Social Network and Job Quality: Evidence from Cameroon

Yogo, Urbain Thierry

CEREG-University of Yaoundé 2

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Abstract

Using Cameroonian data, this paper investigates the effects of social network on job quality. Social network is measured in terms of using friends and relatives while looking for a job. As regards to job quality, two aspects have been taken into consideration: monetary job quality which is captured by wage and non monetary job quality which is captured by a combination of social protection and job security. In order to evaluate the effectiveness of social network as regard to job quality, we make use of both Heckman selection model and Ordered Logit model. Our findings contrast with previous studies. Job seekers who make use of social network do not necessarily get a good job. More precisely, while the users of social networks exhibit a wage premium, they also exhibit a low job quality in terms of social protection and job security. We also find that social network contributes to explain job quality differential according to gender and institutional sectors (formal versus informal).

Keywords: Social Network, Job quality, Heckman selection model, Ordered Logit

JEL Classification: C25; D01; J21 ; J31

Résumé

En faisant usage de l'enquête Camerounaise sur l'emploi et le secteur informel (EESI, 2005), le présent article se propose de questionner l'impact du réseau relationnel sur l'accès à un emploi de qualité. La qualité de l'emploi est appréhendée sous deux angles complémentaires : un angle monétaire (salaire) et un angle non monétaire (combinaison de la protection sociale et de la stabilité de l'emploi). Sur un plan méthodologique, il est fait usage respectivement du modèle de sélection de Heckman et d'un modèle Logit ordonné afin d'évaluer l'efficacité du réseau relationnel dans la perspective de l'obtention d'un emploi de qualité. Au terme de cette analyse, il ressort que l'usage du réseau relationnel ne mène pas nécessairement à l'obtention d'un emploi de qualité. De manière spécifique, si les usagers du réseau relationnel obtiennent une prime salariale, ils obtiennent cependant un emploi de mauvaise qualité au regard de la protection sociale et de la stabilité de l'emploi.

Mots Clés : Réseau relationnel, Qualité de l'Emploi, Modèle de sélection de Heckman, Logit Ordonné

Classification JEL: C25; D01; J21 ; J31

[1] PhD Candidate, Centre of Research on Economics and Management Studies, University of Yaoundé II, Cameroon. Email:yogout@gmail.com. Postal address: 16002 Yaoundé Cameroon. Tel: 0023799989027

1 Introduction

Most of the papers in the social network literature draw the attention on the fact that networks convey useful information in the job search process such that individuals with larger networks should experience a high job arrival rate (Granovetter, 1994, Montgomery, 1991, Calvo-Armengol and Jackson, 2004, Patacchini and Zenou, 2008). However, little attention has been devoted to the quality of the related jobs. Moreover, most of the empirical literature on social network is mainly confined to developed countries studies and very few have analyzed the role of social network in less developed countries' labor markets in general, sub-Saharan Africa to be specific. Nevertheless, in the recent literature, Berardi (2009) addresses the issue of the relationship between social network and wage in Senegal's labor market. While its concern is about a monetary aspect of job quality, namely wage, he left out the issue related to the non monetary aspect (social protection, job security, work hours etc). Now the influence of social network can differs according to the cultural and social context or according to the related monetary or non monetary aspects.

The objective of this paper is to show that while social network helps getting a job, it is not necessarily a good job. Indeed, the type of jobs for whom individuals obtain information depends of the social status of the contact and the institutional (formal or informal) sector in which he practices. So in a context where informal economy is wide-spread, jobs about which one get informations emanate mainly from informal sector which is characterized by low level of wage, lack of social protection and job security. Besides, norms of trust and reciprocity, as well as the spontaneity of activities make difficult fixing of formal rules of hiring and dismissal. Thus our contribution is twofold. First, we show that the effect of social network on job quality differ with respect to the monetary aspect (wage) and non monetary aspect (social protection and job stability). Second, we provide the evidence that the contribution of social network to job quality differential varies according to gender and institutional sector (informal versus formal sector). This contribution helps shedding the light on the specificities of sub-Saharan African labor market as regard to developed countries. Indeed, Sub-Saharan countries are pervaded with informality to a greater extent. In the specific case of Cameroon, informal sector stands at 90.4% of total employment. This wide part of labour market is out of the constraints of labor code and is de facto regulated by social norms such as trust and peer influence. In this context, there is a lack of formal channels of access to job (direct application, public and private agency, state selection) and the use of social network is wide-spread as a substitute to formal job search methods. Although informal job contacts may reduce informational asymmetry in the hiring process, it could increase labour market inequalities, lower job quality and well being.

As far as job quality is a multidimensional concept (L'horty et Fremigacci, 2005; Davoine et Erhel, 2007; Schokkaert & al, 2009), we distinguish between monetary aspect and non monetary aspect of job quality. As monetary aspect of job quality, we make use of wage following Pellizari (2004), while to measure non monetary aspects of job quality, we build an ordered variable made off by job stability (fixed and permanent contract) and social protection (child benefits, pension, employer's liability insurance). On methodological plan we run Heckman selection model and instrumental-variable regression in order to correct sample selection and endogenous bias. In fact the sample selection bias arises since there are no observable market wages for individuals who do not work. Then using the subsample of working individuals to draw conclusions for the entire population will lead to inconsistent estimates. Besides, the choice of using social network as job search methods can be considered as endogenous. Indeed, as underlined by Caliendo et al (2010), individuals with larger networks use informal search channel more often and shift from formal search (direct application, employment agency, news papers) to informal search (use of network of friends and relatives). We analyze the relationship between social network and job quality using dataset of Cameroon's survey on employment and informal sector (EESI[2], 2005). This dataset is the only available dataset focusing exclusively on labor market outcomes and provides extensive informations on some aspects of job quality and job search behavior in Cameroon.

The outline of this article is as follows. Section 2 summarizes some evidences drawn from the literature on social network and job quality. Section 3 presents data used and some descriptive statistics. Section 4 describes the econometric modeling and the estimation strategy. Section 5 is devoted to results while Section 6 concludes.

