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The Impact of Trade Unions on Earnings: New Evidence from Cameroon

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ABSTRACT

The Impact of Trade Unions on Earnings: New Evidence from Cameroon*

The role of trade unions in the Cameroonian labour market is still a little discussed topic, despite the end of trade union monolithism in 1995 and the emergence of collective agreements that have been genuinely negotiated between the social partners since 2000. Using only the second *Survey on Employment and the Informal Sector* (EESI) – due to the unavailability to the public of data from the third wave of this survey at the time of writing – conducted by the National Institute of Statistics in 2010, this paper assesses the influence of union presence and union membership on the monthly earnings of formal and informal sector employees, highlighting the specificities of the Cameroonian industrial relations system. The empirical results – which are mainly based on the Poisson pseudo- maximum likelihood estimator – show that the presence of a trade union and/or a staff representative in a workplace has a positive and significant influence on income, except in the public sector. When the analysis is restricted to workplaces where there is at least one union, the results reveal that union membership is not an explanatory factor for the average earnings gap between union and non-union employees in the informal and public sectors. In the formal private sector, however, union members are paid less than their non-union counterparts.

JEL Classification:
J31, J51

Keywords:
union presence, union membership, union wage differential, Poisson pseudo-maximum likelihood estimator, Cameroon

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1. Introduction

The impact of trade unions on wages is one of the most studied topics in labour economics (BALKIN, 1989; KUHN, 1998; SALMON, 2000; BLANCHFLOWER and BRYSON, 2010; FORTH and BRYSON, 2019; BARTH et al., 2020; SVARSTAD and NYMOEN, 2022). While most studies show that trade unions tend to increase wages, the exact magnitude of this increase varies considerably depending on many factors: the country in which these organisations operate, the variables included in the regression equation, the industry, the group of workers examined, the time period studied, and the type of analysis to which the data are subjected (ROSENTHAL, 1985; FANG and HARTLEY, 2022; BRÄNDLE, 2024).

Empirical studies on the effect of trade unions on wages are abundant mainly in developed countries – the United States and the United Kingdom in particular – and generally evaluate the wage premium associated with union membership (BRYSON et al., 2019; BRYSON, 2007), based on cross-sectional individual or household-level data (BARTH et al., 2020; BRYSON, 2007). Most of these studies find that union members earn on average between 5% and 26% more than non-union members, *ceteris paribus* (BRYSON, 2014). The study of the link between the presence of a trade union in the workplace and wages has also given rise to a great deal of empirical work in developed countries. The results of recent studies on this subject indicate that the presence of a trade union has a positive and significant influence on wages (e.g., LAROCHE, 2004; MORIKAWA, 2010; BREDA, 2015; MAC FLYNN, 2020; OKAMOTO and MATSUURA, 2020).

In developing countries, however, studies on the subject are less abundant[1] and concentrated in Latin America, East Asia, and South-East Asia; while African countries, with the exception of South Africa, have only a few (SALMON, 1999; FREEMAN, 2010; BRÄNDLE, 2024). Therefore, the contribution of new methodologies or data sources from developing countries would be extremely beneficial to further research on the subject (FANG and HARTLEY, 2022). In these countries, most studies that have examined the effect of union membership on wages find a wage premium that ranges from 3% to 24% (see FREEMAN, 2010; BHORAT et al., 2012; TORM, 2014; TORM, 2020; GUTIERREZ RUFRANCOS, 2019; YAO and GUNDERSON, 2021; MA and ZHAN, 2024). As for the studies that have examined the link between the presence of trade

[1] This is mainly due to the lack of databases (SALMON, 1999; TZANNATOS, 2008; BRÄNDLE, 2024).

unions and pay levels, the results are also generally positive (see, for example, SALMON, 2000; GE, 2014; SONG et al., 2016; NILSSON, 2021; OWUSU-AFRIYIE et al., 2023, 2024).

In Cameroon, the question of the effect of trade unions on wages is of little interest to researchers despite "*the retreat of state interventionism in labour relations*" since the end of trade union monolithism in 1995 and, correlatively, the emergence of collective bargaining agreements actually negotiated and signed between the social partners since 2000, thanks to the last reform of the Labour Code on 14 August 1992 (TCHAKOUA, 2010), on the one hand, and the many demands of workers arising from the numerous strikes or attempted strikes observed over the last ten years,[2] on the other hand.

The only published study which really looked into the subject is that of TSAFACK NANFOSSO (2002), based on data from a field survey of 1,074 wage earners in the cities of Yaoundé, Douala, and Bafoussam. This study shows that union members earn 14.17% more, in terms of hourly income, than their non-union counterparts.[3] However, THOMAS and VALLÉE (1996)[4] find as a secondary result that union membership does not affect the level of individual hourly wages in Cameroonian manufacturing firms. It appears then that the relatively contradictory results of the existing work cannot lead to definitive conclusions and call for further investigations on the link between union membership and wages.

