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**Gender Differentials in the Informal Labour Market of
Cameroon**

By

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Abstract

This study attempts to investigate the extent of gender-disparities in the informal sector labour market in Cameroon. Use is made of the 2010 Cameroon labour force survey, a bivariate probit model, a Heckman two-step selectivity correction model, and an Oaxaca-Ransom decomposition framework. Empirical results show that male workers compared to their female counterparts are more likely to make the joint decision of participating in the labour market and working in the informal sector. Results equally depict that globally male employees have a wage premium over their female counterparts. Results further reveal that access to endowments largely accounts for the gender earnings-gap in the informal labour market in Cameroon. Returns to endowment were, however, non-negligible, of which, on average, male workers were over-paid and their female counterparts were under-paid. Meanwhile, returns to female education were solidly consistent in narrowing the gender earnings-gap. This is indication that female informal sector workers have a net education-based advantage over their male counterparts. The implications of these findings are in tandem with the wisdom that promoting education of the girl child would play a key role in alleviating gender-based differentials in the informal sector labour market in Cameroon.

Keywords: Gender, Disparity, Informal, Earnings, Cameroon

1. Introduction

Based on its persistence in most developing countries, informal activities lie at the heart of development policies and have drawn much interest to researchers over the years. The presence of large informal sectors in developing countries has often been cited as a central factor underlying earnings/wage inequality, labour market inefficiencies, and persistent poverty. Like many others, most Sub-Saharan African Regions are characterized by dualism (formal and informal employment), large and growing regional differences in access to formal employment (Njikam et al., 2005; Komon and Tchakounté, 2008). The Cameroonian labour market is characterised by both informal and formal employment. Gradually, the Cameroonian literature on the informal economy is moving away from a traditional view as proof for labour market segmentation (Tchakounté, 2008; Ningaye and Fokam, 2014). The tendency is regarding the informal sector as a mechanism of survival for low productive employees who are waiting until they come across a better employment opportunity.

The 2003 “Doing Business” databases of the World Bank show that Latin America and Sub-Saharan Africa have the largest informal economies. The informal economy represents prospects for better living standards among numerous people in most developing countries as it accounts for more than half of the labour force in Sub-Saharan Africa. According to the National Institute of Statistics, the informal sector in Cameroon has expanded significantly over the past years, particularly, in urban areas as it employs more than 80% of the labour force (CNIS, 2010). It is acquiring a predominant role, particularly, in satisfying domestic demand and absorbing mainly young people and women. The dramatic increase in young men and women in the informal sector during the last decades is largely explained by the scarcity of new formal jobs and the remarkable increase in labour market aspirants.

According to CNIS (2010), 57.8 percent of the employments detained by young men and women aged between 15-34 years in 2009 were focused in the informal sector. Indeed, the informal sector can be considered an employer of last resort in the Cameroon labour market. The World Bank (2012) estimate that compared to 67 percent of men, 87 percent of women in the labour force were employed in vulnerable employment; and 58 percent of women in the labour force were employed in informal agriculture compared to 49 percent of men. This labour market structure can largely be explained by the role played by informal agricultural jobs, which alone

account for 55.2 percent of total employment, while non-agricultural informal jobs account for 35.2 percent. The other 9.6 percent of jobs, offers by the formal sector, are divided between the public and private sectors which offer different earnings compared to the informal sector.

Gender equality in employment is currently one of the greatest development challenges facing countries globally, including those in Africa (Anyanwu and Augustine, 2013). Although much progress has been observed in recent decades in the world in terms of women's rights, it is obvious that women have continued to be victims of many inequalities. Regarding the labour market specifically, it turns out that even if more women have entered the workforce in recent years, they often experience more difficulty in finding a first job, earn less than men and are more likely to work part-time (Organization for Economic Cooperation and Development (OECD, 2012). Indeed, when they are employed, women are generally in a less advantageous position than men, they are over-represented in the informal sector and casual jobs and earn less in the formal sector (Kuepie et al., 2013).

In this regard, the government of Cameroon has initiated a series of legislations to mitigate gender-based differentials in the labour market. These initiatives include: Cameroon's international commitments; the 1992 Cameroon Labour Code that guides the national laws on labour, social security and related human rights concerns; the Cameroonian constitution endorses the principle of gender equality with regards to equivalent access to work for men and women; legal acts by the Cameroon Ministry of Women Empowerment and the Family created in 2004; the recent Cameroon gender national policy; and the Growth and Employment Strategy paper (Government of Cameroon, 2009).

Notwithstanding the effort at promoting the socio-economic status of women in Cameroon overall and reducing labour market gender discrimination, there is still room for improvement. This is because an overview of policy actions geared at upholding a balance between the genders by government and social actors indicates that effort is still disjointed and more evidence-based Knowledge is required to consolidate actions. Therefore, using data from CLFS 2010, an analysis of gender differentials in the Cameroonian informal labour market is expected to provide new ingredients to inform the way forward in this direction.

In this context, the study makes a number of empirical contributions as three key questions emerge : (1) What is the extent of gender-disparity in labour force participation and informal sector employment in Cameroon? (2) What is the role of gender on earnings in the informal labour market in Cameroon? and (3) What role does returns to endowments play in accounting for gender earnings-differentials in the informal labour market in Cameroon? The conforming objectives are, (1) to evaluate gender-disparity in labour force participation and informal sector employment in Cameroon; (2) to explore the role of gender on earnings in the informal labour market in Cameroon; and (3) to investigate the role of returns to endowments in explaining gender earnings differentials in the informal labour market in Cameroon. The rest of the study is structured as follows. Section 2 reviews the literature. Section 3 dwells on the methodology and data used in the study. Section 4 presents empirical results and Section 5 outlines the concluding remarks.