2 Some literature's evidences about social network and job quality

While there is a wide range of literature focusing on social network and job search, the scarcity of papers linking social network and job quality is striking. However some papers have addressed the relationship between social networks and some aspects of job quality, namely wage (Pellizari, 2004; Delattre et Sabatier, 2007; Berardi, 2009; Caliendo et *al*, 2010) and occupational choice (Bentolila et *al*, 2010). In the same time, there is a wide body of literature discussing about job quality measurements. In the following review, we start by presenting some recent evidences about the measure of job quality. We follow by some empirical results about the relationship

[2] Enquête sur l'emploi et le secteur informel

between social networks and wage (monetary aspect of job quality). Finally, we focus on non monetary aspects of job quality with a specific emphasis on social protection and job security.

2.1 Job quality measurement: Objective versus subjective approach

Job quality is not a clearly defined concept and there is no single definition (Davoine, 2007; Grün, Hauser and Rhein, on 2008). So, diverse surrounding areas of definitions coexist and are a function of the approach adopted by the researcher. However, as defined by the European Commission, in its strategic document on employment (2000), Job quality is a relative concept which sends back to a job-worker-relationship and which takes into account both objective and subjective aspects.

The subjective approach is based on the feeling of worker about its job and the related conditions. In this sense, job satisfaction is used as indicator of job quality. This approach is used in particular by Clark (2005). The justification for using job satisfaction scores is that they are strongly correlated with observable events such as quits, absenteeism or productivity. While widely used to measure global job quality, job satisfaction has been criticized for being too subjective (Rose, 2003). According to Kalleberg and Vaisey (2005), assessing the link between specific and overall job quality should recognize that different aspects lead worker to evaluate a job as good. In this vein, they provide an approach based on perceived satisfaction about economic benefits (earning, health insurance and pension) and non economic benefits (degree of autonomy and control, job security, opportunities of advancements)

Alternatively, one may use an objective approach to measure job quality via a set of objective job characteristics. In this sense, authors tend to value hours of work, the level of social protection and job protection, the relationship between family life and work and even the discrimination. This objective dimension agrees well with the notion of «decent work " raised and valued by the International Labour Organization (ILO) since 1999 and seems to be less subject to response bias[3]. This measure is widely used in empirical analysis. For instance Russel and *al* (2008) use hourly wage, probability of training and level of autonomy as a measure of job quality in the case of Ireland. The same approach is used by Stehrer, Ward and Macias (2009) for the EU member states.

While there is no consensus about the relevance of each approach of measurement, Schokkaert & *al* (2009) pointed out the fact that objective measures are too objective as they neglect interindividual differences in preferences while subjective measures are too subjective as

[3] Indeed respondents answer questions according to their true beliefs rather than in the way they think the questioner want them to answer.

they also reflect differences in aspirations. They propose an alternative measure of job quality in terms of equivalent income that does respect individual preferences, but rule out aspirations.

Summing up, the issue of measurement of job quality stills a debated issue and is strongly shaped by methodological and theoretical considerations. This can explain why it is really difficult to address its relationship with major socioeconomic variables.

2.2 Social network and monetary aspects of job quality: A specific emphasis on wages

One of the well studied aspects of job quality is certainly wage as it can be recorded by the number of related papers quoted in social science research network.

According to Delattre et Sabatier (2007), social network mobilization influences wage through two kind of effects, namely informational effect and productivity or peer effect. As regard to information effect, networking speed up information exchange and screen available job opportunities. Therefore, networker users receive more job offers and firms receive more applications. Consequently, the equilibrium wage increase. According to productivity effect or peer effect, employer anticipates that workers hired through networking are monitored by workers in place and then display a higher productivity. Consequently they will propose them a higher wage. As a result, the global effect includes both the information effect and the productivity one, leading to a positive impact on wages. However, as pointed out by Pellizari (2004), there could be an ex post productivity effect due to some kind of mismatch. This would be the case if the employers have overestimated the productivity because of bad information given by network or failure of peer pressure. In the case of mismatch a positive effect of social network is observed in short run while in the long run one may observe a negative effect of social network on wages.

Informational effect and productivity effect have both been tested in the empirical literature. According to Pellizari (2004), using the European Community Household Panel (ECHP), the use of social network does not lead to significantly better paid jobs. The same result is obtained by Delattre et Sabatier (2007) using French dataset and after controlling for endogenous bias. In the same vein Berardi (2009), using Senegal's dataset find that social networks are likely to be adopted as hiring channel for unskilled jobs and result in wage penalty. However, some empirical results confirm the existence of informational effect. For instance, Kugler (2003), using National Longitudinal Survey of Youth (NLSY) find a positive return of social network. However, this effect becomes insignificant after controlling for employment sector. A similar study of Galeotti and Mueller (2005) support the evidence of a wage premium resulting from social network endowment.

Finally there is no strong agreement about the effect of social network on wage as a non monetary aspect of job quality. However, the above studies provided some insight that could be more difficult to find about the non monetary aspects of job quality.

2.3- Social network and non monetary aspects of job quality: A specific emphasis on social protection and job security

While the effect of social network on social protection and job security has received little attention, it is however possible to suggest some channels by which this relationship can occurs. Concerning social protection, the use of social network in place of formal job search channels can favor the informalisation of hiring process, which put the worker out of the work legislation and de facto prevent him from the related advantages, namely the right to social protection and labor contract. In the inverse direction, social network could have a positive effect on job stability due to the fact that the more you have friends in a work place; the less is the probability to quit. This view is mainly supported by Quentin et al (2008) using data from a European household panel data (ECHP). They show that social network is a strong factor of immobility. In the same vein, Cingano and Rosalia (2006) using Italian dataset provide the evidence of a positive effect of social network on job stability.

Finally, the effect of social network on job quality has received little attention in literature. Moreover there is no agreement about the suggested effect.

3 Some stylized fact about social network and job quality in Cameroon

The data used in this paper are drawn from EESI (2005) which is the survey on the employment and the informal sector in Cameroon. This survey has a national cover and was realized with 8540 households, that is 14606 individuals. The main purpose of this survey was to analyze several of labor market outcomes while comparing formal and informal sector. Here informal sector is defined as a sector made of by a set of activities and enterprises that are not recorded and not included in the national accountability. The sampling base is constituted by twelve zones of enumeration. A zone of enumeration is defined as a portion of the territory limited by visible details and containing between 700 and 1100 residents, that is 140 to 230 households. The cities of Douala and Yaoundé being set apart, every region is subdivided into three strata: one urban stratum, one semi urban stratum and one rural stratum. The survey also

addresses the issue of job search. The related question is: How did you get your job? As far as the question is only asked to people who have already got a job, the size of sample is restricted to 5531 individuals. Table 1 presents descriptive statistics about the main channels of job search.

