

Impact of youth unemployment in Ethiopia during COVID-19 Lockdowns: Case study Arsi-Zone, Ethiopia

Alemayehu Derege

alemayehu.ethiopia@astu.edu.et

Adama Science and Technology University

Research Article

Keywords: Unemployment Duration, Labor Policy, COVID-19 lockdown, Employment Ethiopia

Posted Date: July 2nd, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-10080823/v1>

License: © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Additional Declarations: No competing interests reported.

Impact of youth unemployment in Ethiopia during COVID-19 Lockdowns:

Case study Arsi-Zone, Ethiopia

Alemayehu Ethiopia Derege (PhD)^{1*}

¹ *Department of Technology and Innovation Management, College of Humanities and Social Sciences, Adama Science and Technology University (ASTU), Adama, Ethiopia*

*Corresponding author: alemayehu.ethiopia@astu.edu.et | +251 913364396

Abstract

Background: Unemployment is a significant issue in Ethiopia and Arsi Zone, with a high rate of 26%. This study aims to estimate the impact of unemployment using the PSM model and develop indices for latent variables using the SEM model.

Aim: The study aims to analyze the factors driving individuals to self-employment and paid employment, as well as the consequences of unemployment in Arsi Zone, Ethiopia.

Setting: The research is conducted in Arsi Zone, Ethiopia, where unemployment is a pressing issue.

Method: A combination of PSM and SEM models are used to analyze the data, with the PSM model estimating the impact of unemployment and the SEM model reducing dimensions and developing indices for latent variables.

Results: The study finds that personal skills, marital status, and urban status drive individuals to self-employment, while age, income, experience, and education drive individuals to paid employment. The research also reveals that regional economic growth, graduate credit, and government commitment to ban administrative malpractices should be areas of government intervention.

Conclusion: The study highlights the challenges posed by unemployment in Arsi Zone and provides insights into potential solutions and interventions.

Contribution: The study contributes to the literature on unemployment in Ethiopia and Arsi Zone by providing empirical evidence on the factors driving individuals to self-employment and paid employment, as well as the consequences of unemployment in the study area.

Key words: *Unemployment Duration, Labor Policy, COVID-19 lockdown, Employment Ethiopia*

1. Introduction

1.1 Background

Unemployment ensues when individuals capable and willing to work cannot find jobs, at existing market wage rate. High unemployment signifies economic distress, while low rates indicate prosperity. Globally, it reduces economic output, increases poverty, and heightens social tensions, impacting government finances through higher welfare costs and lower tax revenues. On top of this, unemployment disparities can lead to illegal migration, political instability, and hinder global development. In Africa, high unemployment, especially among youth, is exacerbated by inadequate education, limited industrialization, and a skills-job mismatch. Youth unemployment is the most perilous, leading to increased poverty, social unrest, and migration (UNHCR 2021). Addressing this requires education reform, economic diversification, and robust governance.

Countries worldwide are experiencing high unemployment, the most critical development challenge for developed and developing countries. For example, the Copenhagen DSD and the 1995 World Summit for ASD called for a focus on youth¹ employment. The United Nations Millennium Declaration also pledged to “develop and implement strategies that give young individuals, wherever they are, a real chance of finding suitable and decent jobs” (Ayhan, F. 2016).

The COVID-19 lockdowns in Africa led to significant job losses and increased unemployment, particularly in the informal sector, construction, hotel, and tourism industries. For example, South Africa's Gross Domestic Product(GDP) dropped by 51% in the first two quarters of 2020, with 26-40 million sub-Saharan Africans at risk of poverty (GIGA, 2020), and a similar study noted that Kenya lost 2.5 million tourism jobs, and Ghana saw over 770,000 workers face wage cuts and 42,000 layoffs. In Ethiopia, economic activity declined sharply, with an 81% of loss in earning, the impact was severed in the informal sector (Fagbemi et al., 2022). This has sharply reduced exports, Foreign Direct investment (FDI), tourism, and economic growth. As a result, the country has experienced a severe shortage of foreign currency, and the pandemic has exacerbated poverty and socioeconomic tensions among regions.

¹ https://www.youthpolicy.org/national/Ethiopia_2004_National_Youth_Policy.pdf

In 2018, an estimated 172 million individuals (5.0%) were unemployed worldwide. Although the global economy is recovering, global unemployment remains owing to increased labor force participation. Because of its demographic and socioeconomic features, Africa is characterized by a high unemployment rate. The occurrence of the COVID-19 pandemic caused a parallel loss of jobs and life in Africa (Blustein et al., 2020), leading to severe socioeconomic grievances for poor and low-income earners. However, the unemployment rate varies among the nation's regions, sub-regions, and countries, for example, Africa, 8.2%; Sub-Saharan Africa, 5.9%; and South Africa, 32.9% (TE, 2023).

With an estimated population of 108 million, Ethiopia is the second most populous country in Africa, second to Nigeria (UN 2019). Owing to the nation's high fertility rate, its population of young individuals has increased over the last decades. Unfortunately, Ethiopia's low economic performance has resulted in insufficient employment opportunities for this group. Notably, over 70% of the Ethiopian population is younger than 30 years old, and annually, more than 1 million of these individuals join the labor market (Terefe 2019). Moreover, Ethiopia's economy produces far fewer new job opportunities than it would if its economic structure was not largely agrarian (Terefe 2019). The growing imbalance between population and economic growth becomes headache for the government and, preparing impact-based priority interventions are necessary to minimize the consequences. Therefore, in order to widen significant effect of unemployment dimensions, the researchers, the blended dimension reduction technique (factor analysis), and Propensity score matching (PSM) model, based upon the developed indexes from Structure Equation Modeling (SEM), providing new insight into the subject area.

To create adequate employment opportunities, Ethiopia has implemented several policy reforms, for example, policies to promote micro-enterprises and SMEs, savings and credit institutions, youth capacity building, and industrial parks across the country. Notably, youth unemployment remains Ethiopia's main economic and social problem. With the introduction of external shock, the COVID-19 pandemic, the economy experienced a burden it has never experienced and the absence of preparedness for such shock has worsened the problem. Although the problem was intense, little effort has been made to measure the impact of the pandemic on unemployment in the study area. Thus, labor market policy research is required to improve the understanding Ethiopia's unemployment problems and the challenges to

resolving them. Furthermore, research is necessary to confirm whether the problem of insufficient job opportunities in Ethiopia is related to its inability to create them or incompetent job seekers. In this study, in addition to economic factors, all other possible dimensions of the unemployment problem (e.g., social, demographic, institutional, political, and environmental) are investigated using factor analysis.

1.2 Statement of the Problem

Unemployment is a major challenge in Ethiopia. Coupled with COVID -19, the challenges of population growth and increased poverty, in Ethiopia, its low job creation capacity have exacerbated its developmental problems (Mamo et al. 2022). Increases in graduate unemployment affect an economy's long-term growth potential by promoting economic inefficiencies. Furthermore, unemployment is related to increased social problems such as crime, suicide, poverty, alcoholism, and prostitution (Demissie et al. 2021).

Since the economic crisis of 2007, many countries in both capitalist economies and developing countries have experienced high unemployment rates (Ahmed et al. 2021). A major challenge in overcoming this problem in developing countries is their inability to substantially increase employment opportunities, mainly due to rapid population growth, undeveloped productive sectors, and global economic shocks created by COVID-19 (Marinescu et al. 2021). In addition, before its maturity, the growth and contribution of the productive sector (agriculture and industry) in Ethiopia was overtaken by its service sector. Notably, the productivity of these sectors is well below the level of self-employment capacity, causing unemployment problems in Ethiopia's rural and urban areas.

Urban unemployment is a serious problem in Ethiopia. According to Oshora et al. (2021), more than 70% of Ethiopians are aged under 30 years, and the urban unemployment rate in that group is 22%, higher than the overall unemployment rate of 17%. Further complicating the matter is that more than 25% of all jobs in urban areas are informal, and there is a negative relationship between city population size and the proportion of self-employed. For example, according to Kamei and Nakamura (2022), a log increase in town population size lowers the probability of engaging in self-employment by 7.9 percentage points.

High unemployment rates (usually >5%) can also promote incidences of violence; negatively influence household income, health, government revenue, and thus GDP and overall development; and increase political instability. Since 2010, Ethiopia has achieved promising economic growth and was labeled one of the fastest-growing economies worldwide. Despite such improvements, the nation's unemployment rate is high (%19.3 (CSA 2018)). Thus, because of the current conditions of economic growth, reducing unemployment and creating decent work opportunities would be difficult. Considering Ethiopia's peasantry farming (with stagnant growth), high population, and slow structural change, a means by which its economy can create employment opportunities is necessary (Terefe 2019).

Although reliable, fully recorded data are unavailable for Arsi, one of the 20 zones in Oromia, it was said to have one of the highest rates of unemployment rate in 2013/14, ranking third behind the city of Jima and East Shewa zone (OPEDC 2016). This high rank is mainly associated with Arsi's rapidly growing labor force, accounting for 47% of the total zonal population. However, the rate of employment creation for such a rapidly increasing labor force is very low. This mismatch between labor force growth and employment creation has resulted in a high unemployment rate. Therefore, unemployment is becoming an increasingly acute problem, especially in urban areas, and reaching its alarming stage. Another consequence of the high unemployment rate is its promotion of a high emigration rate, especially among the young population and the working age population in general, to neighboring countries in search of employment. According to Bacha (2014), unemployment is much more than not having a job because it, for example, undermines individuals' self-esteem and their sense of purpose and can lead to a loss of hopefulness and dignity.

Although several studies have investigated the determinants of urban unemployment in Ethiopia, studies on rural towns have been limited. Besides, with the occurrence of COVID - 19, the socioeconomic status of households went upside down for the majority of poor and middle-income earners though the depth of the problem remains unclear. Therefore, in this paper, we aimed to contribute to the literature by answering the research question 'why youth unemployment remains high?' Was it because of poverty (economic inability to create jobs) or lack of entrepreneurial mentality or because youth preferred paid employment. The paper explores insight into cause and impact of youth unemployment by deploying blends of analytical econometrics models such as factor analysis, SEM, the Tobit model (TM), and matching models.

2. Empirical Review

To identify the literature gap regarding the impact of unemployment in Ethiopia, we thoroughly investigated all possible searchable papers since 2015. The document review result (Table 1) shows that almost all the literature has focused on factors determining youth unemployment and graduate unemployment and factors contributing to unemployment duration. The results of those papers reveal that economic factors, followed by institutional factors, demographic factors, and external factors, play significant roles. From the literature, the researchers observed an empirical literature gap in the study area, we provided key inputs for decision-makers regarding selecting areas to implement the intervention policies. A limited number of papers have aimed to measure the impact associated with unemployment in the study area using rigorous methodological applications. This paper combined SEM, the treatment effect model (TEM), and the Tobit model to estimate the depth of the problem and the factors correlated with the problem. Unemployment is multidimensional and could be related to many variables in one way or another, therefore, it is imperative to examine how these multiple factors can contribute to unemployment. However, incorporating several numbers of explanatory variables as explanatory variables creates an overfitting issue. To solve this issue, Bai J. and Wang (2016) recommended using factor analysis that reduces the dimensions of the study into a few significant indexes. Incorporating the indices, according to Hoshino et al. (2023), the causal effect of unemployment and determinants of unemployment duration are estimated using the treatment effect and Tobit model, respectively. By incorporating these three models the researcher has brought new insight into the subject area.

