Quality of Employment in the Private Sector in Côte d'Ivoire

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Abstract

Issues related to job quality are increasingly taking centre stage in professional and scientific circles because of the stakes involved. The objective of this research is to identify the characteristics of workers that allow them to benefit from aspects of quality of employment. This study uses two models: Ordinary Least Squares (OLS) and ordered probit. Before using these models, the author estimates a bivariate selection probit with experimentation. The dependent variable is constructed using Multiple Correspondence Analysis (MCA) and Hierarchical Ascending Classification (HAC). The results make it possible to determine the profile of individual beneficiaries. The study shows that a worker with university education, who is familiar with the collective agreement of the companies and who has not experienced a long period of unemployment is more likely to benefit from a good level of quality employment than someone else. The data used are from the 2012 Household Employment Survey conducted by the Agency for Employment Studies and Promotion (AGEPE).

Keywords: Quality of employment; Composite index; Bivariate probit; Ordered probit; Instrument; Selection; OLS; MCA; HAC.
JEL Classifications: C10, C35, J28, J81, J83

1. Introduction

Job quality has been a concept of interest to all labour market actors for almost two decades. It has continually sparked debate in both scientific and institutional circles. Even today, it is not difficult to find research on this unanimous topic. However, the diversity of approaches used to understand it makes it rich.

Job quality is a multidimensional concept that can be understood through dimensions or indicators that make it up. Guergoat-Larivière and Marchand (2012) summarize in a table (see Annex Table A1) the dimensions of job quality retained in the various international approaches. These are the dimensions chosen by international organizations to sometimes serve as a basis for indicator selection.

For Ralle (2006) in "The Quality of Employment" from the Centre for Labour Studies, a quality job is: "A well-paid job, with a stable status and good working conditions, which leaves the possibility of having a fulfilled life outside of work, and in which relations with the professional environment are good." While the definition proposed by Ralle (2006) has the advantage of summarizing a term that is not easy to approach, it should however be noted that the concept itself remains a subject of discussion due to the subjective nature of some of its dimensions, which are often difficult to measure. Indeed, what does a well-paying job mean? What does the possibility of having a full life outside of work mean? Would work in itself be a source of alienation to the point of feeling own life fulfilled outside of it?

In any case, we can hold that the understanding of the notion of job quality refers to the grasp of the following dimensions retained (Cloutier-Villeneuve, 2017) most of the time in empirical works: remuneration, working hours, job stability, qualifications, physical and psychological (working) conditions, typical and atypical working hours, group insurance, retirement plans and paid leave. From these dimensions and depending on the context of the study (purpose, scope, survey data, etc.), it is possible to select their sub-dimensions that could be the subject of research.

From there, the construction of a composite index of job quality becomes a challenge! So far, there has been no unanimous agreement on the rules for composite index construction; the question of the weight to be given to this or that dimension remains unresolved. To facilitate research on the subject and to be able to derive economic policy recommendations, some authors use recurrent dimensions in their work to define job quality, while other authors use other variables such as job satisfaction to designate job quality (Davoine, 2007).

In any case, we note that despite a vagueness that may surround the notion of job quality, it remains a fascinating field of study, especially if we assume that job quality is a source of productivity and performance insofar as it contributes to employee motivation (Amoranto and Chun, 2011).

Several studies at the international level have addressed the issue of job quality with approaches that are certainly different, but that retain the quintessence of the concept (Davoine and Erhel, 2007; Cloutier-Villeneuve and Saint-Frard, 2015; Lapointe, 2013; Burchell et al, 2014; Clark, 2015; Perrenoud, 2015; Cazes, Hijzen and Saint-Martin, 2015; Monga, Shimeles and Woldemichael, 2019).

In Africa, reports on the quality of work are generally carried out by supranational organizations and deal more with working conditions. Studies on job quality are rare. Oumba (2016) and Razafindrakoto and Roubaud (2005), who respectively discuss the issue of decent work in Africa in light of International Labour Organization (ILO) standards and unemployment and working conditions in the urban labour market of Sub-Saharan Africa through stylized facts, refer more to working conditions.

In Côte d'Ivoire, the quality of employment was understood through four dimensions considered recurrent in international research work and concerned all sectors of activity (N'Gratier, 2017).

This study addresses the notion in a league of its own, more particularly in the (Ivorian) private sector, which is supposed to be the relay of public enterprises, participating in the generation of four-fifths of the total production, two-thirds of the investments in Africa according to the International Monetary Fund (IMF). The study involves several dimensions of job quality.

This proposal aims to identify and evaluate the determinants of job quality among private sector workers in Côte d'Ivoire. Specifically, it involves constructing a composite index of the quality of employment for private sector workers, evaluating the factors that explain the job quality for private-sector workers in Côte d'Ivoire, and finally assessing the individual and collective effects of higher education, and knowledge of the collective agreement on said quality. This study initially revolves around all workers in the private sector, whether they are in the formal or informal private sector. Secondly, to make it less open to criticism, the study analyses the quality of employment in the two private sectors separately. Indeed, limiting oneself to studying only the quality of employment in the two sectors could potentially lead to very questionable results; insofar as the private informal sector is an area where most of the time jobs are precarious, even if some actors earn substantial incomes. However, this assertion should be made with caution, as informal (i.e., low-quality) jobs can also be found in the formal private sector, regarding indefinite unwanted part-time contracts, temporary work, subcontracting, lack of social protection, etc.

In contributing to the debate on employment quality, this study focuses on Côte d'Ivoire, a country in the South, which has been posting a higher growth rate compared with some developing countries for nearly a decade. The study relies on data from the 2012 Agency for Employment Studies and Promotion (AGEPE) household employment survey. The choice of these data lies in their richness regarding the number of variables

and questions related not only to the socio-demographic aspects of individuals, the work environment, etc.

Moreover, this study informs economic actors in the countries of the South that the notion of quality of employment is not the prerogative of the countries of the North. Through a literature review and a model based on numerical data, the study shows that the characteristics of certain workers are likely to enable them to benefit from a certain level of employment quality in companies. Moreover, the research attempts to assert that if the improvement of job quality seems to be conditioned for several managers by the achievement of performance on the part of their workers, the acquisition and/or development of given characteristics by the latter could "oblige" them not to expect any more conditions from their employment, even though these may appear legitimate.

2. Literature review

Theories on the quality of employment include theory of efficiency wages with models of donations and counter-donations, slacker, etc; theory of implicit contracts, theories of collective bargaining with the right to manage model, and the efficient contract model.

Theories on the dimensions of quality of employment

The theories outlined below refer to aspects of remuneration, assimilated here by salary, working conditions (psychological and physical), professional recognition, industrial relations, employment contracts, collective bargaining, and working hours, among others.

Theories on compensation, precisely the link between compensation and worker motivation, go back to Leibenstein (1957). He established an inverse causality between wages and productivity since hitherto accepted that high productivity should be rewarded by high wages (Lesueur and Sabatier, 2008). With Leibenstein (1957), salary becomes a source of motivation and leads to employee performance. The theory on the wage efficiency with its microeconomic developments is becoming more precise. Models of gifts and counter-gifts, tug-of-war, and rotation of the labour force puts more significance on the reverse causality established by Leibenstein (1957).

The question of remuneration is so significant in microeconomic theory and labour economics in particular that some authors, in their study of the quality of employment, make it a privileged dimension to the point of retaining it as the sole indicator of job quality (Guergoat-Larivière and Marchand, 2012, citing Fernandez-Macias and Hurley, 2008).

Physical and psychological conditions, and professional recognition, are equally important dimensions of job quality. Theories on these dimensions are generally in the domain of work and organizational psychology. Here, the questions of recognition at work, of merit and thus of categorical and salary advancements, of social ties with others (colleagues, superiors) find their full meaning. Sarnin (2008) rightly points out that "an individual who makes an effort... necessarily asks himself the question of the meaning of this effort, of the know-how used. If others confirm, "it's a good job"... the effort made makes sense. If, on the other hand, the others say nothing, the leaders,..., no comment, then all this effort is made without really making sense, and

the only thing left to the individual is the hardship associated with the effort". Dejours (1993a), quoted by Sarnin (2008), presents through a very illustrative diagram the consequences that could occur in case of non-recognition of the work accomplished (see Annex Table A3).

Another important dimension of job quality is job stability through employment contracts. The theory of implicit contracts makes explicit the work relationship that exists between employers and workers. The latter prefer to sign a contract that guarantees them a stable job with low remuneration, regardless of the economic situation; employees are considered to be averse to the risk of unemployment, and employers are neutral about it.

Professional relations, which can be likened to the social climate in the workplace, contribute to the quality of employment. This climate influences the performance of the organization and the satisfaction of the workers (Martin and Croisille, 2006, citing Lawler, Hall and Oldham, 1974). Martin and Croisille (2006) define climate as the experience of the work environment. Union power also influences the quantity and, to some extent, the quality of employment. The right-to-manage model and the effective contract model are at odds as to the outcome of employment levels due to union negotiations. Indeed, as Cahuc and Zylberberg (1996) note: "The union monopoly model and, more generally, the right-to-manage model, lead to the conclusion that union bargaining power decreases the level of employment...while in the latter it increases it in the (more likely) case where employees are risk-averse."

In addition, hours of work and work schedules are considered essential dimensions of job quality. These dimensions make it possible to perceive the possibilities for the worker to reconcile private and professional life. Often equated with the arduousness of tasks, working hours, or more precisely, the number of weekly working hours, are hotly debated between workers' unions and employers. According to the workers' unions, a quality job would be one that would guarantee workers the possibility of having a normal family life and engaging in other re-creative activities. Staggered working hours, night work, and weekend work force employees to reorganize their family life or their life outside of work, which likely, makes it very different from that of their counterparts with standard working hours.

Studies on the quality of employment

Although studies on the quality of employment differ from one another because of the research context, it is concluded that the diversity of these studies enriches the debate, or rather, shows that there is room for research. In principle, job quality analysis should be carried out within a global analysis of the labour market, which is itself broken down into three levels: macro, meso, and micro. This global analysis makes it possible to identify the contours of job quality (Cloutier, 2008, as quoted by Cloutier and Saint-Frard, 2015).

In a study on the perception of job quality, Yedder and Perreti (2009) concluded, based on a sample of 404 potential workers, that for them, "quality jobs are those that offer decent pay with opportunities for advancement, including access to training, and healthy working conditions." They also note a disparity in expectations about the quality of employment depending on cultural affiliation and personal background. In their study, the subjectivity of the notion takes on its full meaning.

