Union Wage Differential: Cameroon

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Abstract

The general objective of this paper is to compare the union wage differential estimated from a single equation model with that obtained from a simultaneous equations model incorporating wage determination and union membership.

Overall, the results conform with those of Lewis (1986) in validating the single equation modelling procedure. The data base is a 1999 survey of 1,074 wage earners in Cameroon.

Key Word : Union wage differential.

J.E.L. Classification : J31 – J51.

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1- Introduction.

The general concern of the economics of trade unions is to determine the economic objectives of those organisations as well as the methods of their achievement (Cahuc, 1991; Oswald, 1982). On that basis, the trade union behaviour[1] is generally apprehended in examining the condition in which it can succeed in obtaining a wage higher than the equilibrium one. Several studies[2] have look into the effect of trade union on wage, and pointed out a union wage differential.

However, the determination of such a differential encounters at least two problems. The first problem deals with the degree of aggregation of the data. Indeed, the differential obtained on the basis of aggregate data is higher than that calculated from individual cross-section data; which is itself higher than that obtained from the panel data (Booth, 1995, p. 157). The second problem has to do with the methodology applied to the statistical property of union membership of the worker, since wage can be influenced by affiliation and affiliation is determined by wage differential. This idea nourishes a controversy opposing two groups of authors, the pro-simultaneous equation modelling in estimating the differential, and those against.

The first group of authors lay on the general idea according to which as much the wage is influenced by the level of unionisation, as well as the membership decision is affected by the policy which leads to its determination (Booth, 1995, p. 162). Based on such an idea, Lee (1978) builds a simultaneous equations model and validates this assumption by testing it on American survey data. Moreover, he concludes in addition that the differential obtained in a single equation model is 17.458%; which is 2% higher than the value determined by taking this constraint into account (evaluated to 15.68%). Robinson (1989) uses Canadian industrial data and adds to its model, in addition to the ordinary least square (OLS) applied in longitudinal data, control methods such as instrumental variables (IV) and inverse Mills ratio (IM) applied on cross-sectional data. Despite these precautions, major divergences appears between union wage differentials computed according to different methods. The estimators of the differential obtained by the IV or the IM (ranging between 27% and 43%) appear increasingly higher than those resulting from the use of the OLS (which is about 20%).

The second group of authors ground their analysis on conclusions of Freeman and Medoff (1982) and Lewis (1986) according to which, if one only considers results of the studies that endogenously analyse union membership and thus use simultaneous equations methods, the effect of trade unions on wages could not be certain anymore. For example, Freeman (1986) shows that relative level of differential is likely to intensify the refusal of the employers to recognise trade-union. Thus, the differential would at the same time encourage unionisation as well as the resistance to trade unions, so that the net effect on membership would be ambiguous. Lewis (1986) reviews studies with the two approaches and concludes that the estimators computed in a simultaneous equations setting, which are systematically neither

[1] The economics of the trade union distinguishes between three usual models: the first, the monopoly union model (Dunlop, 1944) which is a particular case of the second, the right-to-manage model (Nickell and Andrews, 1983), is build around the idea that wages are bargained whereas employment is unilaterally determined by the firm. The proven disputability of that assumption has led to a third framework known as the optimal contract model (McDonald and Solow, 1981) which studies the case where employer and trade union decide to sign contracts relating at the same time to wages and to employment.

[2] For example, see Booth (1995) or more recently Tsafack-Nanfosso (2000).

lower nor higher than those obtained in a single equation model, have an additional flow, which is their high sensitivity to the estimation method, as well as the inclusion of additional variables, the assumptions about the error terms and to the types of data used. The single equation modelling procedure then led him to a 14% union wage differential for the United States; while Standing (1992) obtains 19.7% for industrial or craft unions and 14.9% for company unions in Malaysia; Panagides and Patrinos (1994) obtain 10.4% for Mexico; Arbache and Carneiro (1999) obtain 29.6% (corresponding for 1992) and 18.8% (corresponding for 1995) in Brazil, and Tsafack-Nanfosso (1999) arrives to a differential of 14.19% for Cameroon.

The objective of this paper is to compare the results of the two approaches while estimating the wage differential from the suitable method according to the union membership variable status. Data are drawn from an original survey conducted in Cameroon in 1999 on 1,074 wage earners selected from firms of all economic sectors. In this country as in many others, union density (about 6% of active population) is not a perfect expression of neither bargaining power nor the nuisance effect of workers organisation (which claim about 30% to 40% members in the private sector). Indeed, "the influence of trade unions at the macroeconomic level is perhaps better indicated by the extent of the coverage of the workforce by union collective agreements, rather than by the measure of union density" (Booth, 1995, p. 5).

The rest of the paper is organised as follows: section 2 gives an outline of the institutional framework of wage determination in Cameroon. Section 3 proposes a simple model to achieve our goal. Section 4 presents the data whose estimated results are discussed in section 5. Section 6 summarises the main conclusions.

2- Institutional framework of wage determination.

In Cameroon as in many other countries, the determination method of the working conditions is formalised by collective bargaining whose main instruments, specified by the Labour Act, are the collective agreement and firm or branch settlements. These instruments are imperatively validated by the presence of trade unions (active in the country since 1932) and cannot derogate from the provisions of the Law. They are on the other hand free to envisage more favourable provisions to the workers, in particular as regards professional categories and wages. Moreover, because of the prerogatives of the government, results and effects of the bargaining can be extended by decree to others branches or sectors.