Furthermore, Cameroon is an interesting case study for examining the ability of workers' representatives (trade unions and staff representatives) to obtain pay rises in an environment characterised, among other things, by low union membership rates (5.4% in 2010 against 5% in 2014 according to ILOSTAT) and low salaried employment rates (14.95% in 1991; 20.36% in 2001; 20.67% in 2011; 23.5% in 2020),[5] a large informal sector (90.4% in 2005; 90.5% in 2010),[6] systematic violations of workers' rights,[7] and a sluggish trade union movement despite the multitude of existing trade unions.

[2] One of the most publicised cases in 2022 was the strike by primary and secondary school teachers in the public sector under the banner "*on a trop supporté*," "*on a trop attendu*". Furthermore, it is worth noting that even if strikes are rare in Cameroon (1.7%), strike notices are nevertheless frequent (41.8%) (INS, 2011).
[3] According to this author, this result is not far from the 18.2% obtained by SINANE (1995) for the city of Yaoundé.
[4] This study uses information from the World Bank's Regional Programme for Enterprise Development (RPED) survey carried out in 1993 among 210 Cameroonian manufacturing firms (wood and furniture, food and beverages, metal and small machinery, textiles and garments) for a total of 1,015 workers surveyed. The overall sample of the study is based on 119 enterprises and 713 workers.
[5] According to the World Bank's World Development Indicators (WDI) 2020 data.
[6] The informal sector is defined as all production units that do not have a tax number and/or do not keep formal accounts (INS, 2011). Data on informality rates are taken from the same source.
[7] According to the ITUC Global Rights Index 2020.

In view of the above, this study aims at investigating the average effect of union presence and union membership on earnings in Cameroon, using a source of statistical data that has not yet been exploited for this purpose. In addition to the fact that this study is the first to take into account the two dimensions of worker representation in the workplace (the trade union and the staff representative), it also uses an estimation method, still not widely used by labour economists, which consists of estimating the union wage differential without applying a logarithmic transformation to the dependent variable.

Overall, our results point out that union presence has a positive and significant influence on earnings in the informal and formal private sectors. The effect of union membership on earnings is not significant over the whole sample, and particularly in the informal and public sector subsamples; whereas unionised employees are paid less than their non-union counterparts in the formal private sector.

The next section provides a brief review of the theoretical arguments on the basis of which unions can influence wages. Section 3 explains how staff representatives and trade unions can influence earnings in the Cameroonian context. Section 4 presents the data. Section 5 describes the empirical approach. Section 6 presents and discusses the empirical results of econometric analysis. The final section concludes.

2. Trade unions and wages: a brief review of the theoretical literature

The theoretical literature generally views the impact of unions on wages in terms of four neoclassical models, which see the union as a "*redistributive pressure group*" whose aim is to maximise the utility function of its members by obtaining a monopoly on the labour supply. These are the "union monopoly," "right-to-manage," "efficient contract," and "insider-dominated union" models (see CREEDY and MCDONALD, 1991). However, the right-to-manage and efficient contract models remain the most widely used (MAILLEFERT, 2004, p. 118).

In the right-to-manage model proposed by NICKEL and ANDREWS (1983), the union and the employer only negotiate the wage under the constraint of the labour demand (equal to the marginal productivity of labour). The determination of the level of employment is the prerogative of the employer. The negotiated wage is then determined by the bargaining power of the union. Specifically, if the union holds all the bargaining power, the solution is the union monopoly model proposed by DUNLOP (1944) which stipulates that the employer determines the volume of employment after the union has unilaterally set the wage. In the opposite case,

the full employment solution is obtained with the wage fixed at the reservation wage level (PUCCI and ZADJELA, 2005). Overall, the model's solutions are suboptimal given the decreasing relationship between wages and employment. However, the employer and the union can reach a Pareto-optimal solution if the negotiations focus simultaneously on employment and wages. This is the basis of the efficient contract model.

In the framework of the efficient contract model proposed by MCDONALD and SOLOW (1981), agents negotiate simultaneously on wages and employment by exploiting all opportunities for mutual gain. The solution of the model is Pareto optimal, but it does not lie on the labour demand curve (MAILLEFERT, 2004, p.119). Moreover, the optimality of this solution refutes the intuition of neoclassical economists according to which trade unions are harmful to employment (PUCCI and ZADJELA, 2005). If this is the case, and as JOHN STUART MILL already remarked in his *Principles of Political Economy*, it would be "*a great mistake to condemn trade unions or the collective action of strikes as such and absolutely*" (BLAUG, 1986, p. 218).

One limitation of the above models, which reflect Anglo-American industrial relations practices, is that the trade union is seen as the only means of collective expression for workers to obtain pay rises. This is not always the case in Cameroon, for example. Moreover, most economists argue in favour of the right-to-manage model to represent wage bargaining, given the validity of the empirical results (CAHUC, 1990; MAILLEFERT, 2004, p. 120). In Cameroon, the absence of employment agreements is also a factor in favour of this model.

It is important to bear in mind that the wage bargaining models developed above emanate from an Anglo-American trade union context where union membership is compulsory before (*closed shop*) or after (*union shop*) obtaining a job, and where the terms of the contract negotiated by the trade union apply only to its members. In Cameroon, however, union membership is voluntary and trade unions negotiate for all workers. This then limits the scope of the analysis of the theoretical models invoked in the Cameroonian context and even in the United States today to a certain extent. Indeed, several federal states, following the *Taft-Hartley Act* in 1947, have already ratified the illegality of *closed shops* and the lack of obligation of *union shop* practices by also giving the right to any employee (union member or not) to take advantage of the benefits of collective bargaining (see SAUVIAT and LIZE, 2018, pp. 21-37).