Moisserons et al (2017), reflecting on women's access to and retention in quality employment in two Maghreb countries and Turkey, show the discrimination suffered by women in accessing and retaining quality jobs, which depends on their place of residence and work, and their level of education. They advocate for an improvement of their working conditions.

In analysing the relationship between quality jobs and firm performance, Amoranto and Chun (2011) note in a sample of Indian firms that large firms tend to offer better quality jobs. They point out that (good) remuneration tends to increase the level of profit, labour, and capital productivity. In a completely different register, Lewandowski et al (2017) show that in Poland, although the creation of temporary jobs has made it possible to reduce the level of unemployment, in most cases it is accompanied by poor quality conditions for the exercise.

Workers, regardless of their status and physical health, should have access to quality jobs. However, this is not always the case, especially for workers with disabilities. Fanjeau (2007) notes, in a study carried out in partnership with the Directorate of Research, Studies and Statistics [Direction de l'Animation de la Recherche, des Etudes et des Statistiques (DARES)], that although most people with disabilities are employed in jobs comparable to those held by able-bodied people, it should be noted that in the medium to long term, differences appear in career development and salary.

Davoine (2007) and Davoine and Erhel (2007), in their research on the quality of employment in Europe, show wide disparities between European countries. Thus, while the intensity of the training effort for workers is identified in Denmark, income and job security are more unfavourable in southern European countries. As for working conditions, they are considered dangerous in southern European countries and difficult in northern European countries and the United Kingdom.

3. Methodology

Construction of a composite index using Multiple Correspondence Analyses (MCA)

The method of constructing the composite index is mainly inspired by the work of Asselin (2002), by Cloutier-Villeneuve and Saint-Frard (2015), Konde (2016), and Ki et al (2005). Indeed, Cloutier-Villeneuve and Saint-Frard (2015) note that Asselin (2002), in his work on multidimensional poverty, vividly defines this approach to understand better the theory behind it. He summarizes it by considering a set of observations (n) ... as a scatterplot in the space $\mathbb{R}^m$ where m is the number of variables contained in the analysis and each point (i) of the data file is assigned a weight for the scatterplot to have an average weight. The space $\mathbb{R}^m$ in which the scatterplot is located can be represented by several dimensions where each dimension is associated with so-called relative inertia. The total inertia (total dispersion) is the weighted sum of the distances between the average weight and the different points in the cloud...
This approach makes it possible to construct the composite index for an individual ii by the following formula:

$$IQE_{i,t} = \frac{1}{K}\sum_{k=1}^{K}\sum_{jk}^{JK} W_{jk}^{k} I_{i,jk}^{k} \quad (1)$$

Where K - is the number of variables retained in our MCA, W_{jk}^{k} - the score of the j^{th} modality of a variable k - on each axis and - $I_{i,jk}^{k}$ - is a binary variable taking the value 1 if the individual has the modality j_k j_k - and 0 to the contrary, and t the chosen axis. Since we retain factorial axis 1 (from the calculations below) for the computation of the composite index from the standard coordinates of the variables from factorial axis 1 of the MCA, the formula of the composite index for an individual ii in the sample becomes again:

$$IQE_{i,1} = \frac{1}{K}\sum_{k=1}^{K}\sum_{jk}^{JK} W_{jk}^{k} I_{i,jk}^{k} \quad (2)$$

In a staggered manner, we have for the individual ii of the sample, the equation:

$$\left.\begin{aligned} IQE_{i,1} &= \frac{1}{K}\sum_{k=1}^{10}\sum_{j=1,k=10}^{2,10} W_{jk}^{k} I_{i,jk}^{k} \\ &= \frac{1}{K}\sum_{k=1}^{10}(W_{jk}^{k} I_{i,0k}^{k} + W_{jk}^{k} I_{i,1k}^{k}) \\ &= \frac{1}{K}\sum_{k=1}^{10}(W_{0k}^{k} I_{i,0k}^{k} + W_{1k}^{k} I_{i,1k}^{k}) \\ &= \frac{1}{K}(W_{01}^{1} I_{i,01}^{1} + W_{11}^{1} I_{i,11}^{1} + W_{02}^{2} I_{i,02}^{2} + W_{12}^{2} I_{i,12}^{2} + \cdots W_{010}^{10} I_{i,010}^{10} + W_{110}^{10} I_{i,110}^{10}) \end{aligned}\right\} \quad (3)$$

Once the composite index is constructed, we standardize it in the interval [0, 1].

Standardization of the composite index for job quality

To standardize the composite indicator in the interval [0,1], we calculate for each individual of the sample, a composite index whose value is also included in the interval [0,1] by the following formula inspired by the UNDP Human Development Indicator (HDI) calculation method:

$$ICN_i = \frac{IC_i - IC_m}{IC_b - IC_m} \quad (4)$$

With, ICN_i - which is the standardized composite index of individual i, IC_m - the composite index of a fictitious individual with poor employment conditions, i.e. whose responses are 0 for the good modalities of the job quality dimensions and IC_b the composite index of another fictitious individual with good employment conditions, i.e., whose answers are 1 for the good employment modalities.
From this formula, we have the composite index for each individual in the sample that is normalized in [0,1].

Econometrics models

This research aims to determine the characteristics of workers that have a significant influence on their probability of obtaining a good level of job quality. We have two estimation methods: Ordinary Least Squares and ordered probit. We retain that the composite explanatory variable (Job Quality) is constructed through the Multiple Correspondence Analysis (MCA) method that we normalize in the interval [0, 1], which will justify the use of an OLS since it is a continuous variable. Moreover, as the quality of employment, like some concepts (satisfaction), can be categorized into several modalities, we perform a Hierarchical Ascending Classification (HAC) of the composite index to estimate an ordered probit.

The job quality model can be written in the following form:

$$QE_i^* = \beta_n x_i^n + \varepsilon_i \quad (5)$$

Where x_i - is a vector of the characteristics of the worker ii and his or her work environment with ε_i the error.

Extensively, it comes to: $QE^* = \beta_0 + \beta_1 x_i^1 + \beta_2 x_i^2 + \cdots \beta_n x_i^n + \varepsilon_i$

$$QE^* = \beta_0 + \beta_1 x_i^1 + \beta_2 x_i^2 + \cdots \beta_n x_i^n + \varepsilon_i \quad (6)$$

with n being characteristics of the individual.

However, as in most micro-econometric models, biases may arise; these are potential selection and endogeneity biases.

Selection bias and endogeneity bias

Selection bias arises when the study subjects are not representative of the parent population; therefore, it is a systematic error made in selecting individuals for the study group. Failure to correct for such bias can lead to biased results and inaccurate policy recommendations. To correct for selection bias, we use the two-step Heckman method, where we generate the inverse of the Mills ratio, which we introduce into our structural equation.

In our case, it involves implementing two binary selection equations for our sample. The first equation is the labour market participation, and the second is the private sector employment. The bivariate probit is as follows:

$$PMT_i^* = X_i\beta + \mu_i \quad (7)$$

$$PMT_i = \begin{cases} 1 \; si \; PMT_i^* > 0 \\ 0 \; if \; not \end{cases} \quad (8)$$

$$ESP_i^* = X_i\beta + \mu_i \quad (9)$$

$$ESP_i = \begin{cases} 1 \; si \; ESP_i^* > 0 \\ 0 \; if \; not \end{cases} \quad (10)$$

Where PMT_i is the individual's participation to labour market i, ESP_i the job occupation in the private sector, and X_i the vector of his characteristics. Once, the bivariate probit is performed, we generate the Inverse Mill's Ratio (IMR), which we introduce into our equation of interest for endogeneity bias correction.

Other complications, and not the least, that we encounter in micro-econometric models is the possibility of inconsistent parameter estimation caused by endogenous regressors (Cameron and Trivedi, 2005). In OLS and ordered probit, the monthly salary variable can potentially be endogenous. Indeed, we wish to explain job quality by one of the variables, the monthly salary. However, the quality of the job also influences the monthly salary, and the latter sometimes explains whether a job is of good quality or not. In any case, there is a potential simultaneity bias between these two variables. Thus, suspecting this endogeneity variable, we need to find a relevant instrument Z to correct for this bias. The OLS or ordered probit in the presence of the instrument is written:

$$QE = QE(X, Z, \mu) \quad (11)$$

A relevant instrument that would verify the conditions of correlation with the potentially endogenous variable, and of independence concerning the error term and the explanatory variables, can be the type of training undertaken by the individual. The monthly wage received by the worker may be a valid reason to believe that the job held is of good quality. The type of training is potentially uncorrelated with the error term, including variables not taken into account in the quality of job the worker held, such as the individual's motivation, health, etc.

Furthermore, the Nakamura and Nakamura (1981) endogeneity test allows us to confirm the endogenous or non-endogenous nature of the suspected variable. First, the endogenous variable is regressed on the exogenous variables of the model and the instrument. Second, the residual from the first step is recovered and included in the model. A significant correlation between the residual and the explained variable leads to the conclusion of the endogeneity hypothesis.

Dimensions of the composite variable explained

The dimensions of the composite variable are: company-funded training, payslip issuance, compliance with the number of hours worked per week, salary increase / year, categorical increment, compliance with the salary scale, paid vacations, health insurance, retirement insurance, absence of salary arrears.

With the MCA, we obtain a standardized continuous variable in the interval [0, 1]. The continuous character of the continuous variable allows us to do our regression on our structural equation by the OLS. However, as mentioned above and given the specific character of the composite variable (possible to categorize it), we proceed in addition to the MCA to an AHC to obtain an ordered probit regression on our structural equation. Therefore, according to the MCA and the HAC results, we obtain the following levels (classes) of job quality: 1 equals to a low level of QE or poor job quality, 2 equals to a medium level of QE or average job quality, and 3 equals to a good level of QE or good job quality.