Table 1: Summary of empirical studies on the causes and consequences of unemployment in Ethiopia, 2015–2023

Author	Title	Main point	Model used	Main results
Demissie, et al. (2021)	Graduates' Unemployment and Associated Factors in Ethiopia: Analysis of Higher Education Graduates' Perspectives	Graduate unemployment in Ethiopia	Multinomial logistic regression was used	The study revealed that demographic characteristics, curriculum, institutional characteristics, graduate characteristics, and economic and labour market conditions plays significant role. Need to design strategic directions in terms of graduates' employability output. Creating an enabling environment for employers to thrive, while higher education institutions adjust their curricula to meet the needs of employers.
Oshora et al. (2021)	Economic Growth, Investment, Population Growth and Unemployment in Ethiopia	Nexus between economic growth, investment, population growth and unemployment in Ethiopia.	Principal component (PCA) analysis	The results revealed that an increase in unemployment is positively correlated, but in the opposite direction to economic growth, investment, total population and the working-age population. On top of the rapid spread of COVID-19, the present protests as a result of the political instability and ethnic problems across the country will lead to an increase in unemployment and the loss of many lives.
Dachito et l. (2020)	The Impact of Public Education Expenditures on Graduate Unemployment: Cointegration Analysis to Ethiopia	Impact of government education spending on the rate of graduate unemployment in Ethiopia using data from 1991 to 2019.	Vector Error Correction Model	Inflation rate and expenditure on education were found to have significant impact on the long-run growth rate of graduate unemployment. While the inflation rate contributed positively, government expenditure has negative influence on the rate of graduate unemployment towards validating the Keynesian theory of employment. Besides, the impacts of both variables were found to persist in the short-run. Both are estimated significant and consistent in sign in the short-run. However, economic growth was found to have a trivial role in explaining the rate of graduate unemployment in both the short-run and the long-run periods. Moreover, the results of VEC causality analysis revealed a significant unidirectional causality running from economic growth towards public funds available for financing education; but no causality was suggested in reverse.
Tsaurai et al. (2020)	Macroeconomic Determinants of Unemployment in	Macroeconomic determinants of unemployment in	Panel data analysis (FE,	Across all the four econometric estimation methods used, the variables which were found not to be significant determinants of unemployment include information and communication technology, human capital

	Africa: A Panel Data Analysis Approach	Africa using panel data ranging from 2001 to 2015	RE, POLS, GMM)	development and infrastructural development. However, the interaction between information and communication technology (ICT) and human capital development was found to have had a significant negative influence on unemployment across all the four econometric estimation approaches. Africa is therefore urged to enhance human capital development if they intend to economically benefit from new technologies especially during the present day 4th industrial revolution otherwise their people becomes redundant. As expected, fixed effects and pooled OLS methods shows that economic growth had a significant negative influence on unemployment in Africa. It is against this backdrop that the study urges African authorities to implement growth-oriented policies if they intend to reduce unemployment in the region.
Abata et al. (2020)	The Effect of Covid-19 on Unemployment and Price Changes in Ethiopia: Evidence from Woldia Town “Does the Downward Sloping Philips Curve Hold True”	Analyze the effect of Covid-19 on the living standard of households in Woldia	OLS	The presence of valuable rise in unemployment and average price levels simultaneously and the OLS regression result disproved the applicability of Philips curve for the study area under the influence of COVID-19. While it emerged from animal hosts, currently COVID-19 continues to spread across the globe through human-to-human contact. It resulted in many socio economy impacts on the world society and deteriorates their day to day activities. Unemployment is the major manifestation of COVID-19 due quarantine requirement designed to control the spread of the virus and this indirectly creates high level of increments in the average price of consumer necessity goods. As per the descriptive and econometric analysis of this study there is high unemployment and rise in average price at a time opposed to the assumption of Philips curve.
Berihe et al. (2021)	Empirical analysis of urban youth unemployment in Ethiopia	Examine the incidences and durations of youth unemployment and their determinant factors	Logit model, a nonparametric Kaplan–Meier survival analysis and Cox hazards model are used.	Both the incidence and duration of youth unemployment is higher in urban Ethiopia. The hazards model shows that the hazard rate of leaving unemployment are significantly related to individual characteristics such as age and educational level of the youth, and labor market factors such as experience and job market information. Gender and regional disparities are observed. Young women exit unemployment much slower than men and the exit rate increases with age. Big and relatively more urbanized regions have a higher incidence and longer duration of unemployment spells than the small regions.

Gebisa et al. (2019)	Determinants of graduate youth unemployment in case of West Shoa zone, Ethiopia	Determinants of graduate youth unemployment in case of West Shoa zone	Binary logistic model	The result indicated that among the nine variables education, number of graduates, work experience, career advice, market information, family income, aspire to the low-income job, education quality, and entrepreneurship all were significantly affect unemployment rate except entrepreneurship.
Geda et al. (2022)	The Challenge of Unemployment and Youth Unemployment amidst Fast Economic Growth in Ethiopia	Youth unemployment during the fast growth period of Ethiopia, 2000-2021.	A demand based simulation	The unemployment problem is accentuated by lack of structural transformation and low or declining productivity across sectors. The probability of being unemployed is also found to be relatively higher for females and youth, compared to males and adults, respectively. Government effort to address the youth unemployment problem through the establishment of technical and vocational training schools is not helping either.
Mokona et al. (2020)	Youth unemployment and mental health: prevalence and associated factors of depression among unemployed young adults in Gedeo zone, Southern Ethiopia	Depression among unemployed young adults in Gedeo, SNNP.	A multivariable logistic regression analysis	The results of our study indicated that depression is an important public health problem among unemployed young adults in Ethiopia. Of the total study participants with depression, 56.7% had mild depression, 36% had moderate depression, and 7.3% had severe depression. Addressing the need of unemployed young people, improving access to care for depression is an important

Zewudie (2022)	Causes and consequences of urban youth unemployment in Kembata Tembaro zone, SNNPR, Ethiopia	urban youth unemployment in Kembata Tembaro zone, SNNPR, Ethiopia	Binary logistic regression model	The study findings revealed that the key causes of unemployment identified during this study includes low levels of education, lack of sufficient skills, job preferences and low job opportunities, rural to urban migration, still as misguided education policies and corruption. However, the most consequence of urban youth unemployment within the study area includes poor standards of living, psychological impact, high dependency, corruptions, suicides and dependence. Moreover, the result from the binary logistic regression model revealed that, education level of the household head, sex of the youth, age of the youth, skill match and education of the youth and access to market information had significantly and negatively influenced youth unemployment within the study area.
----------------	--	---	----------------------------------	---

Source: Own summary based on literature review (2022)

2.1 Conceptual Framework

Theoretically, there are several foundations for explaining unemployment issue during shocks like lockdowns. According to Leontaridi (1998), labor market theory can explain how lockdown can influence unemployment. The lockdowns decrease demand for labor relative to supply of labor, leading to job losses and reduced household income. Based on Strober (1990) of human capital theory, the lockdowns can interrupt skill acquisition and employment continuity, further deteriorating household economic stability. The theory of income smoothing, suggested by Copeland (1968) states that households use savings, assets, or social networks to cope with temporary income loss. Huffman (1968) of household production theory can also be used to explain shifts in household labor allocation, as members may engage in unpaid domestic work or informal sector activities to compensate for lost income. This theory suggests that households can choose to take multiple jobs during times of hardship. Besides, a household decision over various categories of employment depends on the Utility Maximization Theory (Brick et al., 1984) and Human Capital Theory (Strober, 1990). According to the Utility Maximization Theory, households consider income, job security, work conditions, and personal preferences, when deciding which jobs to pursue. The decision is then made based on the utility or satisfaction that each option provides.

According to the human capital theory, people invest in their education and skills to increase their earning potential and level of job satisfaction. If the expected utility of available jobs is less than the perceived benefits of staying unemployed, such as collecting unemployment benefits or indulging in non-market activities, households may opt to remain unemployed. The freedom it provides, the possibility of earning more money, and the opportunity to use certain talents or entrepreneurial aspirations are some reasons why people choose self-employment. The benefits, steady pay, and perceived job stability of government employment make it a desirable option for many. These decisions show how the socioeconomic context, individual preferences, and financial incentives have been balanced.

Taking these theories into account, expecting multiple dimensions of unemployment and its correlates, several factors are captured in the data collection instrument. The thorough literature review is shown in Table 1, in Ethiopia, unemployment results from a mix of demographic, socioeconomic, political, and institutional factors (see figure 1). Addressing unemployment requires coordinated, sustainable economic growth, and entrepreneurship mentality. According

to Okun's hypothesis, reducing unemployment by 1% can increase GNP by 3% (Prachowny, 1993), economic development, therefore, plays a crucial role in improving unemployment conditions. According to Carbadoet al., (2013), vulnerable populations, such as women, individuals with disabilities, and the elderly, are disproportionately affected by unbalanced economic distributions and face greater challenges in competing in the labor market, and hence deserve inclusive policy development and targeted empowerment. Standardized institutional development can gradually mitigate these disparities. Financial support, capacity development activities, and SME projects are key to reducing unemployment. Governments must foster public-private partnerships early on to improve labor market dynamics. This framework demonstrates the interconnected causes, consequences, and features of unemployment within the economy.

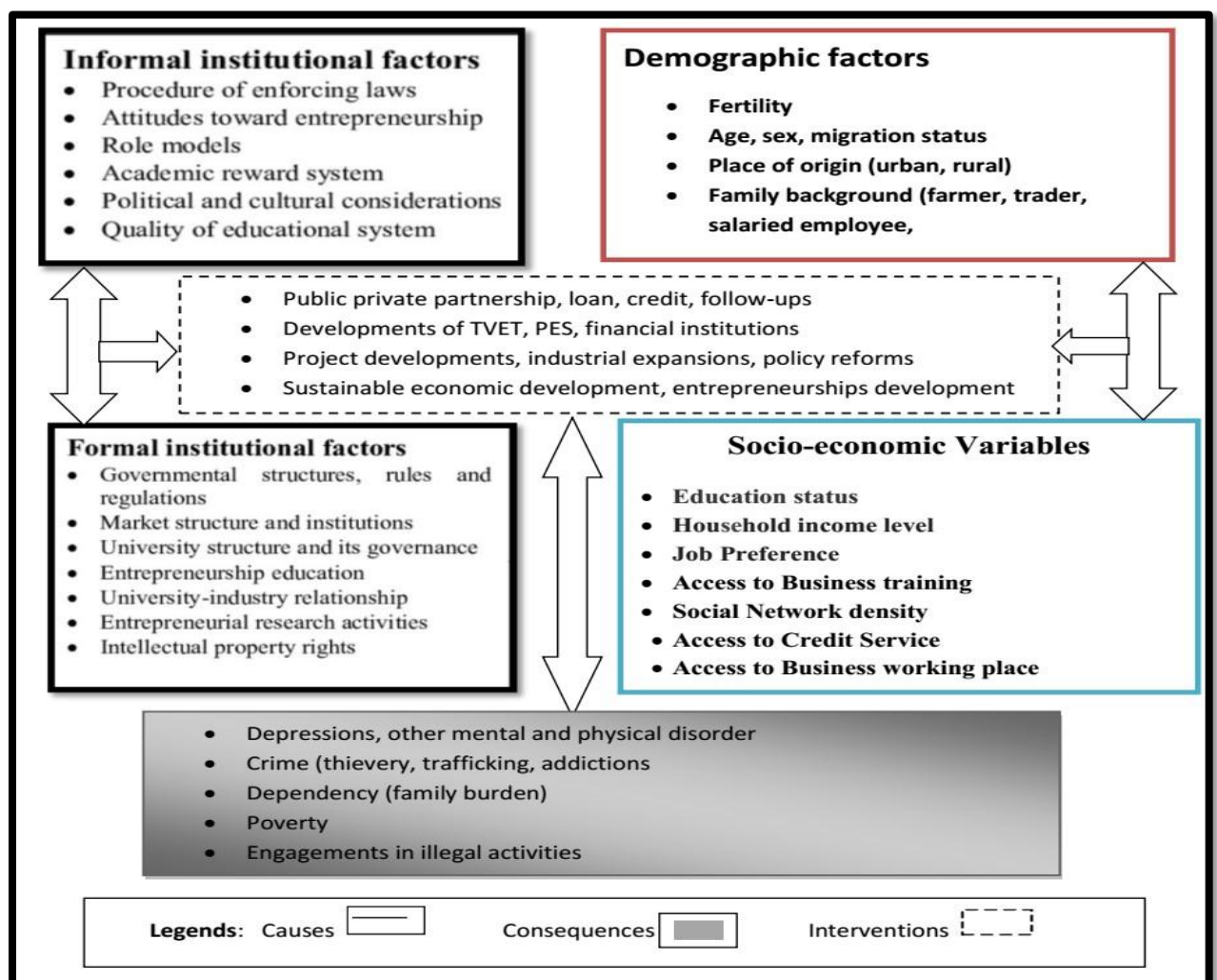


Figure. 1 Conceptual framework of demographic and socioeconomic characteristics causes of unemployment