2. Literature Review

Since the early works of Mincer (1958, 1974), Schultz (1961), Becker (1975), Simpson and Stroh (2002), Polachek (2004) and Schleicher (2008), associated with the human capital theory in explaining gender wage differentials in the labour market as a result of conflicting human capital stocks; literature on gender wage differentials have continue to fuel the labour market such that the concept has been extended to different gender disparity areas such as labour force participation and informal sector employment among others.

The World Bank (2014) estimates that, in Cameroon 58% of women in the labour force were employed in informal agriculture compared to 49% of men. Equally, Totouom et al. (2018) found out that in Cameroon, women are less likely to work in the informal sector than men. Contrary to this; Traoré (2012) found that men are less likely to be informally self-employed than women in Burkina Faso, equally results obtained by Kabubo- Mariara (2003) in the case of Kenya ascertain that women were more likely than men to work in the informal sector as self-employed, also Aikaeli and Mkenda (2014) found that in construction companies in Tanzania women are more informally employed than men.

Empirical studies on gender wage differentials, largely confirm the existence of gender discrimination against female employees in the labour market. Cheng (2005) found out that in Canada, gender earnings differentials exist in favour of men in both public and private sectors. Similarly, Ntuli (2015) found out that there is a gender wage penalty to the disadvantage of women in South Africa. Also, in the case of China, Columbia and Egypt, Mohamed (2015) found out that men earn on average more than women. Equally, Mulenga (2015) found out that in Zambia, females earned less than their male counterparts in 1996 and 2010. We also have; Hoyos et al., (2010) for Columbia, Kagundu and Pavlova (2007) for Uganda, Wang and Cai (2008) for China, Koissy-Kpein (2012) for Mali, Anyanwu and Darline (2013) for Africa and Biltagy (2014) for Egypt

Computing the shares of discrimination and human capital endowment portions to explain gender or racial wage differentials has been popularized by the wage decomposition methodology proposed by Blinder (1973) and Oaxaca (1973). Dogan (2011) use the Oaxaca-Blinder decomposition technique and found out that a greater portion of the wage differential between men and women in the Turkish labour market is due to the differences in human capital endowments. Using the Oaxaca Ransom wage decomposition, Nweke (2014) found out that in Nigeria labour market, the average natural log of hourly wage of men were higher than that of women and that a greater part of the gap between the wages of men and women were due to explained components.

In Cameroon, of studies that address aspects of the labour market, very few studies apply the Oaxaca-Ransom type decomposition approach (Ndamsa et al., 2015; Baye et al., 2016). Yet, none of these studies apply this method to investigate gender wage differentials in the informal sector. Ndamsa et al. (2015) made use of the Ordinary Least Square technique and the Oaxaca-Ransom decomposition to examine the role of male advantage and female disadvantage in assessing the discrimination effect of the gender pay gap in the Cameroon labour market and found out that the discrimination component has a worsening effect on the gender wage gap compared to the little role of the endowment effect. Baye et al. (2016) made use of the Oaxaca-Blinder decomposition technique and an extension of the Oaxaca-Ransom (1994) decomposition

to explain the components of gender wage disparities in Cameroon and found out that a larger part of the wage differential stemmed from differences in characteristics of men and women

None of the studies using data from the Cameroon labour force survey (2010) investigate gender differentials in Cameroonian informal market. Indeed whether gender inequality exists within the informal sector in Cameroon remains an empirical issue. The contribution of this study to other studies in SSA is primarily empirical because studies on gender differentials in SSA in general and Cameroon in particular have focus mostly on the labour market as a whole, and have not investigated these differentials in the informal labour market.

3. Methodology of the Study and Data

The study makes use of a number of econometric and decomposition techniques: a bivariate probit model is used to evaluate gender-disparity in labour force participation and informal sector employment in Cameroon; a Heckman two-step selectivity correction model is use to explore the role of gender on earnings in the informal labour market in Cameroon; and an Oaxaca-Ransom decomposition framework is use to investigate the role of returns to endowments in explaining gender earnings differentials in the informal labour market in Cameroon.

3.1 Modelling the Jointly Determined Decisions of Labour Force Participation (LFP) and Informal Sector Choice (ISC): Bivariate Probit

The bivariate probit appears to be the most appropriate technique of analysing the labour force participation and Informal Sector Choice. This is because we suspect that the two decisions are jointly determined.

Considering the LFP choice, we can model it as follows:

$$LFP^* = X_1\beta_1 + \mu_1$$

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Where LFP^* is the labour force participation, X_1 is the set of explanatory variables that captures the characteristics of the interviewee that help to determine LFP^* , β_1 refers to a set of parameters to be estimated and μ_1 is the error term. Note however that LFP^* is not observed but what is observed is the binary outcome in equation (2). When the market wage is greater than the reservation wage of the individual, the labour force participation is equal to one ($LFP = 1$), indicating that the individual will decide to participate in the labour market. If on the other hand the individual's reservation wage is greater than the market wage, the labour force participation is zero ($LFP = 0$), it will signify that the individual will decide not to participate in the labour market.

$$LFP = \begin{cases} 1, & \text{if } X_1\beta_1 + \mu_1 > 0 \\ 0, & \text{if } X_1\beta_1 + \mu_1 \leq 0 \end{cases} \quad 2$$

The corresponding informal sector choice employment decision is described by the following latent variable model:

$$ISC^* = X_2\beta_2 + \mu_2 \quad 3$$

Where ISC^* is the informal sector employment choice, X_2 is the set of explanatory variables that captures the characteristics of the interviewee that help to determine ISC^* , β_2 refers to a set of parameters to be estimated and μ_2 is the error term. Note, however, that ISC^* is not observed, but what is observed is equation (4). When an individual is unable to secure a job in the formal sector, the informal sector choice is equal to one ($ISC = 1$) implying that the individual will decide to work in the informal sector. If otherwise the individual is able to secure a job in the formal sector then the informal sector choice is equal to zero ($ISC = 0$) meaning that the individual will choose to work in the formal sector.

$$ISC = \begin{cases} 1, & \text{if } X_2\beta_2 + \mu_2 > 0 \\ 0, & \text{if } X_2\beta_2 + \mu_2 \leq 0 \end{cases} \quad 4$$

It is our point of view that these two decisions may not be independent of each other as they may be jointly determined. For example, an individual who decides to participate in the labour market

may choose to work in the informal sector. In such an instance, bivariate probit models would be appropriate as they allow for the interdependence of choices.