Wage determination within such a framework results from a double mechanism: centralised and decentralised. The centralised mechanism is that to which one can generally allot wage increases in the country. It is formally tripartite, as long as the trade unions (represented by the *Organisation Syndicale des Travailleurs Camerounais* OSTC and, since 1995, the *Union des Syndicats Libres du Cameroun* USLC) and employers' federations (represented by the *Syndicats des Industriels du Cameroun* SYNDUSTRICAM and *Groupement Interpatronal du Cameroun* GICAM) together with the government (represented by the Minister for Labour) must suggest (to the Head of State) wage increases. These increases are often decided and then carried out according to a dual method: a quasi complete indexing of the increase to the inflation rate as far as the wages of the personnel at grids lower than VIth category are concerned, then based on a proportion which is a decreasing function of the level of wages for the other personnel. The decentralised mechanism is somewhat different according to the employment sector. In the pubic sector (excluded from our concerns), wages are given in a unilateral way by the government since trade unionism was until a recent period proscribed to

the civil servants. In the private sector (object of this study), wage determination by sector of activity and by occupational category is promulgated by the government on the basis of recommendation of the CNPCCS[3] within which trade unions and owners discuss under the supervision of public authorities.

On the basis of collective agreement, of firm or branch settlements and of the above presented two mechanisms, the national system finally generates clearly negotiated wages, in particular in the private sector. It is not too different from corporatism, which is defines as "a set of institutions in where the interest organisations of labour and capital are brought together in a framework with the state in which a high level of employment is sought by imitation of wage demands" (Newell and Symons, 1987, p. 578).

3- The model.

3.1- Presentation.

The starting point is a standard "statistical earnings function" (Berndt, 1991, p. 161) which deals with Mincer's (1974) human capital theory. It is a function regressing wages on a set of variables which implicitly have an impact on income. The equation is expressed as:

$$\ln w_i = \alpha U_i + \boldsymbol{\gamma} \boldsymbol{X}_i + \varepsilon_i \qquad (1)$$

where U is a dummy variable taking 1 if the individual is unionised and 0 if not, α being the coefficient to be estimated. Relation (1) is suitable when aggregate data are used. An estimate of the union wage differential can then be provided by α (through relation (7) below). But from the available survey data, one can distinguish wage equations between unionised and non unionised workers (Pencavel, 1991). This procedure allows us to estimate in a more precise manner the union wage differential. Relations considered are then:

$$\ln w_{ui} = \boldsymbol{\gamma}_u \boldsymbol{X}_i + \varepsilon_{ui}, \qquad i = 1, 2, \ldots, u \text{ members} \qquad (2)$$

$$\ln w_{ni} = \boldsymbol{\gamma}_n \boldsymbol{X}_i + \varepsilon_{ni}, \qquad i = 1, 2, \ldots, n \text{ non members} \qquad (3)$$

where $\ln w_i$ is the log of hourly income (salary + other benefits)[4], $\boldsymbol{X}_i$ the vector of personal endowments (variable of human capital, other individual characteristics, employment variables, etc), $\boldsymbol{\gamma}_u$, $\boldsymbol{\gamma}_n$ and $\boldsymbol{\gamma}$ the vector of coefficients to be estimated, ε_i the white noise error term, for each category of worker.

The union wage differential d_i is given by $d_i = (w_{ui} - w_{ni})/w_{ni}$ (Booth, 1995, p. 158; Pencavel, 1991, p. 17); which upon some rearrangements gives:

$$\phi_i = \ln w_{ui} - \ln w_{ni} \qquad (4)$$

[3] The Joint National Committee of Collective agreements and Wages (CNPCCS) was created in 1969 to be the masterpiece for all the questions relating to occupational qualification (i.e. skills), wages and employment, especially in the private sector.

[4] Hourly earning = [Monthly earning x 12]/[Working hours per Week x 52]. See Marcouiller and al. (1997, p. 392).

where $\phi_i = ln\ (1 + d_i)$. Using (4) with (2) and (3), one can rewrite the union wage differential as:

$$\phi_i = (\gamma_u - \gamma_n)\boldsymbol{X}_i + \mu_i \tag{5}$$

where $\mu_i = (\varepsilon_{ui} - \varepsilon_{ni})$. The average estimated differential for all the workers will thus be:

$$\bar{\hat{\phi}} = (\hat{\gamma}_u - \hat{\gamma}_n)\overline{\boldsymbol{X}}\,. \tag{6}$$

In equation (6), $\overline{\boldsymbol{X}}$ represents the vector of the means values of the sample variables, and can thus cover either only unionised workers, or only non unionised, or both. That last possibility is what will be used in this paper. It corresponds indeed to the following question: "for a worker with average characteristics, what is the predicted wage differential between his/her working in the union and non-union sectors?" (Panagides and Patrinos, 1994, p. 5). The value of the union wage differential is expressed as a percentage by[5]:

$$[exp(\phi) - 1] \times 100. \tag{7}$$

However, the procedure described by (1)-(3) implicitly hypotheses that wage (w_i) has no influence on membership (U_i). The refutation of this assumption grounds the identification of the determinants of union membership or the probability of affiliation. If $U_i^* > 0$ worker i is unionised (and not if otherwise) with:

$$U_i^* = \beta \ln w_i + \boldsymbol{\lambda Z}_i + \varepsilon_i \tag{8}$$

where $\boldsymbol{Z}_i$ is the vector of exogenous variables explaining the decision to join the union, and $\boldsymbol{\lambda}$ the vector of the coefficients to be estimated. Thus, equation (8) includes wages as an explanatory variable in the decision to belong to a trade union. The required differential must then result from estimation of an equation system made up of expression (2) and (3) to which one adds the union membership determination equation having accounted for the difference of wage resulting from worker status, that is:

$$\begin{cases} U_i^* = \boldsymbol{\lambda Z}_i + \rho(\ln w_{ui} - \ln w_{ni}) + \varepsilon_i \\ \ln w_{ui} = \gamma_u \boldsymbol{X}_i + \varepsilon_{ui} \\ \ln w_{ni} = \gamma_n \boldsymbol{X}_i + \varepsilon_{ni} \end{cases} \tag{9}$$

where ρ is the coefficient of the union wage-gap estimates used in the structural unionisation equation.