Source: author's understanding based on literature review

3. Research Methodology

3.1 Description of the Study Area

Arsi is a zone in the central part of Oromia National Regional State. Geographically, Arsi lies between 7° 08' 58''N and 8° 49'00''N latitude and 38° 41' 55''E and 40° 43'56'' E longitude. It shares a boundary line with the SNNP region of Ethiopia and small boundary lines with Afar National Regional State. In Oromia, Arsi has the longest zonal boundary line (450 km) with East Shewa and the second longest with Bale. Arsi also shares a zonal boundary line with West Arsi and West Haraghe. Arsi's capital is Asella, a town 175 km from Finfinne (Addis Ababa) and 75 km from the town Adama and on the main road, Adama-Asella-Bale Robe. Arsi's total area is 21008 km², accounting for approximately 7% of the total area of Oromia. Arsi is subdivided into 26 rural Administrative Woredas and 1 urban administrative town.

Arsi ranges from <500 to >4245 meters above sea level (masl). The highlands above 1500 masl constitute approximately 80% of Arsi's total area; areas below 1500 masl constitute approximately 20%. Arsi's highland areas are home to more than 90% of the total human population and 80% of the livestock population and account for more than 90% of the cropland (Arsi Zone FEDO 2016). Its climatic condition ranges from cool to warm temperatures, although a slight variation is observed across the area.

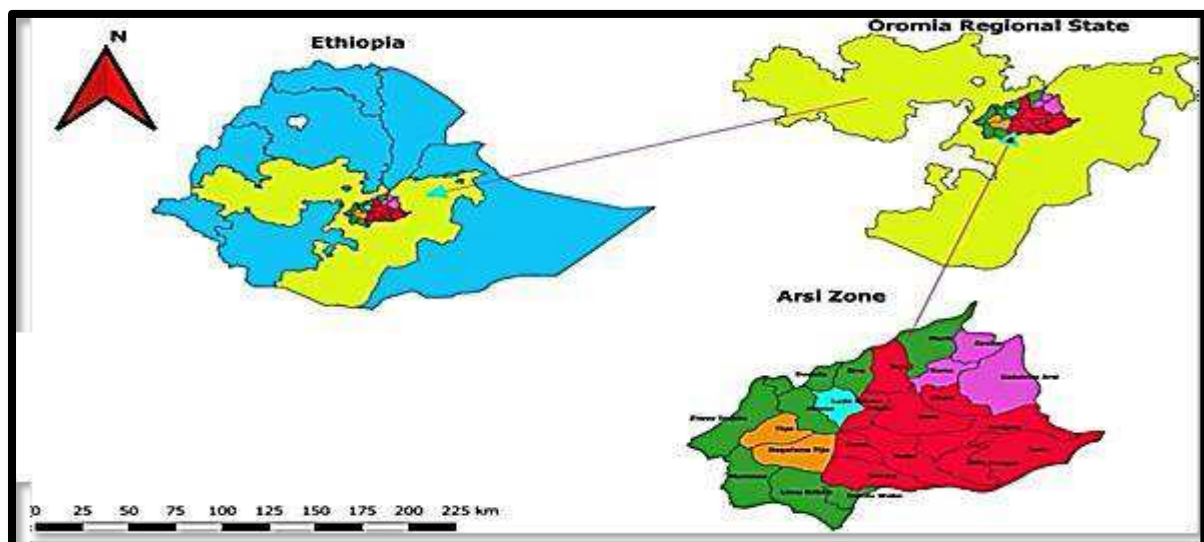


Figure. 2 Map of Arsi

According to the projection from the 2007 population and housing census, in Arsi, in 2019/20, the total population would be 3,778,465 (1,896,323 males and 1,882,142 females), and 3,255,604 would be residing in rural areas and depending on agriculture while 522,861 would be residing in urban areas. Arsi has a crude population density of 180 persons per km², indicating high population pressure on land resources. In the year 2019/20, the zone's dependency ratio was 110, 113 for rural areas and 84 for urban areas, and the average household size was 5.0 persons per household: 4.3 for urban areas and 5.1 for rural areas per household. Industrial sector development can play a crucial role in creating job opportunities for the rapidly growing labor force of Arsi by using local resources. However, this development is in the initial stage. Hence, creating sufficient job opportunities for the zone's rapidly growing youth population under the current conditions is not possible.

3.2 Research Design

In this research, we used primary data sources. Primary data sources were collected from primary respondents using survey, key informant interviews, and focal group discussions. The record audios of interview and FGD was translated and transcribed by experts. The quantitative data was cleaned carefully. Survey data with missing values and inconsistencies were automatically dropped in the database.

3.3 Sampling and Sampling Techniques

As aforementioned, this study employed both probability and non-probability sampling techniques. In the first stage, based on the size of its population and the prevalence of its unemployment problem, Arsi was purposively selected. In the second stage, seven target woredas were purposively selected based on their population and the unemployment rate in Arsi zone, covering approximately 28% of woredas in the zone. In the third stage, we selected kebeles based on their population density and economic activity. In the last stage, the target group (youth, Ethiopian definition [aged 18–29 years]) was selected from a purposively stratified population into unemployed, paid employees, and self-employed. The sample respondents were evenly distributed across gender and employment to capture gender difference in labor market. To reduce the problem of selection bias, we asked the target group to express in months their unemployment duration before they found either paid or self-

employment. Two urban kebeles were purposively selected (representing approximately 20%) based on the following: educated individuals reside in urban areas and may have left their places of origin to find employment. Last, the targeted individuals were randomly drawn from those actively seeking jobs and residing in the kebele. Sample selection was made in collaboration with kebele leaders, development agents, individuals of interest, and residents. Moreover, we had to select a sample size for the study population before selecting respondents. Accordingly, the first sampling units of the study were woredas, and the second sampling unit was the targeted population of our investigation. Many methods of sample size determination have been used. We adopted the mathematical formula developed by Cochran (1977). Accordingly, a sample size of 178 targeted populations was selected for the survey purpose from the sample of eight woredas. The sample size was calculated as follows:

$$n = Z^2(pq)/e^2$$

where

Z is the 95% level of significance,

n is the sample size of the targeted population,

p is the probability of getting a job (0.5) even ratio,

q is the probability of failure (0.5) odd ratio, and

e is the margin of error term (5%).

Proportional probability sampling techniques were applied to distribute the targeted sample across each woreda and kebele. The sampling frame used for sample selection was prepared in close collaboration with kebele leaders of sampled study areas.

Table 2: Number of samples from the studied woredas

No	Sample Woreda	Total unemployment ²	In percent	Sample taken
1	Sirka	2,837	17%	30
2	Merti	2004	12%	21
3	L/Hetosa	2313	14%	25
4	Hetosa	3060	18%	32
5	Robe	3766	23%	41
6	Sude	2660	16%	28
	Total	16,640	100%	<u>178</u>

Source: Arsi Zone (2021)

² Total unemployed youth registered at social and employment creation bureau

3.4 Methods of Data Collection

3.4.1 Enumeration survey

A questionnaire containing open-ended and closed-ended items was prepared and collected by conducting face-to-face interviews with the sample of unemployed and employed individuals. Additionally, respondents were asked to express their unemployment duration (in months). Other information collected from the respondents to characterize the unemployment situation in the study area was their demographics, behavioral information, skills, access to social medias, and socioeconomic features. Moreover, some items probed for reasons for the respondents' unemployment and the individual consequences they have experienced (at the family level). The data collection was conducted by data collectors selected from each woreda on the basis of their education level and organized by the supervisors assigned from woreda for each cluster.

3.4.2 Key informants' interview

In-depth interviews were conducted with selected informants with sufficient knowledge of the causes and consequences of unemployment. According to Hennink & Kaiser (2022), for the low layer of administrative hierarchy³, 9–17 in-depth interviews can reach saturation. Thus, this paper used 24 KII (for a population of less than 50 top administrators). Leaders from the woredas' Enterprise and Industry Development Office; Labor and Social Affairs Office; Women, Children, and Youth Affairs Office; and Administration Office were respondents. Other respondents were from Oromia's credit and saving associations, Woredas' youth association heads and experts, and other concerned bodies.

Table 3: List of key informants

S.no.	Types of Key informant	Number ³
1	Enterprise and Industry Development Office	1 from each woreda
2	Labor and social Affairs office	1 from each woreda
3	Children and Youth Affaires Office	1 from each woreda
4	Administration Office	1 from each woreda
5	Woredas youth Association heads	1 from each woreda
8	SMEs	1 from each woreda
9	Kebele leaders	16
	Total	22

Source: Own estimation based on size of the study area

3.4.3 Focus Group Discussion (FGD)

An FGD is used to obtain in-depth information and perceptions regarding the various factors responsible for unemployment and the means of survival. In this research, the participants were males and females from different age groups and demographic and socioeconomic strata. Following the recommendation of Hennink and Kaiser (2022), from four to eight FGDs of a homogenous group is sufficient to reach the saturation point in qualitative research. Ethiopia has a federal administrative structure (a top-down hierarchy as follows: state, zone, woreda, and kebele). In this paper, we focused on Arsi. The woreda Administration Office guided the participant selection. Each group comprised 12 members: 6 males and 6 females. Each FGD represented one kebele: thus, 16 FGDs in Arsi were conducted (two FGDs per woreda). In each FGD, the causes, practices, and consequences of unemployment at the social and family levels were raised and discussed. FGDs and key informants were used to collect qualitative information to substantiate the results of quantitative data collected from unemployed individuals using close-ended questionnaires.