The bivariate probit model is an extension of the univariate probit model which is made up of a system of simultaneous equations which have correlated disturbances. Evaluation of the probit model likelihood function requires calculation of normal probability distribution functions. If the underlying latent system of equations has continuous error terms which are independent of x , and symmetric about zero, then the specification of the bivariate probit model is:

$$LFP^* = X_1\beta_1 + \mu_1 \quad 5$$

Where $LFP = 1, if LFP^* > 0$ and $LFP = 0, if LFP^* \leq 0$

$$ISC^* = X_2\beta_2 + \mu_2 \quad 6$$

Where $ISC = 1, if ISC^* > 0$ and $ISC = 0, if ISC^* \leq 0$

$$E[\mu_1|x_1, x_2] = E[\mu_2|x_1, x_2] = 0; var[\mu_1|x_1, x_2] = var[\mu_2|x_1, x_2] = 1 \text{ and } cov[\mu_1, \mu_2|x_1, x_2] = \rho$$

The bivariate normal cumulative distribution function in this case captures the joint probability of an individual participating in the labour market and in the informal sector.

Where ρ (ρ) is the correlation coefficient of the error terms; i.e. ρ denotes the correlation between the two sets of unobserved factors or error terms in Equation 5 and Equation 6. If $\rho = 0$ the outcomes are independent and therefore the two equations are best modelled separately. If $\rho \neq 0$ the two outcomes are correlated as the probability of one outcome depends on the probability of the other. The correlation of the two error terms increases as the value of ρ rises from 0 to 1. Similarly, values between 0 and -1 indicate a negative correlation.

As with the results from the univariate probit, the results from the bivariate probit are difficult to interpret. The estimated coefficients reveal the direction of an effect but not its magnitude. The interpretation of these coefficients requires the computation of marginal effects in order to judge the economic size and significance of the variables of interest.

3.2 Modelling Role of Gender on Earnings in the Informal Sector

Most authors have adopted the human capital model as the theoretical basis for the earnings function. This approach will also be used here. At the individual employee level, it is assumed that wages increase with measures of accumulated skills such as education. The modelling of the earning function is based on the traditional Mincerian equation. Using a semi-logarithmic earnings equation, the earnings equation is written as:

$$\text{Ln } W = \alpha_0 + \alpha_1 F + \sum_{k=2}^n \alpha_k M_k + \varepsilon_1 \quad 7$$

Where $\text{Ln } W$ represents the vector of naperian logarithm of an individual's earnings. F is the vector of the gender of individuals which takes value 1 if female and zero otherwise. M is a vector of other personal and labour market characteristics such as levels of education, age in quadratic form, location, marital status, etc. α is a vector of parameters to be estimated and ε is the error term.

However, in this context, the decision to participate in the labour market is likely not random. Equally, the choice of informal sector work with the resulting earnings is likely not to be entirely random. If the data are censored, then OLS estimates of equation (7) would be biased and inconsistent. Hence, in estimating the decision equations (equation 1 and 3), it is imperative to acknowledge that individuals normally have to make the decision to work or not, and to choose between looking for employment in either the formal or informal sectors. If the decision to work and the choice of the sector of employment are not random, then it is imperative to account for sample selection biases when modelling earnings determination. In this regard, the method proposed by Heckman (1979) is an appropriate method to correct for these sample selectivity biases. After the marginal effect of the bivariate probit, we predict the joint probability of participating in the labour market and choosing the informal sector which is given as:

$$\text{Pr}(LFP = 1, ISC = 1/X) = G(X\beta) \quad 8$$

Where G is a response probability generating function taking on values strictly between zero and one. $0 \leq G(w) \leq 1$, for all real number z . This ensures that the estimated response probabilities

are strictly between zero and one. After predicting the joint probability, we generate a probability density function and cumulative density function. Following Heckman (1979), the probability density function is divided by the cumulative density function to generate corresponding inverse Mills ratio (IMR).

$$IMR = \frac{\Phi(PD)}{\phi(PD)} \quad 9$$

Where Φ is the standard normal density function and ϕ is the cumulative density function. The inverse mills ratio is then estimated and included among the explanatory variables of the earnings equation, which is given as:

$$\ln W = \theta_0 + \theta_1 F + \sum_{k=2}^n \theta_k X_k + \lambda IMR + \varepsilon_2 \quad 1$$

3.3 Modelling Gender Earning Gap in the Informal Sector: Oaxaca-Ransom Approach

Measuring gender informal wage differential using the Oaxaca-Ransom decomposition technique consist of breaking down wage gap between the male and female into an explained component (accounted for by the differences in characteristics) and an “unexplained” component (accounted for by the differences in the efficiency by which individual employees are able to convert these characteristics into outcomes). Below is an outline of the decomposition framework.