[5] But for values lower than 0.15, ϕ can be directly compared to a rate. See Halvorsen and Palmquist (1980).

3.2- Estimation procedure.

Estimation of (9) is relatively complex from an econometric point of view, because of the qualitative nature of U_i. The technical developments of such problems are recalled and solved by Fomby and al. (1984, chapter 25) and Robinson (1989), inter alia. Simply speaking, estimation procedure which results from this can be divided into three stages recapitulated by Booth (1995, p. 174) and applied for example by Heckman (1979), Lee (1978) or Rees and Shah (1986). The first stage consists in considering the reduced form of (8) (in fact the first relation of the system (9)), that is:

$$U_i^* = \boldsymbol{\gamma} \boldsymbol{X}_i + \boldsymbol{\lambda} \boldsymbol{Z}_i + \varepsilon_i^* . \tag{10}$$

From that reduced form thus estimated by the maximum likelihood procedure (LOGIT model), one obtains $\hat{\boldsymbol{\gamma}}$ and $\hat{\boldsymbol{\lambda}}$. Given the union status of the workers, earnings equation of unionised becomes:

$$\ln w_{ui} = \boldsymbol{\gamma}_u \boldsymbol{X}_i + \sigma_{1\varepsilon^*} \left[- \frac{f(\psi_i)}{F(\psi_i)} \right] + \eta_u \tag{11}$$

in which $E(\eta_u \mid U_i = 1) = 0$, and $\psi_i = \boldsymbol{\gamma} \boldsymbol{X}_i + \boldsymbol{\lambda} \boldsymbol{Z}_i$. F is the cumulative distribution of a standard normal random variable and f is its density function. In the same way, earnings equation for the non unionised is:

$$\ln w_{ni} = \boldsymbol{\gamma}_n \boldsymbol{X}_i + \sigma_{2\varepsilon^*} \left[\frac{f(\psi_i)}{1 - F(\psi_i)} \right] + \eta_n \tag{12}$$

in which $E(\eta_n \mid U_i = 0) = 0$[6].

From expressions (11) and (12), the second stage consists in an OLS estimation of the $\boldsymbol{\gamma}_u$ parameters by regressing the earnings observed on variables $\boldsymbol{X}_i$ and $[- f(\hat{\psi}_i)/F(\hat{\psi}_i)]$, with $\hat{\psi}_i = \hat{\boldsymbol{\gamma}} \boldsymbol{X}_i + \hat{\boldsymbol{\lambda}} \boldsymbol{Z}_i$. The $\boldsymbol{\gamma}_n$ parameters will be estimated in a similar manner, with $[f(\hat{\psi}_i)/(1 - F(\hat{\psi}_i))]$. Terms in brackets represent IM ratio or selectivity variable. The significance of its coefficient informs about effective selection bias in observed earnings, that is the possibility for a worker of choosing his status (unionised or not) after having observed the advantages (or the disadvantages) of this one, in particular in term of extra payment (Rees and Shah, 1986, p. 101).

The last stage consists in returning to the structural form of membership equation:

$$U_i^* = \boldsymbol{\lambda} \boldsymbol{Z}_i + \rho(\ln \hat{w}_{ui} - \ln \hat{w}_{ni}) + \varepsilon_i \tag{13}$$

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[6] The second term at the right hand side of (11) is in fact the mean $E(\varepsilon_u \mid U_i = 1)$ and the one at the right hand side of (12) is the mean $E(\varepsilon_n \mid U_i = 0)$.

while introducing among the explanatory variables, the estimated wage differential (computed from the estimated coefficients of expressions (11) and (12)) which is received (or expected) by each worker if he is (or if he chooses to become) unionised. Estimation of (13) is again done with maximum likelihood procedure (LOGIT model)[7].

Finally, the union wage differential for the whole sample given by (6) is computed each time by adding the marginal contributions of each exogenous variable of the two last expressions of the system (9).

4- Data.

Data used in the present study come from a survey carried out between March and July 1999, in the three main agglomerations of Cameroon, namely Bafoussam (Western part of the country), Douala (the economic capital city, Littoral of the country) and Yaounde (the political capital city, Centre of the country). The choice of the areas (and thus of their main cities) arises from the results of the preliminary survey carried out to mark out the final one, as well as discussions with those in charge of the two main trade-unions of the country. These three areas indeed allow to cover nearly 90% of trade-union activism, shared out among Douala (50%), Yaounde (30%) and Bafoussam (20%).

Having then chosen the purposive sampling method (Grais, 1990, chapter 5), we distributed 2022 questionnaires among Douala (50%), Yaounde (30%) and Bafoussam (20%). Among those, 1706 were collected, whose only 1074 [Douala (59%), Yaounde (31%), and Bafoussam (10%)] were indeed exploitable because of the rigour of filling (or of the coherence of the answers). Details and other methodological aspects of this investigation are developed in Tsafack-Nanfosso (2000). The definition and the summary of the variables used are presented in table A1 (appendix); the statistical description of these variables being given by table A2 (appendix).

Most of these variables can be found in Arbache and Carneiro (1999), Bates (1972), Panagides and Patrinos (1994) or Standing (1992). The probability of joining should be positively influenced by education and experience. Following Bates (1972), one will check the influence of the marital status, urbanisation (through the birthplace) and regionalisation (thanks to the province of birth). The occupational category should be, theoretically, related to that probability in a decreasing way. One will also question the status of education in the trade-union appeal. Furthermore, the role of pressure group or crowd effect highlighted by Waddington and Whitston (1997) will be apprehended through the total number of unionised (do you join a trade-union because several colleagues are members? Are wages influenced by the number?) which is in addition a proxy of the size of the company.