Table 4: Focus group discussion on unemployment in Arsi

S.No.	Types of FGD	Number ⁴
1	Mixed (male, female, and youth representatives)	8
2	Mixed (poor, people with disabilities, elderly, Aba Gedas, and religious leaders)	8
	Total FGD	16

Source: Own estimation based on study area

³ The administrative structure of Ethiopia has state, zone, woreda and kebele in top down hierarchically

⁴ One FGD has 12 participants and the 16 FGD engages 192 participants

3.5 Methods of Data Analysis

Descriptive statistics such as percentages; ratios; and various types of graphs, tables, and charts were used to analyze the demographic and socioeconomic characteristics that characterize unemployment. It is after carefully addressing the Gaussian conditions like: normality test, Heteroskedasticity test, endogeneity test, multicollinearity test, and overall model adequacy tests that we applied econometrics regression. After assuring the data is free from cross-sectional problems, we moved to select the model that fits the data fairly well. Based the nature of dependent variable and likelihood ratio test, we defined Tobit model unemployment duration, logit model for dichotomous unemployment outcome and treatment effect model for impact assessment. The presence of many factors that could affect unemployment leads us to consider dimension reduction technique. According to Usakli et al., (2023) Covariance Based Structural Equation Modeling (CB-SEM) is preferable over variance-based SEM (PLS-SEM) when the residual has a normal distribution pattern, multiple latent variables, large sample size, and no multicollinearity. Taking this into account, the researchers applied Confirmatory Factor Analysis (CFA) and SEM to develop latent variables, also called indexes, from various indicators affecting unemployment. CFA was used to select appropriate number of variables based on Kaiser–Meyer–Olkin (KMO) and Bartlett’s test. Certainly, variables with loading of 0.3 and below are made to be dropped automatically and solutions are estimated based on the varimax rotation method. Taking these conditions into account, the study applied CB-SEM as a suitable model. In the first step, the study applied dimension reduction with the concept of large factor model as (eq1):

$$X_i = \lambda_i' L_i + e_i \quad (eq1)$$

Where;

X_i	Observed variable
L_i	Vector of latent variable
λ	Unknown factor loading
e	Idiosyncratic error term

The model estimated behavioral indexes, unemployment severity indexes, and satisfaction and dissatisfaction indexes associated with employment and unemployment. Based on the result of

this step, SEM model has been developed to estimate the coefficient of exogenous and endogenous variables using the following equation (eq2).

$$y^* = \beta + \tau\xi + Ax + \varepsilon \quad (eq2)$$

Where;

y^*	is the latent endogenous variables,
β	is constant term
τ	is the exogenous latent variable,
ξ	is the factor loading for exogenous latent variable
A	is the matrix of latent loadings for endogenous variable
x	is the endogenous variable, and
ε	is the endo-syncretic error term.

The reduced form of above equation (eq2) can be written as

$$Y = XB + V \quad (eq3)$$

Where:

Y	Matrix of endogenous variables
X	Matrix of exogenous variables
B	Matrix of reduced form parameters
V	Matrix of error terms

In the next step, incorporating newly created index variables of the first step in to account, the impact of unemployment was measured using a propensity score matching model. In this case, the outcome variables were, reduced productivity, increased drug use and crime, and reduced family income. The dependent variable is a dummy variable with the value 1 for employment and 0 for not yet employed. In the case of binary treatment of the program, the treatment indicator D_i equals 1 if individual i stays more than n months before obtaining employment and 0 otherwise. In the context of this study, the treatment group refers to individuals who have employment, and the control group refers to individuals without formal employment. The potential outcomes are then defined as

$Y_i(D_i)$ for each individual i , where $i = 1, 2, 3, \dots, n$; then, the treatment effect of individual i can be expressed as (eq4):

$$T_i = Y_i(1) - Y_i(0) \quad (eq4)$$

The TEM is used only to assess the potentially observable outcome of each individual and can cause counterfactual problems owing to the presence of other unobservable characteristics of the individual, known as counterfactual outcomes. Therefore, the estimation of individual treatment effects T_i is not possible, and the average processing effect for processed (ATT) occurs and is reported as (eq5):

$$\tau_{ATT} = E(\tau|D = 1) = E[Y(1)|D = 1] - E[Y(0)|D = 1] \quad (eq5)$$

Therefore, the counterfactual mean for those being treated, represented by $E[Y(0)|D = 1]$, is not observed. Referring to Clements et al. (2015) and using further manipulation, we therefore have the following expressions to reduce the problem:

$$E[Y(1)|D = 1] - E[Y(0)|D = 0] = \tau_{ATT} + E[Y(0)|D = 1] - E[Y(0)|D = 0] \quad (eq6)$$

τ_{ATT} is so-called “self-selection bias”; then, the true parameters of τ_{ATT} are only identified if $E[Y(0)|D = 1] - E[Y(0)|D = 0] = 0$. By rearranging the expected income difference between treatment and control group, we have

$$E[Y(0)|D = 1] - E[Y(0)|D = 0] = 0 \Rightarrow \tau_{ATT} = E[Y(1)] - E[Y(0)] \quad (eq7)$$

The common support region given by range is $0 < P(D = 1|X) < 1$, and ultimately, the general PSM model follows the following specification:

$$\tau_{ATT}^{psm} = E_{P(X)|D=1} \{ E[Y(1)|D = 1, P(X)] - E[Y(0)|D = 0, P(X)] \} \quad (eq8)$$

This result shows that PSM estimator is simply the mean difference in outcomes over the common support region, appropriately weighted by the propensity score distribution of participants.

$$Z_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \dots + \beta_{15} X_{15} + U_i \quad (eq9)$$

where Z_i is a function of explanatory variables X_i and $i = 1 \text{ ---- } 15$, which may be represented as

X_i - sex of the explanatory variables supposed to affect employment status

Z_i - employment status of households

Finally, Tobit model (TM) was used for the duration of unemployment. By referring to Gujarati (2004), the TM can be described by the likelihood function given a dummy variable D_i that takes 1 if $y_i > 0$. Unobserved employment status is calculated using standard employment periods for being employed and unemployed. To examine the determinants of unemployment, we used unemployment duration as a proxy. The variable is expected to yield ongoing results based on the individual's length of unemployment before employment. The unobservable state of unemployment is described using a probability function based on the latent variable as follows:

$$\begin{aligned} L_i &= \frac{1}{\sigma} \phi\left(\frac{y_i - \beta_0 - \beta_1 x_i}{\sigma}\right) & \text{if } y_i^* > 0 \\ &= 1 - \Phi\left(\frac{\beta_0 + \beta_1 x_i}{\sigma}\right) & \text{if } y_i^* \leq 0 \end{aligned} \quad (\text{eq10})$$

We let D_i be a dummy variable that takes 1 if $y_i > 0$. Then, the aforementioned likelihood for consumer i (eq10) can be written as

$$L_i = \left[\frac{1}{\sigma} \phi\left(\frac{y_i - \beta_0 - \beta_1 x_i}{\sigma}\right) \right]^{D_i} \left[1 - \Phi\left(\frac{\beta_0 + \beta_1 x_i}{\sigma}\right) \right]^{1-D_i} \quad (\text{eq11})$$

The log specification of the aforementioned L_i equation can be written as (eq12):

$$\begin{aligned} L(\beta_0, \beta_1, \sigma) &= \sum_{i=1}^n D_i \log \left[\frac{1}{\sigma} \phi\left(\frac{y_i - \beta_0 - \beta_1 x_i}{\sigma}\right) \right] + (1 - D_i) \log \left[1 - \Phi\left(\frac{\beta_0 + \beta_1 x_i}{\sigma}\right) \right] \\ &= \frac{N}{2} [\log(\sigma^2) + \log(2\pi)] + \\ &\quad + \sum_{i=1}^n D_i \left[-\frac{(y_i - \beta_0 - \beta_1 x_i)^2}{2\sigma^2} + (1 - D_i) \log \left[1 - \Phi\left(\frac{\beta_0 + \beta_1 x_i}{\sigma}\right) \right] \right] \end{aligned} \quad (\text{eq12})$$

4. Results and Discussion

4.1 Descriptive results

The researchers conducted a cross-tabulation of youth employment status against various socio-economic indices and indicators derived from factor analysis, and employed the Bonferroni test to identify significant categories [5]. The findings reveal a notable difference in political career preference between paid employees and self-employed individuals: none of the self-employed youth (0%) expressed an interest in a political career, whereas about 40% of those with a paid employment mentality did. Additionally, 66% of youth with paid employment mentality prefers securing paid jobs, while only 8% of self-employed youth share this preference, compared to 26% among paid employees.

Academic qualifications show a distinct pattern: those with lower qualifications (Grade C) are more likely to be unemployed (67%) than those with higher qualifications (Grade A), who have a lower unemployment rate (48%) and a higher likelihood of being in paid employment (33%). Grade A individuals tend to prefer securing paid employment (40%), while Grade C individuals are more inclined to start their own business (50%). Similarly, language and computer skills affect employment status, with lower skills linked to higher unemployment (64% and 63%, respectively) and medium skills associated with varied employment categories. The degree of job search effort has a minimal impact on unemployment rates, which remain similar between low and high levels (64% and 67%).

High levels of addiction, dissatisfaction, and involvement in crime correlate with unemployed youth though high level of corruption mentality is observed in youth having paid employment mentality (80%). Majority of youth having entrepreneurship mentality have high level of family favoritism (90%). High nepotism forces youth into unemployment (5%) and self-employment (29%). Rural youth prefer self-employment over paid jobs, while urban youth favor paid employment over self-employment. Youth with low social communication and networking skills are less likely to be self-employed (7%). About 87% of self-employed youth

⁵ According to Simes (1986), Categories sharing at least one subscript are not significantly different, whereas categories with different subscripts are significantly different at the specified significance level.

have high level of social and communication network. Those with a high corruption mentality are more inclined to seek paid employment (27%) compared to pursuing a business career (7%). Youth with an entrepreneurial mindset tend to avoid misconduct (0%) and are less likely to develop a corruption mentality (7%).

Table 5: Cross-Tabulation stats

Variable	Categories	Column percent			Total
		Unemployed	Self-employee	Paid employee	
Political career preference (PCP)	no	70 _a	19 _a	11 _a	100.00
	yes	60_{a, b}	0_b	40_a	100.00
Business career preference (BCP)	no	74 _a	11 _a	16 _a	100.00
	yes	64 _a	15 _a	21 _a	100.00
Paid employment preference (PEP)	no	69 _a	31 _a	0 _a	100.00
	yes	66_{a, b}	8_b	26_a	100.00
Academic qualification	grade c	67 _a	24 _a	10 _a	100.00
	grade b	83 _a	8 _a	8 _a	100.00
	grade a	48_a	19_{a, b}	33_b	100.00
Language	low	64 _a	19 _a	17 _a	100.00
	medium	70 _a	0 _a	30 _a	100.00
Computer skill	low	63 _a	14 _a	23 _a	100.00
	medium	71 _a	29 _a	0 _a	100.00
The degree of job search	low	64_{a, b}	0_b	36_a	100.00
	high	67 _a	0 _a	33 _a	100.00
Family favoritism	low	77 _a	5 _a	18 _a	100.00
	high	55_a	29_b	16_{a, b}	100.00
Addiction	high	72 _a	20 _a	8 _a	100.00
	medium	45_a	15_{a, b}	40_b	100.00
	low	100 _a	0 _a	0 _a	100.00
Depression	high	68 _a	3 _b	29 _a	100.00
	medium	67 _a	33 _a	0 _a	100.00
	low	50 _a	50 _a	0 _a	100.00
Sex	female	57 _a	21 _a	21 _a	100.00
	male	67 _a	16 _a	16 _a	100.00
Birth	rural	70_{a, b}	30_b	0_a	100.00
	urban	62_{a, b}	11_b	27_a	100.00
Social communication and networking	high	67 _a	24 _a	9 _a	100.00
	low	65_{a, b}	4_b	30_a	100.00
HAPPINESS	happy	50 _a	27 _a	23 _a	100.00
	not happy	81_a	4_b	15_{a, b}	100.00
Corruption mentality	no	60_{a, b}	32_b	8_a	100.00
	yes	67_{a, c}	7_b	27_a	100.00
Misconduct	low	62_a	0_b	38_c	100.00
	high	66 _a	34 _b	0 _c	100.00

Note: Each subscript letter denotes a subset of employment categories whose column proportions do not differ significantly from each other at the .05 level.