Table 1: Responses about job search methods

Job search Methods	**Observations**	**%**
Social Network **(**friends & relatives**)**	2363	42.72
Direct Application	569	10.28
Open Competition	420	7.60
Others	2179	39.39
Total	**5531**	**100**

Source: EESI (2005)

Responses about job search are classified in four categories: the use of social network (friends and relatives), direct application, open competition and others. The category "others" refers to all job search methods that are not recorded in the previous three categories. The main observation that can be drawn from table 1 is about the high rate of workers which have found a job through social network. This rate stand at 42% of total employment far above all the others means of search.

Besides, the survey allows dealing with the issue of job quality. Here we focus mainly on wage, social protection and job security. This choice is made due to data availability and the low level of no responses. For instance, in this survey, we do not have information about discrimination, conciliation between job activities and family activities, degree of autonomy or job satisfaction. Table 2 and Table 3 below provide some descriptive statistics about wage, social protection and job security.

Table 2: Variable of monetary aspects of job quality, logarithm of wage

Log(wage)	**Observations**	**%**
[0.15 3.85[	1677	30.22
[3.85 4.54[	1417	26.01
[4.54 5.23[	1296	23.79
[5.23 5.92 [	735	13.49
[5.92 more [	323	5.82
Total	**2428**	**100**

Source : EESI (2005)

Table 2 presents the logarithm of wage divided in five classes starting from the low incomes to the high incomes. As it is shown by the title of this table, we use wage as a proxy measure of monetary aspects of job quality. In this choice, we follow Hamermesh (1997), Kalleberg and

Vaisey (2005). Table 2 exhibits a high wage inequality in the sense that the high income class represents only 6% of the total workers. As regard to non monetary aspects of job quality, we build an ordered variable linking social protection and job security. By Social protection, we mean child benefits, pension and employer's liability insurance. Thus a worker is socially protected if he receives child benefits, pension and employer's liability insurance. In this case the variable which captures social protection takes value 1. Otherwise this variable takes value 0. The question related to this variable is the following: "in your job do you receive fringe benefits such as pension, child benefits and employer's liability insurance? Table 3 below provides descriptive statistics about this variable.

Table 3: Responses about social protection

Binary variable of social protection	**Observations**	**%**
Protected	638	13.05
Not protected	4250	86.95
Total	**4888**	**100**

Source : EESI (2005)

Job security is measured in term of contract. The related question is: "do you have an employment contract?" This question is not an open one because the respondent have to choose between four modalities: No contract, oral contract, fixed term contract and permanent contract. Certainly the less known is the second modality which refers to an informal agreement between worker and employer. This kind of contract is mainly encountered in agriculture (piece-workers) and in the building trade. Table 4 provides descriptive statistics about this question.

Table 4: Responses about job security

Multinomial variable of job security	**Observations**	**%**
No contract	910	29.20
Oral contract	1031	33.08
Fixed term contract	323	10.36
Permanent contract	852	27.34
Total	**3116**	**100**

Source : EESI (2005)

On the basis on these two variables, we build an ordered variable combining all the modalities recorded. This ordered variable ranges from 0 when worker does not receive social protection and have signed no contract (low job quality) to 7 when worker receive social protection and have a permanent contract (high job quality). The idea behind this classification is twofold. First in sub-Saharan African context, Cameroon to be specific, there is a lack of social net that could help people to improve their human capital (health and education), save more and build for the

future. Most of the time, job are bad paid and instable so that people cannot save neither invest. Thus a job with social protection and permanent contract may help people to better manage their life, save more and invest. Second, building an ordered variable is like setting up priorities in terms of economic policies and help dealing with the embarrassing issue of informality. Indeed, to provide social protection, job stability and better paid job (respect of the minimum wage law) cannot be done without moving toward more formal activities. Table 5 presents descriptive statistics related to the ordered variable of non monetary aspects of job quality.

Table 5: Ordered variable of non monetary aspects of job quality

Ordered variable of job quality	**Observations**	**%**
No social protection & no contract	810	33.36
No social protection & oral contract	793	32.66
No social protection & fixed term contract	135	5.56
No social protection & permanent contract	99	4.08
Social protection & no contract	35	1.44
Social protection & oral contract	80	3.29
Social protection & fixed term contract	111	4.57
Social protection & permanent contract	365	15.03
Total	**2428**	**100**

Source : EESI (2005)

In this table, one may observe that workers without social protection and contract or without social protection but who have an oral contract represent more than 66% of the total employment. Besides, workers who benefit for social protection and a permanent contract represent only 15% of the total employment.

Summing up, job of low quality are wide-spread in the Cameroonian labor market. Indeed, according to monetary aspect, the high income class represents only 5% of the total employment while workers who benefit at the same time for social protection and permanent contract represent only 15% of the total employment.

At this stage, one may ask whether the users of social network while looking for a job have a better job quality than the non users. In order to answer this question, at least partly, we present some cross tables which exhibit the correlations between social network and job quality. Table 6 presents the job quality differential with a specific emphasis on gender. Table 7 in the same sense exhibits the job quality differential with a specific emphasis on institutional sector (formal and informal).

Table 6: Job quality differential according to gender

	Users of social network			**Non users of social network**		
	Female	Male	Total	Female	Male	Total
Monetary dimension:	4.85	4.75	4.79	4.86	4.96	4.92
-Log of wage (mean)						
Non monetary dimension						
-Low job quality (%)	58.36	30.06	39.81	33.18	15.34	20.47
-High job quality (%)	7.03	11.31	9.90	21.39	26.98	25.37

Note: Low job quality corresponds to the modality "***No social protection & no contract***" while high job quality corresponds to the modality "***social protection & permanent contract***"[4]. Relative frequencies are in terms of respectively total female users (non users) of network, total male users (non users) of network and total users (non users) of social network.