The "related characteristics" suggest other variables that can also influence membership, such as the occupation of the parents or relatives, their trade-union membership, and the implication of the worker in a secondary activity or another business (that should impede affiliation). Moreover, in most of existing studies, total experience is given by the formula (Age − Years of schooling − 6). But, since we explicitly asked "to give the total working years since (their) very first employment", the answers obtained will be significant here of

[7] Lee (1978, p. 423) which uses the PROBIT instead of LOGIT method, affirms that this procedure is a "two stage probit estimation".

total experience. Experience in job occupied directly results from the question put on for it. Lastly, the "enterprises" characteristics such as the number of lay-offs and the number of re-employ, aim at controlling certain short term effects. For example, a company which lays off (recruits) will be more hostile (open) with the wage increases.

Table A2 (appendix) indicate inter alia, that if total experience is only two years higher than employment experience (assuming that the turnover rate of the majority of worker is somewhat weak and they remain generally faithful with their employer), the seniority ratio is nevertheless higher for unionised (81.35%) than for non-unionised (74.38%). Moreover and beyond their educational background, unionised are on average more trained (in term of recycling and vocational training) than others. In addition, 35% of the whole sample are members, which closely corresponds to the proportion asserted by the existing trade unions. Finally, the average natural log of hourly income reveals less dispersed, substantially higher and statistically significant[8] wages rates among the union than in the non-union subsample 6.7500 > 6.4377. It is primarily this difference that founds developments on union wage differential.

5- Results.

To discuss the results, we first give estimates of the wage differential computed with (expressions (11) and (12)) and without (expressions (2) and (3)) taking into account of the selectivity variable, before estimation of structural membership equation (13).

5.1- The union wage differential.

The estimated parameters of the reduced form (10) which make it possible to get IM ratio are presented in annexe (table A3). Estimation results of equations (11) and (12) are given in table 1, while those of equations (2) and (3) are in table 2. It appears, for individual cross-sectional data and thanks to the statistics at the bottom of the table, that the models correctly explain (58% and 47%) the income of the workers according to their status.

Education has overall a positive and significant impact on wages, which conforms with the human capital theory. Compared to a primary education worker, schooling effect can go up to 111% among unionised against 103% among non unionised[9]. The occupational category is positively related to the income; the difference compared to the unskilled labour being of 180% and 211% for the senior executive respectively for the unionised and non unionised. Those variation are in fact relatively weak and can be ascribed to the double and drastic 1993 salaries cuts (of 65% on average) imposed by the State on the public sector, and then relegated in the private and parastatle sectors. These successive cuts generated a considerable flatness of the income classes differences, a drop in output and the development of moonlighting in the country.

The signs obtained for experience and its square conform with the theory. They indicate that each additional year of experience increases hourly earnings by 4%, but that this profit evolves at decreasing rate. There is thus a hump-shaped relationship between experience and income on the one hand, between seniority and earnings on the other hand. Recycling and

[8] The t-test calculated to compare the means for this purpose is significant at the 1% level.
[9] Given that the dependent variable is in log, this interpretation results from the use of the relation (7) in the text.

vocational training, like birthplace and nationality, are not significant even with positive signs.

Table 1: Earnings functions OLS estimates: unionised and non unionised (with selectivity variable).

Variables	**Unionised**		**Non Unionised**		**Marginal Contribution**
	Coeff.	***t* of Student**	**Coeff.**	***t* of Student**	$(\hat{\gamma}_u - \hat{\gamma}_n)\overline{X}$
Constant	5.584*	20.12	4.084*	8.27	1.500
Educ					
Without	-	-	0.021	0.11	- 0.0002
Gensecon	0.311*	2.78	0.233	1.51	0.0190
Techsecon	0.560*	5.17	0.331**	2.08	0.0665
Genuni	0.672*	5.28	0.446*	2.63	0.0522
Techuni	0.745*	5.33	0.706*	4.09	0.0075
Expt	0.039**	2.36	0.046**	2.39	- 0.0734
Expt²	- 0.00008	0.20	- 0.0003	0.38	0.0377
Expe	0.017	1.49	- 0.0001	0.007	0.1394
Expe²	- 0.0004***	1.83	0.0007	0.88	- 0.1292
Recy	0.004	0.73	0.017	1.42	- 0.0079
Voctrain	0.0006	0.20	0.007	1.20	- 0.0112
Sex	- 0.105	1.23	- 0.235*	3.42	0.1053
Marit					
Single	- 0.366**	2.56	0.313	0.94	- 0.2459
Monoga	- 0.411*	3.35	0.395	1.20	- 0.4202
Polyga	- 0.420*	2.84	0.350	1.04	- 0.0695
Divorced	- 0. 900*	4.25	0.364	1.00	- 0.0212
Birth	0.055	0.93	0.069	1.30	- 0.0078
Natio	0.213	1.51	0.303	1.34	- 0.0873
Tunion	- 0.0003**	2.36	0.0003***	1.87	- 0.0733
Occu					
Others	0.132	0.59	0.591*	3.54	- 0.0265
Senexe	1.028*	5.07	1.135*	8.55	- 0.0109
Execu	0.606*	3.35	0.837*	8.62	- 0.0847
Skilwo	0.158	0.90	0.351*	3.90	- 0.0552
Semiwo	0.048	0.26	0.230**	2.45	- 0.0220
Dismis	- 0.0007***	1.78	- 0.0001	0.29	- 0.0227
Reempl	0.006*	4.23	0.002	1.60	0.0394
Selectivity	0.213	0.89	0.400**	1.99	- 0.1870
R^2	0.579		0.472		
Adjusted R^2	0.548		0.451		
SEE	0.497		0.673		
F-test (Proba)	18.400 (1%)		22.271 (1%)		
N	374		700		
Union Wage Differential					**0.4109**

Note: For education, marital status and occupational category, residual variables are respectively *Primary*, *Widow* and *Unskilled*. Heteroscedasticity is corrected by the White (1980) method. Student t are in absolute values. *(**){***} indicate significant at the 1%(5%){10%} level. $\overline{X}$ is the full sample weighted variable mean. $\hat{\gamma}$ are the estimated coefficients.