Source: Own analysis (2024)

4.2 Reasons for unemployment

Although the causes of unemployment are multifaceted, there are notable differences between the causes of paid employment and self-employment. Paid unemployment is predominantly driven by factors such as the lack of sustainable economic growth, accounting for 58%, and the socioeconomic and political instability within the country, which contributes to 27%. On the other hand, self-employment struggles are primarily due to a shortage of financial resources needed to start new businesses, which affects 64.24% of potential entrepreneurs. In Ethiopia, government is following tight monetary policy that forced financial institutions to stop providing loans. Microfinance institutions are not performing well due to poor loan payment performance and high interest rate. Therefore, business entrepreneurship need to be baked up by especial credit program apart form other financial institutions.

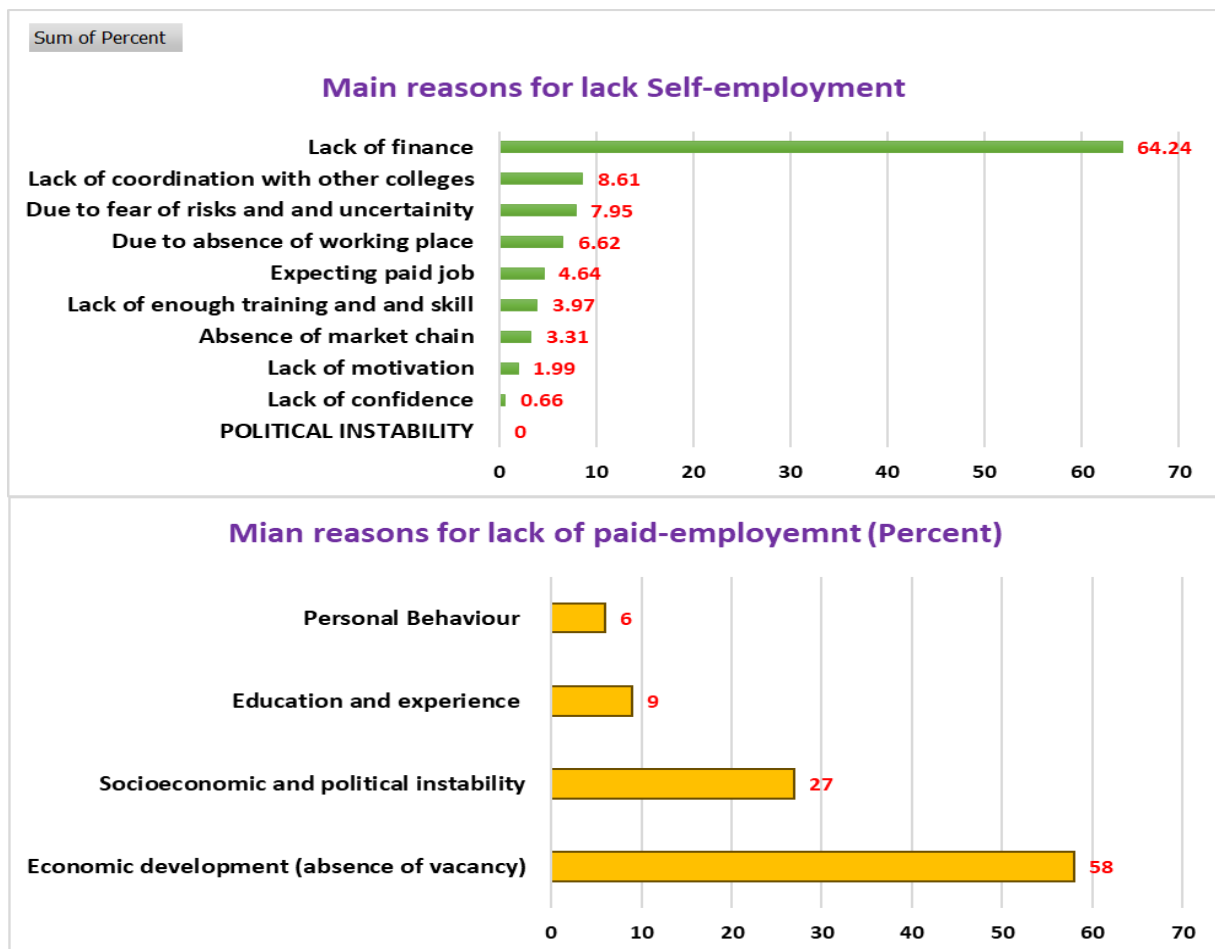


Figure. 3 Reasons for unemployment

4.3 Impact of individual behavior on unemployment

The likelihood of obtaining a job directly depend on behavior. The respondents rated the behavioral variables they perceived to represent their behavior most. Based on their responses, respondents were classified⁶ into one of three groups of graduates Grades A, B, and C using SEM. Graduates in Grade_B were 20% more likely than those in Grade A to obtain self-employment quickly. Graduates in Grade_C found self-jobs 40% more quickly than those in Grade_A did. Overall, graduates in Grade_A wanted to secure permanent paying jobs and were less likely to become entrepreneurs than those in Grades B and C. The graduates in Grade A were risk averse, preferred routines, were hard workers, performed jobs thoroughly, and wanted secure paid jobs. More surprisingly, in Arsi, individuals who quickly engaged in politics obtained a job four times faster than the best academic performers (see figure 3).

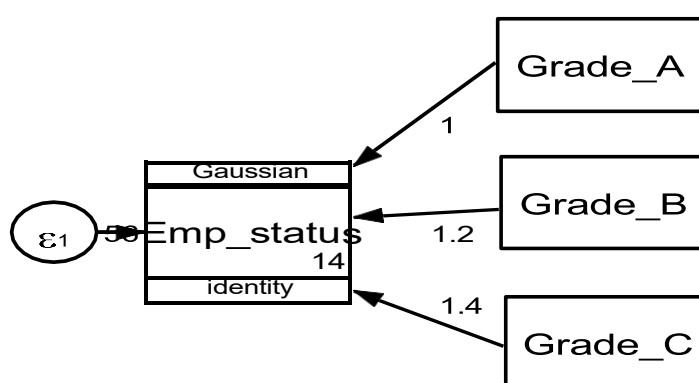


Figure. 4 Relationship between behavior and employment

The impact of education on self-employment is inconclusive and depends on economic development of the country and targeted employment training. Ghasi et al. (2021) found that higher entrepreneurship training, rather than higher education level, increases the likelihood of becoming self-employed, whereas Kangasharju et al. (2002) concluded that higher education decreases the propensity for self-employment, confirming the result of this study, and most

⁶ Note: Grade_A is the work-minded group who wants to secure fixed monthly salaries (they prefer routines and are perfectionists), Group_B is business-minded individuals or entrepreneurs (i.e., they are confident, take calculated risk, are creative, and plan). Group_C is politicians who are passionate, bold, talkative, and academically poor.

highly educated people prefer paid jobs for the security reason. Youth makes decision between paid and self-employment based on relative expected return associated with each alternative. According to Burchell et al (2019) in countries often characterized by limited formal employment opportunities, a large informal sector and depressed local labor markets, self-employment can be seen as the only realistic way many young people can generate an income. youth self-employment in developing countries often serves as a coping mechanism rather than a true entrepreneurial pursuit, offering limited economic and social benefits. Therefore, self-employment depends on trained behavioral entrepreneurship mentality of young people.

4.2.1 Impact of unemployment on health

Unemployment distorts the healthy functioning of the economic system and the natural laws of Economics. It creates unbearable costs to individuals, society, and the economy. Among many aspects, health disorders are one of many consequences that can occur during unemployment. The data shows that the unemployed experience more mental and physical health disorders than the employed. For some youth, unemployment increases the risk of addiction, anxiety, severe depressive disorder, and hospitalization. The result of this study also consistent with the findings of Amir (2022) who identified that youth unemployment exposes them to addiction, anxiety, depression and reduces the chance of self-employment very significantly.

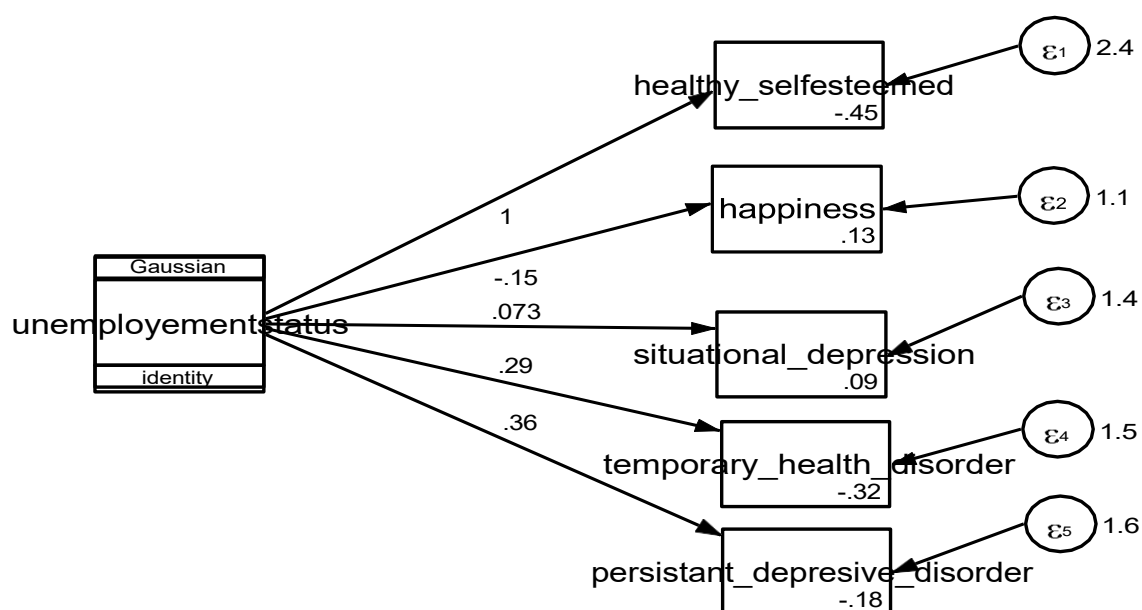


Figure. 5 Consequences of unemployment on health

Source: Own survey from Arsi zone (2021)

Unemployment raises the probability of youth experiencing situational depression (7.3%), a temporary health disorder (29%), and persistent depressive disorder (36%). Accordingly, most unemployed youth are at risk of persistent depressive disorder. As the duration of unemployment increases, the problem increases in severity, and many of these individuals experience addiction, loneliness, and worthlessness and pass their time watching movies and talking with friends. Additionally, groups other than the unemployed experience such health disorders. For example, the employed might experience situational unemployment problems and feel unhappy about their employment condition and working environment. The results of the interviews in Arsi reveal that “being employed does not always guarantee happiness, and many are feeling underemployed and having a lower than expected return,” creating dissatisfaction with the current employment status. On average, see figure 4, unemployed individuals are 0.15 times unhappier than healthy individuals. Although both the employed and unemployed might feel unhappy in their current situation, the former feels less unhappy than the latter.

4.2.2 Involvements in crime

Unemployment and related socioeconomic chaos influence the likelihood of committing crimes as a means of subsistence (e.g., unemployed and poor and desperate individuals) or for betterment and affluence (usually employed individuals). The two groups differ, and their degrees of involvement depend on the strength of various working institutions. Figure 5 reveals that employed individuals are more likely to be involved in corruption and illegal money creation than their counterparts. And the former has more of a corruption mentality than the latter. However, unemployed individuals also commit crimes and are, thus, punished, for example, by imprisonment.