This table shows that the users of social network irrespective of monetary or non monetary aspect exhibit a lower job quality than the non users. Specifically, users of social network exhibit a low wage and are more numerous to be without social protection and without employment contract. According to gender, women are better paid than men among the users of social network while the inverse situation is observed among non users. As regard to non monetary dimension, men have a better job quality than women irrespective of the use or not use of social network. According to institutional sectors, Table 7 show that, while job quality is always better in the formal sector than in the informal sector, the non users of social networks also exhibit better job quality than users.

Table 7: Job quality differential according to institutional sector (formal & informal)

	Users of social network			**Non users of social network**		
	Formal	Informal	Total	Formal	Informal	Total
Monetary dimension:	4.88	4.60	4.79	4.97	4.64	4.92
-Log of wage (mean)						
Non monetary dimension						
-Low job quality (%)	32.55	39.30	36.31	14.28	29.16	20.47
-High job quality (%)	9.56	3.29	6.07	27.04	7.29	25.37

Note: Low job quality corresponds to the modality "***No social protection & no contract***" while high job quality corresponds to the modality "***social protection & permanent contract***". Relative frequencies are in terms of respectively total female users (non users) of network, total male users (non users) of network and total users (non users) of social network.

Finally, one of the main observations drawn from descriptive statistics is that the users of social network are less likely to obtain a better job than the non users. This negative correlation between social network and job quality remain as regard to gender and institutional (formal and informal) sector. However, the fact that women who use social network are better paid than men leave open the possibility that social network may contribute to the reduction of gender wage gap. This is clearly stated by Goos and Salomons (2007). Goos and Salomons, using UK labor

[4] See table 2

force survey found that the use of social network reduces the gender wage gap by 1.9 percent point.

4 The econometric evaluation of network's effects on job quality

In order to estimate the effect of social network on job quality, we follow three steps. First we provide an econometric modeling of the relationship between social network and job quality. In this vein we make use respectively of Heckman selection model and Ordered Logit model. Second, we evaluate the contribution of social network to job quality differential according to gender and institutional sectors. Finally, we discuss about instruments used in order to correct the endogenous bias.

4.1 Modeling job quality

4.1.1-Monetary aspect of job quality

Consider a sample of hired individuals such that:

$$w_i = X_i\delta_1 + \alpha sn_i + \varepsilon_i \quad (1)$$

Where w is the wage of individual i, sn_i is the binary variable which takes 1 for the users of social networks. X is the set of exogenous variables. As mention above, there are two types of biases that must be taken into account while estimating equation (1). The first is due to sample selection bias and the second is related to the endogeneity of social network. In order to deal with the issue of endogeneity, we have to find appropriate instruments for social network (strongly correlated with sn and orthogonal to ε). Then we have the following linear projection:

$$sn_i = X_i\delta_1 + \delta_2 Z_i + \mu_i \quad (2)$$

Where Z is a set of excluded instruments? We discuss about the choice of instruments in a specific subsection. Now, to address the issue of selection bias, we estimate a Probit model of looking for a job and extract the inverse Mills ratio. More specifically, let lj be the choice of looking for a job, a binary variable which takes value 1 if the individual looks for a job or have worked at least one week before the survey and 0 otherwise. Then we have:

$$lj_i = f(X_i, Z_i, y_i, \delta_1, \delta_2, \delta_3, \upsilon) \quad (3)$$

Where $\upsilon \sim$ normal $(0,1)$, y is a set of exogenous variables only present in equation (3). We estimate (3) and recover the inverse Mills ratio,

$$\widehat{IMR} = \frac{\varphi(X_i\hat{\delta}_1 + \hat{\delta}_2 Z_i + \hat{\delta}_3 y_i)}{\phi(X_i\hat{\delta}_1 + \hat{\delta}_2 Z_i + \hat{\delta}_3 y_i)} \quad (4)$$

$\hat{\delta}_m, m = 1..3$ are the maximum likelihood estimations of δ_m, φ is a pdf of a standardized normal distribution and ϕ is its cumulative function (cdf). Now to get consistent estimation of (1), we estimate the following equation by 2SLS, using instruments ($Z_i, \widehat{IMR}$) on the subsample for which we observe both w and sn:

$$w_i = X_i\delta_1 + \alpha sn_i + \gamma \widehat{IMR}_i + \nu_i \quad (5)$$

X= [age, age2, primary, secondaryg, secondaryt, highe,], where age is the age of worker, age2 is the squared of age, primary refers to primary education, secondaryg refers to secondary general education, secondaryt refers to secondary technical education and highe refers to high education.

4.2 Non monetary aspect of job quality

Let suppose that non monetary aspect of job quality can be measured by an ordered variable which depends of social network and a set of exogenous variable such that:

$$Q^* = X_i\beta_1 + \beta_2 sn_i + \eta_i \quad (6)$$

Q^* is a latent variable such that

$$Q_i = \begin{cases} 0 \ if \ Q_i^* < T_1 \\ j \ if \ T_j \le Q_i^* < T_{j+1} \\ 8 \ if \ Q_i^* > T_8 \end{cases} \quad (7)$$

Where j:1..7 is the number of modalities. T is a threshold to be estimated. η is iid $(0, \sigma^2_\eta)$ with $\frac{\eta_i}{\sigma_\eta} \sim$ a logistic law such that:

$$prob[Q_i = j] = \Lambda\left[\frac{T_{j+1}}{\sigma_\eta} - \frac{X_i\beta_1 + \beta_2 sn}{\sigma_\eta}\right] - \left[\frac{T_j}{\sigma_\eta} - \frac{X_i\beta_1 + \beta_2 sn}{\sigma_\eta}\right] \text{ with } \Lambda(.) = \frac{1}{1+e^{-(X_i\beta_1 + \beta_2 sn_i + \eta_i)}} \quad (8)$$

The final specification to be estimated is as follows:

$$Q_i = \beta_{11} age_i + \beta_{12} age2_i + \beta_{13} primary_i + \beta_{14} \sec ondaryg_i + \beta_{15} \sec ondaryt_i + \beta_{16} highe_i + \beta_2 sn_i + \eta_i \quad (9)$$

In this equation, social network is also instrumented in order to correct the endogenous bias. We provide descriptive statistics about the variables used here below.