Table 2: Earnings functions OLS estimates: unionised and non unionised (without selectivity variable).

Variables	Unionised		Non Unionised		Marginal Contribution
	Coeff.	***t* of Student**	**Coeff.**	***t* of Student**	$(\hat{\gamma}_u - \hat{\gamma}_n)\overline{X}$
Constant	5.476*	21.50	4.519*	10.33	0.957
Educ					
Without	-	-	0.024	0.13	- 0.0002
Gensecon	0.3*	2.67	0.216	1.42	0.0203
Techsecon	0.555*	5.12	0.320**	2.05	0.0683
Genuni	0.662*	5.17	0.426*	2.57	0.0545
Techuni	0.731*	5.24	0.685*	4.04	0.0088
Expt	0.040**	2.44	0.045**	2.32	- 0.0525
Expt²	- 0.00012	0.29	- 0.0003	0.39	0.0309
Expe	0.018	1.53	- 0.0008	0.04	0.1532
Expe²	- 0.0004***	1.85	0.0007	0.94	- 0.1292
Recy	0.004	0.71	0.018	1.45	- 0.0085
Voctrain	0.0009	0.26	0.0066	1.18	- 0.0010
Sex	- 0.101	1.21	- 0.228*	3.30	0.1029
Marit					
Single	- 0.363*	2.84	0.292	0.88	- 0.2372
Monoga	- 0.421*	3.80	0.373	1.13	- 0.4140
Polyga	- 0.433*	3.17	0.307	0.91	- 0.0668
Divorced	- 0. 918*	4.34	0.351	0.97	- 0.0213
Birth	0.056	0.95	0.073	1.37	- 0.0095
Natio	0.214	1.53	0.3	1.32	- 0.0834
Tunion	- 0.00016**	2.23	0.0003**	2.02	- 0.0562
Occu					
Others	0.14	0.62	0.587*	3.50	- 0.0258
Senexe	1.038*	5.06	1.137*	8.54	- 0.0100
Execu	0.607*	3.35	0.833*	8.54	- 0.0829
Skilwo	0.156	0.90	0.343*	3.79	- 0.0534
Semiwo	0.043	0.23	0.224**	2.35	- 0.0219
Dismis	- 0.0007***	1.81	- 0.00014	0.35	- 0.0212
Reempl	0.0057*	4.45	0.0025**	1.99	0.0316
R^2	0.579		0.469		
Adjusted R^2	0.548		0.449		
SEE	0.497		0.674		
F-test (Proba)	19.116 (1%)		22.882 (1%)		
N	374		700		
Union Wage Differential					**0.1325**

Note: For education, marital status and occupational category, residual variables are respectively *Primary*, *Widow* and *Unskilled*. Heteroscedasticity is corrected by the White (1980) method. Student t are in absolute values. *(**){***} indicate significant at the 1%(5%){10%} level. $\overline{X}$ is the full sample weighted variable mean. $\hat{\gamma}$ are the estimated coefficients.

The coefficient for gender is nonsignificant for unionised, what is as "highly suggestive of greater gender equality in the union sector" (Panagides and Patrinos, 1994, p. 15) as its marginal contribution to differential is positive. But for nonunionised, it appears that women earn 26.5% more than men. This result which represents an unexpected gender discrimination is counterintuitive but isn't new, since it was already highlighted in the Côte d'Ivoire private sector for example by Lachaud (1994, pp. 107-108). Discrimination against men can result:

- from the qualitative effect on the one hand. The distribution, both by occupational category and by the level of education from our sample is illustrative of this. In relative

terms, women sometimes are more qualitatively than quantitatively represented in investigations similar to those carried out within the framework of this work[10];

- from a purely statistical bias on the other hand. Thus Neumark (1999) shows that such results can reflect a purely statistical discrimination, in which the sign and the level of discrimination come from a statistically erroneous information. In this case, only estimation of two wage equations specified by gender can allow to refine the analysis and to precisely determine the existence and the sign of the aforementioned discrimination[11].

Marital status generally contributes negatively way to the differential. It is negative and significant for the unionised, which means that the various modalities of marital status would be less contributive than that of the widow. This could be due to the fact that widows are relatively older than the average and have already acquired benefits; so they are more available vis-à-vis to the constraints of the militancy and thus on average would "be rewarded better" than the other personnel.

The total number of unionised workers has an impact (although tiny) significant and contradicting in the two sectors. The result on this variable, included in the regression to analyse the influence of lobbies and crowd effect, provide at least two indications: first, the larger the enterprise is, the less workers are affiliated; and second, negotiations (of branches in particular) carried out by the existing numerous trade unions (one counted up to 26 different trade unions in one of the companies of our sample) are ineffective. Finally, the number of lay-offs and the number of re-employ are significant with the expected signs. In other words, as hypothesised, firm which lays off (recruits) is *ceteris paribus* more hostile (open) to the wage increases.

Table 1 shows that the selectivity bias, which is $[-f(\hat{\psi}_i)/F(\hat{\psi}_i)]$ for the unionised and $[f(\hat{\psi}_i)/(1-F(\hat{\psi}_i))]$ for the non-unionised workers is only significant for the latter. In other words, unionised workers do not have any particular information which would ex ante support their decision of joining; only non-unionised select a priori their status. Perhaps, as suggest by Rees and Shah (1986, p. 103), a sample with a greater proportion of unionised would allow a better detection of selectivity bias. In any case, earnings (or the expected extra payment) is not thus probably the a priori reason of joining. On the other hand, 36% from non unionised affirm that their choice is due to the lack of information, 22% to the useless and/or inefficiency of the trade unions, and 15% to the official and/or employers' domination over these organisations (Tsafack-Nanfosso, 2000, chapter 4).