The first step of this regression based decomposition technique is to specify and estimate the Mincerian wage equations for both genders. Recalling the respective equations we have:

$$\ln W^f = Z^f \beta^f + \mu^f \quad 11$$

$$\ln W^m = Z^m \beta^m + \mu^m \quad 12$$

Estimating the above two equations we have:

$$\ln \widehat{W}^f = \bar{Z}^f \hat{\beta}^f \quad 13$$

$$\ln \widehat{W}^m = \bar{Z}^m \hat{\beta}^m \quad 14$$

The gender wage gap is given as:

$$\Delta \ln \widehat{W} = \ln \widehat{W}^m - \ln \widehat{W}^f \quad 15$$

$$\Delta \ln \widehat{W} = \bar{Z}^m \hat{\beta}^m - \bar{Z}^f \hat{\beta}^f \quad 16$$

To resolve the critical issue of having to define a priori a reference structure in the standard Oaxaca-Blinder framework, Oaxaca and Ransom (1994) used a non-discriminatory coefficient (reference structure) $\hat{\beta}^*$ which is the coefficient from the pooled model (male and female). It is based on the assumption that discrimination can be both negative (against one group) and positive (in favour of other group). After the following simple algebra, it is shown that the gender earning gap can be decomposed into the explained and unexplained portion.

Given $\hat{\beta}^*$, the coefficient from the pooled model, the reference structure proposed by Oaxaca and Ransom (1994) will be given as follows; $\bar{Z}^m \hat{\beta}^*$ and $\bar{Z}^f \hat{\beta}^*$

Adding and subtracting $\bar{X}^m \hat{\beta}^*$ and $\bar{X}^f \hat{\beta}^*$ in equation 16, we have;

$$\Delta \ln \widehat{W} = [\hat{\beta}^*(\bar{Z}^m - \bar{Z}^f)] + [\bar{Z}^m(\hat{\beta}^m - \hat{\beta}^*) + \bar{Z}^f(\hat{\beta}^* - \hat{\beta}^f)] \quad 17$$

The first component $[\hat{\beta}^*(\bar{Z}^m - \bar{Z}^f)]$ represents the explained (endowment) components, while the second and third terms $[\bar{Z}^m(\hat{\beta}^m - \hat{\beta}^*) + \bar{Z}^f(\hat{\beta}^* - \hat{\beta}^f)]$ represent the unexplained component (returns to endowment) component. In this returns to endowment component, the first part $\bar{Z}^m(\hat{\beta}^m - \hat{\beta}^*)$ represents the male advantage, while the second part $\bar{Z}^f(\hat{\beta}^* - \hat{\beta}^f)$ represents the female disadvantage. The Oaxaca-Ransom decomposition has an advantage over the standard Oaxaca-Blinder decomposition in that it resolves the problem of the choice of reference category (male coefficients or female coefficients) by using coefficients of the pooled regression.

3.2 Presentation of Data

The study makes use of most recent labour force survey undertaken in 2010. The survey was conducted by the National Institute of Statistics. The Cameroon Labour Force Survey (CLFS 2010) record individual labour market characteristics. The survey was undertaken from 16 May to 17 July, 2010. This survey was intended, inter alia, at: (1) update the activity conditions in the different sectors and their performances; (2) ameliorating national accounting data; (3) measuring the size of the informal sector in the national economy; and (4) suggesting ways to improve how activities are conducted in the sector, with a view to following its transition to the formal private sector.

4. Empirical Results

4.1 Descriptive Statistics

Column 1 of Table 1 harbours the descriptive statistics for full data. The descriptive results indicate that the labour force participation is 56.7%. Regarding the percentage of workers in the Cameroon informal sector, the descriptive findings reveal that 89.2% of work force is in the informal sector. Statistics equally show that 48% the individuals surveyed were male. The average earning was about 72348 FCFA per month with an average log of 10.347 points. Statistics also show that about 19.3% of the interviewees had no level of education. Of all those having a given education level, 30.6% had primary education, 41.6% had secondary education and 8.5% had higher education. Further, results reveal that 43.6% of the interviewees were urban dwellers. On the average the age of individuals surveyed was 31 years. The proportion of the married was 56.8%. Lastly, on the average each interviewee had a child less than six years.

Column (2) and (3) of Table 1 presents the descriptive statistics by gender for data. Descriptive statistics indicates that, the labour force participation rate in 2010 was about 67.7% for male sample and 46.5% for female sample. This finding portraits the existence of a gender disparity in labour force participation rate.

Table 1: Descriptive Statistics for Total Sample and Informal Subsample

Variables	Total sample			Informal Subsample		
	(1) Pooled [M&F]	(2) Male subsample	(3) Female subsample	(4) Pooled [M &F]	(5) Male sub sample	(6) Female Sub sample
Participation	0.567 (0.496)	0.677 (0.468)	0.465 (0.499)			
Informal sector	0.892 (0.311)	0.856 (0.351)	0.930 (0.255)			
Male	0.480 (0.500)			0.501 (0.500)		
Earnings	72348 (150297)	92611 (183984)	47256 (86733)	62427 (143315)	80651 (177628)	41256 (83231)
Log of Earnings	10.347 (1.427)	10.645 (1.370)	9.979 (1.412)	1.404 (4.423)	10.493 (1.362)	9.872 (1.380)
No level of education	0.193 (0.395)	0.132 (0.339)	0.249 (0.432)	0.231 (0.486)	0.147 (0.354)	0.260 (0.439)
Primary Education	0.306 (0.461)	0.304 (0.460)	0.307 (0.461)	0.382 (0.486)	0.327 (0.469)	0.321 (0.467)
Secondary Education	0.416 (0.493)	0.456 (0.498)	0.380 (0.485)	0.355 (0.478)	0.456 (0.498)	0.371 (0.483)
Higher Education	0.085 (0.279)	0.107 (0.309)	0.064 (0.245)	0.032 (0.176)	0.070 (0.256)	0.048 (0.214)
Urban Residency	0.436 (0.496)	0.448 (0.497)	0.425 (0.494)	0.326 (0.469)	0.417 (0.493)	0.410 (0.492)
Age	31.372 (12.736)	31.608 (12.752)	31.153 (12.718)	33.083 (12.674)	30.779 (12.847)	30.896 (12.791)
Married	0.568 (0.495)	0.488 (0.500)	0.641 (0.480)	0.635 (0.382)	0.460 (0.498)	0.641 (0.641)
Children<6years	1.141 (1.341)	1.024 (1.281)	1.250 (1.385)	1.206 (1.340)	1.054 (1.054)	1.270 (1.270)

Source: Computed by authors using Stata 13 and CLFS 2010

Descriptive results equally indicate the informal sector participation rate of 85.6% and 93% respectively for the male sample and female samples. Statistics also show that the average earning in 2010 was about 92611 FCFA for male employees and 47256 FCFA for female employees, with average log earnings of 10.645 and 9.979 respectively.