Table 8 : Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Age	4382	33.02305	10.99084	15	60
Age2	4382	12.11293	7.873538	2.25	36
Sex	4382	.573026	.4946949	0	1
Married	4382	.2026472	.4020176	0	1
Household size	4382	5.75445	3.755109	1	29
Fwork	4382	0.70	0.45	0	1
Fathst	4382	0.06	0.24	0	1
Religion	4382	.9650844	.1835869	0	1
No primary	4382	.1104518	.3134879	0	1
Primary	4382	.3352351	.4721264	0	1
Secondaryg	4382	.2473756	.4315361	0	1
Secondaryt	4382	.1702419	.3758881	0	1
Highe	4382	.1366956	.3435649	0	1
Social network	4382	.4144226	.4926783	0	1
Log of wage	4382	4.333298	1.05482	.2231435	7.600903
Lj	4382	0.53	0.49	0	1

4.2 The contribution of social network to job quality differential

The purpose of this subsection is to evaluate the contribution of social network to job quality differential according to gender and institutional sector. For the sake of simplicity, we adopt a general presentation following Yun (2004). Suppose that we have a variable of job quality which is a function of a linear combination of independent variables such that:

$$jobq = F(V\psi) \quad (10)$$

F is a function which itself may be or may not be linear. $jobq$ is a variable of job quality (monetary or non monetary). V is the $K \times N$ matrix of independent variables and among which we have social network. Suppose that we have two groups A and B. In our context we first talk about men and women and after about Formal and informal sector.

The mean difference between A and B can be decomposed as

$$jobq_A - jobq_B \equiv \left[\bar{F}(V_A\hat{\psi}_A) - \bar{F}(V_B\hat{\psi}_A)\right] + \left[\bar{F}(V_B\hat{\psi}_A) - \bar{F}(V_B\hat{\psi}_B\right] \quad (11)$$

Where $\hat{\psi}$ is the estimated vector of coefficients from equation (10). The first component in bracket measures differences in observable characteristics (explained component) and the second component measures differences in coefficients (unexplained component).

Following Even and Macpherson (1990; 1993), Yun (2005), the contribution of a variable k to job quality differential in explained component is given as follows:

$$C_k = \left[\bar{F}(V_A\hat{\psi}_B) - \bar{F}(V_B\hat{\psi}_B)\right]\left[\frac{(\bar{V}_A^k - \bar{V}_B^k)\hat{\psi}_A^k}{(\bar{V}_A - \bar{V}_B)\hat{\psi}_A}\right] \quad (12)$$

Where $\bar{V}_g^k$ is the mean of observations of the variable k in the group g: A, B. $\hat{\psi}_g^k$ is the estimated coefficient of variable k in group g.

4.3 Discussion about the choice of instruments

An important issue of the econometric test is about the endogeneity of social network. Indeed, the study explicitly allows for the possibility that network are not chosen randomly, but rather that some characteristics such as unobserved preferences or unobserved group characteristics determine the use of social network. Besides, the reverse causality between wage and social network can also lead to endogenous bias. In fact, it is possible that an increase in wage makes easier the development of new ties. Of course it becomes less costly to create all social events or circumstances that generate social interaction such as dinner and birth party. Another issue with the social network measure is the concern of measurement error. This problem is common to survey data and may be explained by the fact that sometime the surveyed think that to admit using friends and relatives is like confessing that one has not the qualifications required for the job. For all the reasons quoted above, we need strong and valid instrument in order to avoid inconsistent estimates. We use the size of household as an instrument of social network. The idea behind this choice is the following: most of household in sub-Saharan African countries is made off by a large number of members. This generates social interactions and a network of solidarities. As argued by Putnam (2000), the high-density living increases social capital and thus social interactions. This argument is in line with sociological literature (Fischer, 1982; Coleman, 1988, 1990) which argue that people living in large areas have a good deal of choice in constructing their social network and can seek out others with similar values and lifestyle.

Besides, living in a household with a large number of members does not only increase social interaction, but also allow each member to benefit for the social network of others. In the same vein, Fischer (1982) clearly states that most adults encounter peoples through their families. Using a survey on personal network in Toulouse (France), Grossetti (2005) shows that more than 42% of friends are found through family. Moreover, Brueckner and Largey (2006) show that social network is an increasing function of population density while Wahba and Zenou (2004) use the latter as a proxy of social network. At the level of household this result can hold in the sense that persons living in larger households have high alternatives for exchange within the household and are able to benefit for external support through the network of each member of the household. Besides, the size of the household is exogenous in most empirical analysis. Indeed even if the size of household may change over the time, this change is not easy predictable.

On the methodological plan, we check whether the instrument chosen is weak or not. Indeed, if the instrument is weak, the coefficient of social network will be weakly identified and the estimates biased [(Dufour (1997; 2003), Staiger and Stock (1997), Doko and Dufour (2008)]. We first run the simple Fisher test on the excluded instrument in the first stage regression [see equation (2)]. Here we have only one exclusion restriction, namely household size. The result is presented in table 10 and shows a F-statistic of 24.94. This value is sufficiently high at the level of 1% so that we can reject the null hypothesis of weak instrument. Moreover, we run the weak instrument test proposed by Stock and Yogo (2005). This test also confirms the rejection of the null hypothesis as far as the Cragg-Donald Wald test F statistic is 34.60 and always above the critical values.

5 Results

This section provides the results of the impact of social network on job quality. First we present the results of both Heckman and ordered Logit estimation. Second, we present the results of the decomposition of job quality differential according to gender and institutional sectors. Finally, we check the robustness of our estimates as regard to the change of instruments and the introduction of a variable which captures labor market structure (formal versus informal sector).

