



## The Impact of the Informal Sector on Urban Household Consumption Expenditure in Burie Town, Ethiopia

Gebyaw Demeke Aniley

Department Economics, College of Business and Economics, Debre Markos University  
Burie Campus, Ethiopia

Corresponding author's email: [gebeyaw\\_demeke@dmu.edu.et](mailto:gebeyaw_demeke@dmu.edu.et)

### Abstract

*In Burie Town, West Gojjam Zone, Ethiopia, this study looks at how the informal sector affects urban family consumption spending. While the informal sector serves as a crucial livelihood avenue for the urban poor, it is often hindered by challenges such as volatile market conditions and limited access to financial services. Using a mixed-methods approach, the aim of this study is to evaluate the impact of informal sector engagement on household consumption patterns. In terms of methodology, 385 households are surveyed using a three-stage sample procedure (purposive, stratified, and random sampling). Descriptive statistics, binary logistic regression, and propensity score matching (PSM) are used in data analysis to assess the factors that influence participation in the informal sector and the consequences for consumption. According to the key findings, 53.77% of the sampled households are engaged in informal sector activities, predominantly in services (30.92%), followed by trade (27.5%) and production (27.5%). Among the challenges are marketing issues (27.05%) and restricted access to financing (29.95%). The findings of the regression show, that while more income decreases involvement, younger, less educated people, women, and larger families are more likely to participate. Involving the informal sector increases household consumption expenditure by 780–1,006 birr, according to PSM study, underscoring its economic significance. The researcher suggests strategies to legalize businesses and upgrade urban infrastructure in addition to improving financial inclusion, occupational training, and social protection for informal workers.*

**Keywords:** Consumption, Ethiopia, expenditure, Informal sector, urban households, Propensity score matching.

### 1. Introduction

"In Ethiopia's cities, informal economic engagements have become a primary means for young individuals to earn a living and sustain their households." according

to ILO (2021). Up to 50% of economic activity in emerging nations takes place in the unorganized sector. Its contribution to economic growth is still up for debate, though (La Porta & Shleifer, 2014). 85% of jobs in Sub-

Saharan Africa and nearly 83% of jobs in Africa are informal (UNDP, 2022).

In many African nations, like Nigeria and Kenya, the informal sector accounts for a sizeable amount of economic activity and is vital to job creation, GDP contribution, and local economic growth. According to the International Monetary Fund's (IMF) 2018 World Economics Report, the informal sector is estimated to represent 33.5% of Ethiopia's economy, which amounts to \$149 billion based on gross domestic product adjusted for purchasing power parity (GDP). This share is notably larger in many developing countries like Ethiopia. They account for a substantial share of the total employment and contribute significantly to the alleviation of youth unemployment, income generation, and increase the consumption. In Sub-Saharan Africa, informal employment constitutes the primary source of livelihood, accounting for 91.0% in Central Africa, 91.6% in Eastern Africa, and 92.4% in Western Africa (ILO, 2018).

Ethiopia is experiencing significant rural-urban migration and rapid urbanization, leading to various socio-economic challenges. Among the most pressing issues in urban areas is the rising rate of unemployment, which has been exacerbated by the fast pace of urban population growth (Kibret, 2014). In the Amhara region, Burie Town stands out as one of the rapidly expanding urban centers, facing mounting pressures related to employment opportunities and urban livelihoods. The Burie District Agricultural Office (2022) reported that there were 143,132 people living in Burie Town (Tadesse, 2022). The

ongoing increase in Ethiopia's unemployment rate and in the city specifically, has sparked widespread outrage. However, the growing number of young people cannot find employment in the official economy. As a result, a growing number of young people are turning to the unorganized sector as a primary source of work and income. Lack of access to organized markets, credit, contemporary technologies, formal training, and public services are among the issues the industry is dealing with (ILO, 2015). Moreover, most informal sector participants lack access to permanent workplaces, leading them to operate through home-based businesses, small kiosks, street vending, and mobile chest-based forms of trade (Central Statistical Agency [CSA], 2020). The industry contributes significantly to the creation of revenue, which lowers unemployment and helps the urban poor maintain their standard of living (Admasu et al., 2019). Globally, there is growing recognition of the informal sector's crucial role in poverty alleviation (Knott & Darbi, 2016). However, despite its dominance in developing countries like Ethiopia, the economic contributions of the informal sector remain inadequately understood and often under-researched (Nordman et al., 2016).

The informal sector plays a crucial role in the life of urban households in developing countries, providing employment and income for millions of individuals, particularly the urban poor. The informal sector has become a lifeline for many in Ethiopia, where there is still substantial unemployment and rising urbanization. It employs a sizable fraction of the work population, particularly women and young people. The sector is still poorly understood despite its significant

contributions to household consumption and employment, especially in towns like Burie in the Amhara region's West Gojjam Zone. The dynamics of the sector have been studied in other Ethiopian cities, including Jimma and Hawassa, but it is not known about how it affects urban household consumption expenditure. Given the town's quick growth and the growing dependence of its citizens on unofficial economic activity, this disparity is alarming. So this research is studied in order to fill the gap by showing the impact of informal sector on urban household's consumption expenditure

### **1.1. Objective of the Study**

#### **1.1.1. General Objective**

To assess the impact of the informal sector on urban household consumption expenditure in Burie Town, West Gojjam Zone, Amhara Region, Ethiopia, by analyzing income sources, expenditure patterns, and employment dynamics.

#### **1.1.2. Specific Objectives:**

- ❖ To analyze the consumption expenditure patterns of households engaged in the informal sector compared to those not engaged.
- ❖ To identify the key factors (e.g., education, gender, business type) influencing informal sector participation and its effect on household consumption.
- ❖ To assess the challenges faced by informal sector workers in sustaining household consumption levels.