Column (4) of Table 1 hosts the descriptive statistics for the informal sector (pooled). Descriptive statistics indicates that the percentage of male workers was 50.1%, and the average earning for informal sector workers was about 62427 FCFA.

Also, about 23.1% of the informal workers have no education. Concerning the workers having a given education level in the informal sector, 38.2% had primary education, 35.5% had secondary education and 3.2% had higher education. Further results indicate that 32.6% of informal sector workers reside in urban. Averagely, each informal sector workers are 33 years old. About 63.5% of informal sector workers are married. On the average, workers of the informal have at least a child less than six years.

Column (5) and (6) of Table 1 reports the descriptive statistics by gender in the informal sector. Statistics reveal that the average earnings in the informal sector was about 80651 FCFA for male workers and 41256 FCFA for female workers. Descriptively, this finding gives an indication of gender earning differentials in the Cameroon informal sector. In the informal sector about 14.7% of the male workers have no level of education while 26% female workers have no level of education. Equally, results indicate that the percentage of workers with primary education in the informal is 32.7% and 32.1% respectively for male and female workers. The proportion of workers with secondary level of education in the informal sector of employment is 45.6% of the male workers as against 37.1% female workers while the proportion of workers with higher level of education for male and female workers respectively is 7% and 4.8%. Furthermore, results show that the proportion of informal sector workers residing in urban areas is 41.7% and 41% respectively for male and female workers. Averagely in the informal sector, male as well as female workers are 31 years of age. The results also reveal that of the proportion of married workers in the informal sector is 46% for male workers against 64.1% for female workers. On the average in the informal, both male and female workers have a child less than six years.

4.2 Econometric Results

4.2.1 Bivariate Probit Regression Results

In this section we focus our discussion on the bivariate probit results reported in Table 2. The joint marginal effects analysis offers the analytical benefit of allowing us to consider the effects of gender disparities on the decision to participate in the labour market and in the informal sector. The Wald test is used to measure the goodness of fit. The significance of the Wald statistics leads to the rejection of the hypothesis that all the regression coefficients are statistically equal to zero. Equally, the Wald test of $\rho = 0$ indicates that ρ which represents the correlation of the two error terms is statistically significant. This led to the rejection of the null hypothesis of independently modelling the two decision equations. Thus, estimating the separate univariate probit models will likely produce biased estimates. Based on this, jointly modelling the two decisions using the bivariate probit suits the purpose. Specifically, the negative estimate of ρ indicates that the unobserved factors affecting labour market participation and informal sector choice are negatively correlated. The predicted value of the joint probability of LFP = 1 and ISC = 1 indicates that the model predicts 81% probability of success.

Table 2 presents the coefficients of labour force participation and informal sector choice in column (1) and (2) respectively, and their joint marginal effects are presented in column (3). The joint marginal effects result indicates that gender, level of education, urban residency, age, age squared, married and number of children under six years significantly affect the joint probability of labour force participation and informal sector choice of employment.

In Table 2, column (3) reveals that there exist gender disparity in favour of male workers in the joint probability of participating in the labour market and choosing to worker in the informal sector. Specifically, findings indicate that male workers compared to their female counterparts are more likely to make the joint decision of participating in the labour market and in the informal sector. In this case, male workers have a probability of 14% higher than their female counterparts in making the joint decision of participating in the labour market and choosing the informal sector

Table 2: Determinants of Labour Force Participation and Choice of Informal Sector Employment (Bivariate Probit Regression)

VARIABLES	(1) Labour force participation [lfp]	(2) Informal Sector choice [informal]	(3) Joint Marginal effect [Pr(lfp=1,informal=1)]
Male	0.759*** (0.043)	-0.325*** (0.052)	0.140*** (0.011)
Primary	0.456*** (0.062)	-0.320*** (0.123)	0.060*** (0.018)
Secondary	0.371*** (0.068)	-1.100*** (0.122)	-0.064*** (0.021)
Higher	0.560*** (0.136)	-2.184*** (0.127)	-0.494*** (0.038)
Urban	0.550*** (0.049)	-0.343*** (0.059)	0.077*** (0.011)
Age	0.196*** (0.011)	-0.124*** (0.014)	0.031*** (0.003)
Age Squared	-0.002*** (0.0001)	0.001*** (0.0002)	-0.0003*** (0.00004)
Married	0.396*** (0.051)	0.003*** (0.062)	0.093*** (0.014)
Children <6 (Nonsel cluster mean)	-0.199*** (0.031)	0.088 (0.057)	-0.036*** (0.009)
Constant	-3.841*** (0.185)	4.950*** (0.307)	
The parameter Atrho		-0.322*** (0.065)	
Rho (ρ)		-0.311 (0.058)	
Log likelihood		-4654940.5	
Wald Chi^2 (18)		2334.39	
Wald test of $\text{rho}=0$		24.733***	
(Prob> $\text{Chi}^2=0.000$)			
Pr(lfp=1,informal=1)		0.810	
Observations	13,044	13,044	13,044

Source: Computed by authors using Stata 13 and CLFS 2010. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Column (3) of Table 2 also show that the level of education is statistically very important in determining the joint probability of an individual participating in the labour market and in the informal sector. Regarding primary level of education, results show that as compared to no education, having primary level education increases the probability of jointly making the decision to participate in the labour market and in the informal sector by 6%. Meanwhile, results also show that, secondary level education reduces the joint probability of an individual participating in the labour market and in the informal sector by 6.4% and higher educational attainment grossly reduces the joint probability of an individual participating in the labour market and in the informal sector by 49.4%. These results are largely consistent with a priori expectations.