With the following modeling and probabilities:

$$QE_i = 1 \; si \; QE_i^* < c_1 \quad (12)$$

$$P(QE_i = 1) = \int_{-\infty}^{c_1 - \beta x_i} f(\varepsilon_i) d\varepsilon_i = \Phi(c_1 - \beta x_i) \quad (13)$$

$$QE_i = 2 \; si \; c_1 \leq QE_i^* < c_2 QE_i = 2 \; si \; c_1 \leq QE_i^* < c_2 \quad (14)$$

$$P(QE_i = 2) = \int_{c_1-\beta x_i}^{c_2-\beta x_i} f(\varepsilon_i)d\varepsilon_i = \Phi(c_2 - \beta x_i) - \Phi(c_1 - \beta x_i) \quad (15)$$

$$QE_i = 3 \; si \; c_2 \leq QE_i^* \quad (16)$$

$$P(QE_i = 3) = \int_{c_2-\beta x_i}^{c_3-\beta x_i} f(\varepsilon_i)d\varepsilon_i = 1 - \Phi(c_2 - \beta x_i) \quad (17)$$

The associated probability function is as follows:

$$L = \prod_{i=1}^{n} \Phi(c_1 - \beta x_i)^{I_1}[\Phi(c_2 - \beta x_i) - \Phi(c_1 - \beta x_i)]^{I_2}\,[1 - \Phi(c_2 - \beta x_i)]^{I_3} \quad (18)$$

Model variables

The dependent variable is a composition of several explanatory variables. The endogenous variables in the bivariate probit are coded in binary mode. Participation in the labour market is 1 and 0 to the contrary; employment in the private sector is 1 and 0 to the contrary. Only individuals who are in the labour force and unemployed people seeking employment participate in the labour market. All unemployed people who declare that they are not actively looking for a job do not participate in the labour market. The explanatory variables, coded in binary mode for some of them, are grouped into two categories: those relating to the socio-demographic aspect of individuals and those relating to their professional environment. The socio-demographic aspect of the individuals contains explanatory variables such as sex (1 for male and 0 for female), age, marital status (1 for married and 0 for unmarried), level of education (1 for university level and 0 if not), and type of training (1 for technical training and 0 for general training). The aspect related to the professional environment includes the monthly salary (0 for less than the Smig[1], 1 for the Smig and less than 3 times of it, 2 for 3 times the Smig and less than 5 times of it, and 3 for 5 times the Smig and more), the size of the company (1 for a large company and 0 if not), the knowledge of the collective agreement of the companies (1 for known knowledge and 0 if not), and the duration of unemployment before getting the job.

The explanatory variables can be described as follows:

- Gender: The gender of the worker is a significant variable in our analysis. In fact, in our research and per empirical work involving this variable, particularly those relating to discrimination theory, we expect to observe negative discrimination against women concerning the benefit of a good level of job quality.
- Age: The worker's age could have a positive effect on the probability of obtaining a good level of job quality. This may be linked to a high level of work experience. We retain all workers with ages greater than or equal to 15 years.
- Education level: According to the human capital theory, we expect that a higher

1 The SMIG (Guaranteed Interprofessional Minimum Wage) in 2012 was FCFA 36,607

level of education plays a positive role in the benefit of a quality job. However, there are some reservations related mainly to the fact that such a level cannot guarantee such a benefit, especially given the unemployment rate that prevails in the Ivorian labour market, where labour supply is much higher than the demand. In addition, the status of first-time job seekers of higher education graduates may adversely affect their likelihood of acquiring good working conditions.

- Knowledge of the firm's collective bargaining agreement: A worker who knows the firm's collective bargaining agreement (CBA) can positively influence his probability of obtaining a good level of job quality; it is, therefore, expected that knowledge of the CBA will have a positive effect on the dependent variable.
- Unemployment period before obtaining the job: The duration of unemployment could negatively affect the acquisition of a good level of job quality. Indeed, after a long period of unemployment, which is interpreted as a bad signal by recruiters, the worker may be ready to accept a job under any conditions, as long as the worker gets a job, has an income, and takes care of self. The desire to fulfill the minimum subsistence needs (primary needs according to Maslow's pyramid) would incline the worker to accept a job that does not necessarily reflect his expectations (training-job adequacy, education-job adequacy, etc). The worker could be led to revise the expectations. These arguments help us not to take for granted a level of higher education that would guarantee a quality job.

Data sources

The data we use are primarily from the 2012 AGEPE household employment survey. It consists of self-reported responses from the individuals interviewed. These secondary data have the advantage of being drawn from a credible public institution on which the state of Côte d'Ivoire relies on to define employment policies. The sampling frame for this survey is the 1998 General Population and Housing Census information. These data provide the household population and number by block, locality, sub-prefecture, department, and region. It covers the entire national territory. Thus, each of the 19 administrative regions formed a stratum, plus the city of Abidjan, making 20 strata. Abidjan, the country's economic capital, is home to a fifth of the national population and half of the urban population. Almost all modern businesses have their headquarters in Abidjan, where public administration, diplomatic representations, and economic infrastructure are concentrated. Sampling was conducted using a two-stage sampling design in each stratum. At the first stage, clusters or census districts were drawn in proportion to their size relative to the number of households. The different clusters were enumerated to list the households they contain. At the second stage, 20 households were drawn according to a systematic drawing method from each cluster. In total, 580 clusters were drawn, and 20 households were selected from each cluster. The two-stage survey used in this way makes it possible to calculate extrapolation coefficients associated with the data collected. Thus, making it possible

to extend the indicators obtained from the sample to the total population. The random sample entails a margin of uncertainty in the statistical results, measured, for a given variable, by the coefficient variation (CV). It provides information on the possible relative difference between the value given by the survey and the true value. In statistical terms, it corresponds to the ratio of the standard deviation of a parameter K to the value of this parameter. The parameter K can be a mean, a total, or a proportion. Considering β, the estimator of the parameter K, the true value of K will be included in 95% of cases in the following range of possible values: [β (1-2CV); β (1+2CV)].

According to Statistics Canada, the following estimates are given for the coefficient variation (see http://www.statcan.gc.ca/pub/88-001-x/2011004/userinfo-usagerinfo-fra.htm) :

- 0% to 4.9%, excellent
- 5.0% to 9.9%, very good
- 10.0% to 14.9, good
- 15.0% to 24.9%, acceptable;
- More than 25% poor accuracy.

In the 2012 employment survey, the coefficient of variation was calculated for the key variables of interest in this survey: the estimated number of jobs and the unemployment rate. This coefficient variation is overall 2.2% for the estimated number of jobs and 2.3% for the unemployment rate. It is differentiated by strata while always remaining at the lower end.

In conclusion, the estimates of the total number of jobs from the 2012 employment survey data are reliable, both overall and for each stratum.

4. Results and interpretation

Multiple Correspondence Analysis, Hierarchical Ascending Classification, and descriptive statistics

We use the Multiple Correspondence Analysis (MCA) because of the nature of the explanatory variables, which are qualitative. The MCA is a method that allows us to study the association between at least two qualitative variables. This method of analysis is to determine qualitative variables while Principal Component Analysis is to determine quantitative variables. It indeed makes it possible to obtain representation maps on which we can visually observe the proximity between the categories of qualitative variables and the observations. The MCA can also be considered as the CFA generalization to the case where there are more than two variables. If it is possible to synthesize a table with n individuals, and p (p>2) qualitative variables in a table whose structure is close to a contingency table, it is much more common in MCA to start from an observation/variable table (for example following a survey, where p questions were asked to n individuals). XLSTAT also allows one to work with a complete disjunctive table. The construction from the complete disjunctive table is yet one of the preliminary steps in the computation of the MCA. The p qualitative variables are broken down into p disjunctive tables Z1, Z2, Zp, composed of as many columns as there are modalities for each of the variables. Whenever a modality m of the jth variable corresponds to individual i, we assign 1 to Zj(i,m). The other values of Zj are null. The p disjunctive tables are then concatenated into a complete disjunctive table. From the complete disjunctive table are calculated the coordinates of the modalities of the qualitative variables, and the coordinates of the observations in a space of optimal representation for the criterion of inertia. In the case of MCA we show that the inertia is equal to the average number of modalities minus one. It does not, therefore , depend solely on the association between the variables. Greenacre (1993) proposed an adjusted measure of inertia, inspired by Joint Correspondence Analysis (JCA). This adjustment makes it possible to have higher and more informative percentages for the representation axes.

Dimensions and axis in construction of composite index

For the sake of clarity, we have not retained all the dimensions of job quality. In our MCA, we use nine of the 10 starting dimensions. These are company-funded training, payslip issuance, regular work hours' benefit, categorical advancement, compliance with the salary scale, paid vacations, retirement insurance and health insurance, and absence of salary arrears. The dimension salary increment/year was excluded from the MCA because it had an over-represented modality (95% - 99%) that could bias the results. Moreover, we see subsequently that according to the main criterion of First Axis Ordering Consistency (FAOC), our selection is justified. Indeed, the dimensions that have the FAOC property obey the rule according to which the good job quality decreases by moving from a situation of benefiting from good employment conditions to a situation of not benefiting from good employment conditions along the first factorial axis; in our case, by moving from the right to the left on the said axis. Good job quality moves from the left to the right.

Table 1 on inertia shows that the first four factorial axes are the most significant, but the most relevant of all remains factorial axis 1. Indeed, the first two alone represent more than 56% of the cumulative inertias. The first axis alone presents an inertia percentage of 32.80%. Moreover, the adjusted inertias give more precision in the choice of the factorial axis. The first factorial axis alone concentrates 87.2471% of the total inertia, which justifies its choice in our composite index calculation.

Table 1: Eigenvalues, inertias, and adjusted inertia

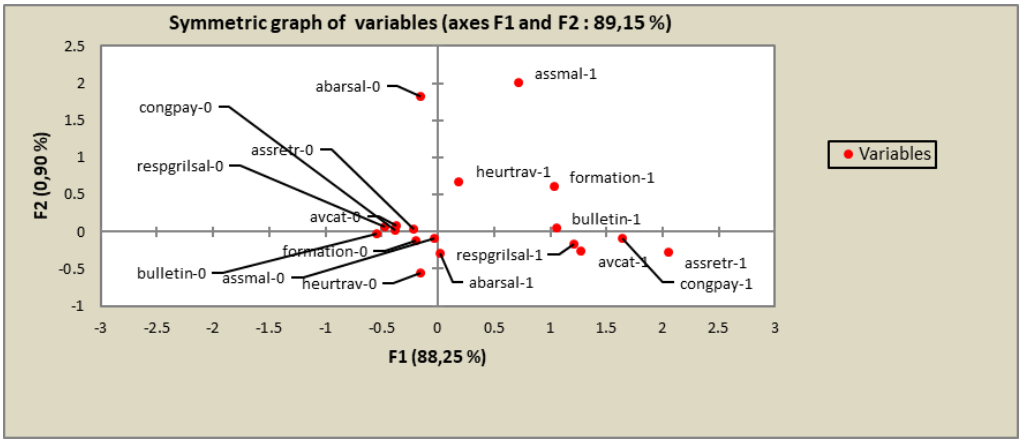
Axes	F1	F2	F3	F4	F5	F6	F7	F8	F9
Eigenvalues	.3280	.1331	.1079	.0989	.0947	.0865	.0639	.0484	.0387
Inertias (%)	32.8020	13.3076	10.7851	9.8922	9.4700	8.6519	6.3858	4.8367	3.8688
Cumulative %	32.8020	46.1096	56.8947	66.7868	76.2568	84.9087	91.2945	96.1312	100.00

Axes	F1	F2
Adjusted inertias	.0595	.0006
Adjusted inertias (%)	88.2471	.9049
Cumulative %	87.2471	89.1520

Source: Author's calculations in XLSTAT

Then, Figures 1 and 2 on the symmetry of the variables and the diagram of the factors in the adjusted inertia and Table 2 of the coordinates show that the modalities of the variables are indeed well discriminated. By choosing the factorial axis 1, which concentrates the maximum amount of information (88.25%) of the adjusted inertia, we see that the modalities of the dimensions taking the value 1 are on the right side, while the modalities of the dimensions taking the value 0 are on the left side of the axis.