## **2. Literature review**

There is no agreed-upon definition of the informal economy; instead, many words are

used by academics and organizations to characterize it. Koufopoulou (2019) and Dell'Anno (2022) note the diversity of terminology such as 'shadow economy,' 'hidden economy,' and 'parallel economy' reflecting the sector's complex nature. Other terms that reflect varying opinions about its nature are "subsistence sector," "underground economy," "unofficial economy," and "irregular sector." The ambiguous and diverse nature of informal economic activity is the cause of this diversity in terminology. While some definitions concentrate on survivalist micro-enterprises (such as "petty commodity production"), others highlight legal non-compliance (such as tax evasion in the "black economy").

Since informal activities often operate outside official regulatory frameworks, the absence of a standardized system complicates both measurement and policy formulation. According to the International Labor Organization (ILO, 2021), the informal economy encompasses all economic activities excluding illegal ones carried out by workers and economic units that are, by law or in practice, either not regulated or insufficiently protected by formal institutional arrangements. Broadly speaking, this refers to the unregulated sector of the market economy that produces goods and services for sale or other forms of payment. The International Monetary Fund (IMF, 2017) further describes the informal economy as comprising "economic activities that avoid costs and are excluded from the benefits and rights incorporated in laws and administrative rules covering property relationships, commercial licensing, labor contracts, torts, financial credit, and social systems," as referenced by

Blanton et al. (2018) and Nguimkeu and Okou (2019).

### **2.1.Types of Informal Economy**

A wide variety of economic activities that take place outside of official regulatory systems are included in the informal sector. These activities differ greatly between rural and urban settings, as Chen (2016) notes. Crop cultivation, livestock husbandry, and fishing are the main agricultural activities that constitute informal work in rural areas. On the other hand, a wide range of jobs are found in urban informal economies, ranging from construction workers and parking attendants to street vendors and garbage recyclers. Notably, small-scale businesses are not the only ones operating in the informal sector. The informal economy includes a wide spectrum of actors, ranging from small and large enterprises to informal professionals such as physicians and lawyers (Skinner, 2018). This diversity challenges simplistic portrayals of the sector. Globally, the informal economy represents a significant component of employment. According to recent estimates, it employs almost 2 billion people globally, accounting for 61.2% of the workforce (Godfrey, 2015; ILO, 2019). Informal employment usually outnumbers formal sector employment in emerging nations. With 85.8% of workers in Sub-Saharan Africa working in the informal sector, the region is notably dependent on it. With more than 90% of workers in the informal sector, Ethiopia's situation is even direr (Friedrich-Ebert-Stiftung, 2022; Stollreiter & Traub-Merz, 2023).

### **2.2.Contribution of Informal Economy**

The informal sector holds a pivotal position in the economies of many countries, offering substantial benefits at both the macro and micro levels. Primarily, it serves as a critical source of employment for a large segment of the global workforce. According to Godfrey (2015) and the ILO (2019), approximately 2 billion people, accounting for 61.2% of the world's employed population, are engaged in informal employment. In many developing countries, informal employment surpasses formal employment in terms of workforce share. More than 90 percent of Ethiopian workers are employed in the unorganized sector, per recent polls. This indicates that people frequently live in poverty and work and produce under hazardous and vulnerable circumstances (Stollreiter and Traub-Merz (2023); Second, it is a significant source of income. The ILO (2021) claims that the only way for the impoverished to meet their basic survival needs is through traditional informal sector activities, such as street hawking, home-based work, casual wage labor, and unpaid labor in family businesses. Participating in the informal sector provides individuals with a vital survival tactic, particularly in nations with poor pay, particularly in the public sector, or no social safety nets (such as unemployment insurance or other forms of social benefits). Furthermore, the informal sector plays a vital role in poverty alleviation by providing livelihood opportunities for vulnerable populations (Traub-Merz & Oehm, 2024).

### **2.3. Conceptual Frameworks**

The literature now in publication provides substantial evidence in favor of a number of theories explaining why urban households would want to increase their consumption. A

comprehensive empirical analysis makes it possible to create a conceptual framework that links the main variables affecting a household's choice to labor in the unorganized sector to its total consumption spending. In addition to economic and financial criteria like income, savings, and access to credit and capital, these influencing factors also include demographic characteristics like sex, age, family size, and

marital status. Household participation in informal economic activities is also significantly shaped by factors such as education level, migration status, and general socioeconomic dynamics. Gaining an understanding of these interrelated components might help one better understand the factors that influence household consumption patterns and participation in the informal sector.

