trade, 943 (20.73%) in construction work, 751 (16.51%) in manufacturing and 532 (11.69%) in urban agriculture.

Research approach
This study used a mixed methods research approach, both quantitative and qualitative data were collected and analyzed. We are in a better position to draw conclusions that will assist policymakers in making well-informed decisions because qualitative evidence demonstrates why women engage in micro-business activities and quantitative data provides concrete evidence for this. This study used a cross-sectional research design.

Sampling technique
Wolaita zone was purposefully chosen because it has the highest number of women-owned micro-businesses in the southern Ethiopia region. Purposive sampling was used to select three administrative towns from the Wolaita zone, namely, Sodo, Areka and Boditi. These towns are micro-business hubs, having a large number of women-owned businesses. Because of the study population's heterogeneity in terms of business sectors such as manufacturing, service and trade, a stratified random sampling technique was used to select women from registered and unregistered manufacturing, trade and service micro-businesses. This stratification ensures that the sample reflects each subgroup more accurately. Two groups of women were identified: those who owned registered and unregistered micro-businesses and they were chosen using a systematic random sample technique based on the formula below:

$$K = \frac{N}{n} \tag{1}$$

Where; k = systematic sampling interval, N = the total number of women who own and manage their micro-business in the study towns and n = sampled women. Women who had been in business for more than two years were chosen for the survey because the longer women have been in business, the more likely they are to have improved their living standards (Gertler *et al.*, 2012). We can make broad generalizations because probability sampling, which is more representative of the larger population and less prone to bias, draws at random from that population.

Sample size determination
Because it is impossible to study the entire population, the authors chose a representative sample size. In reality, available resources always limit the number of study subjects (Lakens, 2022). The cost and time required for data collection were practical considerations for this study when calculating the sample size. For this study, Cochran's sample size determination formula was used, as described by Ahmad and Halim (2017), and the sample size was calculated as follows:

$$n = \frac{Z2pq}{(e)2} = 384 \tag{2}$$

Where n is the sample size and Z^2 is the chosen critical value for the desired confidence level (Z = 1.96 at 0.05). The study population consisted of 4,052 women who owned registered and

unregistered micro-businesses in three different towns, and "p" denotes the estimated proportion of women who owned registered micro-businesses, which was calculated by dividing the sampled women who owned registered micro-businesses by the total population (2107/4052 = 0.52), "q" represents the estimated proportion of women who owned unregistered micro-businesses, which was calculated by subtracting "p" from one, and "e" represents the desired precision level (0.05). As previously stated, a sample size of 384 was calculated, consisting of 200 registered and 184 unregistered micro-business women leaders. This is because some micro enterprises (especially registered businesses) are owned by groups, and the authors sampled the women who managed those micro-enterprises. The sample size was divided by the total study population (384/4,052), and a multiplication factor of 0.095 was used to make the sample proportional to each study town's economic activity, as shown in the sample size distribution Table 1.

Participant selection for in-depth interviews and focus group discussions

Purposive sampling was used to select 36 women (18 interviewees) and 18 additional participants for three focus group discussions (FGDs). These participants were chosen from the three study towns and ran both registered and unregistered micro-businesses in manufacturing, service and trade activities. Three women from registered and three from unregistered micro-businesses in the manufacturing, service and trade business activities participated in interviews and FGDs in each town. Despite the fact that there was a sizable proportion of women-owned micro-businesses in the study towns, the authors deliberately focused on these participants due to their similar backgrounds and the fact that the information required was not very different. As a result, when selecting these participants, it was critical to consider the research topic and objectives, the availability of information and the willingness of participants to engage and provide answers, the nature of the firm, its age and the experience of the operators.

Data collection

A structured questionnaire was designed and pretested on 10% of randomly selected women running micro-businesses in the study towns. The questionnaire was revised after a thorough review of the pre-test results to correct inconsistencies. A large-scale survey was conducted with 384 women who owned registered and unregistered manufacturing, service and trade micro-businesses. The questionnaire asked about frequently consumed foods and non-food items, as well as the respondents' demographics and socioeconomic backgrounds. The authors double-checked the accuracy of their overall field data before beginning data analysis, and 375 sample observations were used for empirical analysis.

| | Manufacturing | | | | Service | | | | Trade | | | |
| | Registered | | Unregistered | | Registered | | Unregistered | | Registered | | Unregistered | |
Towns	P	S	P	S	P	S	P	S	P	S	P	S
Sodo	208	20	218	21	328	31	297	28	668	63	402	38
Boditti	33	3	205	19	224	21	115	11	115	11	213	20
Areka	130	12	194	18	154	15	112	11	247	24	189	18
Total	371	35	617	58	706	67	524	50	1,030	98	804	76

Note: "P" stands for the target population and "S" stands for sample size
Source: Computed from WZFEDD (2018) annual abstract