Regardless of the wage bargaining model, BOOTH (1995, p. 53) notes that the magnitude of the union wage premium depends primarily on the bargaining power of the union − threat of strike, ability to organise and mobilise the majority of workers, etc. − and the degree of competition

to which the firm is subject. However, even if a union controls all the labour supplied to a particular sector, it will be difficult for it to negotiate a large increase in wages relative to the competitive level since *"the magnitude of the union wage effect depends crucially on the wage elasticity of labour demand in the particular sector"* (BOOTH, 1995, p. 57).

At the end of this theoretical overview, it appears that orthodox wage bargaining models have limited explanatory power in the Cameroonian context. It also appears that unions have a positive effect on wages through their participation in collective bargaining.

3. How can staff representatives and trade unions influence earnings? Contextual framework

In Cameroon, employees are defended by staff representatives and trade unions. The trade union is the spokesperson for employees' demands[8] in the context of collective bargaining. It is only within this framework that they can express their demands for new or improved benefits, such as better pay.[9]

As far as staff representatives are concerned, they are the only professional institution in the workplace that represents employees vis-à-vis the employer (SIM, 2007; TJOUEN, 1996). Most of them are union members, and must be elected in any establishment that usually employs at least twenty people. Their duties include: *i*) presenting any workers' individual or collective complaints[10] to the employer and ensuring the application of labour legislation, social protection, health, and safety in the establishment; *ii*) communicating to the employer any useful suggestions for improving the organisation and performance of the enterprise (SIM, 2007). On the first point, staff representatives have a duty to remind the employer to apply the pay benefits contained in the collective bargaining agreement. If the employer refuses to do so, the staff representatives have a duty to inform the labour inspector and ask him to intervene to resolve the situation. On the second point, the staff representatives (whether or not there is a trade union in the workplace) can persuade the employer to increase certain elements of remuneration (bonuses, gratuities, etc.) on the grounds of increasing labour productivity and, consequently, the workplace's performance. Decisions taken in this context do not have the binding force of an agreement concluded with the union, but they do constitute a commitment on the part of the employer.

[8] A demand is a request to enforce a new right.
[9] The Labour Code authorises workers, without any restrictions or prior authorisation, to freely set up trade unions.
[10] A complaint is a request to enforce an existing right.

In the light of the above, it goes without saying that the actions taken by staff representatives to obtain better pay can sometimes be likened to the role of the trade union. Thus, the presence of a staff representative and/or a trade union in the workplace is likely to improve earnings. This study therefore innovates by taking into account the similarity between the role of the trade union and that of the staff representative in improving earnings.

At this stage of the analysis, it is important to emphasise that the effectiveness of staff representatives in defending workers in Cameroon depends on their quality, their experience, and the zeal they are prepared to display in carrying out their duties in the face of the risk of being unfairly dismissed or suffering any other form of trade union discrimination (TJOUEN, 1996). As for the presence of a trade union in the workplace, this does not necessarily imply intense demands or the defence of workers' interests, since there are "yellow" trade unions that have little concern for workers' demands or interests (SALMON, 2000).

Finally, even if employees in the informal sector are excluded from the scope of labour laws, there is nothing to prevent them from getting together or appointing a colleague to present their complaints or demands to their employer. Such actions, where they exist, are similar to the ordinary role of a trade union or a staff representative.

4. Data

Due to the unavailability to the public − at the time of writing − of data from the third wave of the *Survey on Employment and the Informal Sector* (EESI) carried out in 2021 by the National Institute of Statistics (NIS), data from the second wave of this survey, carried out in 2010, have been used. The EESI, which was first carried out in 2005, is the main national microeconomic survey of the labour force in Cameroon. It is conducted in two phases: the Employment Survey for the first phase and the Informal Sector Survey for the second phase. Moreover, the sample for EESI-type surveys is stratified and drawn in two stages.

The choice of using only the EESI 2 for the analyses is explained by the fact that it contains information on an important dimension of employee representation in workplaces: the presence of staff representatives. This is not the case for the EESI 1.

Of the 8,160 households in the EESI 2 sample, 7,932 were identified and actually surveyed. Of the households surveyed, 22,765 individuals aged 10 years or older were successfully surveyed.