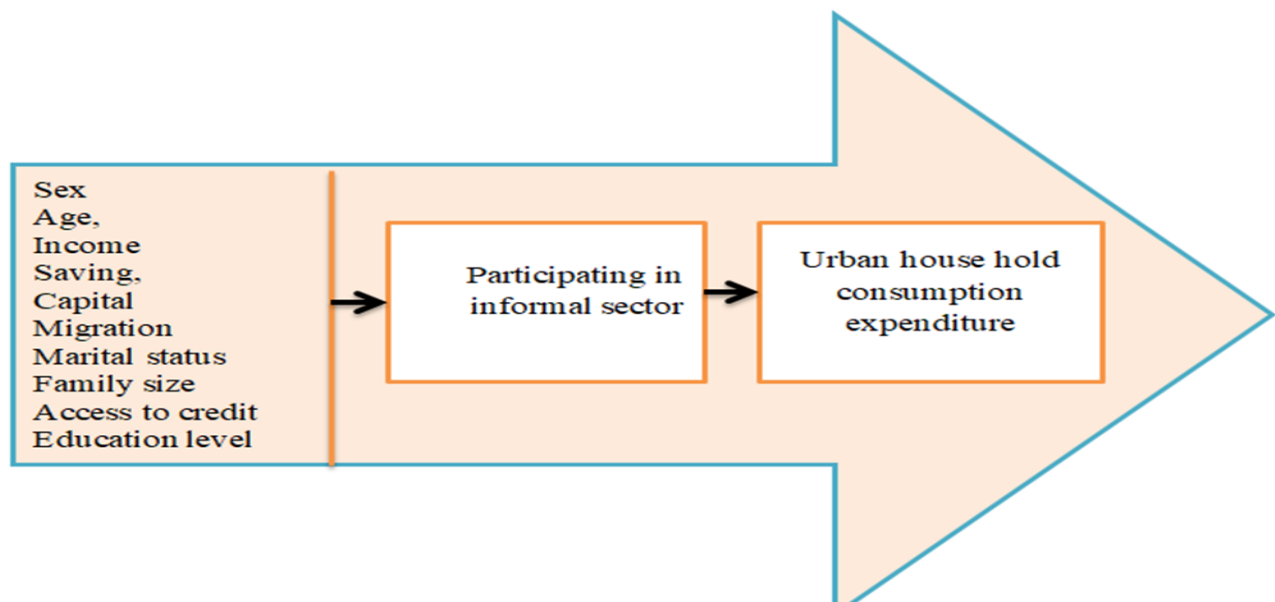


Figure 1. Conceptual framework of informal sector (2025)

Source: from theoretical and empirical literature review, 2025.

### 3. Research Methodology

Burie Town is one of the administrative towns in the West Gojjam Zone of the Amhara Regional State. Geographically, it is located at 10°42'N latitude and 37°4'E longitude, with an elevation of 2,091 meters above sea level. The town is located about 411 km northwest of Addis Ababa and 150 km from Bahir Dar, covering an area of 11.582 km<sup>2</sup>. Strategically positioned along the Federal No. 3 asphalt road, which connects Addis Ababa to Bahir Dar, the town

serves as a vital transportation and trade corridor.. Additionally, it serves as a junction for roads leading to Nekemte and Shindi. The town's accessibility through major roads in all four directions has made it an attractive destination for investment and trade. Furthermore, the establishment of the Bure Integrated Agricultural Production and Processing Industrial Park has further enhanced the town's economic significance, positioning it as a key hub for agro-industrial development in the region.

### 3.1. Research design and study approach

The objectives of the study, the data sources that are accessible, the cost of acquiring the data, and the time available all influence the

choice of research design (Creswell & Clark, 2017). The pragmatic (basically hybrid) methodology used in this study included quantitative and qualitative research techniques.

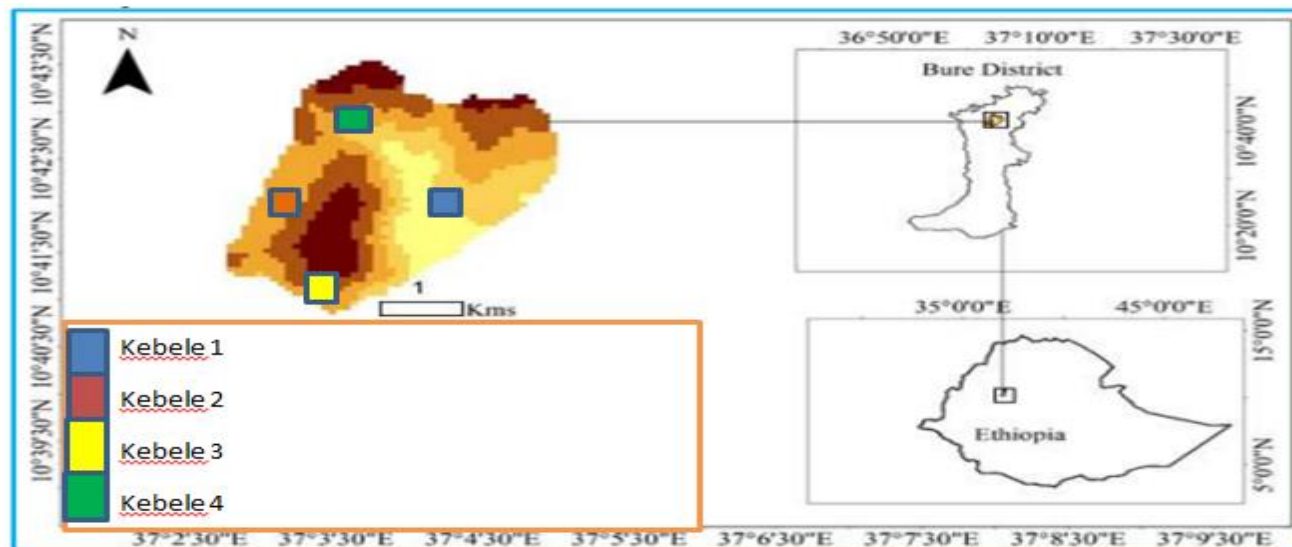


Figure 2. Map of burie town (2025)

### 3.2. Sampling techniques and procedures

A combination of purposive, stratified and simple random sampling methods was employed to capture a representative cross-section of respondents. First, Burie town in northern Ethiopia was purposively selected due to its high youth unemployment and large informal sector, which supports many urban and rural migrant workers. Next, the town's eight kebeles were stratified into low, medium, and high levels of informal business activity. Finally, within each stratum, kebeles were randomly selected, with Kebeles 1, 2, 3, and 4 chosen for their high concentration of informal enterprises. This approach ensured a balanced and reliable representation of households engaged in informal sector activities, enabling a comprehensive analysis of socioeconomic dynamics.