Table 1.
Sample size distribution for study towns and microbusinesses

The interviews were conducted on the participants' business premises by the authors, who also took notes and recorded the participants with their permission. Each FGD consisted of six micro-entrepreneurs (registered and unregistered manufacturing, service and trade economic activities) and each study town had one focus group discussion session. FGDs were led by the authors and mediated by trained assistants, group discussions were recorded and notes were taken. The authors hired a skilled facilitator to moderate the focus group sessions. Because it was critical to record all notes made during the discussion process, information from the group discussion was documented and the audio from the conversation was recorded (for participant profiles for the in-depth interview, see Appendix 1). Open-ended questions were used to allow participants to respond freely and express their thoughts, opinions and beliefs. Data from focus groups and in-depth interviews were transcribed and arranged into major themes to facilitate further investigation. A contextual analysis was done on these recordings and notes. The audio recordings from our focus groups and interviews were converted to text. We categorized the notes from our interviews and focus groups and identified key themes, such as the motivations for women's participation in micro-businesses and the key benefits they obtained.

Data analysis
Quantitative data were analyzed using descriptive and econometric (propensity score matching) methods, as discussed further below.

Descriptive analysis
The basic characteristics of the respondents were presented using descriptive statistics such as mean and standard deviation, percentages, chi-square and *t*-tests. To analyze quantitative data, Stata software version 12 was employed. Major themes were identified, explored, interpreted and presented using transcribed text from FGDs and interviews.

Econometric analysis
The majority of research on the relationship between women's microbusiness participation and the impact on poverty is observational. Women who participated in a Registered Micro-business (RMB hereafter) are referred to as the treated group, while those who participated in non-registered micro-businesses (URMB hereafter) are referred to as the untreated or control group. RMBs benefit from government business assistance programs such as credit, entrepreneurial training and workplace accessibility, all of which increase the spending of registered women-owned micro-businesses and have a significant effect on women's businesses. When attempting to compare RMBs (treatment group) to URMBs (control group) owned by women, the investigators encountered two selection biases. This is because, to assess the effect of a treatment, such as women's micro-business participation on poverty, a counterfactual scenario about the outcome (poverty proxy variable) of the treated group must be established. In the absence of treatment, the RMB participants' counterfactual outcome indicators would be determined.

The counterfactual indicators would be compared to the outcome variable such as food and nonfood consumption expenditure of registered and unregistered micro-business owners to assess their participation impact on poverty. In this regard, URMB participants' consumption expenditure would be counterfactual for RMB participants and the consumption expenditure of RMB participants would be counterfactual for URMB participants. Because evaluating counterfactuals in observational studies can be challenging, some studies used the control group's consumption expenditure as a counterfactual (Araya and Teka, 2011; Tadesse *et al.*, 2021). This has been proven to result in biased estimates of the treatment's effect. Comparing the level of expenditures in the

treatment and control groups, which are statistically equal, will aid in the removal of selection bias (Khandker *et al.*, 2009).

Rosenbaum and Rubin (1985) recommend the propensity score matching (PSM) approach for addressing selection bias. The PSM technique would reduce selection bias by matching the outcome (expenditure on food and non-food items) of treatment and control respondents with comparable observable characteristics. The PSM is used to correct for the presence of these confounding factors while adjusting for the estimation of micro-business program effects, with the premise that bias is reduced when the comparison is made using comparable treated and untreated respondents. The PSM is chosen from among the non-experimental methods because it does not require baseline data and is considered the best alternative to non-experimental (observational) research in minimizing selection biases.

The propensity score is calculated using a binary model based on observable characteristics. Any discrete choice model, such as the logit or probit, can be used because the propensity score, a conditional probability estimator, yields the same results (Caliendo and Kopeinig, 2008). In estimating the logit model, our dependent variable is women's participation in microbusiness, which takes the value of one (1) if a woman, participated in RMB and zero (0) otherwise. The logit model is used in this study and is defined as:

$$P(X) = P(D = 1/X) = F\big(\beta_1 X_1 \dots + \big(\beta_i X_i = \mathrm{F}(\mathrm{X}\beta) = e^{X\beta} \tag{3}$$

Where F(.) denotes response probability which strictly ranges between zero(0) and one (1) and X represents all observable characteristics (covariates) that influence treatment (participation in micro-business), β is the parameter of interest to be estimated. This model enables us to predict the probability (propensity score) of participation in the micro-business. As a balancing score, the propensity score allows the likelihood of a conditional treatment to yield a distribution of respondents' covariates that makes these variables the same for treated and control groups. Assuming all information relevant to women's micro-business participation and consumption expenditure is observable then, the propensity score produces valid matches which can be used to estimate the effect of women's participation in micro-business on consumption expenditure. This is done by matching the two groups of respondents based on the predicted propensity score:

$$ATET = \mathrm{E}_{p(x)} \left\{ \left\{ E\left(\frac{Y1}{D_i} = 1, P(X)\right\} - E\left(\frac{Y_{i0}}{p(X_i)D_i} = 0, P(X)\right) \right\} \tag{4}$$