Figure 1: Symmetric graph of variables.



Source: Built by the author from the CMA in XLSTAT

Figure 2: Two main factors

Source: Built by the author from the MCA in XLSTAT

Table 2: Coordinates (scores) of the MCA modalities according to the first factorial axis

	Coordinates (scores)
	Axis 1
Dimensions of job quality	
Company-funded training	1.8004
No company-funded training	-.3501
Insurance of a payslip	1.8387
Non-Insurance of a payslip	-.9543
Standard working hours	.3270
Non-standard working hours	-.2684
Categorical advancement	2.2209
No-categorical advancement	-.6397
Compliance with the salary scale	2.1098
Non-compliance with the salary scale	-.8313
Paid leave	2.8678
Unpaid leave	-.6710
Pension insurance	3.5823
No pension insurance	-.3752
Health insurance	1.2489
No health insurance	-.0585
No salary arrears	.0417
Salary arrears	-.2651

Source: Author's calculations in XLSTAT

Once the factorial axis has been chosen, we proceed to the actual construction of our composite index of job quality from the MCA and the AHC as described above.

Hierarchical Ascending Classification

The Hierarchical Ascending Classification (HAC), which was carried out following the construction of the composite index of the employment and work qualities, was based on the first factorial axis that concentrates the maximum amount of information on each individual. This classification along the first factorial axis, which is according to an individual ii factorial coordinate on said axis, also corresponds to the classification of that individual ii composite index. This classification was done by applying the Euclidean distance calculation regarding the dissimilarity between individuals. The aggregation method used is Ward's method. The HAC along the first factorial axis gives us three classes (class 1 = 1; class 2 = 2; and class 3 = 3) of employment quality of which we do not know a priori the good, the intermediate, and the poor.

Before defining the classification criteria, we first analyse its relevance. The results of the HAC are reported in Tables 3 and 4.

Table 3: Variance decomposition for optimal classification

	Absolute	Percentage
Intra-class	.0084	12.74%
Inter-class	.0579	87.26%
Total	.0663	100%

Source: Author's calculations in XLSTAT

Table 4: Results by class

	1	2	3
Number of individuals	273	154	132
Sum of weights	273	154	132
Intra-class variance	.0003	.0069	.0272

Source: Author's calculations in XLSTAT

How can we judge the quality of the different class segmentation?

A segmentation is good if the individuals of the same class are close and if the individuals of two different classes are far apart. Mathematically, this translates into a small intra-class variance and a large inter-class variance. The analysis of Table 3 shows that the inter-class variance has a percentage of 87.26% and the intra-class variance of 12.74%. From this variance decomposition, we can state that the classification was optimal. Moreover, within a class, as shown in Table 4, the intra-class variances are low. These take the values 0.0003, 0.0069, and 0.0272 for classes 1, 2, and 3, respectively.

The fact that the classification is optimal, it is important to define the good class, the intermediate class, and the poor class. In other words, what is each class value?

To not bias the definition of our classes, we use both the disjunctive table of the MCA, where we have the responses of the individuals according to the modalities of each dimension of the quality of the job; and the table of the classes, resulting from the HAC, which presents the corresponding class for each individual and the number of employees in each class.

The aim is to find the percentage of individuals who respond that they have good employment conditions (respectively poor employment conditions) and therefore whose responses for good employment conditions are 1 (respectively 0 for poor employment conditions) in each class and each modality.

On this basis, we have Table 5 on the criterion of the classes, the analysis of which will allow a better definition of their distinction.

Table 5: Class definition criteria

	Class 1	Class 2	Class 3
No company-funded traning-0	100%	74%	61%
Company-funded training-1	0%	26%	39%
Total	100%	100%	100%
No payslip-0	100%	55%	8%
Payslip-1	0%	45%	92%
Total	100%	100%	100%
Non-standard working hours-0	61%	55%	42%
Standard working hours-1	39%	45%	58%
Total	100%	100%	100%
No categorical advancement-0	100%	77%	32%
Categorical advancement-1	0%	23%	68%
Total	100%	100%	100%
Non-compliance with the salary scale-0	100%	69%	17%
Compliance with the salary scale-1	0%	31%	83%
Total	100%	100%	100%
Unpaid leave-0	100%	92%	29%
Paid leave-	0%	8%	71%
Total	100%	100%	100%
No health insurance-0	99%	94%	91%
Health insurance-1	1%	6%	9%
Total	100%	100%	100%
No pension insurance-0	100%	99%	61%
Pension insurance-1	0%	1%	39%
Total	100%	100%	100%
Salary arrears-0	14%	15%	12%
No salary arrears-1	86%	85%	88%
Total	100%	100%	100%

Source: Author's calculations in XLSTAT

The analysis of Table 5 shows that class 1 contains the highest percentages of individuals declaring not to benefit from good employment conditions. Class 3 has the highest percentage of individuals reporting good employment conditions. Class 2 is similar to the intermediate class. A reading of the table from left to right (from class 1 to class 3) indicates that the percentages of modalities with a value of 0 (for poor employment conditions) are decreasing. On the other hand, a reading from left to right indicates that the percentages are increasing for the modalities taking the value 1 (for good employment conditions).

We conclude on this basis that poor job quality corresponds to class 1 and is therefore worth 1, average job quality corresponds to class 2 and is worth 2, and good job quality corresponds to class 3 and is worth 3.

Descriptive statistics

The descriptive statistics reported in the following tables provide an overview of the characteristics of the overall sample (Table 6) and of the differences in frequencies that can be observed for the modalities of the explanatory variables pertaining to the quality of the employment (Table 7). Overall, the estimates are based on a sample of 2,487 individuals. The minimum age required to participate in the labour market is 15, and the average is about 33. There are more men than women in the sample, fewer individuals with higher education, and very little knowledge of the companies' collective agreement.

Table 6: Descriptive statistics

Variables	Observations	Mean	Std. Dev	Min	Max
Gender	2487	.63001	.4829		
Type of training	2487	.1560	.3629	0	1
Age	2487	32.6956	10.2371	15	65
Marital status	2487	.4338	.4957	0	1
Level of education	2487	.3160	.4650	0	1
Knowledge of the collective agreement of the companies	2487	.0752	.2637	0	1
Size of the company	2487	.1741	1.2327	0	1

Source: Author's calculations based on STATA

In addition, a frequency difference test on job quality (see Annex Table A5) allows us to refine our statistical analyses. Table 7 gives us the significant and non-significant differences between the modalities of the explanatory variables and the quality of the job. All the differences between the modalities of the explanatory variables are significant at the 1% level. Men, compared to women, benefit the most from good working conditions. It is the same for married workers, those with a university education, and those with knowledge of the companies' collective agreement, compared to unmarried workers, those with a high school or primary education, and those without knowledge of the companies' collective agreement, respectively.

Table 7: Difference in frequencies between modalities of explanatory variables

	Man	Woman	Difference	Married	Unmarried	Difference
	1.5238	1.8199	.2960***	1.5737	1.9798	.4060***
Quality of employment	University level	Non-university level	Difference	Knowledge of the collective agreement	No knowledge of the collective agreement	Difference
	2.2789	1.5655	.7134***	2.4792	1.6849	.7942***
	Large company	SME	Difference			
	2.5429	1.7004	.8424***			

Source: Author's calculations based on STATA

Econometric results

Ordinary least squares, bivariate probit, and ordered probit for endogeneity and selection bias correction

The first potential bias to correct is the endogeneity bias. The two-step Nakamura Nakamura test allows us to confirm the endogenous character of the suspected monthly salary variable. First, the monthly salary is regressed on explanatory variables including gender, age, age^2, marital status, level of education, and type of training, which we consider as our instrument (Table 8). Next, we generate the residual of the suspected endogeneity variable. This variable and its residual are introduced into the OLS and ordered probit, which constitute our structural models to confirm the endogenous character of the suspected variable (Table 10). In addition, before considering the type of training as our instrumental variable, we enter it at the cluster level with the "egen" command in Stata and then introduce it into our two binary probit models constituting the bivariate probit model.

Table 8: OLS on monthly salary

Variables	Coefficients	Robust Std. Err.	t
Type of training [Ref. Technical]			
General	-.0753	.0600	-1.26
Gender [Ref. woman]			
Man	.3444***	.0415	8.29
Age	.0393***	.0116	3.38
Age squared	-.0001	.0002	-.43
Marital status [Ref. not married]			
Married	.3112***	.0438	7.10
Level of education [Ref. non-university]			
University	.5989***	.0479	12.50
Constant	-.9692***	.1957	-4.95
Observations	2487		
F(6, 2480)	163.31		
Prob>F	.0000		
R-Square	.2832		
Root MSE	.9663		

Source: Author's calculations from STATA
*;**;***: significance at 10%, 5% and 1% threshold respectively

Table 9: Bivariate probit

	Participation in the labour market	Private sector employment	Marginal effects	
Variables	Coefficients	Coefficients	dy/dx	Std. Err.
Type of training [Ref. Technical]				
General	.1280***	.1232	.0372	.0278
Gender [Ref. woman]				
Man	.4567***	.5264***	.1448***	.0035
Age	.0702***	.0645***	.0188***	.0010
Age squared	-.0007***	-.0008***	-.0002***	.0000
Marital status [Ref. not married]				
Married	-.0662***	-.0916***	-.0266	.0343
Level of education [Ref. non-university]	.3511***	-.3633**	-.1002***	.0383
University	-.5733**	-2.1309***		
Constant				
Observations	2487			
Wald test of rho = 0 Chi2 (1)	553.52			
Prob > Chi2	.0000			

Source: Author's calculations from STATA
*;**;***: significance at 10%, 5% and 1% threshold respectively

Let us test the independence or not of the two bivariate probit equations. The test problem is the following:

$$H_0: The\ two\ equations\ are\ independents$$

$$VS$$

$$H_a: The\ two\ equations\ are\ not\ independents$$

The number of degrees of freedom is equal to

$(p-1)(q-1) = (2-1)(2-1) = 1$, where $p\ and\ q$ are the respective modalities of the explanatory variables of labor market participation and private sector employment. At this number of degrees of freedom, we have χ^2_{read} = 6.635 at the 1% threshold.