### 3.3. Sample size determination

The sample size from the target population was determined using the unknown sample size determination formula put forward by Cochran (1977) because there is no set number (registered) of target populations for the research.

$$n = \frac{z^2 \cdot p_i(1-p_i)}{e^2} = \frac{1.96^2 \cdot 0.5 \cdot 0.5}{0.05^2} = 384.16 \approx 385$$

Where  $q=1-p$ ,  $z$  represents the critical value corresponding to the desired confidence level,  $e$  (5%) denotes the acceptable margin of error,  $n$  is the required sample size, and  $p$  is the estimated proportion of the population possessing the attribute of interest. In this study, the sample size was calculated using  $p=0.5$  to maximize variability and ensure a conservative estimate.

### 3.4. Methods of data collection

To produce pertinent and useful information, the study used primary and secondary data sources that contained both qualitative and quantitative data. Structured and unstructured questionnaires, key informant interviews, and focus groups with the respondents were used to gather primary data. The study also made use of secondary data, which was mostly gathered from Woreda-level government records, books, journals, manuals, and the annual reports of Woreda periodicals, among other sources.

### 3.5. Method of Model specification and Data analysis

This study employed both descriptive and econometric analysis techniques to meet the goals of this study. The factors influencing participants in the informal sector were investigated using the logistic regression model. The logit and probit models are the most often used methods for estimating regression models with dummy dependent variables (Gujarati, 2021). According to Hosmer et al. (2013), a logistic regression model is better than other models for analyzing dichotomous outcome variables because it is highly adaptable, simple to use mathematically, and produces a meaningful interpretation. Consequently, this study uses the binary logit model to investigate the variables influencing the participants in the informal sector. According to Hosmer et al. (2013) and Gujarati (2021), the logistic model's functional form can be described as follows:

$$P_i = (Y = 1/X_i) = \frac{1}{1 + e^{-Z_i}} \dots\dots\dots (1)$$

Where  $p_i$  represents the probability of participating in the informal sector, and  $Z_i$  is a linear combination of  $n$  explanatory variables ( $X$ ), expressed as:

$$Z_i = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \dots + \beta_n X_{in} \dots\dots (2)$$

Where:  $\beta_0$  is the intercept, and  $\beta_1, \beta_2 \dots \beta_n$  are the coefficients (slopes) of the explanatory variables in the model. These coefficients indicate how changes in the independent variables affect the log-odds of participating in the informal sector. Since  $p_i$  is non-linear in both  $X$  and the  $\beta$ 's, it can be expressed in the following functional form:

$$P_i = \frac{1}{e^{-\beta_1 + \beta_2 x_i + \dots \beta_n x_m}} \dots\dots\dots (3)$$

This indicates that the OLS approach is not suitable for estimating the parameters. The fact that this equation is largely linear, as demonstrated below, makes the issue more apparent than actual.  $p_i$  represents the probability (likelihood) of participating in the informal sector, while  $(1-p_i)$  denotes the probability of not participating in the informal sector.

$$1 - P_i = 1 - \frac{1}{1 + e^{-Z_i}} \dots\dots\dots (4)$$

Therefore, taking the proportion of the probability of participating to non-participation can be written as

$$\frac{p_i}{1 - p_i} = \frac{\frac{1}{1 + e^{-Z_i}}}{\frac{1}{1 + e^{Z_i}}} \dots\dots\dots (5)$$

It is the ratio of the probability of the household was participating in informal sector to the probability that did not

participate. Finally, by taking the natural logarithm of equation (5), we obtain:

$$Li = \ln \frac{pi}{1-pi} = e^{zi}, zi = \beta_1 + \beta_2 xi + \dots \dots \dots \beta_n xn \dots \dots \dots (6)$$

Where:  $Li$  is the log-odds (logit) of participating in the informal sector, which is linear in both the explanatory variables ( $X$ ) and the model parameters ( $\beta$ 's). By introducing a stochastic disturbance term ( $\epsilon_i$ ), the logit model is specified as:

$$Zi = \beta_0 + \sum \beta_i Xi + \dots \beta_n xn + Ei \dots \dots \dots (7)$$

In this study, the above econometric model was employed to analyze the data. The model parameters were estimated using the iterative Maximum Likelihood Estimation (MLE) procedure. This estimation technique provides unbiased, efficient, and consistent parameter estimates.

### 3.5.1. Model specification of PSM

It is incorrect to compare participants and non-participants directly based on their level of consumption expenditure because other socioeconomic factors may have contributed to the discrepancies between them. Switch Regression Models (SRM), the difference in differences (DID), and propensity score matching (PSM) are the three most popular quasi-experimental design techniques. PSM was used in this model to examine the impact of informal sector on consumer expenditure. The following factors supported the researcher's selection of PSM: The study used cross-sectional data, making DiD infeasible, Selection bias was driven by observable factors (e.g., education, income), which PSM effectively addresses, Switching regression would require strong untestable

assumptions about unobserved selection mechanisms. PSM provided a transparent, robust, and policy-relevant estimate of the informal sector's impact on consumption, aligning with the study's objectives and data constraints.

Generally speaking, estimation aims to calculate the program's mean impact, which is determined by averaging the influence over all population members. Average Treatment Effect, or ATE, is the name given to this parameter: When double treatment occurs, the treatment indicator  $D_i$  is equal to 1 if the person receiving treatment is treated and 0 otherwise. The average treatment impact in this situation can be determined using the formula below:

$$ATE = E(\delta) = E(Y_1 - Y_0) \dots \dots \dots (8)$$

$E$  represents the average (or expected value).