Where Ep(x) denotes the expected distribution of propensity scores across all sampled women, where ATET stands for Average Treatment Effect on Treated (women who own RMBs) and D_i denotes the ith women micro-business participation indicator which is equal to one [1] if a woman participated in RMBs and zero 0 if she participated in URMBs. The estimation of ATET depends on the counterfactual level or the outcome variable, i.e. food and non-food expenditure of the two groups: treated and control for (Y1/Di = 1) and (Y1/Di = 0)}, respectively, as explained above.

Women who own URMBs should be paired with those who have the highest propensity score among RMB owners; the purpose is to pair registered and unregistered micro-business participants with similar propensity scores. It is possible to find and use the right approach by using selection criteria to complete the match in the correct order of application. To do so, the three most popular alternative propensity score matching techniques, according to the literature, are nearest neighbor, caliber and kernel matching (Khandker *et al.*, 2009).

These three matching estimators can be used to match the authors' data, and their results will differ. To calculate the average difference in food and non-food expenditures between each matched treated and comparison group, the matching estimator that best meets the conditions must be chosen.

Following this, the common support region (CSR) could be accomplished by comparing the lowest and highest propensity scores for the two groups. The primary requirement of the CSR strategy is to discard any data, typically for both treatment and control groups, with a propensity score that is outside of the CSR. For data falling within the CSR, the mean difference in expenditure on food and non-food items for each matched treated and comparison group is computed. The other critical exercise could be to determine whether the propensity score is properly balanced. The covariate balancing method, which ensures that treated and untreated people have equal means for all covariates; can be used in a variety of ways. The most commonly used techniques are standard bias, the t-test, joint significance and pseudo R^2 (Caliendo and Kopeinig, 2008).

As a result, the study used each of these covariate balancing test procedures to ensure that the means of all scores and covariates were equal. Equation (4) computes the average difference in outcome variables between the treatment and control groups following a PSM balance diagnosis and quality check. The final stage of this study's PSM application could be a sensitivity analysis of outcome variables, which can aid in resolving the problem because it is impossible to determine the extent of selection bias from non-experimental data. Rosenbaum's upper-bounding method is used to investigate the sensitivity of RMB participants' expenditure on food and non-food goods (Rosenbaum, 2002). This could be accomplished by adjusting the Gamma level (represented by the letter I), which is used to quantify how far a treatment deviates from chance In this regard, if our study's results are free of hidden bias, the probability values (p-values) should be lower than the specified confidence interval level, and the likelihood of women starting a microbusiness is solely dependent on selected covariates.

Results and discussions
This section presents the study's findings, specifically the respondents' demographic and socioeconomic backgrounds, the results of the logit model's analysis of the variables influencing women's participation in micro-businesses and the effect of this participation on their poverty level, and the findings of the qualitative component related to women's micro-business participation.

Respondents' characteristics
This section discusses the socioeconomic and demographic characteristics of the respondents. Table 2 shows the mean, standard deviation and percentage distributions of these covariates, as well as their associated test statistics (t-test and chi-square test).

Table 2 shows that young women between the ages of 30 and 29 are involved in both registered and unregistered micro-businesses. Dependents in this investigation are described as economically inactive people (under the age of 15 and over the age of 65 in Ethiopian contexts) and depend on women who own micro-businesses to meet their basic needs (WZFEDD, 2018). This study discovered that women who owned registered and unregistered micro-businesses had less than two economically inactive or dependent family members on average. According to this study findings, women worked for their businesses for an average of 5.2 days per week and approximately nine hours per day.

Women-owned businesses, both registered and unregistered, are in the early stages of growth, according to this survey, with an average age of about five years. On average,

Continuous covariates	Registered ($n = 193$) Mean (S.D.)	Unregistered ($n = 182$) Mean (S.D.)	t-test
Women – owners' age in years	30.44 (8.08)	29.07 (8.78)	1.57
Number of dependents	1.73 (1.52)	1.52 (1.32)	1.41
Days per week worked	5.74 (0.99)	5.01 (1.65)	5.25***
Hours per day worked	9.42 (1.84)	8.62 (2.16)	3.83***
Micro-business age in years	5.14 (2.74)	5.19 (3.39)	0.182
Entrepreneurial experience in years	3.16 (3.66)	3.52 (3.89)	0.94
Discreet covariates	%	%	χ^2–test
Educational attainment			
Illiterate	6.22	36.26	65.15***
Completed 1–8 years	35.23	32.42	
Completed 9–12 years	31.61	23.08	
One to two years of skill training	10.88	1.10	
Diploma	9.84	5.49	
Degree and above	6.22	1.65	
Marital status			
Married	73.06	60.44	7.51*
Unmarried	20.21	31.32	
Divorced	3.63	5.49	
Widowed	3.11	2.75	
Credit usage			
Yes	18.65	7.69	9.74***
No	81.35	92.31	
A member of the family who works for pay or compensation			
Yes	27.98	16.48	7.12***
No	72.02	83.52	
Saving			
Yes	64.29	59.07	1.07
No	35.71	40.93	
Income received by women from other sources			
Yes	29.53	21.98	2.79*
No	70.47	78.02	