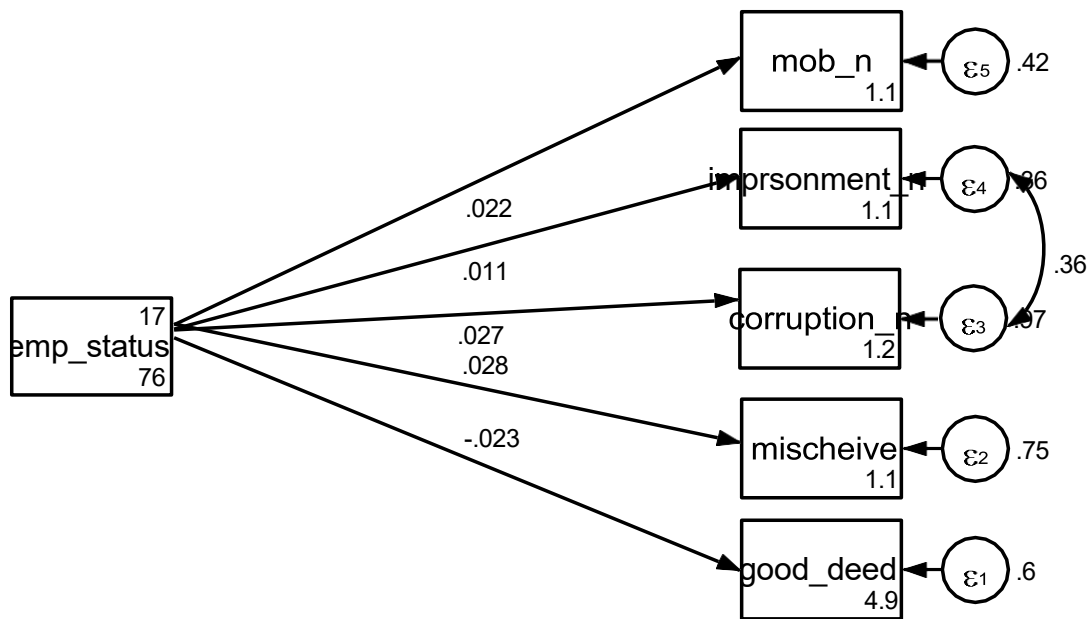


Figure. 6 Degrees of involvement in crime

Source: Own survey based on data from Arsi zone (2021)

Unemployment increased corruption mentality by 2.7% and reduced good deeds by 2.3%. Therefore, being unemployed can increase the risk of committing crimes but is not a significant driver. The result of this study is supported by Omboi (2020) who identified that youth unemployment leads them to violent crime; while low salary and culture of per-diems are developing corruption mentality of the paid employees in Africa.

4.3.1 Factors determining unemployment

Determinants of unemployment were identified using principal component analysis, truncated regression, and binary models. Initially, with the help of principal component analysis, various indexes were developed for a series of multiple-response questions designed for each theme. Based on the result of Table 5, regression models were implemented to determine the strength and directions of the determining factors. We posed a hypothesis based on our theoretical and empirical literature review. Accordingly, the results showed that income was negatively (and significantly) associated with the unemployment duration after paid employment. Two possible reasons for this finding are as follows: First, an increase in income will lead to growth and job creation through multiplier and trickle-down effects. Second, private individuals (private sectors) require a higher income for business creation, promoting additional employment

opportunities. In addition, income was a nonsignificant factor in the unemployment durations of entrepreneurs (who had been previously unemployed).

Table 6: Marginal effect after Tobit, probit, and OLS models

Determinants of unemployment	(Tobit model)	(Tobit model)	(Probit model)	(OLS)
Variables	Unemployment duration for self-employment	Unemployment duration for paid-employment	Unemployed	Unemployment duration
Income	-0.000156 (0.000108)	-0.000183* (9.31e-05)	-1.03e-05 (1.89e-05)	7.243** (3.238)
Academic skill	-5.256*** (1.536)	-0.560 (0.834)	0.107 (0.275)	-5.226 (3.497)
Experience	-0.203 (0.721)	-1.548** (0.667)	-0.423* (0.248)	-2.559 (3.649)
Health/wellness	-2.827*** (0.994)	-0.539 (0.660)	0.453** (0.188)	-0.219 (2.386)
Leisure time	-3.207*** (0.926)	3.404** (1.278)	-0.695* (0.378)	1.152 (4.018)
Age	-0.131 (0.331)	-0.0511*** (0.0189)	0.0601 (0.107)	-0.0615* (0.0351)
Education	-0.144 (0.412)	0.753* (0.373)	-0.126 (0.0882)	-1.012 (0.869)
Level of social network	0.843 (2.310)	-3.360* (1.724)	0.452 (0.506)	3.290 (4.560)
Happiness/pursuing happiness	-0.621 (1.982)	-0.324 (1.207)	0.756** (0.325)	5.917 (3.463)
Crime/illegality	-0.841 (0.773)	-0.278 (0.583)	-0.217 (0.205)	-2.157 (3.085)
Gender	-0.101 (1.852)	-0.191 (2.234)	0.613 (0.536)	-5.740 (6.397)
Birth place (1=R, 2=town, 3=city)	-10.53** (4.989)	-1.638 (1.601)	-1.723*** (0.544)	-24.79*** (8.067)
Residential area (1=R, 2=town, 3=city)	11.37*** (4.059)	2.968 (2.946)	0.0504 (0.512)	21.34** (8.932)
Marital status (1=S,2=M,3=W)	5.473** (2.411)	1.888 (2.173)	-1.043* (0.626)	-8.960* (5.165)
Unemployment duration for self and paid)	6.516** (2.880)	18.11** (6.982)		
Constant	-16.98** (8.257)	-9.281 (6.706)	3.887* (2.024)	-32.33 (30.46)
Observations ⁷				

⁷ The model is applied sub-sample regression based on the nature of dependent variable. Accordingly, the value of dependent variable can be employed (with no duration of unemployment), unemployment duration for paid

	53	53	53	38
R-squared				0.560

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Study result (2021)

The other critical concern is that academic skills were critical in reducing the unemployment duration of the self-employment group, and experience was important in reducing the unemployment duration of the paid employment group. Table 5 shows that the degree of wellness reduced (significantly) the duration of self-unemployment. Moreover, high leisure time reduced the duration of unemployment before the individual became self-employed but tended to increase (significantly) the duration of unemployment (before the individual obtained paid employment). These results imply that leisure time increases the likelihood of creating self-employment and decreases the opportunity of obtaining paid employment. Age of the respondent significantly reduced the unemployment duration (especially for individuals inclined to paid employment); this result implies that unemployment is more associated with being a youth than being an elderly individual.

Education tended to increase the duration of paid unemployment. This phenomenon might have occurred because “more educated individuals are job seekers than less educated individuals”; thus, the former tend to wait longer than the latter until they find paid employment. This phenomenon is mostly true for individuals who have a low CGPA. The level of an individual’s social network significantly reduced the duration of paid employment. This finding implies that socially connected individuals (graduates) can find more paid jobs than those who are not. Pursuing happiness increases the chance of being unemployed. Being born in big cities is much more important in reducing the duration of self-unemployment and unemployment. However, migrating to big towns and cities (those living outside their birthplace are affected by the residential coefficient) increases the duration of unemployment and self-employment. In addition, urban residents have a higher duration of unemployment than rural and town residents.

employee (the number of periods the paid employee remained unemployed before finally finding paid job), and unemployment duration for self-employment (the number of period the person remained jobless before he decided to start its own self-employment).

The marital status of the respondents was significant in determining unemployment. The death of a spouse increased the duration of self-unemployment (meaning individuals waited too long before opening their business after the death of their spouse). However, the death of a spouse can also motivate widowers to obtain other types of unemployment relatively quicker than single individuals. The other important drivers were the expected duration of unemployment before opening a business and obtaining paid jobs. On average, individuals waited 6.5 months and 18.1 months before self-employment and paid employment, respectively. Therefore, rather than waiting for paid jobs, the recommendation to start a business of any type.

4.3.2 Impact of unemployment on income

Using the TEM, we estimated the impact of unemployment on average and potential income earned. The model showed the income gap between individuals who were employed and unemployed.

Table 7: Treatment effect of unemployment on income

The impact of unemployment	(Average treatment effect)	(Potential outcome mean)	(outcome mean effect of employed)	(outcome mean effect of unemployed)
Outcome independent	ATE	POmean	OME0	OME1
Individual flexibility			6.354*** (1.422)	6.676* (3.926)
Individual skills			4.870*** (684.6)	-619.1 (5.800)
Non-academic experience			-1.243*** (265.1)	14.326*** (3.482)
Health disorder			-4.230*** (511.0)	2.147 (3.065)
Leisure time			-12.831*** (2.318)	3.759 (2.934)
Age			971.3*** (163.9)	1.773*** (416.9)
Education			2.421*** (270.2)	-3.159*** (1.061)
Level of social network			10.840*** (1.472)	4.113 (3.457)
Happiness (happy life)			-2.508** (1.189)	-3.357 (5.587)
Illegality			-3.712*** (450.6)	2.270 (1.693)
Unemployed vs employed	-260.0 (5.110)			
Employed		6.513** (2.756)		

Observations	27	27	27	27
--------------	----	----	----	----

Robust standard errors in parentheses

*** p<0.01. ** p<0.05. * p<0.1

Source: Study Result (2021)

As shown in Table 7, employed individuals received approximately ETB 260 per month more income than unemployed individuals. When unemployed, the average loss per person was ETB 260 per month. In this framework, for 2021, if all unemployed individuals of Arsi (10,694) had been employed, the zone could have earned a total income of ETB 34 million per year (Table 8).

Table 8: Estimated total population, unemployment, and income lost as a result

Total population of Arsi zone	Total population of active working labor force	Estimated unemployed person as of last year	Total income those unemployed people could have generated per month	Total income those unemployed people could have generated per year
3743013	1497205	10694	Birr 2,780,524	Birr 33,366,291

Source: Own estimated based on CSA (2021) and treatment output

As shown in Table 7, skilled and experienced employed workers were the group most likely to earn a high income. The income of unemployed individuals increased based on non-academic experience and skills, individual flexibility, and age. For employed individuals, the opportunity to increase earnings was significantly and positively affected by individual flexibility, skill, age, education, and level of social network, and health disorders, leisure, illegality, and happiness were negatively (and significantly) related to their income. Table 5 also reveals that education is one of the main causes of unemployment/poverty; thus, higher education is yielding neither an equivalent level of income nor fruitful results. Unexpectedly, employed individuals were more likely to be involved in crime and illegal activities (especially low-income earning individuals) than unemployed individuals.

4.3.3 Impact of unemployment on health

The treatment model also shows that unemployed individuals experience health disorders more frequently than employed individuals. Using the TEM, we estimated the average health level difference between unemployed and employed individuals and observed that unemployed individuals experienced health disorders (hospitalized) 20.6% more frequently than employed individuals. As shown in Table 9, income, leisure time, and motivation positively and significantly contributed to the wellness (health) of employed individuals, and unemployment status of individuals deteriorates the health condition of these individuals (significantly). In addition, the absence of jobs significantly deteriorated the health condition of unemployed individuals.