One of the problems with individual data from household surveys, such as the EESI, is the difficulty in tackling omitted variable biases that influence unionisation and wages due to the

Table 1. Means and standard deviations by union presence

		Pooled		Unionised workplaces		Non-unionised workplaces	
		Mean	SD	Mean	SD	Mean	SD
Monthly earnings (in thousands of CFA francs)		90.325	96.982	130.379	123.320	73.112	77.013
Log (1 + monthly_earnings x 1000)[11]		10.937	1.077	11.361	1.041	10.755	1.040
Education level	Higher	0.229	0.421	0.364	0.481	0.172	0.377
	Not in school	0.046	0.210	0.018	0.134	0.058	0.234
	Primary	0.229	0.420	0.135	0.342	0.270	0.444
	Secondary	0.495	0.500	0.483	0.500	0.501	0.50
Job tenure		5.463	6.626	7.341	7.837	4.657	5.851
Employer-funded vocational training or retraining	No	0.755	0.430	0.635	0.482	0.806	0.395
	Yes	0.245	0.430	0.365	0.482	0.194	0.395
Age	15 – 34	0.578	0.494	0.468	0.499	0.625	0.484
	35 – 54	0.387	0.487	0.477	0.500	0.348	0.476
	55 – 64	0.036	0.185	0.055	0.228	0.027	0.163
Marital status	Single	0.417	0.493	0.288	0.453	0.472	0.499
	Married	0.427	0.495	0.540	0.499	0.378	0.485
	Widowed/separated	0.038	0.192	0.037	0.188	0.039	0.193
	Common-law	0.118	0.323	0.134	0.341	0.112	0.315
Gender	Female	0.264	0.440	0.256	0.437	0.267	0.442
	Male	0.736	0.440	0.744	0.437	0.733	0.442
Type of work	Regular	0.928	0.259	0.979	0.143	0.906	0.292
	Occasional	0.072	0.259	0.021	0.143	0.094	0.292
Institutional sector	Informal	0.556	0.497	0.314	0.456	0.660	0.474
	Public	0.286	0.452	0.421	0.494	0.228	0.420
	Formal private	0.158	0.365	0.265	0.442	0.112	0.316
Sector	Services	0.671	0.470	0.706	0.458	0.656	0.475
	Primary	0.050	0.217	0.029	0.168	0.059	0.235
	Industry	0.189	0.392	0.211	0.409	0.179	0.384
	Trade	0.090	0.286	0.053	0.225	0.106	0.307
Location	Rural	0.307	0.461	0.284	0.451	0.317	0.465
	Urban	0.693	0.461	0.716	0.451	0.683	0.465
Union presence	Non-unionised workplaces	0.699	0.459				
	Unionised workplaces	0.301	0.459				
Presence of a trade union	No	0.804	0.397				
	Yes	0.196	0.397				
Presence of a staff representative	No	0.755	0.430				
	Yes	0.245	0.430				
Occupation	Skilled worker	0.239	0.427	0.268	0.443	0.227	0.419
	Unskilled worker	0.238	0.426	0.122	0.328	0.288	0.453
	Semi-skilled worker	0.277	0.447	0.215	0.411	0.303	0.460
	Middle manager	0.150	0.357	0.218	0.413	0.121	0.326
	Senior executive	0.096	0.294	0.177	0.382	0.060	0.238
n		3658		1093		2565	

Source: Author's calculations using data from the second *Survey on Employment and the Informal Sector* (2010).

absence of a significant number of workplace characteristics (BARTH et al., 2020; BRYSON, 2007). Indeed, the paucity of employer controls in cross-sectional individual or household-level data tends to result in an upward bias in union wage effects (BLANCHFLOWER and BRYSON, 2010; BRYSON, 2007). For this reason, these authors consider that the use of matched employer-employee data is likely to reduce the bias in estimating union wage effects.

[11] A common technique for dealing with zero values (04 in this case) in a log wage equation is to add a constant to the data before applying the log transformation. However, this technique can cause significant biases (BELLÉGO et al., 2022).

It should also be noted that the data used in this study do not allow us to establish a causal relationship between unionisation and wages.

After data processing,[12] the study is based on an overall sample of 3,658 employees aged between 15 and 64. The descriptive statistics for the relevant variables used in this paper are provided in Tables 1 and 2.[13] The variables of interest are *union presence* and *union membership*.[14] The choice of control variables is not discussed here as they are standard in the literature.

With regard to Table 1, we note that 2,565 employees (70%) have their main job in a workplace without a union presence compared to 1,093 employees (30%) in a workplace with a union presence. These statistics suggest a strong lack of obligation to respect workers' rights in most workplaces in Cameroon. On average, employees in unionised workplaces are more educated, more trained, more numerous at the top of the job hierarchy, and have more years of job tenure than employees in non-unionised workplaces respectively. 42% of employees in unionised workplaces work in the public sector, compared to 23% of employees in non-unionised workplaces.

About 56% of employees in the whole sample are employed in the informal sector, with 66% in non-unionised workplaces compared with 31% in unionised workplaces. On average, workers in unionised workplaces receive higher monthly earnings than those in non-unionised workplaces.[15] In the light of this finding, it is worth examining whether union presence is a factor in explaining this difference in income.

We note that the coefficient of variation (CV) of the earnings of employees in unionised workplaces, for both the original dependent variable and its logarithm, is lower than that of employees in non-unionised workplaces. Consequently, this difference in earnings dispersion reveals that the standard approach to estimating wage differentials based on semi-log earnings

[12] Missing data relating to the variables “type of work,” “job tenure,” “training,” “presence of a trade union,” “presence of a staff representative,” “union presence,” and “union membership” were imputed using the responses of similar individuals.

[13] We used the *svy* prefix command after specifying the EESI 2 design characteristics with the *svyset* command.