Table 2 equally shows that being an urban resident relative to rural residency increases the joint probability of participating in the labour market and in the informal sector. In particular, urban dwellers have a joint probability of participating in the labour market and in the informal sector of 7.7% higher than their rural counterparts. Also married workers have a joint probability of an individual participating in the labour market and in the informal sector of 9.3% higher than their unmarried counterparts.

Results further indicate that age is positively related to the joint probability of participating in the labour market and in the informal sector. In particular, the joint probability of an individual participating in the labour market and in the informal sector increases by 0.031 for every additional year of the individual below about 49 years. Meanwhile, for individuals above 49 years old, the probability of participating in the informal labour market reduces for any additional year. This finding shows that the age of workers exhibit a quadratic behaviour, which is a diminishing effect on the joint probability of labour force participation and informal sector engagement.

The number of children below six years old captured at the cluster level was used to instrument and identify the probit choice models. The number of children below six years old in the same household hosting a worker significantly reduces the joint probability of participating in labour market and in the informal sector by 3.6%.

4.2.2 Role of Gender on Earnings in the Informal Sector

This section hosts estimates of the Mincerian wage equation for the informal sector using OLS and correcting for sample selection. The main objective in this section is to evaluate the role of gender on earnings in the informal sector, while controlling for other correlates. Table 3 harbours the result obtained using OLS and Heckman (corrected for sample selection bias). In particular, Column 1 hosts the OLS estimates of the structural parameters of equation (1). These estimates could be afflicted by sample selection bias. Column (2) gives estimates of the structural parameters corrected for potential sample selectivity bias. The results in Table 3 show that gender is positively and significantly associated with earnings in the informal sector. The OLS estimate of the coefficient on male workers is 0.540 (Column 1). It is possible that employees used their characteristics to include or exclude themselves from labour market participation and from the informal sector, implying that sample selection may bias the OLS estimates. Thus accounting for sample selection bias, the estimate drops to 0.367 (Column 2). The OLS estimates are therefore overestimating gender earnings-differentials in the informal labour market in Cameroon. These results indicate the likelihood of gender earnings-differential in the Cameroon informal labour market in the order of 36.7% in favour of male workers. Results in Table 5 column 2 are therefore to be preferred.

Column 2 of Table 3 shows that returns to education are incremental in the informal labour market in Cameroon. In particular, workers with primary level education earn about 47.7 % more than their counterparts with no education. By the same token, those with secondary level (higher level) education earn about 55.1% (70.1%) more than their counterparts with no education. Column 2 of Table 3 also shows that residing in the urban areas positively and significantly affects earnings in the informal sector of Cameroon. Specifically, urban dwellers earn about 40.2% more than their counterparts in the rural areas.

Table 3: Role of Gender on Earnings in the Informal Sector

VARIABLES	(1) OLS	(2) Heckman (Correcting for sample selection bias)
Male	0.540*** (0.054)	0.367*** (0.080)
Primary Education	0.589*** (0.068)	0.477*** (0.078)
Secondary Education	0.653*** (0.076)	0.551*** (0.083)
Higher Education	0.861*** (0.169)	0.701*** (0.178)
Urban Residency	0.535*** (0.075)	0.402*** (0.088)
Age	0.096*** (0.0145)	0.063*** (0.018)
Age squared	-0.001*** (0.0002)	-0.0008*** (0.0002)
Married	0.111 (0.071)	0.021 (0.078)
Inverse Mills Ratio (IMR)		-1.012*** (0.345)
Constant	7.397*** (0.262)	8.719*** (0.521)
Observations	2,412	2,412
R-squared	0.141	0.144

Source: Computed by author using Stata 13 and CLFS 2010. Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Equally, column 2 of Table 3 indicates that age has an effect on earnings in the informal labour market in Cameroon. In particular, the earnings of an individual in the informal sector increases by 0.063 log points for every additional year of the individual below 40 years. Meanwhile, for individuals above 40 years old, earning of an individual in the informal sector reduces for any additional year. This finding shows that the age of workers exhibit a quadratic behaviour, which is a diminishing effect on the earnings of an individual in the informal labour market.

In the Mincerian wage regression for the informal sector, the inverse mills ratio is statistically significant. Significance of the negative selection coefficient for labour force participation and informal sector employment implies that earnings of a worker with average characteristics in the population is lower than for any worker who would be drawn randomly into the informal employment.

4.3 Results of Gender Earnings Decomposition in the Informal Sector.

This section presents the decomposition of the gender earnings differentials, the summary of earnings decompositions between male and female employees based on the 2010 survey and the contribution of the individual variables in explaining the predicted earnings differentials between male and female employees.

4.3.1 Decomposition of the Gender Earnings Differentials

Table 4 presents the decomposition of the gender earning differentials in the informal sector obtained from CLFS 2010. The predicted log earning for the male sample is presented in column (1), the predicted log earnings for the female sample is presented in column (2) and the earning gap is presented in column (3).

Results of Table 4 indicate that in 2010, the predicted mean of the natural log earnings of male workers was 10.419 higher than that of female workers which stood at 9.942. These results are consistent with the raw mean of earnings depicted by the descriptive statistics. The gender earnings gap stood at 0.477 log points indicating that male employees earned a wage premium of 0.482 log points over their female counterparts.