Notes: S.D. = Standard deviations, n = sample size, ***, ** and * are levels of significance at 1, 5 and 10%
Source: Survey data (2021)

Table 2.
Demographic and
socio-economic
characteristics of
respondents by
business type

women who owned micro-businesses have almost three years of entrepreneurial experience in both registered and unregistered categories. Our survey found that 73.16% of registered women and 91.76% of non-registered women who ran micro-businesses had less than 12 years of formal education. RMB operators had higher levels of education than URMB owners. In terms of marital status, 73% and 60%, respectively, of women in both the registered and unregistered groups were married, and 20% and 31%, respectively, were unmarried. According to our survey, women who owned registered and unregistered micro-businesses had divorce rates of 3.63% and 5.49%, and widowed rates of 3.11% and 2.75%, respectively.

According to this findings, more than 80% of the women surveyed had never used credit. Credit was used by 18.65% of registered and 7.65% of unregistered women microbusiness owners, respectively. In some instances, groups of women in the study area meet and raise money for one another to meet their credit demands; they use this money as an important source of finance to launch and expand their micro-businesses, also known as "Iquib" in the

local language. More than 70% of the women in our study had no waged or salaried household members. Women who owned RMBs, on the other hand, were more likely to live with income-earning household members, which may have had a positive impact on their food and non-food expenditure.

The majority (64.29% and 59.07%) of registered and unregistered micro-business owners saved money. Women who owned RMBs had better savings habits, which may have a positive effect on their expenditure. According to our survey, only a small percentage (29.53% and 21.98%) of women who owned registered and unregistered microbusinesses received money from other sources. This demonstrates that women's current micro-businesses in the study area account for the vast majority (more than 70%) of their consumer expenditure.

Determinants of women's microbusiness participation

Table 3 displays the logit model results, with the estimated coefficients, and odds ratios.

The odds ratios in this study indicate the direction of the relationship between the study's demographic and socioeconomic factors and women's microbusiness participation, with a negative relationship indicated by less than one and a positive relationship indicated by greater than one. The overall model is statistically significant with a p-value of 0.000. The logit model revealed that 8 of the 12 factors influencing women's microbusiness participation, such as age, days per week worked, dependents, entrepreneurial experience, credit utilization, family members who work for pay or compensation, income received by women from other sources, years of schooling and uptake of short-term trainings were

Lists of covariates	Coefficients	Std. Err.	Odds ratio
Woman's age	0.05***	0.02	1.05
Age of women-owned micro-business	−0.02	0.05	0.98
Days per week worked	0.45***	0.11	1.56
Hours per day worked	0.29***	0.07	0.75
Number of dependents	0.19**	0.10	1.21
Entrepreneurial experience	0.02	0.03	1.02
Credit utilization	0.76*	0.42	2.15
Member of the family who works for pay or compensation	0.73**	0.34	2.07
Savings	−0.94***	0.30	0.39
Income received by women from other sources	0.17	0.32	1.18
Educational attainment: Degree and above was used as a base category for regression			
Illiterate	−4.40***	0.89	0.01
Completed 1–8 years	−1.69**	0.77	0.18
Completed 9–12 years	−1.14	0.77	0.32
One to two years of skill training	0.77	1.07	2.17
Diploma	−0.56	0.87	0.57
Marital status: Widowed was served as a base category			
Married	−0.59	0.80	0.55
Unmarried	−1.66**	0.85	0.19
Divorced	−1.51	1.02	0.22
Constant	1.30	1.60	3.69
N = 375, Log likelihood = −177.42, LR chi2 (18) = 164.70, p = 0.000, Pseudo R^2 = 0.3170			

Table 3.
Logit regression results of women's participation in micro businesses

Note: ***, ** and * indicate the levels of significance at 1, 5, and 10%, respectively
Source: Survey data (2021)

among other factors having a significant and positive influence on women's likelihood to engage in RMBs.

The model results show that as women get older, their likelihood of engaging in RMB increases. As the number of days they work for the business grows, so does their likelihood of being involved in RMB. The likelihood of women engaging in RMB also increases as their number of dependents grows. When there is credit access, women are more likely to engage in RMB. Living with employed family members increases a woman's chances of engaging in RMB. Women are more likely to engage in registered business when they have some business skills training.