[14] The answers to two questions led to the construction of the “union presence” variable, which refers to the presence of at least one trade union and/or one staff representative in the workplace: (1) “*Is there one (or more) union(s) in the firm/administration/organisation or body where you are employed or in your main occupation?*” (2) “*Is there one (or more) staff representative(s) in the firm/administration/organisation where you are employed or in your main occupation?*” For affirmative responses to question (1), the following question is asked and allowed to construct the variable "union membership": “*Are you a member of one (or more) of these unions?*”

[15] The mean-comparison test indicates a statistically significant difference at the 1% significance level (see Table A1). The same is true when we take into account the difference between the presence of a trade union and the presence of a staff representative in the workplace (see Table A2 and Table A3).

equations is inappropriate (HIRSCH and SCHUMACHER, 2012; BLACKBURN, 2007, 2021). In other words, this finding *"causes the log wage gap (exponentiated) to provide a poor approximation of the percentage difference in arithmetic mean, at least for wage gaps absent control"* (HIRSCH and SCHUMACHER, 2012).

Table 2. Means and standard deviations by union membership

		Pooled		Union workers		Non-union workers	
		Mean	SD	Mean	SD	Mean	SD
Monthly_earnings (in thousands of CFA francs)		143.370	127.061	153.734	124.417	136.424	128.483
Log (monthly_earnings x 1000)		11.487	0.979	11.560	1.028	11.437	0.944
Education level	Higher	0.361	0.481	0.347	0.477	0.371	0.484
	Not in school	0.015	0.123	0.009	0.094	0.020	0.139
	Primary	0.146	0.353	0.146	0.354	0.146	0.353
	Secondary	0.477	0.500	0.497	0.501	0.463	0.499
Job tenure		7,665	7.897	9.684	8.567	6.311	7.11
Employer-funded vocational training or retraining	No	0.611	0.488	0.571	0.496	0.639	0.481
	Yes	0.389	0.488	0.429	0.496	0.361	0.481
Age	15 – 34	0.447	0.497	0.360	0.481	0.504	0.501
	35 – 54	0.491	0.500	0.556	0.498	0.448	0.498
	55 – 64	0.062	0.242	0.084	0.277	0.048	0.214
Marital status	Single	0.267	0.443	0.189	0.392	0.320	0.467
	Married	0.544	0.498	0.635	0.482	0.483	0.500
	Widowed/separated	0.042	0.201	0.020	0.140	0.057	0.232
	Common-law	0.147	0.354	0.156	0.363	0.140	0.348
Gender	Female	0.243	0.429	0.153	0.360	0.304	0.460
	Male	0.757	0.429	0.847	0.360	0.696	0.460
Type of work	Regular	0.980	0.140	0.983	0.130	0.978	0.147
	Occasional	0.020	0.140	0.017	0.130	0.022	0.147
Institutional sector	Informal	0.281	0.450	0.255	0.437	0.299	0.458
	Public	0.438	0.496	0.446	0.498	0.433	0.496
	Formal private	0.281	0.450	0.299	0.459	0.268	0.444
Sector	Services	0.723	0.448	0.686	0.465	0.748	0.435
	Primary	0.020	0.141	0.021	0.145	0.020	0.139
	Industry	0.218	0.413	0.255	0.437	0.193	0.395
	Trade	0.039	0.193	0.038	0.192	0.039	0.195
Location	Rural	0.253	0.435	0.250	0.434	0.254	0.436
	Urban	0.747	0.435	0.750	0.434	0.746	0.436
Union membership	Non-union worker	0.599	0.491				
	Union worker	0.401	0.491				
Occupation	Skilled worker	0.261	0.440	0.266	0.443	0.258	0.438
	Unskilled worker	0.111	0.314	0.066	0.249	0.141	0.349
	Semi-skilled worker	0.203	0.402	0.215	0.412	0.194	0.396
	Middle manager	0.234	0.423	0.252	0.435	0.221	0.416
	Senior executive	0.192	0.394	0.201	0.402	0.185	0.389
n		718		268		450	

Source: Author's calculations using data from the second *Survey on Employment and the Informal Sector* (2010).

As regards Table 2, we note that 40% of workers are union members in workplaces where there is at least one union. Moreover, union members are more trained and have more years of job tenure than non-union members. Union membership would therefore reflect a low rate of staff turnover, which would tend to encourage employers to finance vocational training or retraining of workers. Among union workers, 36% are young people (aged 15 to 34), 85% are men, 64% are married, 27% are skilled workers, 75% work in urban area, and 69% work in the service sector. When we look at the institutional sector, we see that 26% of union workers work in the

informal sector, compared with 30% of non-union workers; 45% in the public sector, compared with 43% of non-union workers; and 30% in the formal private sector, compared with 27% of non-union workers.

Finally, it is very instructive to observe that unionised employees seem to earn higher earnings than non-union employees. However, this difference is not statistically significant according to the results of the mean-comparison test (see Table A4). Thus, union membership would have no influence on earnings. The econometric results will enable us to confirm or refute this finding.