From the summation of the marginal contributions, one obtains the overall union-nonunion wage differential presented in the last column of the tables. It thus appears, on the basis of relation (6), that the differential is 0.4109 with adjusted selection and 0.1325 without adjustment. Calculation with expression (7) gives respectively 50.82% and 14.17% (the

[10] The distribution of workers by occupational category and level of study is indeed not definitely unfavourable to the women. The following table, drawn from the survey is illustrative:

	Direct	Senexe	Execu	Skolwo	Semiwo	Unskilled
Women (%)	8.1	9.6	34.9	28.7	13.9	4.8
Men (%)	5.2	10.3	37.1	28.6	11.7	7.2
	Without	Primary	Gensecon	Techsecon	Genuni	Techuni
Women (%)	1.0	3.3	27.3	30.1	16.7	21.5
Men (%)	0.7	3.9	23.4	28.8	24.6	18.6

[11] This is not our purpose however. But the estimation of two earning equations (for women and men) can indeed allow to compute a gender wage differential in our sample. That could constitute the frame of a paper to come.

difference resulting almost entirely from the constant term difference)[12]. The gap between these two measurement, although very different from that of Lee (1978), is similar to that computed by Robinson (1989); the high level of the adjusted differential justifies it all while it reconciles criticism made by Freeman and Medoff (1982) and by Lewis (1986). If we restrict ourselves to the later result which is more likely, we conclude that while controlling for certain wage generating characteristics, unionised workers earn 14.17% more in hourly wages than do non unionised one. This value is close to the 14% computed by Lewis (1986) for the United States, and is not far from the 18.2% obtained by Sinane (1995) for Yaounde[13].

5.2- Union membership.

Estimated results of membership equation (13) appear in table 3. The model explains quite well the decision of joining. The chi-square is 232.0 which, for a degree of freedom of 38, is significant at the 0.1% level. In addition, qualitative test H&L from Hosmer and Lemeshow (1989, chapter 5) produces excellent goodness-of-fit of 11.51.

The difference in earning received or expected from unionisation $(\ln \hat{w}_{ui} - \ln \hat{w}_{ni})$ is not significant[14]. This result confirms to some extent the absence of selectivity bias obtained among unionised (see table 1) and indicates that this variable does not explain the joining behaviour. On the other hand, relevant variables (because statistically significant) in explaining that decision are the technical secondary level of study, the total experience, the birth in the Northwest province, the occupational status of semiskilled worker and, above all, militant relationship.

Workers with the technical secondary level of education have a probability of joining which is 61% higher than that who have the technical university level. This result somewhat confirms the idea according to which there would be a negative correlation between affiliation and the level of schooling. For all other levels of study, the result is not significant.

Total experience is favourable to unionisation. In particular, each additional year of experience increases the probability of syndicating by 11.5%. Although nonsignificant, this tendency grows at a decreasing rate (the coefficient of experience squared being negative). In other words, as far as experience increases, there is a need to join a union, until a certain number of years from which, worker is less and less interested by the question. The trade unions should then strengthen their recruitment policy on the workers of less than 10 years of experience (the average number of years) to thus hope to engage the greatest number.

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[12] Within the framework of a differential between independent and wage workers, Rees and Shah (1986) suggest that this difference in the constant terms means that the differential obtained is due to the "capital's share" of the income of self employed. In the case studied here, one can allot this difference to the "initial endowments" of the unionised workers.

[13] Estimation of the relation (1) in the text gives a differential of 11.6%; that is 12.30% by using the relation (7).

[14] In Tsafack-Nanfosso (2000), this variable is ignored. As well, a distribution by class of monthly earnings is determined. It thus appears that a monthly earning of less than 50,000 fcfa reduces by 61.45% the probability of joining, compared to that or those who earn more than 500,000 fcfa. This result thus confirms the idea highlighted during the survey, according to which some workers do not join because of "low salary" and/or because of the amount of the trade union subscription (which is 1% of the basic pay in Cameroon).

Table 3: Union membership determinants: LOGIT estimates of structural equation.

		β	*t* of Student	exp(β)
Constant		- 2.28**	2.18	-
$\ln \hat{w}_{ui} - \ln \hat{w}_{ni}$		0.014	0.11	1.014
Educ				
	Without	- 6.30	0.50	0.002
	Primary	0.286	0.66	1.332
	Gensecon	0.12	0.46	1.127
	Techsecon	0.48***	1.95	1.610
	Genuni	0.012	0.05	1.012
Expt		0.11**	2.54	1.115
Expt²		- 0.002	1.46	1.000
Expe		0.06	1.55	1.060
Expe²		- 0.0002	0.17	1.000
Recy		0.03	0.89	1.030
Voctrain		0.02	1.39	1.020
Sex		- 0.19	1.01	0.824
Marit				
	Single	0.45	0.55	1.562
	Monoga	0.75	0.93	2.113
	Polyga	0.47	0.56	1.606
	Divorced	- 1.22	1.18	0.294
Prov				
	Adama	- 1.06	1.10	0.346
	Centre	- 0.64	1.05	0.527
	East	0.05	0.07	1.051
	Extrem	- 7.37	0.60	0.001
	Litto	- 0.89	1.47	0.409
	North	- 1.22	1.08	0.296
	Northwest	- 1.85***	1.89	0.158
	West	- 0.78	1.27	0.458
	South	- 0.60	0.92	0.547
	Southwest	- 0.61	0.85	0.541
Relatoc				
	Private	0.17	0.79	1.178
	Civil	0.10	0.49	1.100
	Paras	0.05	0.14	1.047
Unirel		0.71*	3.25	2.044
Infor		- 0.23	1.02	0.798
Tunion		0.0001	0.25	1.000
Occu				
	Others	0.27	0.68	1.304
	Execu	- 0.10	0.37	0.903
	Skilwo	0.47	1.52	1.592
	Semiwo	0.67***	1.88	1.951
	Unskilled	0.43	0.99	1.535
Khi-Squared			232.0	
H&L			11.51	
N			1,074	

Note: The residual variables are respectively: *Techuni* for education, *Widow* for the marital status, *Abroad* for the province of birth, *Unempl* for the occupation of the parents, and *Senexe* for the occupational category. The t-stat are in absolute values. H&L = Hosmer and Lemeshow Goodness-of-fit Test. *(**){***} indicate significant at the 1%(5%){10% } level.