Conclusion: $\chi^2_{Observed} > \chi^2_{read}$. We reject H_0 and conclude that the two equations are not independent. Decisions are made simultaneously, and the use of the bivariate probit makes sense.

Following the correction of the endogeneity bias, we generate the inverse of the Mills ratio, which we introduce into our equation of interest (whether in OLS or ordered probit) to correct the selection bias. Both models will be controlled by two explanatory variables, which are education level and knowledge of the collective agreement.

In Table 10, we have an OLS and an ordered probit with its marginal effects for both formal and informal private sectors. We note in both the OLS and the ordered probit with the control variables that the residual of the suspected endogeneity variable is significant at the 1% threshold. This effectively confirms the endogenous nature of the monthly salary variable. Furthermore, the inverse of the Mills ratio introduced into the OLS structural equation confirms that there was selection bias. The IMR is significant at the 1% level. On the other hand, this bias is not significant in the ordered probit model; it was, therefore, not necessary to introduce it into the structural equation of this model. Tables 11 and 12 give us the OLS and ordered probit results for the quality of employment classes in the formal private and informal private sectors, respectively.

Table 10 : OLS and ordered probit on job quality classes in private sector

			Ordered probit				Ordered probit with control		
	OLS	OLS with control		Marginal effects QE = 1	Marginal effects QE = 2	Marginal effects QE = 3		Marginal effects QE = 1	Marginal effects QE = 2	Marginal effects QE = 3
Variables	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.
Monthly salary [Ref. Smig]										
[Smig – 3 times Smig [	.2485*** (.0865)	-1.8885*** (.5001)	.6245 (.5468)	-.2422 (.2029)	.0725 (.0475)	.1697 (.1570)	-8.9158*** (2.8170)	.9998*** (.0009)	-.0067 (.0201)	-.9930*** (.0209)
[3 times Smig – 5 times Smig [	.6007*** (.1676)	-3.6891*** (.9991)	1.4148 (1.0158)	-.4517** (.2093)	-.0270 (.1574)	.4783 (.3650)	-17.7275*** (5.6396)	.9970*** (.0076)	-..431 (.0736)	-.9540*** (.0812)
[Smig – 3 times Smig [	.8244*** (.2484)	-5.6456*** (1.5001)	1.4393 (1.4996)	-.4611 (.3134)	-.0222 (.2212)	.4833 (.5334)	-27.4383*** (8.4794)	.9999*** (.2789)	-.0002 (.0011)	-.9998*** (.0011)
Residual_monthly salary	-.1918** (.0817)	1.9544*** (.4972)	-.0734 (.4900)	.0292 (.1948)	-.0104 (.0697)	-.0187 (.1251)	9.5268*** (2.8198)	-3.7740*** (1.1151)	1.3508*** (.4335)	2.4232*** (.7356)
Gender [Ref. woman]										
Man	-.1217*** (.0458)	.8365*** (.2044)	-1.0744*** (.2718)	.3827*** (.0802)	-.0446* (.0232)	-.3380*** (.0951)	3.3261*** (1.2492)	-.7982*** (.0980)	.3807*** (.0297)	.4174*** (.1135)
Age	-.0089 (.0101)	.1090*** (.0256)	-.1188** (.0544)	.0472** (.0216)	-.0169** (.0081)	-.0303** (.0139)	.4234*** (.1604)	-.1677*** (.0634)	.0600** (.0238)	.1077** (.0416)

Table 10 : Continued

	OLS	OLS with control	Ordered probit				Ordered probit with control			
				Marginal effects QE = 1	Marginal effects QE = 2	Marginal effects QE = 3		Marginal effects QE = 1	Marginal effects QE = 2	Marginal effects QE = 3
Variables	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.
Age squared	.0001 (.0001)	-.0004*** (.0001)	.0015* (.0007)	-.0006** (.0003)	.0002* (.0001)	.0004* (.0002)	-.0009 (.0010)	.0004 (.0004)	-.0001 (.0001)	-.0002 (.0002)
Marital status [Ref. not married] Married	-.0326 (.0394)	.6067*** (.1534)	.2266 (.2322)	-.0898 (.0916)	.0312 (.0313)	.0585 (.0606)	3.0685*** (.8540)	-.8579*** (.1053)	.0896* (.0523)	.7683*** (.1536)
Level of education [Ref. non-university] University		1.3438*** (.3009)					6.1352*** (1.7729)	-.9308*** (.0614)	-.0636 (.0534)	.9944*** (.0081)
Knowledge of collective agreement [Ref. no] Yes		.1366*** (.0379)					.6071*** (.1956)	-.2231*** (.0639)	.0347*** (.0130)	.1885*** (.0701)
Company size [Ref. SME] Large company	.2174*** (.0453)	.2027*** (.0424)	1.1204*** (.2499)	-.3662*** (.0551)	-.0205 (.0461)	.3867*** (.0966)	1.1162*** (.2529)	-.3587*** (.0541)	-.0258 (.0483)	.3845*** (.0977)
Duration of unemployment before getting a job	.0013 (.0003)	.0001 (.0057)	.0254 (.0364)	-.0101 (.0145)	.0036 (.0052)	.0065 (.0093)	.0178 (.0367)	-.0070 (.0146)	.0025 (.0052)	.0045 (.0094)

Table 10 : Continued

	OLS	OLS with control	Ordered probit				Ordered probit with control			
				Marginal effects QE = 1	Marginal effects QE = 2	Marginal effects QE = 3		Marginal effects QE = 1	Marginal effects QE = 2	Marginal effects QE = 3
Variables	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.
Duration of unemployment before getting a job squared	-.0001 (.3940)	.0001 (.0003)	-.0015 (.0024)	.0006 (.0010)	-.0002 (.0003)	-.0004 (.0006)	-.0006 (.0025)	.0002 (.0010)	-.0001 (.0003)	-.0002 (.0006)
Inverse Mills Ratio	-.2632 (.3940)	1.1381*** (.3861)	-6.3283** (2.6087)	2.5157** (1.0385)	-.9008** (.3983)	-1.6149** (.6640)	.9345 (2.8899)	-.3702 (1.1447)	-.1325 (.4094)	.2377 (.7358)
Constant	.3403 (.3070)	-2.9107*** (.6894)								
Observations	552	552	552				552			
R-squared	.4115	.4678								
Pseudo R^2			.2122				.2329			
Cut 1			-3.5191				11.6586			
Cut 2			-2.4895				12.7261			

Source : Author's calculations based on STATA

std. err. in brackets

*;**;*** : signifiance at the 10%, 5% and 1% threshold respectively

Table 11 : OLS and ordered probit on job quality classes in formal private sector

		Ordered probit with control			
	OLS with control		Marginal effects QE = 1	Marginal effects QE = 2	Marginal effects QE = 3
Variables	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.
Monthly salary [Ref. Smig]					
[Smig – 3 times Smig [	-1.6248* (.8471)	-5.8887 (4.9970)	.9963*** (.0243)	-.0487 (.1495)	-.9476*** (.1738)
[3 times Smig – 5 times Smig [	-3.1373* (1.7033)	-11.3698 (10.0473)	.9994*** (.0046)	-.0183 (.0921)	-.9810*** (.0966)
[Smig – 3 times Smig [	-4.7134* (2.5561)	-17.3660 (15.0751)	1 (0)	-4.88e -08 (.0000)	-1 (0)
Residual_ monthly salary	1.6770* (.8532)	6.2956 (5.0357)	-1.7161 (1.3710)	-.6981 (.6194)	2.4143 (1.9341)
Gender [Ref. woman] Man	.8419* (.4398)	2.3024 (2.6510)	-.7499 (.5652)	.2451 (.3478)	.5048** (.2242)
Age	.1168** (.0561)	.3188 (.3369)	-.0869 (.0916)	-.0353 (.0399)	.1222 (.1294)

Table 11 : Continued

	OLS with control	Ordered probit with control			
			Marginal effects QE = 1	Marginal effects QE = 2	Marginal effects QE = 3
Variables	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.
Age squared	-.0007* (.0004)	-.0012 (.0022)	.0003 (.0006)	-.0001 (.0002)	-.0005 (.0008)
Marital status [Ref. not married] Married	.5439** (.2523)	2.3201 (1.4730)	-.6408* (.3446)	-.0692 (.0729)	.7101** (.2900)
Level of education [Ref. non-university] University	1.1820** (.5729)	3.9799 (3.4265)	-.7809* (.4223)	-.1721 (.2377)	.9530*** (.1859)
Knowledge of collective agreement [Ref. no] Yes	.1445*** (.0493)	.5726* (.2933)	-.1326** (.0570)	-.0914 (.0623)	.2240** (.1139)
Company size [Ref. SME] Large company	.1424** (.0538)	.7756** (.3428)	-.1581*** (.0512)	-.1437 (.0835)	.3018** (.1264)
Duration of unemployment before getting a job	-.0142 (.0140)	-.0099 (.0769)	.0026 (.0209)	.0011 (.0085)	-.0040 (.0295)

Table 11 : Continued

		Ordered probit with control			
	OLS with control		Marginal effects QE = 1	Marginal effects QE = 2	Marginal effects QE = 3
Variables	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.
Duration of employment before getting a job squared	.0008 (.0011)	-.0006 (.0063)	.0002 (.0017)	.0001 (.0007)	-.0002 (.0024)
Inverse Mills Ratio	1.5531 (1.3891)	.6457 (8.3803)	-.1760 (2.2837)	-.0716 (.9308)	.2476 (3.2140)
Constant	-3.1024* (.6894)				
Observations	164	164			
R-squared	.4969				
Pseudo R^2		.2359			
Cut 1		8.4395			
Cut 2		9.5935			

Source : Author's calculations based on STATA
std. err. in brackets
*;**;*** : significance at the 10%, 5% and 1% threshold respectively

Table 12 : OLS and ordered probit on job quality classes in informal private sector