5. Methodology

5.1. Which econometric method should be used to estimate the union wage differential?[16]

Despite the variety of methods and databases mobilised in the empirical literature to obtain unbiased and consistent estimators of the union wage effect, it is clear that no estimation method is currently the subject of a consensus among researchers because of the difficulty of identifying the true causal effect of unionisation on wages (HIRSCH, 2004; BRYSON, 2007; EREN, 2007; CHOI and RAMOS, 2023). On this basis, the choice of the method for estimating the union wage differential is then left to the researcher (BLUNCH and VERNER, 2004).

The average impact of unionisation on wages – via a specification of the earnings equation in Mincerian form – is usually estimated from ordinary least squares (OLS), panel data regression methods (usually fixed effects), and selection and endogeneity bias correction methods; although propensity score, quantile, and discontinuity regression methods are also of interest to researchers (FANG and HARTLEY, 2022). However, it should be noted that several authors criticise and consider inappropriate the standard practice for economists to estimate wage and even expenditure equations via a semi-log model on both cross-sectional and longitudinal data (see, for example, BLACKBURN, 2007, 2008, 2021; HIRSCH and SCHUMACHER, 2012; KAISER, 2016; FISHER, 2016; MELSTROM, 2016; PETERSEN, 2017; POWELL and SEABURY, 2018). Indeed, these authors generally raise two problems inherent in using such an approach. Firstly, observations for which the dependent variable is zero are eliminated from the estimation

[16] "The union wage differential is defined as the percentage increase in expected pay for a worker with characteristics X as they go from non-union to union status, that is: $\Delta = \frac{E(w|U=1,X) - E(w|U=0,X)}{E(w|U=0,X)}$" (BLACKBURN, 2008).

sample, which leads to a source of bias. Secondly, the estimation of the semi-log model only provides consistent estimators if the error term is normally distributed and homoscedastic.[17]

As a substitute for the standard log-linear and semi-log models, SANTOS SILVA and TENREYRO (2022, 2011, 2006) advocate the use of the Poisson pseudo-maximum likelihood (PPML) estimator among all the pseudo-maximum likelihood (PML) estimators belonging to the linear exponential family. Indeed, these authors justify the predilection for the PPML estimator by the following main arguments: (*i*) it allows to keep the observations for which the dependent variable is null; (*ii*) it changes very little if the estimation is carried out by excluding the observations for which the dependent variable is null; (*iii*) it assigns the same weight to all the observations compared with the Normal-PML and Gamma-PML estimators; (*iv*) it remains robust in the face of a misspecification of the conditional distribution of the model; (*v*) it converges towards the true value of the parameter even in the presence of heteroskedasticity; (*vi*) it generally behaves well even when the conditional variance is far from being proportional to the conditional mean.

This study chooses to consider only the PPML estimator for the reasons given above by SANTOS SILVA and TENREYRO (2022, 2011, 2006), although BLACKBURN (2007, 2008) and KAISER (2016) use several estimators of the PML (including the PPML estimator) to estimate the union wage differential in the United States. The choice of this approach is further supported by the fact the estimation strategy[18] proposed by KAISER (2016) to decompose the arithmetic mean of the union wage differential produces results strongly similar to those obtained by the PPML estimator.

In addition to the bias resulting from the use of log-wage regression, potential self-selection and endogeneity biases must also be taken into account when estimating the union wage differential (BRYSON, 2007; KAISER, 2016; FANG and HARTLEY, 2022).

When estimating the impact of union presence on wages, it is important to consider a possible self-selection bias in the wage equation. Indeed, most empirical work assumes that the union status of individual workers results solely from utility-maximising decisions by workers (see, for example, SALMON, 2000).[19] However, FARBER (1983) argues that *"the union status of*

[17] Nevertheless, PETERSEN (2017) demonstrates that *"homoscedasticity for error terms is neither a necessary nor a sufficient condition for estimation on the logged dependent variable to give unbiased estimators for the coefficients for the relative arithmetic means."*

[18] The *"doubly robust" weighted Poisson quasi-maximum-likelihood (WPQML)* estimator.

[19] It is assumed here that the worker chooses to work for a unionised firm if the net income associated with union coverage is higher than the income from his job in a non-unionised firm.

workers is determined as the result of separate decisions by workers and potential union employers. Workers decide whether they would prefer union or non-union jobs based on the utilities that these jobs yield to them. At the same time, union employers are deciding which of the workers who want union jobs to hire given that workers differ in their productive characteristics and that these characteristics are compensated differently in the union and non-union sectors."

On the basis of FARBER's (1983) study, the use of workers' preference for union representation as a valid exclusion restriction (the Heckman two-step procedure) would normally have made it possible to correct for self-selection bias in the estimation of the wage premium linked to union presence. Unfortunately, the data used in the present study do not contain this information. However, not taking account of this potential self-selection bias might be unimportant in the Cameroonian context, since the results of the YOGO (2011) study show that individuals rely more on the social network (friends and relatives) not only to obtain a salaried job, but also a good job in the sense of a higher wage.