$Y_i (D_i = 1)$  and  $Y_i (D_i = 0)$  cannot be found in the same family at the same time, nevertheless. The unobserved result (also known as the counterfactual outcome) is either  $Y_i (D_i = 1)$  or  $Y_i (D_i = 0)$ , depending on the household's position within the treatment participant. The "average treatment effect on the treated" (ATT), which is defined as follows, is the variable that has been given the greatest attention in the calculating literature:

$$ATT = E[Y_1 - Y_0 | P(X)] = E[Y_1/D=1 | P(x)] - E[(Y_0/D=0 | p(x))] \dots \dots \dots (9)$$

Where  $E(Y_1/D=1)$  represents the urban household's informal sector participant's consumption expenditure.  $E(Y_0/D=0)$  represents the consumption expenditure of urban households' non-participants in the informal sector. ATT stands for average



treatment effect. This is guaranteed and the treatment impact is determined in a social experiment where treatment assignment is random. This refers to whether or not I am a household participant and whether or not my household received the treatment. This research was carried out in accordance with established ethical standards. Prior to data collection, ethical approval was obtained from the Research Ethics Review Committee of the Department of Economics at Debre Markos University. Additionally, official permission to conduct the research was granted by the local administrative authorities in Burie Town, West Gojjam Zone, Ethiopia.

Participants were clearly informed about the objectives, scope, and voluntary nature of the study. All participants provided informed consent before taking part in the research. Verbal and written consent were obtained from each respondent before participation. Respondents were assured of the confidentiality and anonymity of the data collected and was informed of their right to withdraw from the study at any stage without any negative consequences. All data gathered were used solely for academic research purposes. No identifying information was collected, stored, or disclosed. The authors affirm that the study does not contain any content that requires additional ethical approvals. Consent for publication was obtained from all participants, and all necessary protocols regarding participant privacy and data protection were strictly followed.

### 3.6.Funding

This study was fully funded by the researcher. All expenses related to the design, data collection, analysis, and preparation of

the manuscript was personally covered by the author. No external funding or financial assistance was received from any institution, organization, or donor agency. The funding source had no influence on the study design, data interpretation, or publication process.

## 4. Results and Discussion

### 4.1.Descriptive analysis

The table below presents the distribution of individuals involved in informal sector activities. Among the total sample of 385 respondents, 53.77% (207 individuals) are participants in informal sector activities, while 46.23% (178 individuals) are non-participants. This distribution highlights a slightly greater proportion of individuals actively engaged in the informal sector, offering insights into the role of informal employment within the studied population. This distribution highlights a slightly greater proportion of individuals actively engaged in the informal sector, offering insights into the role of informal employment within the studied population.

Table 3 presents a detailed breakdown of business activities across four key sectors: trade, service, production, and construction. The trade sector, accounting for 27.40% of the total, includes the sale of diverse goods such as clothing, shoes, spiritual books, candles, and fresh produce like vegetables and fruits. The service sector, the most prominent at 30.92%, encompasses activities like selling cooked foods and local drinks, operating roadside beauty salons, and offering shoe polishing services. Production, making up 27.54% of the total, involves home-based food production, weaving, and crafting bamboo and basket products. Lastly, the construction sector, the smallest at

14.01%, focuses on bicycle maintenance, repair services, and small-scale street construction work. With a total of 207 recorded instances, the data reveals that service and trade dominate the local business landscape, while production remains a significant contributor. The relatively smaller

share of construction suggests it plays a more niche role in this economic environment. This distribution underscores the prevalence of informal and small-scale enterprises, particularly in food, retail, and artisanal production, reflecting broader trends in local commerce.

Table 1. Variables and work hypothesis table

| <p>➤ <b>Dependent variable;</b> Dummy variables (1= if households participate in informal sector are participant; 0 =if non-participant)</p> <p>➤ Outcome variable                      continuous (consumption expenditure)</p> |                             |                                |            |          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|--------------------------------|------------|----------|
| <u>Independent variable</u>                                                                                                                                                                                                      |                             |                                |            |          |
| Variable                                                                                                                                                                                                                         | Description                 | Measurement                    | Type       | Exp sign |
| AGE                                                                                                                                                                                                                              | Age of respondent           | In number                      | continuous | -        |
| EDUC                                                                                                                                                                                                                             | Education level             | 0=if illiterate; 1=if literate | dummy      | -        |
| INCM                                                                                                                                                                                                                             | Income of respondent        | In number                      | continuous | -        |
| CREDIT                                                                                                                                                                                                                           | Access to credit            | 1= if yes; 0 =No               | dummy      | +        |
| FAMSIZ                                                                                                                                                                                                                           | Family size of respondent   | In number                      | continuous | +        |
| SEX                                                                                                                                                                                                                              | Sex of respondent           | 1 = if male; 0 = No            | dummy      | -        |
| SAVING                                                                                                                                                                                                                           | Saving states of respondent | 1 = if yes, 0 = No             | dummy      | +        |
| MTSTS                                                                                                                                                                                                                            | Marital status respondent   | 1 = single,0 = otherwise       | dummy      | +        |
| CAPTL                                                                                                                                                                                                                            | Capital respondent          | In Birr                        | continuous | +        |
| MIGRN                                                                                                                                                                                                                            | Migration                   | 1 if migrants, and 0 otherwise | dummy      | +        |

Table 2. Distribution of participation in informal sector

| participation in informal sector activity | Frequency | percent |
|-------------------------------------------|-----------|---------|
| Participant                               | 207       | 53.77   |
| Non-participant                           | 178       | 46.23   |
| total                                     | 385       | 100     |

Source: Own survey data (2025)

Table 3. Types of informal sector business activities in Burie town

| Business sector   | Trade                                                                                                          | Service                                                                           | Production                                                      | Construction                                                                   | total |
|-------------------|----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------|--------------------------------------------------------------------------------|-------|
| <b>Activities</b> | Selling clothes& shoes, spiritual books, pictures, candles, various items, such as vegetables fruits, and wood | Selling cooked Foods & local drink roadside beauty works/ salons, shoe polishing, | Home-made food staff producers, weaving, bamboo& basket working | bicycle, maintenance and repair; providing construction services along streets |       |
| <b>Frequency</b>  | 57                                                                                                             | 64                                                                                | 57                                                              | 29                                                                             | 207   |
| <b>Percentage</b> | 27.40                                                                                                          | 30.92                                                                             | 27.54                                                           | 14.01                                                                          | 100   |

Source: Own survey data (2025)

Table 4 highlights the major challenges faced by businesses, with limited access to credit emerging as the most significant issue (29.95%), followed closely by marketing problems (27.05%) and lack of initial capital (24.64%). A smaller yet notable proportion (18.36%) cites unsuitable government administration as a barrier. These findings, drawn from 207 responses, reveal that financial constraints spanning credit access

and startup funding are the dominant hurdles, while market visibility and regulatory challenges also play substantial roles in hindering business growth. Addressing these obstacles could significantly improve entrepreneurial success rates. Table 5 compares key socio-economic variables between participants (n=207) and non-participants (n=178), revealing statistically significant differences (marked with \* or \*\*).