Being born in the Northwest province reduced by about 16% the probability of joining compared to that of those who are born abroad. Since all the coefficients obtained from the variables of provinces of birth are negative, this result suggest that workers born out of Cameroon seems to be more concerned with trade-union culture than those born in the

country. Given that the union protests are hardly presented on the media (contrary to those of the European countries largely diffused in the world), workers have a tendency to assign a very modest role to their organisations. Concerning particularly the natives of the Northwest province, it is necessary to recall that they belong to one of the two Anglo-Saxon areas of the country, which inherited from British colonisation a type of often victorious trade-union claims because very targeted within the framework of firm or branch settlements and the decentralised bargaining[15]. With the harmonisation of the industrial legislation all around the country in 1967, the English-speaking cameroonians observed a real retreat of their trade-union practices in favour of those resulting from the French labour law; retreat which has been able justified the aforementioned disaffection.

Trade-union relationship obviously plays the major role in trade-union membership. The fact of having a relative which belongs to an organisation of workers yields quasi certain the need to join a trade union, compared to that who have any unionised member in their family. The very found seedbed of the trade unions is thus the parental proximity of the members. At the same time as this result is "reassuring" for the perennial future of the union, at the same time it reveals the need of the trade unions to invigorate their sensitising and recruitment methods to widen the potential base their militants.

The probability that semiskilled worker is unionised is 95.1% higher than that of senior executive. Here still, it is noted that affiliation is more widespread and relatively more probable among manpower of weak occupational category. All other variables introduced in the regression have no statistically significant marginal effect on union membership.

6- Conclusion.

The purpose of this paper was to examine the relation between wages and trade-union membership to highlight a union-nonunion wage differential. We thus build a model that proposes a simultaneous determination of the trade-union status and wages and then permits to compare estimates with and without endogeneity. Four principal results are obtained:

- the union wage differential estimated with the selection bias is 50.82% while that obtained without accounting for the selection, more likely, is 14.17%. This gap, relatively high as in Robinson (1989), derives almost entirely from the difference of the constant terms, that is to some extent, from the "initial endowments" of the unionised workers;
- the wage gap expected from the unionisation explains the willingness to join the union to a lesser extent that workers do not select a priori their status;
- trade-union relationship is the major determinant of trade-union membership;
- the lack of radiation of the trade unions is the cause of lack of joining.

[15] For example, before 1965, trade unions of the Anglo-Saxon part of the country had succeeded in obtaining from the larger company of the region (which always remains the largest of the country, *Cameroon Development Corporation*), the implementation of a scaled grid of salaries while at a moment when any system of categories of wages was not officially defined.

7- References.

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8- Annexe.

Table A1 : List of Variables.

Variables	Definitions
Ln w	Neperian log of earnings (salary + all others benefits) per hour (that is taking into account the time of work really confessed during the survey and not the official one of 8 hours a day)
Human Capital:	
Educ	Level of study – dummy – 1=without, 2=primary, 3= general secondary, 4= technical secondary, 5=general university, 6=technical university
Expt	Total experience – in years
Expe	Employment experience – in years
Recy	Recycling – in months
Vocatrain	Vocational training – in months
Others personal characteristics:	
Age	Age in years
Sex	Dummy – 1=man, 0=woman
Marit	Marital status – dummy – 1=single, 2=monogamous, 3=polygamous, 4=divorced or separated, 5=widow
Birth	Place of birth – dummy – 1=town, 0=country
Natio	Nationality – dummy – 1=cameroonian, 0=non cameroonian
Prov	Province of birth – dummy – 1=abroad, 2=adamaoua, 3=centre, 4=east, 5=extreme-north, 6=littoral, 7=north, 8=nordwest, 9=west, 10=south, 11=southwest
Employment characteristics:	
Union	Union member – dummy – 1=yes, 0=no
Tunion	Total number of unionised
Occu	Occupational category – dummy – 1=all others personnel, 2=senior executive and engineer, 3=executive, 4=skilled worker, 5=semi-skilled worker, 6=unskilled worker
Dismis	Number of lay-offs
Reempl	Number of reemployed
Related characteristics:	
Relatoc	Relatives' occupation – dummy – 1=private business, 2=cicil servant, 3=parastatle worker, 4=unemployed
Unirel	Union membership of parents – dummy – 1=yes, 0=no
Infor	Informal activity – dummy – 1=yes, 0=no

Table A2 : Mean and standard deviation.