	OLS with control	Ordered probit with control			
			Marginal effects QE = 1	Marginal effects QE = 2	Marginal effects QE = 3
Variables	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.
Monthly salary [Ref. Smig]					
[Smig – 3 times Smig]	-2.0491*** (.5036)	-11.6258*** (3.6864)	.9999*** (.0037)	-.0002 (.0014)	-.9997*** (.0014)
[3 times Smig – 5 times Smig [	-4.0185*** (1.0064)	-23.2528*** (7.3668)	.9965*** (.0097)	-.0485 (.0876)	-.9479*** (.0972)
[Smig – 3 times Smig]	-6.2615*** (1.5151)	-36.1517*** (11.0977)	.9994*** (.0021)	-.0135 (.0358)	-.9860*** (.0379)
Residual_monthly salary	2.1238*** (.5043)	12.3041*** (3.6976)	-4.8279*** (1.4559)	2.5842*** (.8275)	2.2437*** (.7146)
Gender [Ref. woman] Man	.8463*** (.2185)	4.3554*** (1.6371)	-.8261*** (.1121)	.3774*** (.0656)	.4488*** (.1703)
Age	.1063*** (.0284)	.5299** (.2143)	-.2079** (.0843)	.1113** (.0466)	.0966** (.0405)
Age squared	-.0004** (.0002)	-.0010 (.0014)	.0004 (.0005)	-.0002 (.0003)	-.0002 (.0002)
Marital status [Ref. not married] Married	.6598*** (.1537)	3.8410*** (1.1210)	-.9374*** (.0688)	.0751 (.0864)	.8623*** (.1536)
Level of education [Ref. non-university] University	1.4327*** (.3118)	7.9358*** (2.3233)	-.9588*** (.0403)	-.0387 (.)	.9975*** (.0036)
Knowledge of collective agreement [Ref. no] Yes	.0882* (.0491)	.6010* (.3552)	-.2351* (.1312)	.0858*** (.0244)	.1493 (.1119)
Company size [Ref. SME] Large company	.2220*** (.0063)	1.2521*** (.3435)	-.4377*** (.0835)	.0535 (.0568)	.3842*** (.1344)
Duration of unemployment before getting a job	-.0104 (.0063)	.0564 (.0465)	-.0221 (.0182)	.0118 (.0099)	.0103 (.0085)

Table 12 : Continued

		Ordered probit with control			
	OLS with control		Marginal effects QE = 1	Marginal effects QE = 2	Marginal effects QE = 3
Variables	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.	Coef. & std. err.
Duration of unemployment before getting a job squared	-.0004 (.0004)	-.0019 (.0033)	.0008 (.0013)	-.0004 (.0007)	-.0003 (.0006)
Inverse Mills Ratio	.8864* (.5050)	1.5628 (3.8264)	-.6132 (1.5018)	.3282 (.8039)	.2850 (.6993)
Constant	-2.8101*** (.7823)				
Observations	338	338			
R-squared					
Pseudo R^2	.3852	.1993			
Cut 1		14.6565			
Cut 2		15.7257			

Source : Author's calculations based on STATA
std. err. in brackets
*;**;*** : significance at the 10%, 5% and 1% threshold respectively

A difference test of the thresholds (in Annex 6) shows us that these are significant, and the use of the ordered probit is appropriate beside the linear regression.

Interpretation of results and marginal effects of ordered probit

Overall, whether for the linear regression or the ordered probit, we find that the level of education, knowledge of the collective agreement, and the company size are significant explanatory factors in getting a quality job. It is true whether in the formal or informal private sector. Workers with a university education, those with knowledge of the company collective agreement and working in a large company have a higher chance of getting a quality job compared to workers with less than a university education, not knowing the company collective agreement and working in an SME, respectively. However, the marginal effects of the ordered probit are more expressive.

Gender influence on getting good employment conditions

The likelihood of men benefiting from poor employment conditions decreases compared to their female counterparts; that is, women are less likely to have good employment conditions. This result is in contradiction with labour market theories, particularly that of discrimination and dualism. As Combarnous (1994) notes, taking up Becker's (1957) concept of discrimination, the fundamental hypothesis of the model is that men and women can be subject to substitution in production in a competitive situation. Nonetheless, for the employer, employing a woman implies, in addition to the salary that he must normally pay, an additional psychological cost, which does not exist when hiring a man. We note that to minimize this extra cost, employers will offer women (assumed to be from the minority group) precarious jobs with few career prospects. As Briard and Valat (2018) note, professional inequalities are generally to the disadvantage of women; these inequalities increase with motherhood. Regardless of the number of children, they point out, inequalities become more glaring with the birth of the first child. However, these inequalities, while widening, increase but at a slower rate depending on the educational level, the number, and the age of the children. Although laws have been introduced to reduce gender inequality in the workplace, the fact remains that the enforcement of these laws remains a challenge (Laufer and Silvera, 2008). Indeed, the ILO's 2016 report on trends in working women around the world is indicative of this inequality. Even though women today have comparable levels of education to men, they do not enjoy the same good employment conditions as men in most regions of the world, particularly in Africa, as the report notes.

Education level and job quality

Education is a powerful means to benefit from good employment conditions. Indeed, the probability of workers benefiting from good employment conditions increases with the level of education. The economic literature on the returns on education has been abundant since the pioneering work of Schultz, Mincer, and Becker. University-educated workers possess, all other things being equal, the skills likely to increase the productivity of companies. Drawing a parallel with efficiency wage theories, we can affirm that employers and workers with a higher education prefer to sign employment contracts with good conditions that ensure the former productivity and the latter an ideal framework to exercise their function. Explicitly, the work on the quality of employment does not define a close link between the education level and the quality of employment. It is rather a link between the level of education and one or other of the dimensions of the employment quality and work (job stability, remuneration, promotion within the company, working hours, etc.). For example, while it is assumed that job quality can be equated with job satisfaction (Davoine, 2007), Razafindrakoto and Roubaud (2005) show in their study that the level of education does not influence the quality of the job. In any case, the level of education appears to be a powerful means of acquiring good employment conditions, as previous studies have emphasized.

Knowledge of the collective agreement and job quality

The knowledge of the collective agreement of the companies, which is supposed to contain the duties and obligations of the workers towards their employers, is also an efficient way to obtain good employment conditions. Compared to workers who do not know the collective agreement of the companies, those who do know it have a lower probability of obtaining poor job quality. The probability of being granted an average job quality increases; finally, their chance of receiving a good job quality also increases. There is thus a positive relationship between knowledge of the collective agreement and job quality. Obtaining good working conditions would depend partly on the workers' ability to abide by the conditions that dictate their obligations, but also their rights.

Impact of the age of workers and the duration of unemployment on the quality of employment

Age appears to evolve positively with job quality; but too advanced an age would affect the likelihood of benefiting from good working conditions, which is generally the case for older workers who voluntarily re-enter the labour market to monetize their labour power. What would explain that age increases with the level of job quality? A first explanation could be that with age, the learning effect increases (learning by doing). It will become costly for the employer if such a worker resigns or is hired elsewhere. The opportunity cost of losing such a worker could induce the employer to offer him employment conditions (job stability, pension insurance, etc.), which would dissuade him from doing so.

The time spent unemployed before obtaining a job may have a deleterious effect on job quality. A long period of unemployment is not conducive to ensuring quality employment.

Company size, unemployment duration, and job quality

The size of the company seems to ensure good job quality for workers. Marginal effects analysis shows us that the probability of experiencing poor quality of employment and work for a worker in a large company decreases relative to a worker working in an Small and medium enterprise (SME). This result is consistent with the work of Amoranto and Chun (2011), who show that large companies tend to offer their employees quality jobs. Moreover, too long an unemployment duration is likely to lower the probability of getting a quality job. All these results hold in general whether workers are in the formal or informal sector. It shows that the acquired capabilities of workers can play a vital role in obtaining quality jobs.

Individual and collective effects of educational level and collective knowledge of companies

With the thresholds, it is possible to calculate, for any individual in the sample, the probabilities associated with the different job quality classes. It is possible to modify the characteristics of this ordinary individual to perceive the impact of these changes in characteristics on the different levels of probability. Thus, in the econometric table, the three thresholds are such that:

$$QE_i = 1 \; if \; QE_i^* < c_1$$
$$QE_i = 2 \; if \; c_1 \leq QE_i^* < c_2$$
$$QE_i = 3 \; if \; QE_i^* > c_2$$

We obtain realizations $\hat{c}_1 =$ 11.6586 and $\hat{c}_2 =$12.7261 We calculate for each individual the probability of having a QE in the different classes as indicated above. Thus, the probability of obtaining a low QE is written:

$$Prob\ (QE_i = 1) = Prob\ (QE_i^* < \hat{c}_1) = \Phi(\tilde{c}_1 - x_i\tilde{\beta}) \quad (19)$$

where $\tilde{c}_1 = {}^{c_1}/_{\sigma_\varepsilon}\tilde{c}_1 = {}^{c_1}/_{\sigma_\varepsilon}$, $\tilde{\beta} = {}^{\beta}/_{\sigma_\varepsilon}.\tilde{\beta} = {}^{\beta}/_{\sigma_\varepsilon}.$

Therefore, we can estimate this probability as follows:

$$\widehat{Prob}(QE_i = 1) = \Phi\ (\hat{c}_1 - x_i\hat{\beta}) \quad (20)$$

Where - $\hat{c}_1$ is a convergent estimator of $\tilde{c}_1\tilde{c}_1$ - and where $\hat{\beta}$is a convergent estimator of - $\tilde{\beta}$.

For any individual in our sample, we have the following characteristics: male, married, 44 years old, with secondary or primary education, not knowing the collective agreement of the companies, having experienced a certain period of unemployment before obtaining his job and working in an SME.