Table 9: Consequences of unemployment on health disorders

Health model	(Average treatment effect)	(Potential mean effect)	(Observed mean of employed)	(observed mean of unemployed)
Variables	ATE	POmean	OME0	OME1
Income			2.96e-05***	8.37e-06
			(1.07e-05)	(1.28e-05)
Welfare (measured in terms of expenditure)			-0.355***	-0.0901
			(0.0952)	(0.169)
Addiction time			0.258	-0.0919
			(0.275)	(0.140)
Working time			-0.375*	-0.604**
			(0.191)	(0.288)
Leisure time			0.291*	0.117
			(0.169)	(0.232)
Crime index			0.0210	0.285
			(0.141)	(0.417)
Age			0.0700	0.000402
			(0.0706)	(0.00372)
Education			0.132	-0.00756
			(0.0810)	(0.0839)
Gender			-1.156***	-0.108
			(0.354)	(0.596)
Dependency level			-0.406	-0.216
			(0.823)	(0.474)
Lack of motivation			0.315**	-0.177
			(0.138)	(0.242)
Lack of finance			0.157	-0.0566
			(0.145)	(0.144)
Level of social network			-0.519	0.130
			(0.401)	(0.257)

Happiness			0.0183	-0.403
			(0.215)	(0.415)
Corruption mentality			0.324	0.0630
			(0.227)	(0.454)
Unemployed vs employed	-0.216			
	(0.635)			
Employed		-0.630		
		(0.532)		
Constant			-2.798	-1.095
			(2.446)	(1.094)
Observations	52	52	52	52

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Own study result (2021)

Based on the current scenario and Table 8, employed individuals were neither healthy nor feeling positive (not happy) about their living conditions.

4.3.4 Consequences of unemployment on crime

Crime involves the violation of civil laws, subjected to penalties imposed by government authorities. According to FGD conducted across various districts in the Arsi zone, the study area, most unemployed youth face significant challenges in starting their businesses. Many cannot support profit-generating ventures due to low income, and these difficult living conditions have driven them, often unwillingly, into activities such as armed gambling, robbery, arson, theft, kidnapping, fraud, bribery, public disorder, smuggling, drug abuse, and similar offenses. As shown in Table 10, employed individuals were more inclined to participate in illegal activities (crime) than unemployed individuals. With an average treatment effect of (-0.63), employed individuals were 63% more likely than unemployed individuals to break laws and regulations. The reason for this finding may be that because civil servants in Ethiopia receive a lower return from their jobs than from underground activities (in short cut), they choose the latter to increase their quality of life.

Table 10: Consequences of unemployment on crime

Crime (illegal) model	(Average treatment effect)	(Potential mean effect)	(Observed mean of employed)	(observed mean of unemployed)
Control variables	ATE	POmean	OME0	OME1
Income			3.11e-06	8.96e-06
			(3.70e-06)	(5.48e-06)
Welfare			-0.0403	-0.0794
			(0.0951)	(0.0533)
Addiction time			-0.0133	-0.0443
			(0.206)	(0.0616)

Leisure time			-0.201	0.430***
			(0.200)	(0.144)
working time			-0.288***	-0.231***
			(0.102)	(0.0829)
Age			-0.0324	-0.00487***
			(0.0313)	(0.00141)
Education			0.0597	0.0327
			(0.0633)	(0.0366)
Gender/Male			0.00493	0.789***
			(0.291)	(0.207)
Dependency level			0.983	0.397
			(0.669)	(0.278)
Lack of motivation			0.260	-0.0524
			(0.181)	(0.106)
Lack of finance			0.242**	-0.104
			(0.104)	(0.128)
Level of social network			-0.375	-0.198
			(0.329)	(0.150)
Happiness			0.0620	0.397**
			(0.146)	(0.187)
Corruption mentality			0.542***	0.877***
			(0.138)	(0.143)
Unemployed vs employed	-0.634			
	(0.492)			
Employed		1.151***		
		(0.439)		
Constant			1.302	-0.778
			(1.368)	(0.540)
Observations	54	54	54	54

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Study result (2021)

As shown in Table 9, unemployment was positively and significantly related to leisure time, being male, pursuing happiness, and a corruption mentality but was negatively and significantly associated with the absence of working time and being young. The older the age, the lower likelihood of committing crimes (illegal activities). Similarly, insufficient finances to start a new business (to improve the quality of life) and a corruption mentality were drivers for employed individuals to commit crimes (participate in crime). By contrast, being busy at work (higher working time) limited the time for employed individuals to commit crimes (illegal activities).

5. Conclusion and Recommendations

5.1. Conclusion

Unemployment is a critical concern in Arsi. This paper examined the impact of youth (aged 19–34 years) unemployment by using cross-sectional data collected from respondents in Arsi in 2020/2021. The demographic and socioeconomic surveys were mainly conducted in the woredas of Lode Hetosa, Sirka, Sude, Arsi Robe, Hetosa, and Merti in Arsi. Descriptive statistics and econometric models were used to signify the depth of the problem in the study area. We used stratified random sampling to select 178 respondents.

In Arsi, youth choose self-employment only when a paid job is not available (46.97%). The insufficient job creation (economic factors) of this zone is the main cause of insufficient jobs. This result suggests that the current economic situation of Ethiopia cannot create a sufficient and equal number of jobs for all graduates. Although 28.79% of the youth prefers self-employment to wage jobs, financial deprivation (absence of credit) is a major factor restricting self-employment. In addition, without a workplace, obtaining credit, the fear of risk and low performance, and the expectations of paid employment are substantial drivers roles in rejecting self-employment. Students with good academic achievement are observed to prefer paid employment, preferring secured and less risky earning while those students with low grade “grade C” have high tendency of pursuing their own job.

Corruption is a major obstacle to employment in Arsi. For paid and self-employment jobs, workers are demanded to pay high “facilitation fees” and bribes. In addition, discrimination, misconduct, and unnecessary bureaucracy have driven many individuals into unemployment. The degree of misconduct varies across employment status wherein youth having high paid employment preference are more inclined to develop corruption mentality and less likely to start their own self-employment venture. Majority of people operating self-employment tends to favor their family than hiring non-relative job seekers.

Behavioral factors play a critical role in motivating and discouraging individuals regarding self-employment. Those youths with an entrepreneurship mentality were less likely to be unemployed than those who were work minded. Individuals with a political mentality are more likely to find jobs than entrepreneurs and academicians. In addition, individuals with higher-level academic and non-academic skills such as languages, various trainings, and knowledge

of basic computer and statistical application software were less likely to be unemployed than those with such qualifications.

Information plays a critical role in self-employment creation and matching jobs with job seekers. People with low communication and networking are less likely to start self-employment. Although the existing job search system does not bring significant contribution on finding job, the youth with paid mentality uses websites, newspapers, and personal contacts and relationships are the top three sources of job information that helped the job applicant find jobs in the area. On average, individuals waited 6.5 months and 18.1 months before starting self-employment and paid employment, respectively.

Unemployment creates unbearable costs to individuals, society, and the economy. Our findings show that unemployed individuals are more likely to experience persistent depression, situational depression, mental and physical health disorders, and be involved in crime for the betterment of life than employed individuals. Unemployment had a significant impact on reducing income. When unemployed, on average, a given individual loses ETB 260 per month, and with this framework, for 2021, if the unemployed individuals in Arsi (10,694) had been employed, the zone could have earned a total income of ETB 34 million per year. The TEM showed that unemployed individuals experience health disorders (hospitalization) 20.6% more frequently than employed individuals. By contrast, income, leisure time, and motivation positively and significantly contributed to the wellness (health) condition of employed individuals.

5.2 Recommendation

Based on our results, our recommendations are as follows: Government should focus on attracting high employing productive private sectors investment, though attractive incentive mechanisms. The government of Ethiopia should enact, support and enforce youth centered credit and financial institutions that can accommodate young graduates with the necessary skills and experience but without physical structures as collateral. Especial entrepreneurship, language and capacity development training skill should be prepared and provided at high school and university level through higher institutions/TVET/development partners. Higher education institutions should focus on admitting selective top-grade scorers, who are entitled to innovations and wants to secure paid employment while the vocational schools and lower

academic and training institutions should focus on self-employment creations opportunities for low performing students. Besides, young graduates should develop an entrepreneurial mentality from the grassroots level, and parents play a critical role in shaping their children's work habits. Higher education institutions, TVET, and vocational schools should focus on producing a skilled workforce that promotes the individuals' knowledge by providing practice-based and market-oriented training. Moreover, the job recruitment policy of Ethiopia and its nongovernmental and private institutions should be revised based on employment equity, competitiveness, and corruption-free networks. Unemployment is mainly a poverty driven problem, and therefore, new economic reforms are necessary to attract investors (diaspora, foreign and domestic) on extended campaign. Serious legal measures need to be taken against the civil code offenders. The government structures related to employment creation should work integrally to motivate youth to join the labor market and implement strong corrective measures to remove anything hindering a free, competitive labor market. Furthermore, the current economic growth development of the region could able to sustain is high population growth and therefore, until significant economic growth is recorded, it is advisable to follow mandatory population control.

Declarations

Ethics and guidelines

The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Prior to data collection, data collectors received appropriate training on research ethics and procedures. Participants were clearly informed about the objectives of the study, and no data were collected without their informed consent. the study was reviewed and approved by research ethics approval committee (REAC) of Technology and Innovation Management Department. It also indicates that the research was conducted in accordance with the Adama Science and Technology University Research and Technology Transfer Guidelines.

Consent to Participate

Freely given, informed consent to participate in the study was obtained from all respondents prior to their involvement. Participants were fully informed about the purpose of the research, the procedures involved, the voluntary nature of participation, and their right to withdraw at any time without any negative consequences. Consent was obtained before any data were collected.

Consent to Publish

Informed consent for publication was obtained from all participants prior to their inclusion in the study. Participants agreed to the use and publication of the data collected for academic and research purposes. For participants under the age of 18, informed consent to publish was obtained from their parent and/or legal guardian.

Competing interests

The authors declare there is no conflict of interest

Clinical trial number: not applicable.

Funding

No funding to declare

Availability of data and materials

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request. I have data collected, edited and cleaned in SPSS and excel. If you want this file shared to you will provide to you immediately on demand

6. References

- Abate, T. W. (2020). The effect of COVID-19 on unemployment and price changes in Ethiopia: Evidence from Woldia town “Does the downward sloping Philips curve hold true”. *Economics*, 9(4), 73–78.
- Abebe Fikre, K. (2012). Unemployment in urban Ethiopia: Determinants and impact on household welfare. *Ethiopian Journal of Economics*, 21(2), 127–157.
- Ahmad, Z. A., & Khan, J. (2018). *An analysis of the causes and consequences of unemployment in District Peshawar*.
- Ahmed, H. M., & Ahmed, Y. A. (2021). Constraints of youth entrepreneurs in Ethiopia. *Journal of Global Entrepreneurship Research*, 11(1), 337–346. <https://doi.org/10.1007/s40497-021-00287-1>
- Amadeo, K. (2019). *Types of unemployment*.
- Arsi Zone MSE. (2019). *Official data collected from Woreda, Asella, Arsi Zone, Ethiopia*.
- Amiri, S. (2022). Unemployment associated with major depressive disorder and depressive symptoms: A systematic review and meta-analysis. *International Journal of Occupational Safety and Ergonomics*, 28(4), 2080–2092. <https://doi.org/10.1080/10803548.2021.1954793>
- AZFED. (2019). *Arsi Zone Finance and Economic Development Office unpublished documents*. Assela, Ethiopia.
- AZFED. (2020). *Arsi Zone Finance and Economic Development Office unpublished documents*. Assela, Ethiopia.
- AZFED. (2021). *Arsi Zone Finance and Economic Development Office unpublished documents*. Assela, Ethiopia.
- Asalfew, A. (2011). *Demographic and socio-economic determinants of youth unemployment in Debre Birhan Town, North Showa Administrative Zone, Amhara National Regional State* (Doctoral dissertation, Addis Ababa University).
- Ayhan, F. (2016). Youth unemployment as a growing global threat. *Aktualni Problemy Ekonomiky*, 7, 262–269.
- Bai, J., & Wang, P. (2016). Econometric analysis of large factor models. *Annual Review of Economics*, 8(1), 53–80. <https://doi.org/10.1146/annurev-economics-080315-015242>
- Baker, D. (2009). *Job sharing: Tax credits to prevent layoffs and stimulate employment*. Center for Economic and Policy Research.
- Berhe, M. W. (2021). Empirical analysis of urban youth unemployment in Ethiopia. *African Development Review*, 33(1), 104–116. <https://doi.org/10.1111/1467-8268.12508>
- Berihanu, D., Tekeste, A., & Van Der Deijl, H. (2005). *Characteristics and determinants of youth unemployment, underemployment and inadequate employment in Ethiopia*. International Labour Office.