Regarding the potential endogeneity of union presence, it results from the non-inclusion in the regression equation of an important variable (firm size or establishment size, in this case), which affects both union presence and earnings. Due to the absence of suitable instruments or a *proxy* variable for the omitted variable, this study does not control for the endogeneity of union presence.[20]

With regard to the potential self-selection bias linked to union membership, it is very unlikely in the Cameroonian context that an employee would decide to join a union in order to obtain a higher income than that of his or her non-union counterpart. This is because the labour legislation favours the equitable distribution of the fruits of collective bargaining among all employees, whether unionised or not.[21] TSAFACK NANFOSSO (2002) checks this source of selection (and also endogeneity) and confirms this reality. This leads us to disregard it in this study.[22]

[20] The database used contains a categorical variable for establishment size. However, this variable is not taken into account in the regression equations because the question that measures it excludes public administration workers.
[21] BRYSON (2007) and MAC FLYNN (2020) consider that it is not relevant to assess the effect of union membership on wages in such a context, but rather the effect of collective bargaining arrangements on wages.
[22] This choice is further supported by the fact that RIOS-AVILA and HIRSCH (2014) indicate that the selection bias associated with union membership cannot cause a significant bias in the estimation of the average wage differential between union members and non-union members.

In addition to the simultaneity bias mentioned above, the endogeneity of union membership may also be related to unobservable individual characteristics that may jointly affect the wage and the membership decision. Unfortunately, the data used in this study do not provide suitable instruments, according to the literature, to correct for this source of endogeneity. Potential instruments mentioned in the literature include: a dummy variable indicating *"whether the individual lives in a household with other union members"* (BHORAT et al., 2012), and *"trust in union"* measured by a dummy variable indicating whether or not the worker trusts the union (WANG and LIEN, 2018). In the end, this study does not also control for the potential endogeneity of union membership.[23]

At this stage of the analysis, it is important to stress that it is possible to control for the endogeneity of union presence and union membership using the Lewbel (2012) method, which is based on the heteroskedasticity in the error term of the reduced form equation to construct instruments when external instruments are weak or unavailable. However, Stata does not allow to perform the heteroskedasticity test after running regressions with the *svy* prefix command.

In summary, this paper is limited to using the PPML estimator to estimate the union wage differential. However, the OLS estimator of the semi-log model will be used as a benchmark since most of the studies on the subject have used it.

5.2. Econometric specification[24]

This study follows the approach of BLACKBURN (2021), which shows that a parameter interpretable as the average treatment effect for the treated (ATT) can be estimated for both linear and non-linear models by a standard interactive specification.[25] Thus, the semi-log specification of the earnings equation is:

$$\log(w_i) = \beta_1 U_i + \beta_2' X_i + \beta_3' U_i (X_i - \bar{X}_U) + \varepsilon_i \quad (1)$$

where w_i represents the monthly income received by individual *i*, including the sum of direct wages (remuneration in kind and/or in cash paid to employees for hours worked or work performed) as well as bonuses and gratuities, family and housing allowances, and remuneration for hours not worked; *U* is a dummy variable, equal to 1 if a trade union and/or a staff

[23] BLANCHFLOWER and BRYSON (2010) did not also seek to control for the endogeneity of union membership owing to the unavailability of suitable instruments in their data.
[24] The econometric model presented here is based on the study by BLACKBURN (2021) in which he estimates, for the United States, the relative earnings differentials between public sector teachers and equivalent non-teachers in the private sector.
[25] The existence of this approach is mentioned in WOOLDRIDGE (2010, pp. 919-920).

representative is in the workplace (or if the individual is a union member) and 0 otherwise; X the vector of control variables; $\bar{X}_U$ the vector of averages of the variables of the sample of unionised workplaces (or of union members); and ε_i the error term. Subtracting $\bar{X}_U$ from X_i implies that β_1 can be interpreted as:

$$\beta_1 = E\left[\log(w)\middle|U=1, X=\bar{X}_U\right] - E\left[\log(w)\middle|U=0, X=\bar{X}_U\right] \quad (2)$$

i.e., the log difference in expected earnings between workers in unionised workplaces (or union members) and workers in non-unionised workplaces (or non-union members) for an individual with the average characteristics of the sample of workers in unionised workplaces (or union members). However, the problem of the log transformation remains but can be dealt with either by assuming that equation (1) is normally distributed (and estimating a variance function) or by directly estimating the exponential regression by PML. In the latter case, the equation to be estimated is written as:

$$w_i = e^{\gamma_1 U_i + \gamma_2' X_i + \gamma_3' U_i (X_i - \bar{X}_U)} + v_i \quad (3)$$

which, if correctly specified, can be used as a consistent estimate of the union wage differential for any individual with the average characteristics of the sample of workers in unionised workplaces (or union workers), i.e., when $X_i = \bar{X}_U$. When $X_i = \bar{X}$ (the vector of average characteristics of the overall sample), then the estimated parameter can be interpreted as the average treatment effect for the entire population (ATE).

The percentage conversion of the estimated union wage differential can easily be obtained using the *seldum* command in Stata. Indeed, this command calculates the "virtually unbiased" estimator proposed by KENNEDY (1981) while taking into account the unbiased estimator of its minimum variance as proposed by JAN VAN GARDEREN and SHAH (2002).

6. Results and discussion

The main findings of the study are presented in the following paragraphs.[26] As the focus here is on the union wage differential, the results for the control variables are not discussed in detail.