From these data, we show that the realization of the estimation of the latent variable is:

$x\widehat{\beta}$ = 0 × 0 + (−1.283616) × 9.5268 + 1 × 3.3261 + 44 × 0.4234 + 1936 × (−0.0009) + 1 × 3.0685 + 0 ×(-6.1352) + 0 × (-0.6071) + 0 × (-1.1162) + 18 × 0,0178 + 324 × (−0.0006) + 0.1511891 × 0.9345 = 11.3203 (21)

For this individual, the probability of having a poor QE is:

$$\widehat{Prob}(QE = 1) = \Phi\ (\hat{c}_1 - x\hat{\beta})$$

$$\begin{aligned}\widehat{Prob}(QE=1) &= \Phi(\hat{c}_1 - x\hat{\beta}) \\ &\approx \Phi(11.6586 - 11.3203) \\ &\approx \Phi(0.3383) \\ &\approx 0.6293\end{aligned} \tag{22}$$[2]

The probability for this individual 2 to have an average QE is as follows:

$$\begin{aligned}\widehat{Prob}(QE=2) &= \Phi(\hat{c}_2 - x\hat{\beta}) - \Phi(\hat{c}_1 - x\hat{\beta}) \\ &\approx \Phi(12.7261 - 11.3203) - 0.6293 \\ &\approx \Phi(1.4058) - 0.6293 \\ &\approx 0.9192 - 0.6293 \\ &\approx 0.2899\end{aligned} \tag{23}$$

The probability for the same individual 2 to have a good QE is as follows:

$$\begin{aligned}\widehat{Prob}(QE=3) &= 1 - \Phi(\hat{c}_2 - x\hat{\beta}) \\ &\approx 1 - 0.9192 \\ &\approx 0.0808\end{aligned} \tag{24}$$

Effect of education level on $\boldsymbol{QE}$.

If for the same individual we assume, all other things being equal, that he has a university level, the realization of the estimate of the latent variable will be:

$x\hat{\beta}$ = 17.4555

Table 13: Effect of education level on different levels of $\boldsymbol{QE}$

Level of QE	$QE=1$	$QE=2$	$QE=3$
Associated probabilities	0.0001	0.0009	0.999

Source: Author's calculations based on thresholds from Table 10

We find an improvement in the different probability levels due to an influence of the education level.

2 Reading made in the normal law table

Coupled effect of education level and knowledge of the collective bargaining agreement on QE.

If for the same individual, we assume, all other things being equal, that he still has a university level, coupled this time with knowledge of the collective bargaining agreement of the companies. We have the following table

Table 14: Coupled effect of education level and collective bargaining agreement on different levels of QE

Level of QE	$QE = 1$	$QE = 2$	$QE = 3$
Associated probabilities	0.0001	0.0009	0.999

Source: Author's calculations based on thresholds from Table 10

These results are consistent with the coefficient of marginal effects associated with the education level variable.

5. Conclusion and policy recommendations

In this research, we attempted to model the quality of employment while looking for the characteristics of workers that would influence their probability of benefiting from it. To define the notion of quality of employment, we undertook a literature review that provided a theoretical framework for the research and enabled us to understand what has been done elsewhere. The dimensions of job quality, which were selected for the construction of the composite index, are those that have been recurrent in previous research and exist in our database. After constructing the composite index using Multiple Component Analysis and classifying it using Hierarchical Ascending Classification, we established the profile of workers with a good level of job quality. To avoid biased results, we corrected for potential selection and endogeneity bias. Of all the workers, those who benefit the most from good employment conditions are those who have a university level of education, know the collective agreement of the companies, work in a large company, and have not experienced a long period of unemployment.

Based on these results, we make the following recommendations:

- Encourage post-secondary education on both the demand side and the supply side. The positive effect of education on certain employment conditions, notably the level of salary, has been demonstrated through the human capital theory and its derivatives and is still being demonstrated today. Mincer's earnings equation is a perfect illustration.
- Disseminate, through campaigns and organizations in charge of employment, the merits of workers taking ownership of the collective agreement of companies, which contains all the obligations of employers towards their employees. Once equipped and informed, workers would increase their chances of seeing their working conditions improve tenfold; hence, they would be in a position to make demands or to contest any decision taken against them.
- Find socio-professional integration mechanisms for graduates and unemployed people within reasonable time limits. A long period of unemployment negatively affects the probability of obtaining a top quality job.

References

Amoranto, G. and N. Chun. 2011. “Quality employment and firm performance. Evidence from Indian firm-level data”. Working Papers Series No 277. Asian Development Bank.

Asselin, L.-M. 2002. “ Multidimensional poverty, theory”. IDRC, in MIMAP Training Session on Multidimensional Poverty. Quebec, June 2002.

Briard, K. and E. Valat. 2018. "A quels moments les inégalités professionnelles entre les femmes et les hommes se forment- elles?" Document de travail DARES, No 215.

Burchell, B., K. Sehnbruch and A. Piasna. 2014. “The quality of employment and decent work: definitions, methodologies, and ongoing debates”. At https://www.researchgate.net/publication/262335410.

Cameron, A. C. and P.K. Trivedi. 2005. *Microeconometrics : Methods and applications*. Cambridge: University Press.

Cahuc, P. and A. Zylberberg. 1996. *Economie du travail, la formation des salaires et les déterminants du chômage*. De Boeck, Université.

Cazes, S. A., A. Hijzen and A. Saint-Martin. 2015. “Measuring and assessing job quality: The OECD job quality framework”. OECD Social, Employment and Migration Working Papers, No. 174, Paris: OECD Publishing.

Clark, A. E. 2015. “What makes a good job? Job quality and job satisfaction”. Doi:10.15185/izawol.215.

Cloutier-Villeneuve, L. and R. Saint-Frard. 2015. *Construction d’un indicateur synthétique de la qualité de l’emploi résultats méthodologiques et empiriques*. Institut de la statistique du Québec. Québec.

Cloutier-Villeneuve, L. 2017. *La qualité de l’emploi au Québec : développements conceptuels et création d’une typologie-Etat actuel de la réflexion*. Institut de la Statistique du Québec.

Combarnous, F. 1994. “Discrimination et marché du travail: concepts et théories”. At https://www.researchgate.net/publication/5178482.

Davoine, L. 2007. "La qualité de l’emploi : une perspective européenne." Thèse de doctorat. Université Panthéon. Paris 1, Sorbonne.

Davoine, L. and C. Erhel. 2007. “La qualité de l’emploi en Europe : une approche comparative et dynamique”. *Economie et statistique,* 410 : 47-69.

Fanjeau, C. 2007,. *Accès à l’emploi et qualité de l’insertion professionnelle des travailleurs handicapés en milieu ordinaire de travail*. DARES Document d’études N° 126.

Greenacre, M. J. 1993. *Correspondence analysis in practice*. London: Academic Press.

Guergoat-Larivière, M. and O. Marchand. 2012. "Définition et mesure de la qualité de l'emploi : une illustration au prisme des comparaisons européennes". *Economie et statistique,* 454 :23-42.

Ki, J. B., B. Faye and S. Faye. 2005. *Pauvreté multidimensionnelle au Sénégal : une approche non monétaire par les besoins de base*. Cahier de recherche 2005-05. Politique Economiques et Pauvreté.

Kondé, K. 2016. "Analysis of multidimensional poverty in Democratic Republic of Congo: A non-monetary approach of capabilities." MPRA Paper No 74993.

Lapointe, P.-A. 2013. *La qualité du travail et de l'emploi au Québec : données empiriques et cadres conceptuels.* Presses de l'Université Laval.

Laufer, J. and R. Silvera. 2006. "L'égalité des femmes et des hommes en entreprise: de nouvelles avancées dans la négociation ? " *Revue de l'OFCE,* 97 :245-271.

Leibenstein, H. 1957. *Economic backwardness and economic growth*. New York: Wiley.

Lesueur, J-Y and M. Sabatier. 2008. *Microéconomie de l'emploi, Théories et applications*. Ed. De Boeck. Ouvertures Economiques.

Lewandowski, P., M. Gora and M. Lis. 2017. "Temporary employment boom in Poland-A job quality vs. quantity trade-off?" IBS Working Paper 04/2017.

Martin, D. and X. Croisille. 2006. "L'organisation, le climat et les conduites professionnelles : une étude en entreprise". 2006. At halshs-00008978.

Moisseron, J.-Y., R. Chabbert, P. de la Cruz, G. Gillot, D. de Facci, K. Kateb, C. Groppo and F. Guerin. 2017. "L'accès et le maintien des femmes à l'emploi de qualité au Maroc, en Tunisie et en Turquie." Notes techniques, No. 32. AFD.

Monga, C., A.Shimeles and A. Woldemichael. 2019. "Création d'emplois décents : stratégies, politiques et instruments." Document de recherches sur les politiques 2. 406 p. African Development Bank Group.

N'Gratier, A. 2017. "La qualité de l'emploi en Côte d'Ivoire : Analyse des déterminants d'un concept multidimensionnel." Thèse de doctorat en Sciences Economiques. Université Félix Houphouët-Boigny d'Abidjan.

Nakamura, A. and M. Nakamura. 1981. "On the relationships among several specification error tests presented by Durbin, Wu, and Hausman". *Econometrica,* 49: 1583-88.

OIT. 2016. Femmes au travail: tendances 2016. At ISBN 978-92-2-130795-2. Genève, 2016.

Oumba, P. 2016. "La problématique du travail décent en Afrique à la lumière des normes de l'OIT". Café socio-anthropologique. Le travail dans tous ses états. Yaoundé, Cameroun.

Perrenoud, S. 2015. "La qualité de l'emploi en Suisse". Rapport 03, Travail et rémunération.

Ralle, P. 2006. "Introduction". In Centre d'études de l'emploi, ed., *La qualité de l'emploi*. Collection Repères. La découverte.

Razafindrakoto, M. and F. Roubaud. 2005. "La satisfaction dans l'emploi: une mesure de la qualité de l'insertion professionnelle en regard des aspirations". In IRD AFD, ed., *Les marchés urbains du travail en Afrique Subsaharienne.*

Sarnin, P. 2008. "Psychologie du travail et des organisations." *Ouvertures psychologiques*; Ed De Boeck.

Yedder, M. B. and J.-M. Peretti. 2009. "Qualité de l'emploi: diversité internationale des attentes." No. *28 Management Prospective Ed. Cairn. Info.*

Annex

Table A1: Correspondences between the dimensions of job quality used in different international approaches

Dimensions	BIT (2008)	CE-Laeken (2001)	CE-Bruxelles (2011)	Foundation of Dublin (2002)	UNECE (2010)
Health and safety at work, Working conditions	5. Forms of work that should be abolished 7. Equal opportunities and treatment in employment 8. Workplace safety	3. Gender equality 4. Occupational health and safety 9. Diversity and non discrimination	3.1. Occupational health and safety 3.2. Work intensity 4.2. Gender equality	Health and well-being	1. Occupational safety and ethics
Remuneration	2. Earnings adequate and productive employment	1. Intrinsic job quality	1.1. Appropriate salaries	Income*	2. Employment-related income and benefits
Working hours and reconciliation of work and family life	3. Decent working hours 4. Ability to reconcile work, family and private life	7. Work organization and work/life balance	4.1. Work/life balance	Work life / non-work life Conciliation	3. Working hours and work/life balance
Employment security and social protection	6. Stability and occupational safety 9. Social security	6. Flexibility and security	1.2. Employment security and career progression	Employment status * - Social protection	4. Employment security and social protection
Social dialogue and collective representation	10. Social dialogue and representation of workers and employers	8. Social dialogue and worker participation	3.4. collective representation	Workers' rights *	5. Social dialogue
Lifelong learning		2. Lifelong learning and career progression	2. Skills development and employability	Skills development	6. Access to training and skills development
Other dimensions	1. Employment opportunities 1.1. Economic and social context for decent work	6. Inclusion and access to the labor market 10. Overall work performance (productivity)	3.3 Autonomy at work and work practices		7. Workplace relations and work motivation
* Grouped in a large dimension “Employment security and career paths".					

