# An Empirical Investigation of the Factors Influencing Formal and Informal Employment in the City of Asmara

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## Abstract

This study investigates the factors influencing formal and informal labour market in Asmara, the capital city of Eritrea. The findings reveal that variables such as age, gender, education and birth place influence formal and informal labor market of the city. The chances for young people getting jobs in formal are low relative to older people. Higher educational level is related to securing jobs in the formal sector. Regarding gender males have more chances in the formal sector than females. People from Maekel/Central Region (townships surrounding Asmara) have higher chances to engage in self-employment. Generally, the results reveal that the labor market in Asmara show varied characteristics.

**Keywords:** formal, informal, employment, developing country, Eritrea

## 1. Introduction

### 1.1 Background and Empirical Literature

As far as, urban labor markets in developing countries are concerned, it is generally classified as formal and an informal sector (Pradhan and van Soest, 1995). The informal sector includes all jobs in informal sector enterprises. According to (OECD, 2009), informal sector was mainly considered as characteristics of developing countries and it was assumed that it would disappear as these countries economy develops.

Mazumdar (1989) describes an urban labor market structure in a typical developing country as being subdivided into three main categories: the formal sector, informal sector and the unemployed. Similarly, the International Labor Organization (ILO) also categorizes employment in the informal sector as: ``employment in the informal sector`` and ``informal employment`` with the informal sector being the largest sector in many countries (ILO, 2002).

The question that is central at formal or informal work is whether individuals choose to work in the informal sector or they opt to work in the sector as the only alternative at their disposal. The former considers employment in the informal sector to be supply-led and voluntary (Heckman and Sedlacek 1985; Malony 2004; Packard 2007); while the latter views informal work as a secondary market where all those without access to the primary formal market find themselves (Fields, 1990).

Fields (2005) also expanded the debate by presenting a third feature of the informal sector stating as a 'last resort sector', a 'desirable sector', and with 'internal dualism' combining the first two. Heterogeneity in the formal and informal sectors was usually done by distinguishing labor inside the formal and informal sector according to employment type as well as position in earning distribution (Arias and Khamis 2008; Bargain and Kwenda, 2009; Nguyen et al. 2011; Tansel and Kan, 2012; Harati, 2013). As aforementioned informal sector is crucial for the functioning of the labor market, since it affects income distribution (inequality) and poverty with implications for efficiency in terms of allocation of labor. This explains why the role of the informal sector has recently been analyzed extensively.

What strategies should be in place to enable government in developing countries to generate new employment and income opportunities and reduce informality and unemployment? In this regard, the need to create employment opportunities in Eritrea is underscored by the fact that the size of the informal market has been growing faster due to several economic and social issues.

There are various research reports on the determinants of labor market participation and labor market modeling. This work has generally modified with the three strands of labor market namely formal sector, self-employed informal sector participants and informal wage earners.

Several scholars using logit, random utility, and ordinary least square (OLS) models conducted research in various countries including Guinea, Kenya, Ghana, Tanzania, Morocco, Cameroon, Burkina Faso, Mexico, and Pakistan. Their research findings show that higher the more a person is educated the more he/she can be employed in the formal sector (Glick and Sahn, 1997; Mariara, 2003; Rankin *et al*., 2010; Amin *et al*., 1995; Irfan, 1983; El Aynaoui, 1997; Traore, 2013; Faridi, 2011; Gong *et al*., 2000). However, this doesn't mean that other variables do not have any influence in the determination of labour market. For instance, age and place of residence determine whether a person chooses the formal or informal sector.

The main objective of this study is to investigate the factors that influence the formal and informal labor market in Eritrea. We employed multinomial logit model by dividing the labor market participation into formal employment (private and public) and informal employment. The specific objectives of this study are: *What are the factors that influence labor market in Eritrea? What are the occupational choice determinants of an individual on the labor market?*

## 2. Methodology

This study investigates the determinants of formal and informal labour market based on data collected from the metropolitan area of Asmara, Eritrea. In conducting this study, primary and secondary data have been used. Primary data were collected from individual residents of the city using survey questionnaire. A total number of 1200 questionnaires were distributed. Of the entire distributed questionnaire, we obtained 1080 correctly completed usable questionnaires, which is 90% response rate. Individuals were requested to give information related to their participation in the labor market. Moreover, relevant socioeconomic and demographic characters of the individuals were also collected.

This is helpful to estimate the probability of being in each employment type and allows for the marginal impact of explanatory variables to vary across the employment types. This study provides a practical explanation of the different determinants for the employment choices. Thus, the study employs a quantitative approach for the purpose of examining magnitudes of the effects of various factors. Data collected were analyzed and interpreted by using SPSS version 23 and multinomial logit (MNL) regression model.