Matching strategy used
Table 4 shows the results of a search for the best matching algorithm on the research data set. The best algorithm had a low pseudo R^2, a large matched sample size, a low mean standardized bias and a small number of statistically insignificant factors.

As shown in Table 4, after kernel matching (bandwidth 0.25), the mean values of both groups are nearly identical, and all covariates have statistically insignificant p-values (less than 0.05) and small t-statistics, indicating that no significant differences exist between the treatment and control groups. Thus, a kernel-based matching estimator with a bandwidth of 0.25 is the best match that meets all four criteria.

Confirmation of common support condition
Figure 2 shows the density distributions of the projected propensity scores for the two groups as well as the proportion of respondents who owned RMBs and those who did not.

The distribution of women's propensity scores in the treated and untreated groups overlaps significantly. The minima–maxima comparisons were performed under the assumption of CSR. The CSR was estimated to be between 0.01 and 0.91. This means that observations with estimated propensity scores lower or higher than these CSRs were excluded. The requirement for common support has been met, and a total of 164 women who owned RMBs were compatible with 182 women who owned URMBs.

Matching estimators	Matched sample size	Pseudo R^2	Mean bias	No. of Insignificant covariates
Nearest neighbor matching (NNM)				
NN(1)	345	0.059	13.5	09
NN(2)	345	0.030	11.1	10
NN(3)	345	0.031	10.6	09
Caliper matching				
Radius 0.01	325	0.045	10.7	08
Radius 0.05,0.1 and 0.5	345	0.059	13.5	09
Kernel matching				
Bandwidth (0.01)	325	0.029	10.5	11
Bandwidth (0.05)	345	0.016	8.2	11
Bandwidth (0.1)	345	0.010	6.6	12
Bandwidth (0.25)	*345*	*0.013*	*5.6*	*12*
Bandwidth (0.5)	345	0.053	9.0	11
Source: Survey data (2021)				

Table 4.
PSM matching
methods and their
performance on
given indicators
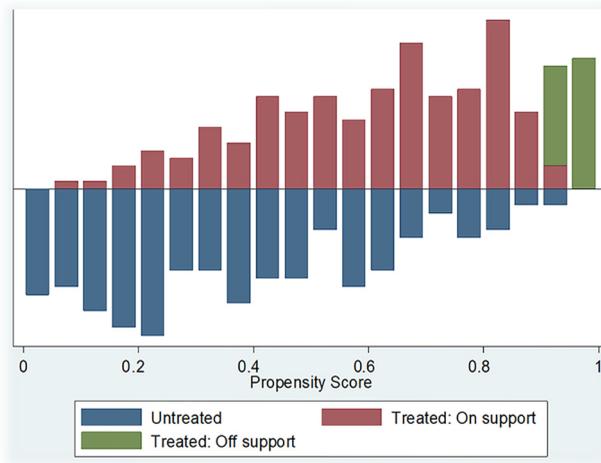
Figure 2.
Density distribution
of propensity scores
using kernel-based
matching

Source: Presented based on survey data (2021)

Assessment of matching quality

The matching quality is assessed using after matching pseudo R^2, Log-likelihood ratios, mean standardized bias and statistical significance.

As evident in Table 5, before matching, the pseudo R^2, log-likelihood ratio and average SB all had extremely high values. After matching, it was determined that the P-value was extremely low. This implies that the study's variables performed well in the propensity-matching exercise.

Impact of women's participation in micro-business on poverty

As previously stated, the effect of women's micro-business participation on their annual food, non-food and overall consumption expenditure was examined against matched similar samples in both the registered and unregistered micro-businesses that are owned by women.

Food spending was examined as one indicator of consumption improvement to determine whether the consumption status of businesswomen had improved as a result of microbusiness participation because ensuring food security is one of Ethiopia's top policy priorities and a major issue in the research region. Table 6 shows that the annual food expenditure for women who ran both registered and unregistered micro-businesses was 7,838.9 birr and 5418.9 birr after matching. The difference in annual food expenditure between the two groups, which favored RMB owners over control groups, was 2420.00 birr. This suggests that women who run RMBs spend more money on food than those who do

Matching	Pseudo R^2	Log-likelihood	P-values	Mean bias (SB)	SB (reduction in %)
Before	0.249	129.51	0.000	26.3	
After	0.013	6.01	0.916	5.6	152

Source: Survey data (2021)

Table 5.
Comparison of before
and after matching
quality tests results

not, indicating that engaging in RMBs helps women earn money while also increasing food expenditures. Furthermore, as food consumption rises, participants in RMBs are less likely to be poor. Poverty decreases as food spending increases. Women may have paid more for food because they were able to earn more money for their consumption.