5.1 The effect of social network on job quality

The results of the estimation of the effects of social network on job quality are presented in Table 10 and 11 in Appendix. In table 10, we present the effect of social network on monetary aspect of job quality captured by the logarithm of wage. Columns (1) and (2) show both OLS and

Heckman two step estimates while the column (5) presents 2SLS regression. The results suggest that social network have a positive effect on monetary aspect of job quality. Indeed, the users of social network obtain a premium of 1.53 point percentage of the average wage. This result differs from what obtained by Delattre et Sabatier (2007) on French data and also from those of Berardi (2009). However, this positive effect can be explained by the information effect as pointed out by Delattre et Sabatier (2007). In fact in context of job scarcity and when the main job search method consist in using social network (42% of job seekers), the information effect is greater than the productivity effect. Moreover, the productivity effect is less relevant in the context of a widespread of informal activities. In table 11, we present the effects of social network on non monetary aspect of job quality. As explained in section 3, this variable is an ordered combination of social protection and job security. Column (1) shows the ordered Logit estimates while column (3) presents 2SLS estimates. The results suggest that social network has a negative effect on non monetary aspect of job quality. There are two possible explanations of this finding. First, in the context of wide-spread of informal activities, the labor code which is supposed to regulate the labor market and to guarantee job quality is not applicable. Besides, in a context of scarcity of jobs and in which most of activities are low value-added activities, there is a trade-off between information effect and productivity effect. In other words, job seekers prefer to get a job even though this job is a low quality one than stay unemployed. In the same vein employers use this disequilibrium between labor supply and labor demand to reduce labor costs.

5.2 The effect of social network on job quality differential

Table 12 presents the decomposition of job quality differential according to gender and institutional sectors. We follow two objectives in this line. First, we evaluate the contribution of social network to job quality differential between men and women. Second, we evaluate the contribution of social network to job quality differential between formal sector and informal sector. Columns (1) and (2) show the contribution of explanatory variable to the wage differential. The results show that while social network has no effect on formal-informal wage differential, it contributes to the reduction of gender wage gap. In fact, it represents 0.7% of the explained wage gap. This result is in line with those of Goos and Salomons (2007). Columns (3) and (4) present the contribution of explanatory variables to job quality differential as regard to non monetary aspect. According to these results, social network contributes to the explained differential between formal sector and informal sector while it has no effect on gender differences. In this case, the magnitude of the effec represents 0.9% of explained differential. Summing up, the obtained results show that while social network contributes to the explained

wage differential between men and women, according to the non monetary aspect, it only contributes to the explained differential between formal sector and informal sector.

5.3 Robustness check

We perform two robustness checks. The first one consists to see whether the results change while controlling for institutional sectors (formal sector/informal sector). Tables 13 and 14 present our findings. They suggest that the effects of social network are robust to the account of the dual structure of labour market in the case of wage. However, unsurprisingly, the results are not robust in the case of non monetary aspect (combination of social protection and job stability). The second robustness check consists in introducing additional instruments for social networks. Two variables are used in this vein. The first variable, named "fwork" is a binary variable which takes value 1 if the worker's father has a job and 0 otherwise. Indeed we expect that the job seekers of whom the father has a job are more likely to benefit from informational effect than those of whom the father is jobless. The second variable, named "fathst" is a binary variable which takes value 1 if the worker's father is senior executive and 0 otherwise. In this case, we expect that job seeker of whom the father is senior executive benefit as well for informational effect as for the influence. Table 15 and 16 present the results. We present both the 2SLS model and the treatment effect model. Indeed we presume that fathst and fwork which are possible instrument of social network are not been able to pass the weak instrument test due to a kind of misspecification. In fact the 2SLS first step regression (see Table 10 column 4) is a linear regression when the endogenous variable (social network) is a binary variable. In this case the treatment effect model is useful due to the fact that the first step regression is a Probit one. The conclusion that can be drawn is that the effect of social network remains whatever the instrument of social network. However, when we look at the first step regression (see Table 17, columns 1 and 3), only Fwork is correlated to the variable of social network. But the coefficient of the household size remains significant.

6 Concluding remarks

The idea of job quality is a recurrent theme in the empirical literature of labor economic. While the main focus is about the better way to measure job quality, little have been done to link this concept with a wide set of economic variables. While there is an increasing literature about social network and their effects on labour market, it seems useful to know whether the recorded positive effect of social network on job remain robust if one put an emphasis on quality.

The main contribution of this paper is to provide the evidence according to which, while social network helps getting a job, it is not necessarily a good job. In fact, using dataset of Cameroonian survey on employment and informal sector (EESI, 2005), we provide an evidence of a mixed effect of social network on job quality. Making the difference between monetary aspects of job quality (captured by wage) and non monetary aspect of job quality (captured by a combination of social protection and job security), we found that, as regard to monetary aspects, social network has a positive effect on job quality. However, according to the non monetary aspect, the effect of social network on job quality is negative. Besides, the results show that social network has a significant, but not substantial effect on job quality differential according to gender and institutional sectors.

These results are robust to the change of the instruments of social network and to various specifications.

The bottom line of this paper is that social network has a significant effect on job quality. However, this effect differs according to monetary aspect and non monetary aspect.

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Appendix

Table 9 : Glossary

Variables	Description
Age	Age of the labour force
Age2	Age squared
Sex	Dummy variable which takes 1 for male and 0 for female
Married	Dummy variable of marital status : 1 for married people and 0 otherwise
Household size	Number of people living in the household
Fwork	Dummy variable: 1 if the father's worker has a job and 0 otherwise
Fathst	Dummy variable:1 if the father's worker is senior executive and 0 otherwise
Religion	Dummy variable :1 if the surveyed is Christian or Muslim and 0 otherwise
Primary	Dummy variable : 1 if the individual has the level of primary school and 0 otherwise
Secondaryg	Dummy variable :1 if the individual has the level of secondary general school and 0 otherwise
Secondaryt	Dummy variable :1 if the individual has the level of secondary technical school and 0 otherwise
Highe	Dummy variable : 1 if the individual has attend to university and 0 otherwise
Social network	Dummy variable : 1 if the individual has used friends and relatives while looking for a job and 0 otherwise
Log of wage	Logarithm of wage
Formal	Dummy variable :1 if the worker evolves in the formal sector and 0 if the worker evolves in the informal sector
Lj	Dummy variable: 1 if the individual looks for a job or have worked at least one week before the survey and 0 otherwise