## 3. Data Analysis

The data gathered has been analyzed using logit model, which is the most common method of describing how individuals choose between different occupational choices. As mentioned above, in this study individuals are sorted into three labor force categories, formal employment (private and public), informal self-employment and informal wage employment in informal and formal enterprises. The model allows the dependent variables to take three mutually exclusive and exhaustive values, j=0 (formal employment), 1 (informal self-employment), or 2 (informal wage-employment). The explanatory variables used include the individual's socioeconomic and demographic characteristics such as age, gender, marital status, level of education, household size, religion, birth place, ethnicity and income.

In this paper, we use latent utility function framework to analyze the characteristics of occupational choice in the case of Asmara metropolitan area residents and to look for relationships that the above mentioned characteristics such as sex, age, education, income and others have with the individual's choice of a sector. The results can be used to find, understand and compare the attractiveness of each choice and determine the reasons and motives behind each of these choices.

The designing of choice model needs extensive evaluation of observed data and the efficiency of the whole model system. In the current study, specific parameters are predicted to impact individuals' behavior, when individuals have different choices. These requirements consist of the parameters such as gender (*Gender*), educational (*Education*) level, age (*Age*), household size (*HHSize*), marital status (*Mstatus*), religion (*Religion*) and birth place (*BirthPlace*) of the respondent (respondents are categorized based on their birth place from one to four being (Asmara =1; Maekel Region = 2; other Eritrean Regions = 3 and born outside of Eritrea = 4).

## 4. Discussion of Results

### 4.1 Descriptive Analysis

The data comprises of 1080 respondents and 44.8 % of these are females. Out of the total respondents, 545 are formal employees, 291 are informal self-employees and 244 are informal wage employment in informal and formal

enterprises. The mean age of respondents is 36.7 years with minimum of 12 years and maximum of 75 years. Low minimum age reflects that there are young and poor respondents who work in the informal self-employment sector working as petty retailers. Table 1 below presents summary of respondents.

Table 1. Summary Statistics

| Sector of Employment | Frequency | Percent |
|---|---|---|
| Formal Employees | 545 | 50.5 |
| Informal Self-employees | 291 | 26.9 |
| Informal wage employees | 244 | 22.6 |
| **Total** | **1080** | **100** |
| **Socio-economic status** | | |
| Gender | Frequency | Percent |
| Male | 596 | 55.2 |
| Female | 484 | 44.8 |
| **Total** | **1080** | **100.0** |

Table 2. Age Statistics

| Mean | 36.7 |
|---|---|
| Standard Deviation | 13.66 |
| Minimum Age | 12 |
| Maximum Age | 75 |

In doing the analysis, the formal employment was used as a base (reference) so that the other two choices (self-employment and informal wage employment) were compared to this base. The model summary as presented in Table 3 shows a Likelihood Ratio value of 265.683 which is significant at the 0.0001 level. The Pseudo R-squared values (Cox and Snell and Nagelkerke) of 0.218 and 0.250 reveal the model is useful in predicting the employment choice of respondents. Table 2 and table 3 provide further details.

Table 3. Model Summary

| Model | Fitting criteria | Likelihood Ratio Tests | | |
|---|---|---|---|---|
| Intercept only | 21.98051 | Chi-square | Df | Significance |
| Final | 19.52990 | 245.061 | 22 | 0.0001 |
| *The Goodness-of -Fit* | | | | |
| Pearson | | 2084.236 | 2024 | 0.172 |
| Deviance | | 1921.113 | 2024 | 0.993 |
| *Pseudo R-squared* | | Cox and Snell | Nagelkerke | McFadden |
| | | 0.203 | 0.232 | 0.110 |

Table 4. Classification

| | Predicted | | | |
|---|---|---|---|---|
| Observed | Formal | Self-employed | Informal wage employees | Percent Correct |
| Formal | 462 | 61 | 22 | 84.8% |
| Self-employed | 140 | 118 | 33 | 40.5% |
| Informal wage employees | 166 | 41 | 37 | 15.2% |
| Overall Percentage | 71.1% | 20.4% | 8.5% | 57.1% |

The regression results as presented in Table 5 shows that some of the determinants such as age (*Age*), gender (*Gender*), birth place (*Birthplace*), marital status (*Marital Status*) household size (*Hosueholdsize*), education (*Education*) and religion (*Religion*) statistically affect the probability of a respondent choices of sector of employment in the labor market.