Again as indicated in Table 7, non-food expenditures for women who owned registered and unregistered micro businesses were 4,741.0 birr and 1,306.1 birr after propensity scores matchings. Non-food expenditure for women who owned RMBs was thus 27.26% higher after the matching. Women who work in RMBs are less likely to become impoverished. This means that women who own RMBs spend more money on non-food commodities than women who own URMBs, implying that operating in RMBs is a better way to increase non-food expenditure.

Furthermore, both registered and unregistered micro-business women spent a total of 12,579.9 birr and 8,853.8 birr on all food and non-food expenditures after the propensity scores have been matched. The average spending differed by 29.45% between the two groups. Overall annual expenditure for women who owned RMBs was thus 3,726.9 birr higher during the survey period as a result of their participation in RMBs. This demonstrates women's participation in micro-business has a significant effect on consumption expenditure and, as a result, poverty. Furthermore, in terms of poverty reduction, women benefit more from participating in RMBs than URMBs.

Results of sensitivity analysis
Table 7 shows the results of a sensitivity analysis of food, non-food and overall spending by women operating RMBs.

Outcome variable	Sample	Registered	Unregistered	Difference	S.E.	t-stat
Food expenditure	Unmatched	7838.9	5424.7	2414.1	219.7	10.99
	ATT	7838.9	5418.9	2420.0	244.9	9.88
Nonfood expenditure	Unmatched	4741.0	3463.6	1277.4	149.1	8.57
	ATT	4741.0	3434.9	1306.1	171.1	7.63
Overall expenditure	Unmatched	12579.9	8888.4	3691.5	324.9	11.36
	ATT	12579.9	8853.8	3726.1	363.9	10.24

Source: Calculated from survey data (2021)

Table 6.
Estimated effect of women's participation in micro-business on annual food and non-food spending

Gamma (I)	Food expense Sig+	Non-food expense Sig+	Overall expense Sig+
1	0.000	0.000	0.000
1.5	1.4e-11	3.0e-11	9.0e-13
2	4.3e-08	8.2e-08	4.2e-07
2.5	4.9e-06	8.7e-06	6.4e-07
3	0.000109	0.000179	0.000017
3.5	0.000932	0.001452	0.000177

Notes: Gamma represents log odds of differential assignment due to unobserved factors. Sig + denotes the upper bound critical level
Source: Calculated from survey data (2021)

Table 7.
Sensitivity analysis with Rosenbaum's bounds on probability values on food and non-food expenditure ($N = 164$)

In Table 7, in the base scenario, gamma (I) = 1, indicating that there is no unobserved bias among the outcome variables subject to sensitivity analysis. Hidden bias influenced the estimated treatment effect on food, non-food and total expenses at lower gamma levels. The p-values of our outcome variables (food, non-food and total expenditure in birrs) varied with the gamma level, and the estimates occasionally revealed evidence of hidden bias. Our p-values surpass the threshold at gamma levels ranging from 1.5 to 2.5 at 0.5 intervals. Our p-values are less than the 5% confidence interval threshold at later gamma levels of 3–3.5, indicating that our outcome variables are free of hidden bias at these levels.

Results of interviews and focus group discussions

As discussed in the methods and material sections, in this study, 18 women micro-business owners participated in interviews and another 18 in FGDs. The results are presented and discussed below. The audio recordings from our focus groups and interviews were transcribed and grouped according to the key topics that emerged such as the reasons why women participated in MBs and the main advantages they attained.

Many of the women stated that their family members' well-being had improved. For example, a woman who participated in a fast foods preparation and selling business in Sodo town said:

> I've spent the last five years working in a micro-business that has to prepare and sell fast foods. I was a migrant in Beirut before getting involved, and after more suffering, I returned to Ethiopia and started this business. There are numerous advantages to being involved in the business. Aside from increasing my income, interacting with people has allowed me to meet a diverse range of people, all of whom have helped me completely change my social status and social interaction. Praise the Lord, I've learned a lot. My participation in micro-business has increased my confidence and ability to make spending decisions (Interviewee 06).

Furthermore, some women discussed how starting their micro-business improved their quality of life and allowed them to meet their family's needs for both food and non-food items:

> My own and my family's food and non-food consumption have increased as a result of my participation in this firm, and I've been able to support my younger brother, who has obtained a civil engineering degree from Wolaita Sodo University. All twelve members of my family are fully reliant on the earnings from my business for both food and non-food items. I pay for their education and give them the necessities (Interviewee 01).

Women start micro-businesses to meet their most basic needs. For example, one interviewee stated:

> I didn't have enough money. I didn't have a steady source of income. As a result, I was forced to work as a daily laborer. My previous earnings couldn't even cover my basic needs, let alone support my family. Then I decided to establish my micro-business. Since I started working in this business, my personal and my family's food and non-food consumption have improved. I am currently the sole owner of a business. I now have the authority to make household purchase decisions. I've been able to save more money as my earnings have increased (Interviewee 08).