Table 4: Decomposition of the Gender Earnings Differentials

VARIABLES	(1) Prediction for Male Sample	(2) Prediction for Female Sample	(3) Differentials
Primary Education	0.083	0.225	-0.143
Secondary Education	0.124	0.326	-0.202
Higher Education	0.025	0.072	-0.048
Urban Residency	0.243	0.084	0.159
Age	2.087	1.384	0.703
Age Squared	-1.022	-0.542	-0.480
Married	0.151	-0.158	0.309
IMR	-0.269	-0.373	0.104
Constant	8.998	8.923	0.075
Total	10.419	9.942	0.477

Source: Computed by author using excel and CLFS 2010.

4.3.2 Summary of the Earnings Decomposition between Male and Female Employees Based on the 2010 Survey

Table 5 hosts summative decomposition results between male and female workers based on the 2010 survey. The Oaxaca–Ransom decomposition enables the separation of the discrimination effect into two components: the male advantage and the female disadvantage. The male advantage refers to the extent to which the coefficients for males exceed the non-discriminatory wage structure and the female disadvantage refers to the extent to which the coefficients for females fall below the non-discriminatory benchmark.

Table 5: Summary of Wage Decompositions between Male and Female Employees Based On the 2010 Survey

Components of Earnings Differentials	Oaxaca-Ransom Decomposition
Endowment Effect	0.334 (70%)
Informal Labour Market Returns to Endowments	0.143 (31.5%)
• Male Advantage	0.055 (38.5%)
• Female Disadvantage	0.088 (61.5%)
Total Earnings Gap	0.477

Source: Computed by author using excel and CLFS 2010.

The findings of Table 5 show that of the labour market discrimination component of 0.143, male advantage is 38.5% indicating that men receive higher wages compared to the non-discriminatory wage structure. By the same token, the female disadvantage is 61.5%, which represents a significant underpayment of women.

4.3.3 Contribution of the Individual Variables in Explaining the Predicted Earnings Differentials between Male and Female Employees

Table 6 presents the decomposition of wage differentials between male and female employees based on the Oaxaca–Ransom approach. Gender differences in both composition and coefficients in terms of endowments, male advantage and female disadvantage of urban residency and married are consistent with widening the earning pay gap between male and female employees. Only the age variable narrowed the earning gap for the endowment component. Variables that solidly mitigate the gender earning gap for both the male advantage and female disadvantage are secondary education, higher education and age squared.

Table 6: Decomposition of Earning Differentials between Male and Female Workers

VARIABLES	(1) Endowment Effect	(2) Male Advantage	(3) Female Disadvantage	(4) Total
Primary Education	0.002	-0.035	-0.110	-0.143
Secondary Education	0.039	-0.085	-0.156	-0.202
Higher Education	0.013	-0.016	-0.045	-0.048
Urban Residency	0.002	0.140	0.017	0.159
Age	-0.003	1.288	-0.583	0.703
Age Squared	0.003	-0.536	0.054	-0.480
Married	0.018	0.196	0.096	0.309
IMR	0.262	0.427	-0.585	0.104
Constant	0	-1.325	1.400	0.075
Total Earnings Gap	0.334	0.055	0.088	0.477
Percentage	70%	11.5%	18.5%	100

Source: Computed by author using excel and CLFS 2010.

From Table 6, female disadvantage effect are gender earning gap reducing for primary education, secondary education, higher education, age, age squared and the inverse mills ratio. Indeed, this is tantamount to saying that men were under rewarded and women were over-rewarded in terms of these variables. These outcomes were, however, not strong enough to eliminate labour market discrimination against women because up to 30% of the aggregate earning gap between men and women of 0.477 was accounted for by labour market discrimination.

5. Concluding Remarks and Policy Implications

This study investigated gender differentials in the informal labour market of Cameroon. To evaluate gender-disparity in labour force participation and informal sector employment in Cameroon, the study made use of a bivariate probit model; and results indicated that there exist gender disparity in favour of male workers in the joint probability of participating in the labour

market and choosing to work in the informal sector. To examine the effect of gender on earnings in the informal labour market, a Heckman two-step selectivity correction model was employed; and results revealed that gender is positively and significantly associated with earnings in the informal sector. Investigating the role of returns to endowments in explaining gender wage differentials in the informal labour market, the study made use of the OLS and the Oaxaca-Ransom approach. Findings show that globally male employees have a wage premium over their female counterparts. Results equally reveal that access to endowments largely accounts for the gender earnings-gap in the informal labour market in Cameroon. Returns to endowment were, however, non-negligible of which, on average, male workers were over-paid and their female counterparts were under-paid. Meanwhile, returns to female education were solidly consistent in narrowing the gender earnings-gap, which is indication that female informal sector workers have a net education-based advantage over their male counterparts. These findings provide useful information for public policy in Cameroon. The implications of these findings are in tandem with the wisdom that promoting education of the girl child would play a key role in alleviating gender-based differentials in the informal sector labour market in Cameroon. Therefore, a number of measures should be implemented in order to ensure the better schooling of women. Such measures might include, for instance, making primary education compulsory and investing more in priority education areas (East and northern regions mainly) where the rate of schooling remains very low.

References

- Anyanwu, J. C. and A. Darline (2013), 'Gender Equality in Employment in Africa: Empirical Analysis and Policy Implications', *African Development Review*, Vol. 25, No. 4, pp. 400–20. (OECD), 2012
- Baye, F.M., B.N. Epo and J. Ndenzako (2016), 'Wage Differentials in Cameroon: A Gendered Analysis', *African Development Review*, Vol.28, No.1, pp.75–91.
- Becker, G.S. (1971), 'The Economics of Discrimination. Chicago', The University of Chicago Press.