Table 10: Job quality regressions: monetary aspect

	(1)	(2)	(3)	(4)	(5)
				2SLS first step	2SLS
	OLS	Heckman	Heckman first step		
DependentVariable	Log(wage)	Log(wage)	Lj	Social network	Log(wage)
Age	-0.00281	0.0845***	0.223***	-0.0569***	0.0333***
	(0.00850)	(0.0125)	(0.00900)	(0.00579)	(0.0123)
Age squared	0.000185	-0.000879***	-0.00271***	0.000587***	-0.000109
	(0.000119)	(0.000162)	(0.000128)	(7.46e-05)	(0.000151)
Sex			0.536***		
			(0.0397)		
No education			0.647***		
			(0.0720)		
Primary education	0.669***	0.708***	0.684***	0.0194	0.601***
	(0.0536)	(0.0534)	(0.0561)	(0.0254)	(0.0630)
Secondaryt	1.079***	1.035***	0.357***	0.0885***	0.971***
	(0.0587)	(0.0595)	(0.0605)	(0.0285)	(0.0724)
Secondaryg	0.890***	0.794***	0.288***	0.0787***	0.835***
	(0.0557)	(0.0566)	(0.0553)	(0.0272)	(0.0660)
Maried			-0.319***		
			(0.0468)		
Household size			-0.0255***	0.0105***	
			(0.00438)	(0.00210)	
Religion			0.0850		
			(0.0962)		
Social network	**0.0584****	**0.0852*****			**1.536*****
	(0.0293)	**(0.0296)**			**(0.300)**
IMR		0.760***		-0.328***	
		(0.0805)		(0.0409)	
Constant	3.293***	1.351***	-4.057***	1.641***	1.889***
	(0.150)	(0.252)	(0.187)	(0.116)	(0.330)
Observations	4391	7040	7040	4422	4385
R-squared	0.222			0.081	
Instrument F-stat					24.94
Cragg-Donald Wald F-stat					34.60

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. IMR is the inverse Mills ratio. The endogenous variable is Social network. Social network is instrumented by household size nd the inverse Mills ratio. The Cragg-Donald Wald F-stat of weak identification is compared to the Stock-Yogo weak ID test critical values[19.93(10%); 11.59(15%); 8.75 (20%); 7.25 (25%)]

Table 11: Job quality regression , non monetary aspect

	(1)	(2)	(3)
Dependent Variable	Non monetary job quality O LOGIT	Social network First step 2SLS	Non monetary job quality 2SLS
Social Network	**-0.767*** **		**-4.354** **
	(0.0992)		**(1.904)**
Age	-0.0735*	-0.0569***	0.143***
	(0.0425)	(0.00579)	(0.0361)
Age squared	0.00151***	0.000587***	-0.00119**
	(0.000564)	(7.46e-05)	(0.000596)
Primary education	0.972***	0.0194	1.043***
	(0.215)	(0.0254)	(0.302)
Secondaryg	1.740***	0.0787***	1.289***
	(0.220)	(0.0272)	(0.293)
Secondaryt	2.168***	0.0885***	1.916***
	(0.226)	(0.0285)	(0.292)
High education	3.643***	0.00300	2.737***
	(0.252)	(0.0293)	(0.445)
IMR	-2.366***	-0.328***	
	(0.273)	(0.0409)	
Household size		0.0105***	
		(0.00210)	
Constant		1.641***	0.470
		(0.116)	(1.402)
Observations	1872	4422	1872
R-squared		0.081	

Notes : Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 12: Contribution of social network to the job quality differential

	Monetary aspect of job quality		Non monetary aspect	
	(1)	**(2)**	**(3)**	**(4)**
	Formal-informal difference	**Gender difference**	**Formal-informal difference**	**Gender difference**
Overall				
Difference	0.33*** (7.53)	0.07** (2.32)	0.10	0.03
Explained	0.18*** (7.91)	-0.08** (-1.89)	0.07	0.02
Unexplained	0.14*** (3.33)	0.16*** (3.12)		
Explained	-			
Age	-0.0009 (-0.24)	-0.03 (-1.29)	-0.03 (-1.33)	0.004 (0.84)
Age2	-0.003 (-0.50)	0.02 (1.51)	0.04 (1.51)	0.008* (1.82)
Social network	-0.002 (-1.09)	0.006** (1.94)	0.009*** (2.88)	0.0008 (1.08)
Primary	-0.12***(-5.86)	-0.015 (-1.57)	-0.21*** (53.8)	-0.02 (1.28)
Secondaryg	-0.007 (-0.56)	-0.02*** (-2.72)	0.03*** (5.53)	-0.02*** (-4.00)
Secondaryt	0.04*** (3.12)	0.03*** (3.05)	0.08*** (17.21)	0.03* (1.87)
Highe	0.27*** (9.18)	0.14*** (7.85)	0.15*** (31.47)	0.02*** (5.76)
IMR	-0.004 (-0.60)	-0.22*** (-5.31)		
Unexplained				
Age	-1.95* (-1.85)	-4.64*** (-4.28)		
Age2	0.99** (2.10)	2.29*** (4.52)		
Social network	-0.03 (-0.99)	-0.05** (-2.27)		
Primary	0.08* (1.68)	0.02 (0.75)		
Secondaryg	0.09 (1.58)	0.06** (2.31)		
Secondaryt	0.07* (1.65)	0.02 (1.25)		
Highe	0.05 (1.35)	-0.003 (-0.22)		
IMR	-0.21* (-1.85)	-0.38*** (-2.83)		
Observations	2084	4835	1043	1872

Note: T-statistics are in parentheses. ***p<0.01 **p<0.05 *p<0.1. Linear decomposition is applied for monetary aspects while non linear decomposition is applied for non monetary aspects.

Table 13: Monetary aspect of job quality, controlling for formal and informal sector

	(1)	(2)	(3)
	2SLS	2SLS first step	2SLS
DependentVariable	Log(wage)	Social network	Log(wage)
Household size		0.0133***	
		(0.00316)	
Inverse Mills ratio		-0.358***	
		(0.0620)	
Age	0.0333***	-0.0663***	0.00487
	(0.0124)	(0.00977)	(0.0237)
Age squared	-0.000109	0.000718***	0.000308
	(0.000152)	(0.000134)	(0.000312)
Primary education	0.601***	0.0916**	0.349***
	(0.0660)	(0.0448)	(0.135)
Secondaryg	0.835***	0.190***	0.475***
	(0.0682)	(0.0460)	(0.139)
Secondaryt	0.971***	0.189***	0.520***
	(0.0747)	(0.0476)	(0.152)
High education	1.944***	0.195***	1.226***
	(0.0778)	(0.0535)	(0.164)
Formal		0.0729**	-0.177
		(0.0354)	(0.108)
Informal		0.109***	-0.301***
		(0.0336)	(0.107)
Social Network	**1.536*** **		**1.924*** **
	(0.302)		**(0.452)**
Constant	1.889***	1.616***	2.645***
	(0.334)	(0.191)	(0.510)
Observations	4385	1982	1959
R-squared		0.078	
Instrument F-stat	24.94		17.76

Note : Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The endogenous variable is social network. Social network is instrumented by the size of household and the inverse Mills ratio.