Another interviewee reported as follows:

> I've been in the fruit trading business for three years. Because I didn't have a steady source of income, my lifestyle has improved since I began doing business. By deducting it from the income generated by my current business, I can save money myself. My family is now safe, and I can honestly say that being involved in this business has greatly helped me, particularly in terms of increasing my income (Interviewee 12).

In Areka town, one interviewee stated:

> My earnings have increased since I started this business. I never imagined my life could change for the better because I lacked a solid educational foundation. Thanks to God, I am now a businesswoman and hope to become a wealthy woman (Interviewee 03).

Our FGDs with businesswomen yielded useful information. The authors conducted FGDs with women micro business owners. In one focus group, women in Areka town were asked if their access to food, clothing, medical care, and other necessities had improved. One of the women in this group responded:

> My income increased after I became involved in the business. I assist my partner and children who are enrolled in private colleges and universities. I was able to purchase school uniforms and other supplies for teenagers, as well as pay their school fees. I am unworried about paying for my own and my family's medical care, food, and clothing. My current business now covers all of my expenses. My home is well-equipped with home appliances such as a refrigerator, sofa set, and a television (FGD 03).

FGD participants also explained that they now have enough money to cover personal expenses, support family or relatives, and set up personal savings accounts. One FGD participant in Sodo town, for example, reported:

> This current micro-business is the only source for my food and non-food consumption. As a result, I am less concerned about my consumption of medication and education (FGD 01).

Based on our FGDs and interviews, we contended that women's participation in micro-businesses provided the foundation for their consumption needs, but also supported their family's efforts to escape poverty through education (Interviewee 01). Women migrate due to economic hardship in their home countries, and while abroad, they face physical, economic, and mental challenges (Interviewee 06). For these women, micro-business is the most secure option, with many stating that their life has changed dramatically after they decided to start and participate in a micro-business. Women frequently reported that their capacity for social interaction, non-food consumption, and decision-making had increased as a result. This supports the claim made in the literature "the importance of microbusiness as a true economic engine and a tool for poverty reduction for women" (Costic, 2013).

Furthermore, women's participation in micro-businesses, as noted in Interview 08, gave them more control over how much money they spent on daily necessities. Furthermore, it aided them in saving money, allowing them to escape poverty and reduce future suffering and deprivation (Interviewees 08 and 12). The women we interviewed lack the educational credentials required to work in the public or private sectors, but micro-business has emerged as a way out of poverty for those with no or little education (Interviewee 03). The majority of women who took part in FGDs stated that having a micro-business benefited them in a variety of ways. Throughout the FGD sessions, participants stated that they could spend more money on necessities such as food, which was difficult for them and their families to obtain before establishing their micro-businesses. They were able to demonstrate how their participation in micro-businesses affected their spending on both food and non-food commodities by comparing their expenditure before and after micro-business participation, and they judged their micro-business engagement as beneficial. Our estimated propensity scores matching results, which examined how women's participation impacts poverty, are consistent with the findings of Tadesse *et al.* (2021) and Araya and Teka (2011), who investigated the impact of women's participation on micro and small enterprises in Ethiopia and discovered that it had a positive impact on their food, non-food and overall expenditure, whereas our research concentrated on micro-businesses and poverty on an individual level.

Furthermore is to be omitted the findings of FGDs and interviews support Admasu (2016); research findings in Addis Ababa on the roles of MSEs in women's livelihood.

Recommendation and policy implications

Women make up half of the population in the study area and are disproportionately affected by poverty. The first SDG for 2030 is to eliminate poverty, with a particular emphasis on women (Persaud and Dagher, 2021). Eskezia (2011) estimated that 70% of Ethiopian women who have not participated in income-generation activities have no assets. The study's findings suggested that Ethiopian women could escape poverty by starting microbusinesses to pay for necessities such as food, health care and education. The purpose of our study was to investigate women's microbusiness participation decisions and their effects on poverty in the Wolaita zone southern Ethiopia. Its inspiration was drawn from the need to stress the importance of women entrepreneurs in the development process, given the high poverty rates in the study areas. We discovered that women's participation had a significant effect on the level of women poverty.

Our study discovered that women who work in micro-business spend more on food, non-food and overall commodities. Our PSM estimation result specifically demonstrated that women who owned registered micro-businesses outperformed those who owned unregistered micro-businesses in terms of their annual food, non-food and overall spending. Interviews and FGDs revealed that most women who owned microbusinesses saw an increase in total income, higher levels of food consumption, access to better medical care, better education for themselves and their family members (children), more expenditure on clothing, ownership of durable assets, improved decision-making power for a family economic issue and social acceptance.