Table 5. MNL results for labor market choice

| Variables | Self-employment | | | | Informal wage employment | | | |
|---|---|---|---|---|---|---|---|---|
| | Coefficient | Std. error | Sig. | Odds Ratio | Coefficient | Std. error | Sig. | Odds Ratio |
| Intercept | 3.453 | 0.797 | 0.0001* | | 2.035 | 0.950 | 0.032 | |
| *Age* | -0.029 | 0.007 | 0.0001* | 0.971 | -0.041 | 0.007 | 0.0001* | 0.960 |
| *Gender* | -0.353 | 0.168 | 0.035* | 0.702 | -0.615 | 0.169 | 0.0001* | 0.541 |
| *Education* | -0.240 | 0.026 | 0.0001* | 0.786 | -0.207 | 0.026 | 0.0001* | 0.813 |
| *Marital Status* | -0.472 | 0.502 | 0.347 | 0.624 | 0.981 | 0.605 | 0.105 | 2.666 |
| *Hosueholdsize* | -0.044 | 0.035 | 0.205 | 0.957 | -0.041 | 0.036 | 0.254 | 0.960 |
| *BirthPlace*(2) | 1.249 | 0.530 | 0.019* | 3.489 | 0.522 | 0.632 | 0.410 | 1.685 |
| *Religion* | 0.215 | 0.229 | 0.349 | 0.807 | -0.053 | 0.241 | 0.826 | 0.948 |

The reference category is *Formal Employment*

* Statistically significant at 5% significance probability level

The above table shows the most acceptable model. Some of the models that were analyzed have revealed inadequate statistical goodness of-fit and/or had counter-intuitive signs; and therefore were invalidated and discarded. As stated previously, the basic idea behind the mode choice estimation was to identify factors influencing respondents' choice between formal and informal sector employment. Greater parts of the variables presented have significant parameter estimates.

Of the specific parameters used to predict the choice of sector employment, the demographic variable age (*Age*) is important for these two informal subsectors (informal self-employment and informal wage employment) of employment. The result is significant with a negative coefficient implying that the likelihood of people to be employed in these informal subsectors decreases with age. The odds ratios are also below one supporting the argument. As age is related to experience, this result concurs with Goldar (2010), where generally older individuals are preferred in the formal labor market.

Gender (*Gender*) variable has a negative coefficient and is statistically significant in the informal self-employment and informal wage employment sub-sectors and it`s odds ratio is less than one. This implies that the chances for males in the informal self-employment and informal wage employment subsectors are low. The result simply shows that the majority of males have high probability of working in the formal sector compared to females for the simple fact that males face fewer barriers related to qualification and discrimination. In addition, some women may prefer the informal sector in order to cope with the need to care for children and domestic chores to the extent that this sector enables them to combine productive and reproductive work.

Regarding *Education* variable, the coefficient of is negative and significant. The negative effect of education on these two subsectors implies that having better education diminishes the chances of being employed in these two subsectors or enhances the opportunity for working in the formal sector. This chance increases with the level of education and is therefore higher for university education. The odds ratios are also below one supporting the argument.

Finally, *Birthplace* variable is introduced to explain the labor market choice behavior of the respondents. The result was found to be positive and significant for the category (Maekel Region) indicating that the probability of employment in informal self-employment sector increases for those who are born in this Region. Maekel (central) is one of the six regions of Eritrea and the city of Asmara is located in this region. Residents of this region have easy access to the city as they live from fifteen to thirty kilometers away from the city. In the pick seasons they work in their farms and during slack seasons they come to the city to do some informal self-employment activities.

## 5. Conclusions and Implications

The main goal of this paper is to assess the variables that determine the choice of employment in the formal/informal sector in the metropolitan area of Asmara. As discussed in the aforementioned section, four variables—*Age, Gender, Education and Birth place* are important in determining the sectorial choice. That is, variable age (statistically significant with a negative coefficient); gender (negative coefficient and is statistically

significant); the coefficient of education variable is negative and significant; and the result of birth place variable was found to be positive and significant for the category (Maekel Region).

In general, formal sector employment in both public and private sectors is male-dominated while women occupy the inferior informal sector (inferior in the sense of low incomes, precarious tenure and unregulated forms of employment). Regarding formal employability of workers, improving quantity and quality of education is important as an enabling instrument. In pursuit of educational achievements, gender imbalance has to be addressed as a way of increasing professionalism of women and to emancipate them from being preys of informal employers.

This study raises many questions for further research while identifying education and employment policy gaps: What specific skills or qualities do employers look for when recruiting new employees? Is the current education system demand or supply driven, and does it equip graduates with adequate skills to become self-employed? In addition, a great concern is to identify whether gender discrepancy is a result of labor market discrimination against or is justified on the basis of human capital skills. Answers to these questions have broad policy implications towards an achievement of gender balance in education, the labor market and poverty eradication.

Our study is not without limitations. This study focuses on the supply factors only excluding the demand side. A thorough understanding of the demand would be necessary to complement such a study, but relevant data on the demand side are lacking. Future research and survey data collection methodologies should incorporate the demand-side information.

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