Table 14: Non monetary aspect of job quality, Controlling for formal and informal sector

Independent Variable	(1) 2SLS Non monetary job quality	(2) 2SLS Non monetary job quality
Social network	-4.354**	-1.268
	(1.904)	(1.752)
Age	0.143***	0.160***
	(0.0361)	(0.0478)
Age squared	-0.00119**	-0.00174**
	(0.000596)	(0.000708)
Primary education	1.043***	0.462
	(0.302)	(0.343)
Secondaryg	1.289***	0.834**
	(0.293)	(0.374)
Secondaryt	1.916***	1.305***
	(0.292)	(0.392)
High education	2.737***	2.516***
	(0.445)	(0.347)
Formal		0.668***
		(0.226)
Informal		0.169
		(0.205)
Constant	0.470	-1.764
	(1.402)	(1.675)
Observations	1872	967
R-squared		0.259

Notes : Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 15: Monetary aspect of job quality regression comparing various instruments

	(1) 2SLS	(2) 2SLS	(3) Treatment effect Model	(4) Treatment effect model
Dependent Variable	Log(wage)	Log(wage)	Log(wage)	Log(wage)
Age	0.398	0.668	0.0674***	0.0904***
	(0.532)	(0.637)	(0.0158)	(0.0163)
Age	-0.00411	-0.00684	-0.000691***	-0.000955***
	(0.00548)	(0.00650)	(0.000187)	(0.000204)
Primary education	0.531	0.546	0.650***	0.708***
	(0.345)	(0.443)	(0.0483)	(0.0602)
Secondaryg	0.397	0.340	0.887***	0.932***
	(0.695)	(0.689)	(0.0540)	(0.0647)
Secondaryt	0.509	0.426	1.034***	1.064***
	(0.912)	(0.808)	(0.0566)	(0.0673)
High education	1.820***	2.102***	1.888***	1.953***
	(0.250)	(0.554)	(0.0581)	(0.0712)
Household size			0.0862***	0.0856***
			(0.00453)	(0.00518)
Inverse Mills ratio	2.283	3.672	0.275***	0.382***
	(2.563)	(3.200)	(0.101)	(0.108)
Social network	**6.184**	**12.12**	**0.608*** **	**0.876*** **
	(10.41)	**(13.34)**	**(0.190)**	**(0.140)**
Constant	-8.114	-16.87	1.188***	0.555
	(16.08)	(19.94)	(0.386)	(0.360)
Instrument F-stat	0.22	0.74		
Log Likelihood			-6090.31	-8673.38
LR test p>chi2			[0.0006]	[0.05]
Observations	4383	3148	4383	3148

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Social network is instrumented respectively by Fwork (which takes 1 if the worker's father has a job and 0 otherwise) and Fathst (which takes 1 if the worker's father is senior executive and 0 otherwise).

Table 16: Non monetary aspect of job quality regression with various instruments

	(1)	(2)	(3)
	2SLS	2SLS	2SLS
Dependent Variables	Non monetary job quality	Non monetary job quality	Non monetary job quality
Social network	-4.354**	-13.90	-7.755**
	(1.904)	(9.143)	(3.009)
Age	0.143***	0.192*	0.158***
	(0.0361)	(0.110)	(0.0528)
Age squared	-0.00119**	-0.00263	-0.00174**
	(0.000596)	(0.00203)	(0.000888)
Primary	1.043***	1.722*	1.275***
	(0.302)	(0.977)	(0.447)
secondaryg	1.289***	2.068**	1.459***
	(0.293)	(1.035)	(0.431)
secondaryt	1.916***	2.509***	2.026***
	(0.292)	(0.902)	(0.427)
High education	2.737***	1.415	2.147***
	(0.445)	(1.558)	(0.679)
Constant	0.470	6.284	2.760
	(1.402)	(6.107)	(2.190)
Observations	1872	1359	1871
Instrument F-stat	24.94	0.22	0.74

Notes : Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 17: Instrumentation equations

Dependent Variable	(1) OLS Social network	(2) OLS Social network	(3) Probit Social network	(4) Probit Social network
Household size	**0.0105*** **	**0.00905*** **	**0.0294*** **	**0.0238*** **
	(0.00210)	**(0.00251)**	**(0.00578)**	**(0.00677)**
Fwork	0.00733		0.0399	
	(0.0158)		(0.0433)	
IMR	-0.328***	-0.311***	-0.887***	-0.833***
	(0.0409)	(0.0483)	(0.113)	(0.132)
Age	-0.0570***	-0.0528***	-0.1505***	-0.1409***
	(0.00579)	(0.00693)	(0.0166)	(0.0196)
Age squared	0.000588***	0.000539***	0.00151***	0.0014***
	(7.46e-05)	(8.99e-05)	(0.000216)	(0.000257)
Primary	0.0194	0.00934	0.0637	0.0426
	(0.0254)	(0.0304)	(0.0684)	(0.0795)
Secondaryg	0.0786***	0.0529	0.214***	0.141
	(0.0272)	(0.0322)	(0.0743)	(0.0844)
Secondaryt	0.0888***	0.0540	0.244***	0.141
	(0.0284)	(0.0335)	(0.0774)	(0.0800)
High education	0.00273	-0.0168	-0.0217	-0.0962
	(0.0293)	(0.0348)	(0.0846)	(0.0983)
Fathst		0.0410		0.411***
		(0.0475)		(0.119)
Constant	1.636***	1.581***	2.982***	2.876***
	(0.117)	(0.138)	(0.331)	(0.386)
Log Likelihood			-8389.18	-6090.31
Observations	4420	3171	4383	3148
R-squared	0.081	0.074		

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1