Given the significant and positive effects of women's participation in micro-business, notably in registered businesses, it is recommended that local governments and partners, such as those involved in entrepreneurship and market development, job creation and other public agencies, work together to boost the economic benefits for women. Market development and municipal offices at various executive levels in Ethiopia should encourage women who run unregistered micro-businesses to transition to registered micro-businesses because being able to access government business support services such as credit facilities, training and market connections and run legally protected micro-businesses helps to alleviate poverty.

Women are discouraged from starting microbusinesses due to a lack of education (Abagissa, 2013; Karippai and Kassa, 2010). To achieve the SDGs, Ethiopia must work to strengthen a cohesive policy framework that prioritizes critical development initiatives such as education and training, gender and entrepreneurship and poverty eradication. Stakeholders working to improve the status of women in developing countries should promote this type of training for women, which should be delivered through functional literacy programs in areas such as manufacturing, finance management, entrepreneurship and business competence. The value of credit in enabling women to start and grow their businesses cannot be overstated. Given that more than 80% of the women in the current investigation who owned micro-businesses did not use credit, it is recommended that key players in this sector assist women by providing the financing they need to stay in business. Furthermore, the majority of young people from disadvantaged backgrounds work for unlicensed businesses. Consequently, regulations and support programs aimed at fostering micro-business must be developed in light of the diversity of these businesses and their founders.

Therefore, this study's findings have far-reaching implications for policymakers, academics and organizations that help women-owned micro businesses. Our research focused on the effects of women's micro-entrepreneurship on poverty in low-income communities. Rather than providing food, clothing and/or other aid to women in disadvantaged communities, the authors asserted that assisting women and their micro-businesses allows them to be self-sufficient in terms of food and clothing as a long-term solution to poverty reduction. As a result, policymakers can use our findings to gain a better understanding of how women's microentrepreneurship affects poverty reduction, allowing them to develop more effective anti-poverty initiatives. Our findings will assist micro-business owners in making the transition from operating an unregistered to a registered enterprise due to its increased potential to reduce poverty. Our study's findings are novel and add to the body of knowledge in Ethiopia and the sub-Saharan African region.

Study's limitations
Our investigation has the following limitations. One of the study's weaknesses was that it gathered information from participants using a cross-sectional design, a structured questionnaire, open-ended interviews and FGD guidelines. Because of the volatile nature of the consumer market and food price inflation, estimates of women's spending may differ, and different conclusions may be reached when using a longitudinal methodology and other poverty metrics.

In our impact analysis, we considered both registered and unregistered women-owned micro-businesses. We believe that contrasting business owners' expenditure with that of non-business owners will be more credible in demonstrating the impact of women's participation on poverty. Propensity score analyses differed from randomized control trials in that unmeasured confounding variables could exist and skew the results. In this regard, the results of our PSM estimation could be influenced by unobservable pre-participation factors that influenced our estimation at lower gamma values. For our impact assessment, we used self-reported data on seven-day food and non-food expenditures as a proxy for women's poverty. This method could have had issues due to exaggerated self-reported responses and respondents' embarrassment at disclosing personal information, which could have impacted projected spending.

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Appendix 1

Interviewee code	Age in years	Educational attainment	Registration status	Economic sector	Business location
URT01	28	9 years of formal schooling	Non- registered	Trade	Sodo town
RM06	28	10 years of formal schooling	Registered	Manufacturing	Sodo town
RS08	30	3 years of technical and vocational training	Registered	Service	Boditi town
URT12	32	6 years of formal schooling	Registered	Trade	Areka town
URS03	35	Illiterate	Unregistered	Service	Areka town

Source: Survey data (2021)

Table A1.
In-depth interview
participant's profile

Appendix 2

Name of variables	Definition
Women's participation in micro-business	Dummy dependent variable; 1 if women engage in a registered micro-business, 0 if she engages in an unregistered micro-business
Age of operators	Continuous variable expressed in years
Educational attainment	Categorical variable 1 = illiterate, 2 = 1–8 years of formal education, 3 = 9–12 years of formal education, 4 = 1–2 years of skill training, 5 = three years of college diploma and. 6 = a bachelor's degree or higher
Marital status	Categorical variable 1 = married, 2 = single, 3 = divorced, 4 = widowed
Number of dependents	Individuals from women's families aged fewer than 15 and over 65, a continuous variable expressed in numbers
Hours/day	Continuous variable expressed as the number of hours women worked on their businesses
Days/week	Continuous variable expressed as the number of hours women worked on their businesses
Credit usage	Dummy variable, 1 if women received a credit within a year, 0 otherwise
Remittance	Dummy variable, 1 if women received other income from internal or external sources within a year, 0 otherwise
Savings	Dummy variable 1 = if surveyed women have a savings account and save money, 0 = otherwise
Entrepreneurial experience	Continuous variable expressed in years
Firms age	Continuous variable expressed in years
Food, nonfood, and overall annual adult expenditure	Outcome variables expressed in Ethiopian Birr

Source: Based on the authors' review of the literature (2022)

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