Table 4. Challenges of working at informal sector

| Challenges                           | Frequency | Percentage |
|--------------------------------------|-----------|------------|
| lack of initial capital              | 51        | 24.64      |
| limited access to credit             | 62        | 29.95      |
| marketing problems of product        | 56        | 27.05      |
| unsuitable government administration | 38        | 18.36      |
| total                                | 207       | 100.00     |

Source: Own survey data (2025)

Table 5. Summary of variables by participation status

| Variables            | Participant (n=207) | Non-participant (n=178) | t-test/chi square |
|----------------------|---------------------|-------------------------|-------------------|
| Age of respondent    | 41.33333            | 46.09551                | 1.5286**          |
| Education level      | 45.50%              | 54.50 %                 | 10.1985*          |
| Income of respondent | 2372.899            | 2743.82                 | 3.3468*           |
| Sex of respondent    | 43.48%              | 54.49 %                 | 4.6495 **         |
| Migration            | 53.14%              | 49.44 %                 | 0.5250            |
| Capital respondent   | 1664.686            | 1672.528                | 0.0813            |
| Access to credit     | 52.66 %             | 47.75%                  | 0.337             |
| Saving               | 56.04 %             | 46.63%                  | 3.3973**          |
| Family size          | 5.004831            | 4.662921                | -1.9147**         |
| Marital status       | 53.14               | 52.81                   | 0.0042            |

Source: Own survey data (2025)

\*Significant at 1% probability level, \*\* Significant at 5% probability level.

Participants were younger (41.3 vs. 46.1 years), less educated (45.5% vs. 54.5%), and had lower incomes (2,373 vs. 2,744 units). There were notable gender disparities, with females comprising 43.5% of participants compared to 54.5% among non-participants. Participants also tended to have larger household sizes (an average of 5.0 members compared to 4.7) and higher savings rates (56.0% versus 46.6%). No significant differences were found in migration status, capital, credit access, or marital status. These findings suggest that participation correlates with younger age, lower income, and distinct financial behaviors.

## 4.2. Diagnostic test

### 4.2.1 Multicollinearity test

The Variance Inflation Factor (VIF) was used to assess collinearity among continuous variables, while contingency coefficients

were applied to check the degree of association among categorical variables. As presented in Tables 6 and 7, the results confirm that no strong multicollinearity exists among the independent variables. Consequently, all explanatory variables were retained for the final regression analysis. This robust preliminary assessment ensures that the logit model provides accurate and unbiased estimates, offering valuable insights into the key determinants of informal sector participation.

### 4.2.2. Heteroskedasticity Test

To check for heteroskedasticity in the regression model, the Breusch-Pagan test was conducted. The test assumes homoskedasticity as the null hypothesis. The result, shown in Table 8, reports a chi-squared value of 0.07 with a p-value of 0.7872. As the p-value is above 0.05, the null

hypothesis cannot be rejected, indicating that heteroskedasticity is not present.

Table 6. Variance Inflation Factor (VIF) for continuous explanatory variables

| Variable             | Variance Inflation Factor (VIF) | 1/VIF    |
|----------------------|---------------------------------|----------|
| Age of respondent    | 1.07                            | 0.938888 |
| Income of respondent | 1.06                            | 0.940887 |
| Capital respondent   | 1.04                            | 0.964491 |
| Family size          | 1.02                            | 0.977645 |
| Mean                 | 1.05                            |          |

Source: Own computation (2025)

Table 7. Contingency coefficients for discrete variables

|        | MIGRN   | SAVING  | MTSTS   | EDUCLVL | CREDIT | SEX    |
|--------|---------|---------|---------|---------|--------|--------|
| MIGRN  | 1.0000  |         |         |         |        |        |
| SAVING | 0.1628  | 1.0000  |         |         |        |        |
| MTSTS  | 0.1571  | 0.0579  | 1.0000  |         |        |        |
| EDUCL  | 0.1227  | -0.1216 | 0.1338  | 1.0000  |        |        |
| CREDIT | 0.0024  | 0.0283  | -0.1436 | 0.0079  | 1.0000 |        |
| SEX    | -0.1266 | 0.0244  | -0.0425 | -0.0915 | 0.1016 | 1.0000 |

Source: Own computation (2025)

Table 8. Breusch-Pagan test for heteroskedasticity

|             |        |
|-------------|--------|
| chi2(1)     | 0.07   |
| Prob > chi2 | 0.7872 |

Source: Own computation (2025)

#### 4.2.3. Model specification test

The null hypothesis of the Ramsey RESET test: The null hypothesis ( $H_0$ ) is that the model is correctly specified (i.e., no need for higher-order terms). The alternative hypothesis ( $H_1$ ) is that the model is misspecified (i.e., higher-order terms are needed). A significant result (a low p-value) indicates that there may be a specification

error in the model. If the test statistic is not significant, we fail to reject the null hypothesis and assume the model is correctly specified. Therefor from the table 9 below it is possible to conclude that with a p-value of 0.0637, the result is marginally significant. A significance level ( $\alpha$ ) of 0.05 is commonly used in standard hypothesis testing. Since 0.0637 is slightly greater than 0.05, we would

fail to reject the null hypothesis at the 5% significance level.