- Blustein, D. L., Duffy, R., Ferreira, J. A., Cohen-Scali, V., Cinamon, R. G., & Allan, B. A. (2020). Unemployment in the time of COVID-19: A research agenda. *Journal of Vocational Behavior, 119*, 103436. <https://doi.org/10.1016/j.jvb.2020.103436>
- Brick, I. E., & Jagpal, H. S. (1984). Utility theory, value maximization and the quality decision under uncertainty. *International Economic Review, 25*(2), 369–381. <https://doi.org/10.2307/2648870>
- Brotherhood of St Laurence, McClelland, A., & Macdonald, F. (1998). *The social consequences of unemployment: Report for the Business Council of Australia*.
- Burchell, B. J., & Coutts, A. P. (2019). The experience of self-employment among young people: An exploratory analysis of 28 low- to middle-income countries. *American Behavioral Scientist, 63*(2), 147–165. <https://doi.org/10.1177/0002764218794236>
- Carbado, D. W., Crenshaw, K. W., Mays, V. M., & Tomlinson, B. (2013). Intersectionality: Mapping the movements of a theory. *Du Bois Review: Social Science Research on Race, 10*(2), 303–312. <https://doi.org/10.1017/S1742058X13000349>
- Copeland, R. M. (1968). Income smoothing. *Journal of Accounting Research, 6*, 101–116. <https://doi.org/10.2307/2490070>
- Central Statistical Agency (CSA). (2007). *Population and housing census of Ethiopia*. Addis Ababa, Ethiopia.
- Central Statistical Agency (CSA). (2018). *Statistical report on the 2018 urban employment-unemployment survey* (Statistical Bulletin No. 586). Addis Ababa, Ethiopia.
- Central Statistical Agency (CSA). (2019). *Ethiopia unemployment rate*. Trading Economics. Trading Economics
- Dachito, A. C., Alemu, M., & Alemu, B. (2020). The impact of public education expenditures on graduate unemployment: Cointegration analysis to Ethiopia. *Journal of International Trade, Logistics and Law, 6*(2), 62–78.
- Demissie, M. M., Herut, A. H., Yimer, B. M., Bareke, M. L., Agezew, B. H., Dedho, N. H., & Lebeta, M. F. (2021). Graduates' unemployment and associated factors in Ethiopia: Analysis of higher education graduates' perspectives. *Education Research International, 2021*, 4638264. <https://doi.org/10.1155/2021/4638264>
- Echebiri, R. N. (2005, July). Characteristics and determinants of urban youth unemployment in Umuahia, Nigeria: Implications for rural development and alternative labor market variables. Paper presented at the ISSER/Cornell/World Bank Conference on Shared Growth in Africa, Accra, Ghana.
- Eita, J. H., & Ashipala, J. M. (2010). Determinants of unemployment in Namibia. *International Journal of Business and Management, 5*(10), 92–104. <https://doi.org/10.5539/ijbm.v5n10p92>
- Ethiopia National Youth Policy (ENYP). (2004). *Ethiopia national youth policy*. Ministry of Youth, Sport and Culture. National Youth Policy PDF

- Jarosch, G. (2018). *Essays on the causes and consequences of unemployment* (Doctoral dissertation, The University of Chicago).
- Fagbemi, F., Osinubi, T. T., & Olatunde, O. S. (2022). COVID-19 and unemployment: Showcasing Sub-Saharan African experience. *Jindal Journal of Business Research*, 11(1), 24–33. <https://doi.org/10.1177/22786821221088441>
- Ghasi, N. C., Daniel, C. O., Isaac Adio, A., & Aina, E. I. (2021). Entrepreneurship education and graduate employment rate in a developing economy. *Turkish Online Journal of Qualitative Inquiry*, 12(3).
- Gebisa, D. A., & Etana, N. G. (2019). Determinants of graduate youth unemployment in case of West Shoa Zone, Ethiopia. *Asian Journal of Multidimensional Research*, 8(11), 23–36. <https://doi.org/10.5958/2278-4853.2019.00364.5>
- Geda, A. (2022). *The challenge of unemployment and youth unemployment amidst fast economic growth in Ethiopia*.
- GIGA. (2020). *Africa after the COVID-19 lockdowns: Economic impacts and prospects*. GIGA Focus Report
- Gujarati, D., & Porter, D. C. (2004). *Basic econometrics* (4th ed.). McGraw–Hill.
- Hennink, M., & Kaiser, B. N. (2022). Sample sizes for saturation in qualitative research: A systematic review of empirical tests. *Social Science & Medicine*, 292, 114523. <https://doi.org/10.1016/j.socscimed.2021.114523>
- Hoshino, T., & Yanagi, T. (2023). Treatment effect models with strategic interaction in treatment decisions. *Journal of Econometrics*, 236(2), 105495. <https://doi.org/10.1016/j.jeconom.2023.105495>
- Huffman, W. E. (2011). Household production theory and models. In *The Oxford handbook of the economics of food consumption and policy* (pp. 34–74). Oxford University Press.
- International Labour Organization (ILO). (2019). *World employment and social outlook*. Geneva, Switzerland.
- Kamei, A., & Nakamura, S. (2022). Urban agglomerations and wage and self-employment jobs in Ethiopia. *The Journal of Development Studies*, 58(9), 1693–1710. <https://doi.org/10.1080/00220388.2022.2061853>
- Kangasharju, A., & Pekkala, S. (2002). The role of education in self-employment success in Finland. *Growth and Change*, 33(2), 216–237. <https://doi.org/10.1111/0017-4815.00191>
- Kingdon, G. G., & Knight, J. (2004). Unemployment in South Africa: The nature of the beast. *World Development*, 32(3), 391–408. <https://doi.org/10.1016/j.worlddev.2003.10.005>
- Knotek II, E. S. (2007). How useful is Okun’s law? *Economic Review-Federal Reserve Bank of Kansas City*, 92(4), 73–103.
- Kothari, C. R. (1985). *Research methodology: Methods and techniques*. Wiley Eastern Limited.
- Leontaridi, M. (1998). Segmented labour markets: Theory and evidence. *Journal of Economic Surveys*, 12(1), 103–109. <https://doi.org/10.1111/1467-6419.00048>

- Adil, H. M. (2011). Important theories of unemployment and public policies. *Journal of Applied Business and Economics*, 12(5), 100–110.
- Mamo, W. B., Feyisa, H. L., Yitayaw, M. K., & Tereda, S. N. (2022). Employment status during the COVID-19 pandemic: Evidence from Ethiopia. *The Indian Journal of Labour Economics*, 65(1), 123–135. <https://doi.org/10.1007/s41027-021-00355-1>
- Mankiw, N. G. (2002). *Macroeconomics* (5th ed.). Worth Publishers.
- Marinescu, I., Skandalis, D., & Zhao, D. (2021). The impact of the federal pandemic unemployment compensation on job search and vacancy creation. *Journal of Public Economics*, 200, 104471. <https://doi.org/10.1016/j.jpubeco.2021.104471>
- Meron, H. (2007). *The role of microfinance in empowering women in Addis Ababa* (Unpublished master's thesis, Addis Ababa University).
- Mokona, H., Yohannes, K., & Ayano, G. (2020). Youth unemployment and mental health: Prevalence and associated factors of depression among unemployed young adults in Gedeo Zone, Southern Ethiopia. *International Journal of Mental Health Systems*, 14(1), 1–11. <https://doi.org/10.1186/s13033-020-00395-2>
- Noveria, M. (1997). Unemployment in less developed countries: Patterns, causes and its relationship to the problems of poverty. *Bulletin Pengkajian Masalah Kependudukan dan Pembangunan*, 8(2–3).
- Oshora, B., Nguse, T., Fekete-Farkas, M., & Zeman, Z. (2021). Economic growth, investment, population growth and unemployment in Ethiopia. In *SHS Web of Conferences* (Vol. 90, p. 01013). EDP Sciences. <https://doi.org/10.1051/shsconf/20219001013>
- PEDCO. (2016). *Physical and socio-economic profile of Oromia* (4th ed.). Finfinnee, Ethiopia.
- Prachowny, M. F. (1993). Okun's law: Theoretical foundations and revised estimates. *The Review of Economics and Statistics*, 75(2), 331–336. <https://doi.org/10.2307/2109440>
- Rafik, M., Ahmad, I., Ullah, A., & Khan, Z. (2010). Determinants of unemployment: A case study of Pakistan economy (1998–2008). *Abasyn Journal of Social Sciences*, 3(1).
- Serneels, P. (2004). *The nature of unemployment in Ethiopia* (CSAE WPS/2004-01).
- Simes, R. J. (1986). An improved Bonferroni procedure for multiple tests of significance. *Biometrika*, 73(3), 751–754. <https://doi.org/10.1093/biomet/73.3.751>
- Singh, S. N. (2019). *Business inefficiencies and youth unemployment in Ethiopia: A case study of Mettu Town*.
- Stiglitz, J. E. (1974). Alternative theories of wage determinants and unemployment in LDCs: The labour turnover model. *The Quarterly Journal of Economics*, 88(2), 194–227. <https://doi.org/10.2307/1883069>
- Strober, M. H. (1990). Human capital theory: Implications for HR managers. *Industrial Relations*, 29(2), 214–239. <https://doi.org/10.1111/j.1468-232X.1990.tb00752.x>

Trading Economics (TE). (2023). *Unemployment rate in Africa by countries*. Trading Economics Africa Unemployment Rates

Terefe, D. (2019). *Youth unemployment*. Paper presented at workshop, Bishoftu Town.

Transparency International. (2009). *Low salaries, the culture of per diems and corruption*. U4 Expert Answers. Transparency International Report PDF

Tsaurai, K. (2020). Macroeconomic determinants of unemployment in Africa: A panel data analysis approach. *Acta Universitatis Danubius. Oeconomica*, 16(2), 89–112.

UNHCR. (2021). *Oromia region information brochure*. UNHCR Oromia Region Brochure PDF

Usakli, A., & Rasoolimanesh, S. M. (2023). Which SEM to use and what to report? A comparison of CB-SEM and PLS-SEM. In *Cutting edge research methods in hospitality and tourism* (pp. 5–28). Emerald Publishing Limited. <https://doi.org/10.1108/978-1-80382-915-220231002>

World Bank. (2011). *Ethiopia country brief*. World Bank Ethiopia Country Brief

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [unemploymentinarsi.sav](#)