	Total		Unionised		Non unionised	
	Mean	**Standard deviation**	**Mean**	**Standard deviation**	**Mean**	**Standard deviation**
Ln w	6.5464	0.8658	6.7500	0.7394	6.4377	0.9082
Educ						
Without	7.449E-03	8.602E-02	0.00	0.00	1.14E-02	0.11
Primary	3.818E-02	0.1917	5.08E-02	0.22	3.14E-02	0.17
Gensecon	0.2412	0.4280	0.27	0.44	0.23	0.42
Techsecon	0.2905	0.4542	0.39	0.49	0.24	0.43
Genuni	0.2309	0.4216	0.15	0.36	0.27	0.45
Techuni	0.1918	0.3939	0.14	0.35	0.22	0.41
Expt	10.49	7.83	14.21	8.01	8.51	6.97
Expe	8.15	7.15	11.56	7.99	6.33	5.90
Recy	0.61	2.38	0.85	3.27	0.48	1.71
Vocatrain	1.75	5.18	2.44	6.72	1.37	4.08
Age	35.50	7.58	38.41	7.57	33.94	7.12
Sex	0.81	0.40	0.80	0.40	0.81	0.39
Marit						
Single	0.3622	0.4809	0.22	0.41	0.44	0.50
Monoga	0.5214	0.4998	0.64	0.48	0.46	0.50
Polyga	9.032E-02	0.2868	0.12	0.33	7.43E-02	0.26
Divorced	1.676E-02	0.1284	1.07E-02	0.10	2.00E-02	0.14
Widow	9.311E-03	9.609E-02	8.02E-03	8.93E-02	1.00E-02	9.96E-02
Birth	0.56	0.50	0.51	0.50	0.59	0.49
Natio	0.97	0.16	0.97	0.17	0.98	0.15
Prov						
Abroad	1.304E-02	0.1135				
Adama	1.024E-02	0.1007				
Centre	0.2682	0.4432				
East	2.421E-02	0.1538				
Extrem	7.449E-03	8.602E-02				
Litto	0.2700	0.4442				
North	7.449E-03	8.602E-02				
Northwest	1.583E-02	0.1249				
West	0.2877	0.4529				
South	6.518E-02	0.2470				
Southwest	3.073E-02	0.1727				
Union	0.35	0.48	1.00	0.00	0.00	0.00
Tunion	122.18	295.81	154.44	357.52	90.54	215.01
Occu						
Others	5.773E-02	0.2333	5.61E-02	0.23	5.86E-02	0.23
Senexe	0.1015	0.3021	8.56E-02	0.28	0.11	0.31
Execu	0.3669	0.4822	0.35	0.48	0.38	0.48
Skilwo	0.2858	0.4520	0.33	0.47	0.26	0.44
Semiwo	0.1210	0.3263	0.13	0.34	0.11	0.32
Unskilled	6.704E-02	0.2502	4.81E-02	0.21	7.71E-02	0.27
Dismis	37.89	75.85	48.62	87.57	31.06	66.54
Reempl	9.86	22.17	10.40	20.21	9.46	23.57
Relatoc						
Private	0.19	0.39				
Civil	0.22	0.41				
Paras	6.24E-02	0.24				
Unemploy	0.53	0.50				
Unirel	0.14	0.34				
Infor	0.14	0.35				
Number of obs.	1,074		374		700	

Table A2 gives details about the transformation of variables from multiple dummies to dichotomic dummies. So, *without*, *primary*, *gensecon*, *techsecon*, *genuni* and *techuni* are respectively without any level of study, primary, general secondary, technical secondary, general university and technical university. Concerning the province of

birth, *abroad*, *adama*, *centre*, *east*, *extrem*, *litto*, *north*, *northwest*, *west*, *south* and *southwest* are respectively born abroad or in the province of adamaoua, centre, east, extreme north, littoral, north, northwest, west, south and southwest. In the same way, *single*, *monoga*, *polyga*, *divorced* and *widow* are respectively the status of single, monogamous, polygamous, divorced and widow. Occupational category is divided into all others personnel *others*, senior executive and engineer *senexe*, executive *execu*, skilled worker *skilwo*, semi-skilled worker *semiwo* and unskilled worker *unskilled*. Finally, the occupation of the parents is divided among those who work in the private sector *private*, those who are civil servant *civil*, who are in the parastatle sector *paras*, or those who are unemployed *unemploy*.

Table A3 : Membership equation :
LOGIT estimates of reduced form.

		β	*t* of Student	exp(β)
Constant		- 2.49*	2.24	-
Educ				
	Without	- 6.33	0.51	0.002
	Primary	0.26	0.60	1.296
	Gensecon	0.11	0.44	1.122
	Techsecon	0.46***	1.87	1.577
	Genuni	- 0.04	0.16	0.961
Expt		0.10**	2.40	1.108
Expt²		- 0.002	1.31	1.000
Expe		0.06	1.49	1.058
Expe²		- 0.0001	0.08	1.000
Recy		0.03	0.96	1.033
Vocatrain		0.02	1.48	1.022
Sex		- 0.19	1.00	0.824
Birth		- 0.02	0.11	0.983
Marit				
	Single	0.39	0.48	1.483
	Monoga	0.73	0.90	2.074
	Polyga	0.46	0.54	1.581
	Divorced	- 1.32	1.27	0.268
Prov				
	Adama	- 1.06	1.03	0.348
	Centre	- 0.67	0.96	0.513
	East	- 0.02	0.02	0.981
	Extrem	- 7.35	0.60	0.0006
	Litto	- 0.92	1.34	0.397
	North	- 1.50	1.20	0.222
	Northwest	- 1.86***	1.80	0.155
	West	- 0.81	1.16	0.444
	South	- 0.62	0.81	0.538
	Southwest	- 0.68	0.86	0.501
Natio		0.31	0.64	1.370
Tunion		- 0.00007	0.18	1.000
Occu				
	Others	0.27	0.70	1.315
	Senexe	- 0.11	0.40	0.895
	Skilwo	0.48	1.55	1.612
	Semiwo	0.68***	1.89	1.969
	Unskilled	0.43	1.00	1.543
Dismis		0.003*	2.31	1.003
Reempl		- 0.006	0.97	1.000
Relatoc				
	Private	0.18	0.87	1.197
	Civil	0.11	0.54	1.113
	Paras	0.07	0.21	1.073
Unirel		0.75*	3.36	2.109
Infor		- 0.21	0.95	0.810
Khi-Sqared			237.7	
H&L			14.09	
N			1,074	

Note: Residual variables are respectively : *Techuni* for education, *Widow* for marital status, and *Senexe* for the occupational category. *t*-stat are in absolute values. *H&L = Hosmer and Lemeshow Goodness-of-fit Test*. *(**)[***] indicate significant at the 1%(5%)[10%] level.