Table 9. Ramsey RESET test using powers of the fitted values of PIFS

|          |        |
|----------|--------|
| F(3,371) | 2.44   |
| Prob>F   | 0.0637 |

Source: Own computation (2025)

#### 4.2.1. Significant explanatory variable in the logit model

As it is shown in table 10, the regression results reveal several significant factors influencing the dependent variable, with varying degrees of impact. Age (AGE) exhibits a negative and statistically significant effect (coefficient = -0.0139,  $p < 0.05$ ), suggesting that older individuals are marginally less likely to experience the outcome, with each additional year reducing the probability by 0.3%. Similarly, Education (EDUC) and income (INCM) show strong negative associations (coefficients = -0.754 and -0.00037, respectively;  $p < 0.05$ ), implying that higher education and income levels reduce the likelihood of the outcome by 17.0% and 0.008% per unit increase, respectively. Conversely, family size (FAMSIZ) has a positive and significant influence (coefficient = 0.192,  $p < 0.05$ ), increasing the probability by 4.3% per additional member, possibly reflecting household dynamics that favor the outcome. Gender (SEX) also plays a notable role, with a negative coefficient (-0.571,  $p < 0.05$ ), indicating that one gender (likely males, if coded as 1) is 12.8% less likely to exhibit the outcome compared to the other.

#### 4.3. Propensity Score Matching Result; impact of participating in nonfarm activity on rural house hold income

The analysis of predicted propensity scores identified a common support region ranging from 0.0022524 to 0.9034147. This means that households with propensity scores below 0.0022524 or above 0.9034147 were excluded from the matching process. As a result, only 2 out of 385 observations (0.52%) fell outside this range and were discarded to ensure robust matching.

The common support condition, as illustrated in Figure 3, was effectively met. The substantial overlap in the distribution of propensity scores between participant and non-participant groups confirms that a reliable comparison can be made. This overlap ensures that the matching process is based on comparable observations, strengthening the validity of the impact estimation.

##### 4.3.1. Algorithm Selection for Matching

Choosing an appropriate matching estimator is crucial for ensuring that explanatory variables are well-balanced while maximizing the number of matched observations. The ideal matching algorithm is one that achieves the lowest pseudo- $R^2$  value and produces a sufficiently large matched sample size. In this study, various widely used matching techniques Nearest Neighbor Matching (NN-

1, NN-5) and Kernel-Based Matching (KB-0.03, KB-0.06) were tested. Among these, the selected algorithm demonstrated optimal performance in balancing covariates while retaining an adequate number of observations for analysis.

#### 4.3.2. Testing for Propensity Score and Covariate Balance

The effectiveness of the matching process was evaluated using multiple statistical tests. As presented in Table 11, the results confirm that the matching procedure successfully balanced the characteristics of treated and matched comparison groups. This conclusion is supported by the following findings:

- ❖ A reduction in mean standardized bias between matched and unmatched households.

- ❖ A decrease in pseudo- $R^2$  after matching, indicating improved covariate balance.
- ❖ Insignificant likelihood ratio tests, suggesting that systematic differences between treated and control groups were minimized after matching.

These results validate the robustness of the propensity score matching (PSM) approach, confirming that the methodology effectively eliminates observable differences between participant and non-participant households. Consequently, the matched sample provides a reliable basis for assessing the impact of non-farm activity participation on household outcomes.

Table 10. Parameter estimates of the logistic regression model

| Explanatory variable | Estimated coefficient | Standard error    | Marginal effect(dy/dx) |
|----------------------|-----------------------|-------------------|------------------------|
| AGE                  | -.0138537**           | .0070721          | -.0030784              |
| EDUC                 | -.7544394*            | .2257823          | -.1700528              |
| INCM                 | -.0003668*            | .0001045          | -.0000815              |
| CREDIT               | .2258196              | .2211189          | .0502651               |
| FAMSIZ               | .1921491*             | .0672345          | .0426973               |
| SEX                  | -.5713339*            | .2223512          | -.1278573              |
| SAVING               | .2911655              | .2213537          | .065071                |
| MTSTS                | .0550867              | .2255559          | .0122395               |
| CAPTL                | .0001103              | .0001224          | .0000245               |
| MIGRN                | .0831527              | .2261501          | .0184919               |
| Constant             | .8957972              | .5636665          | -----                  |
| Pseudo R2            | 0.0812                | LR chi2 (p-value) | -244.18597 ( 0.0000)   |
| 2log likelihood      | 43.16                 | Number of cases   | 385                    |
| Sensitivity          |                       | 71.98%            |                        |
| Specificity          |                       | 57.30%            |                        |

\* Significant at 1 percent probability level, \*\* Significant at 5 percent probability level

Source Own STATA result computation 2025.