Source: Guergoat-Larivière and Marchand (2012)

Table A2: The nine main dimensions of job quality

1. Remuneration

Regular
Other

2. Leave (paid or unpaid)

Annual
Holiday and floating
Holiday
Parental
Sick leave
Social

3. Retirement plans*

Registered plans
Non-registered plans

4. Group insurance

Salary
Disability
Life insurance Health
Optical Care
Dental care
Other

5. Working hours

Habitual
Overtime
Other

6. Working hours (typical / atypical)

Day / evening / night / week-end
On-call
Split shifts
Rotating
Variable
Flexible

7. Stability

Job security
Permanent / Temporary

8. Qualification

Skilled / semi or low skilled job
Skilled / overqualified worker

9. Physical and psychological conditions

Painfulness
Nuisances / Toxic risks
Intensity / interruptions
Margins of initiative / rhythm constraints

*These are supplementary retirement plans
Source: Institute of Statistics of Quebec (2017)

Table A3: Pleasure or suffering in work (Dejours, 1993a)

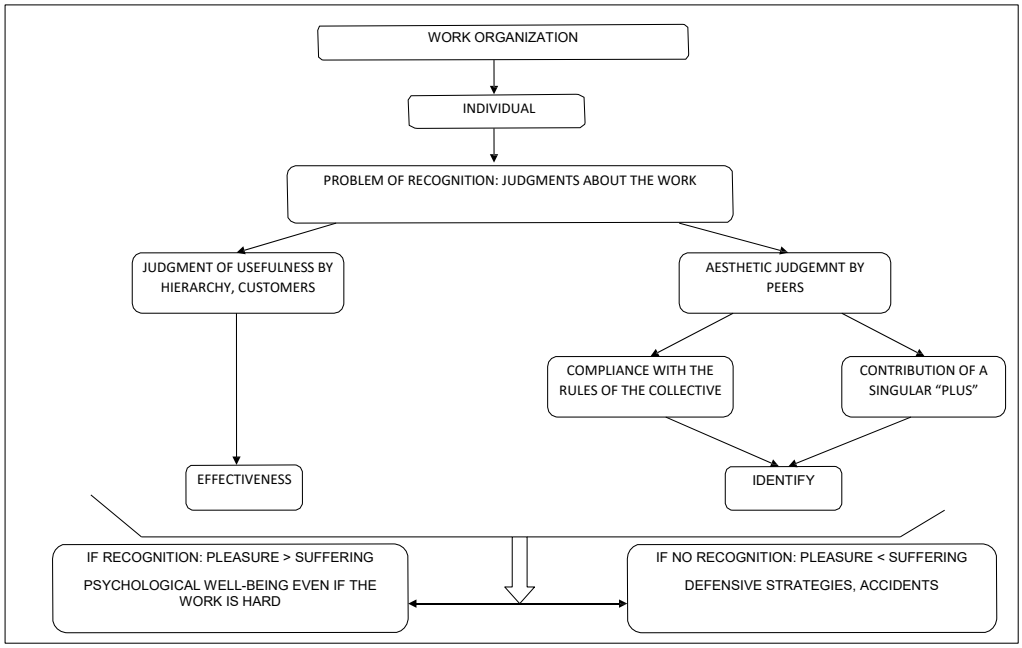


Table A4: The three levels of labour market analysis

MACRO LEVEL

- ☐ Population (active – inactive)
- ☐ Employment - unemployment
- ☐ Labour standards
- ☐ Employment equity
- ☐ Salary distribution
- ☐ Workplace accidents
- ☐ Strike-lockout incidence
- ☐ Family-work reconciliation
- ☐ Social dialogue
- ☐ Social protection
- ☐ Other dimensions

Labor market quality

MESO LEVEL

- ☐ Remuneration
- ☐ Working hours
- ☐ Stability
- ☐ Leave
- ☐ Qualifications
- ☐ Work schedules
- ☐ Group insurance
- ☐ Retirement plans
- ☐ Physical and psychological conditions

Quality of employment

MICRO LEVEL

- ☐ Professional autonomy
- ☐ Professional relationships
- ☐ Support among colleagues
- ☐ Job content
- ☐ Skill development
- ☐ Career opportunities
- ☐ Work environment
- ☐ Professional recognition
- ☐ Participation in decisions
- ☐ Employee assistance programs
- ☐ Other dimensions

Quality of work

Source: Cloutier-Villeneuve (2017)

Annex 5: Frequency comparison and threshold tests

- The problem data

For the whole population, we distinguish subpopulations of different samples. Consider the two samples: male and female of sizes n_1 and n_2 respectively.

On the first sample, we observe K_1 times a certain character, i.e., a frequency $f_1 = \frac{1}{n_1} K_1$

Since we are in the presence of a distribution table, we note that $K_1 = \sum_{i=1}^{4} (n_1^i \times QET^i)$ where n_1^i = number of men with job quality when it is 1 and QE^i = job quality for different values of QE.

In the first sample, we observe $K_2 K_2$ times a certain trait, i.e., a frequency $f_2 = \frac{1}{n_2} K_2$. It comes $K_2 = \sum_{i=1}^{4} (n_2^i \times QET^i)$

where n_2^i= number of women with the job quality when it is 1 and $QET^i =$ of the job for the different values of QE.

The problem: is there a significant difference between the $f_1$and f_2 frequencies?

- Test procedure

The null hypothesis H_0 is posed: "the samples come from the same population in which the probability (unknown) of the observed characteristic is equal to pp".

The hypothesis test is:

$$\begin{cases} H_0 : p_1 = p_2 \\ H_1 : p_1 \neq p_2 \end{cases}$$

Where p_1 and p_2 are unknown proportions.

Consequently, on a sample of size n_1, extracted from this population, the probability of observing K_1 times a characteristic is governed by a binomial distribution with:

$$E(K_1) = n_1 p \text{ and } Var\ (K_1) = n_1 p(1-p).$$

Since $f_1 = \frac{1}{n_1} K_1$, we deduce that: $E(f_1) = \frac{n_1 p}{n_1} = p$ and

$$Var\ (f_1) = \frac{n_1 p(1-p)}{n_1^2} = \frac{p(1-p)}{n_1}.$$

The same is true for sample n_2.

If n_1 and n_2 are large enough, these binomial distributions can be approximated by normal distributions with the same parameters. Since the two samples are independent, the variable $D = f_1 - f_2$follows a normal distribution with mean $E(D)$ and variance $Var(D)$. The expectation and variance of the random variable D are given by:

$$E(D) = E(f_1 - f_2) = E(f_1) - E(f_2) = p - p = 0$$
$$Var(D) = Var(f_1 - f_2) = Var(f_1)Var(f_2)$$
$$= \frac{p(1-p)}{n_1} + \frac{p(1-p)}{n_2} = p(1-p)\left[\frac{1}{n_1} + \frac{1}{n_2}\right]$$

Since p is unknown, it is estimated by the weighted average of the frequencies:

$\hat{p} = \frac{K_1 + K_2}{n_1 + n_2} = \frac{\sum_{i=1}^{4}(n_1^i \times QET^i)}{\sum_{i=1}^{4}(n_2^i \times QET^i)}$, with $E(\hat{p}) = \frac{n_1 p + n_2 p}{n_1 + n_2} = p$

$\hat{p}$ is an unbiased estimator of p.

$$Var(\hat{p}) = \frac{1}{(n_1 + n_2)^2}[n_1 p(1-p) + n_2(1-p)]$$

$\hat{p}$ is a convergent estimator because its variance tends to zero.

The test procedure is to compare the absolute value of the centered and reduced variance calculated on our two samples:

$$t_0 = \frac{f_1 - f_2}{\sqrt{\hat{p}(1-\hat{p})(\frac{1}{n_1} + \frac{1}{n_2})}}$$

At the value of t_α read from the centered and reduced normal distribution table (reduced deviation table).

The decision rule is as follows:

- If $|t_0| > t_\alpha$, then we reject H_0: the frequencies are significantly different

- If , $|t_0| < t_\alpha$ then we accept H_0: the frequencies are not different.

Test on thresholds

Table B1: Relevance of thresholds on the Ordered Probit with control

Thresholds	Coef.	Standard deviation	Z	P > |Z|	[95% Conf. Interval]	
Thresholds 1	11.6586***	4.4796	2.60	.009	2.8787	20.4384
Thresholds 1	12.7261***	4.4835	2.84	.005	3.9385	21.5136

Source: Author's calculations in STATA from ordered probit in table 10

We find that all the thresholds are significant at the 1% level, which reveals their relevance to the analysis. Moreover, if we were to attempt to aggregate the job quality modalities, we would find that this would not be relevant; indeed, the following test shows us that the null hypothesis is rejected.

Let's assume the following:

$$H_0: \alpha_1 = \alpha_2 \quad vs \quad H_a: \alpha_1 \neq \alpha_2$$

We accept H_0 if the $p - value > 0.05$, in which case aggregation of the modalities of the explained variable would be relevant and estimation of the ordered probit model would not be necessary.

Table B2: Aggregation or not of the explanatory variable modalities

Thresholds	Coef.	Standard deviation	Z	P > |Z|	[95% Conf. Interval]	
Aggregation	-1.0675***	.0757	-14.11	.000	-1.215829	-.9192417

Source: Author's calculations in STATA from ordered probit in table 10

We reject the null hypothesis of aggregation of the modalities and we conclude that the use of the ordered probit makes sense.

Mission

To strengthen local capacity for conducting independent, rigorous inquiry into the problems facing the management of economies in sub-Saharan Africa.

The mission rests on two basic premises: that development is more likely to occur where there is sustained sound management of the economy, and that such management is more likely to happen where there is an active, well-informed group of locally based professional economists to conduct policy-relevant research.

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