- Biltagy, M. (2014), 'Estimation of Gender Wage Differentials in Egypt using Oaxaca Decomposition Technique', *International Household Survey Network*, Vol.16, No.1, pp.17-42.
- Cheng, X. (2005).*The Gender Wage Gap in the Public and Private Sectors in Canada*.Masters Thesis, University of Saskatchewan Saskatoon.
- CNIS (2010).The Cameroon Labour Force Survey (CLFS 2010), phase 2: Complain on the Informal Sector, Principal report, Yaounde.
- Doğan, B., (2011), 'Gender Wage Gap in the Turkish Labour Market', Master Thesis, Institute of Social Sciences.
- Government of Cameroon (2009), 'Growth and Employment Strategy Paper', Ministry of Economy and Planning, Yaounde, Cameroon.
- Hoyos, A., H. Ñopo and X. Peña (2010), 'The Persistent Gender Earnings Gap in Colombia, 1994-2006', IZA Discussion Paper No. 5073.
- Kabubo-Mariara. (2003), 'Wage Determination and the Gender Wage Gap in Kenya: Any Evidence of Gender Discrimination'? AERC Research Paper, *African Economic Research Consortium*, Vol.132.
- Kagundu, P. and O. Pavlova (2007), 'Gender Wage Differentials in Uganda: Evidence from the Uganda National Household, Research Paper Series, Working Paper 07-25, Department of Economics International Studies Program, Andrew Young School of Policy Studies, Georgia State University.
- Koissy-Kpein, S. (2012), 'Gender and Competition between Economic or Non-Economic Labour and Schooling: Evidence from EPAM Mali', *African Development Review*, Vol. 24, No. 1, pp. 107–23.
- Komon, J.C. and N.M. Tchakounté (2008), 'Informal Unemployment and Employment in Cameroon', *Economic Revenue and applied management*, Vol.5, pp.54-79.
- Kuepie, M., A. Dzossa and S. Kelodjoue (2016), 'Determinants of Labor Market Gender Inequalities in Cameroon, Senegal and Mali: The Role of Human Capital and the Fertility Burden', *Canadian Journal of Development Studies*, Vol.37, No.1, pp.66-82.
- Mincer, J. (1974), 'Investment in Human Capital and Personal Income Distribution',*Journal of Political Economy*,Vol.66, No.4, pp:281-302.

- Mincer, J. (1958), 'Investment in Human Capital and Personal Income Distribution', *Journal of Political Economy*, Vol. 66, No. 4, pp. 281–302.
- Mulenga, M. S. (2015), 'Determinants of Wage Inequality in Zambia', Master Thesis, University of Zambia Lusaka.
- Ndamsa, D.T., A.M. Njong, F.M. Baye, and J. Youyem (2015), 'Investigating the Role of Male Advantage and Female Disadvantage in Explaining the Discrimination Effect of the Gender Pay Gap in the Cameroon Labour Market', Oaxaca-Ransom Decomposition Approach, *EuroEconomica*, Vol.34, No.1, pp.1582-8859.
- Ningaye, P. and F. D. Talla (2014), 'Labour Market Segmentation and Gender Inequality in Cameroon', *International Journal of Business and Economic Research*, Vol.3, No.2, pp.9-98.
- Njikam, G. B., T.R. Lontchi and V. F. Mwaffo (2005), 'Characteristics and Determinants of Youth's Employment in Cameroon', Employment Strategy Paper, ILO Employment Sector, Employment Strategy Development, Geneva.
- Nweke, N. (2014), 'Gender Wage Differences, the Case of Nigeria', Master Thesis, Swansea University, *Research Gate publication*.
- Ntuli, M. (2010), 'Determinants of South African Women's Labour Force Participation', Cape Town: University of Cape Town Press, Discussion Paper No. 3119.
- Oaxaca (1973), 'Male-Female Wage Differentials in Urban Labour Markets', *International Economic Review*, Vol.14 No.3, pp.693-709.
- Oaxaca, L. R. and M. R. Ransom (1994), 'On Discrimination and the Decomposition of Wage Differentials', *Journal of Econometrics*, Vol. 61, pp. 5–21.
- Oaxaca, R. L. and M. R. Ransom (1999), 'Identification in Detailed Wage Decompositions', *Review of Economics and Statistics*, Vol. 81, No. 1, pp. 154–57.
- OECD (2008), *OECD Employment Outlook, Declaring Work or Staying Underground: Informal Employment and in Seven OECD Countries*, Chapter 2, pp. 1-21.
- Polachek, (2004), 'How the Human Capital Model Explains why the Gender Gap Narrowed', IZA Discussion Paper No. 1102.
- Schleicher, A. (2008), 'Student Learning Outcome in Mathematics from a Gender Perspective: What Does the International PISA Assessment Tells us? In Girls' Education in the 21st

- Century. Gender Equality, Empowerment and Economic Growth', Washington. The World Bank.
- Simpson, P. A. and L.K. Stroh (2002), 'Revisiting Gender Variation in Training', *Feminist Economist*, Vol.8, No.3, pp.21-53.
- Tchakounté, N. M. (2008), 'Market Flexibility of Industrial Employment and Reduction of Unemployment in Cameroon', Ph.D Thesis, FSEGA, University of Douala, 282p.
- Totouom, A., P. V. Mboutchouang and H. K. Fotio (2018), 'The Effects of Education on Labour Force Participation in Cameroon: A Gender Perspective', *African Development Review*, Vol.30, No.1, pp.45–55.
- Traoré (2012), 'Revisiting the Determinants of Informal Sector in Burkina Faso', University Ouaga II, Laboratory of Economic Policy Analysis. MPRA Paper, No. 49006
- Wang, M. and F. Cai (2008), 'Gender Earnings Differential in Urban China. *Review of Development Economics*, Vol.12, pp.442-454.
- World Bank Cameroon Office (2012), Cameroon Economic Update: Unlocking the Labour Force an Economic Update on Cameroon, Issue No. 3, World Bank Cameroon Country Office, Yaoundé, Cameroon.