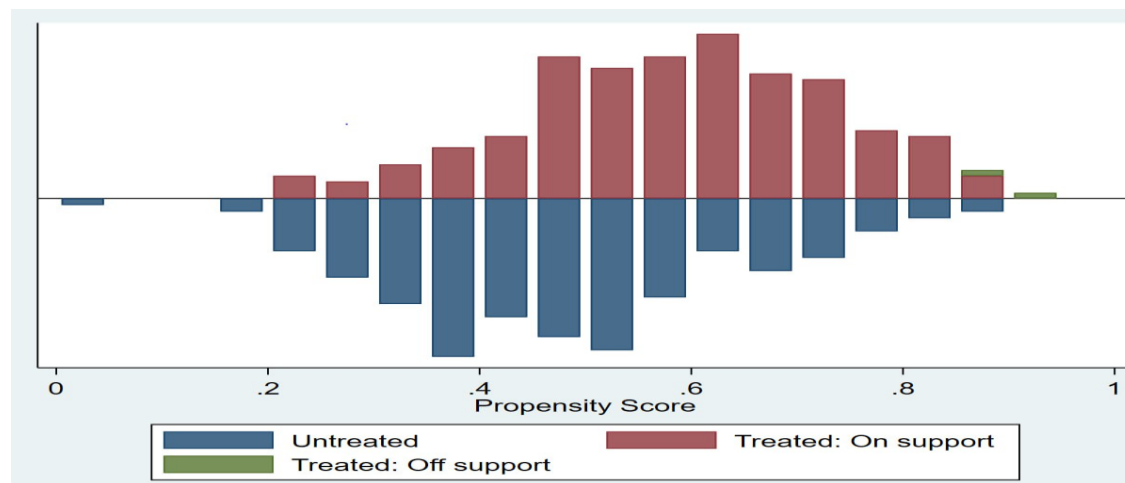


Figure 3. Propensity score matching graph (2025)

Table 11. Covariate balance indicators before and after matching

| Matching algorithm               | NNM-1         | NNM-5        | KBM-0.03      | KBM-0.06      |
|----------------------------------|---------------|--------------|---------------|---------------|
| Mean std. bias (before)          | 16.2          | 16.2         | 16.2          | 16.2          |
| Mean std. bias (after)           | 14.5          | 5.8          | 14.5          | 14.5          |
| Pseudo R <sup>2</sup> (before)   | 0.080         | 0.080        | 0.080         | 0.080         |
| Pseudo R <sup>2</sup> (after)    | 0.056         | 0.011        | 0.056         | 0.056         |
| LR $\chi^2$ withp-value (before) | 42.73(0.000)  | 42.73(0.000) | 42.73( 0.000) | 42.73( 0.000) |
| LR $\chi^2$ with p-value (after) | 31.58 (0.581) | 5.98(0.817)  | 31.58(0.581)  | 31.58 (0.581) |

Source: computed Own survey data (2025).

Table 12. Average treatment effects on the treated (ATT) estimation results

| Matching algorithm | ATT        | Std. err.  | t-stat |
|--------------------|------------|------------|--------|
| NNM-1              | 1005.85366 | 172.693384 | 5.82** |
| NNM-5              | 779.902439 | 134.489261 | 5.80** |
| KBM-0.03           | 1005.85366 | 172.693384 | 5.82** |
| KBM-0.06           | 1005.85366 | 172.693384 | 5.82** |

Source: computed Own survey data (2025)

\*\* Shows significant at 5% significant level

NNM-1: Nearest neighbor matching with single neighbors, NNM-5: Nearest neighbor

matching with five neighbors, KBM-0.03: Kernel-based matching with 0.03 bandwidth,



KBM-0.06: kernel-based matching with 0.06 bandwidth. As shown in Table 12, the results from the

Average Treatment Effect on the Treated (ATT) estimation provide strong evidence that participation in the informal sector significantly increases household consumption expenditure. The analysis, conducted using various matching algorithms, consistently demonstrates a positive and statistically significant impact on household spending. Across all matching methods Nearest Neighbor Matching (NNM-1 and NNM-5) and Kernel-Based Matching (KBM-0.03 and KBM-0.06) households engaged in informal sector activities exhibit substantially higher consumption expenditures compared to their non-participating counterparts. The estimated increase in household spending ranges from approximately 780 to 1006 units, with all results being highly significant. These findings underscore the economic importance of informal sector participation, particularly in settings where access to stable formal employment is limited.

## 5. Conclusions

The study on the impact of the informal sector on urban household consumption expenditure in Burie Town, Ethiopia, underscores the sector's critical role as a lifeline for many households, particularly the urban poor. With 53.77% of surveyed households engaged in informal activities primarily in services, trade, and production the sector significantly boosts consumption expenditure by 780–1,006 birr per household, as revealed by propensity score matching analysis. However, challenges such as limited access to credit (29.95%) and marketing

difficulties (27.05%) hinder its potential. Key determinants of informal sector participation include younger age, lower education levels, larger family sizes, and female gender, highlighting the sector's role as a refuge for marginalized groups. In contrast, higher levels of income and education are associated with reduced dependence on informal employment, highlighting the importance of policies that promote financial inclusion, expand access to education, and strengthen vocational training programs. The findings advocate for targeted interventions: expanding microfinance access, simplifying formalization processes, and investing in skills development.

## 6. Recommendations

The study on the impact of the informal sector on urban household consumption expenditure in Burie Town, Ethiopia, reveals critical insights into the sector's role in livelihoods and economic stability. The analysis reveals that low-income, less-educated, and larger households are significantly more inclined to engage in informal sector activities to sustain their consumption needs. This indicates that informality is a coping strategy driven by economic necessity rather than choice. Therefore, policy interventions should not aim to restrict informal sector participation outright, but rather focus on: Enhancing household income through micro-enterprise support programs targeted at low-income families, Investing in adult education and skill upgrading for informal sector participants, as education significantly reduces dependency on informality, Designing family-based economic support systems recognizing that larger family sizes increase the pressure to engage in informal

work, Gender-responsive policies are essential, as participation likelihood differs significantly by sex.

Moreover the researcher recommends that, since 29.95% of informal workers face limited access to credit, local governments and financial institutions should design low-interest loan programs tailored to programs to mitigate income instability, strengthen skills development and education vocational training programs: given that higher education reduces informal sector participation, targeted vocational training (e.g., business management, digital skills) can enhance productivity and income stability, formalization and policy support for informal enterprises simplified business registration reduce bureaucratic hurdles to

formalization while offering tax incentives for small informal businesses transitioning into the formal economy.

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