6.1. A positive link between union presence and earnings

[26] We used the *svy* prefix with the *regress* and *glm* commands in Stata.

Table 3 below presents all the results of the estimates obtained from equations (1) and (2). At first sight, it can be seen that the values and signs of the coefficients of the control variables do not change when the parameter of interest is interpretable as the ATT or the ATE. Furthermore, the observable earnings differential between employees in unionised and non-unionised workplaces is positive and significant only in columns 2, 3 and 4. In other words, union presence has a positive effect on earnings. This result validates the idea that employees in unionised workplaces are on average better paid than their counterparts in non-unionised workplaces.

Table 3. Union presence and earnings (pooled)

Estimator dependent variable		(1) **ATT with OLS** $\ln(1+w_i)$		(2) **ATT with PPML** w_i		(3) **ATE with OLS** $\ln(1+w_i)$		(4) **ATE with PPML** w_i	
		Coeff.	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**
Δ_i		0.079	(0.057)	0.067*	(0.037)	0.099**	(0.050)	0.073**	(0.037)
Education level	Higher	Ref.		Ref.		Ref.		Ref.	
	Not in school	-0.527***	(0.157)	-0.537***	(0.088)	-0.527***	(0.157)	-0.537***	(0.088)
	Primary	-0.220***	(0.075)	-0.349***	(0.058)	-0.220***	(0.075)	-0.349***	(0.058)
	Secondary	-0.096	(0.062)	-0.139***	(0.046)	-0.096	(0.062)	-0.139***	(0.046)
Job tenure		0.00668	(0.013)	0.0109	(0.009)	0.00668	(0.013)	0.0109	(0.009)
	Job tenure^2	-0.000168	(0.0004)	-0.00018	(0.0003)	-0.000168	(0.0004)	-0.00018	(0.0003)
Training	No	Ref.		Ref.		Ref.		Ref.	
	Yes	0.124*	(0.068)	0.170***	(0.045)	0.124*	(0.068)	0.170***	(0.045)
Age	15 – 34	Ref.		Ref.		Ref.		Ref.	
	35 – 54	0.081	(0.057)	0.145***	(0.051)	0.0805	(0.057)	0.145***	(0.051)
	55 – 64	0.145	(0.114)	0.303***	(0.116)	0.145	(0.114)	0.303***	(0.116)
Marital status	Single	Ref.		Ref.		Ref.		Ref.	
	Married	0.142***	(0.041)	0.131***	(0.036)	0.142***	(0.041)	0.131***	(0.036)
	Widowed/separated	0.292***	(0.078)	0.169**	(0.079)	0.292***	(0.078)	0.169**	(0.079)
	Common-law	0.264***	(0.054)	0.216***	(0.070)	0.264***	(0.054)	0.216***	(0.070)
Gender	female	Ref.		Ref.		Ref.		Ref.	
	Male	0.197***	(0.045)	0.201***	(0.039)	0.197***	(0.045)	0.201***	(0.039)
Type of work	Regular	Ref.		Ref.		Ref.		Ref.	
	Occasional	-0.225***	(0.076)	-0.120	(0.098)	-0.225***	(0.076)	-0.120	(0.098)
Institutional sector	Informal	Ref.		Ref.		Ref.		Ref.	
	Public	0.417***	(0.058)	0.375***	(0.056)	0.417***	(0.058)	0.375***	(0.056)
	Private formal	0.433***	(0.047)	0.404***	(0.042)	0.433***	(0.047)	0.404***	(0.042)
Sector	Services	Ref.		Ref.		Ref.		Ref.	
	Primary	-0.127	(0.141)	-0.0460	(0.084)	-0.127	(0.141)	-0.0460	(0.084)
	Industry	0.212***	(0.049)	0.248***	(0.055)	0.212***	(0.049)	0.248***	(0.055)
	Trade	0.0618	(0.084)	0.0942	(0.064)	0.0618	(0.084)	0.0942	(0.064)
Location	Rural	Ref.		Ref.		Ref.		Ref.	
	Urban	0.344***	(0.079)	0.239***	(0.066)	0.344***	(0.079)	0.239***	(0.066)
Occupation	Skilled worker	Ref.		Ref.		Ref.		Ref.	
	Unskilled worker	-0.398***	(0.063)	-0.454***	(0.057)	-0.398***	(0.063)	-0.454***	(0.057)
	Semi-skilled worker	-0.226***	(0.057)	-0.273***	(0.065)	-0.226***	(0.057)	-0.273***	(0.065)
	Middle manager	0.322***	(0.061)	0.265***	(0.046)	0.322***	(0.061)	0.265***	(0.046)
	Senior executive	0.603***	(0.094)	0.621***	(0.066)	0.603***	(0.094)	0.621***	(0.066)
Union presence*job tenure_centered		0,0253	(0.017)	0.0129	(0.010)	0.0253	(0.017)	0.0129	(0.010)
Union presence*job tenure^2_centered		-0.00062	(0.0006)	-0.00044	(0.0004)	-0.00062	(0.0006)	-0.00044	(0.0004)
Constant		10.32***	(0.086)	3.725***	(0.076)	10.30***	(0.085)	3.719***	(0.076)
R^2		0.406				0.406			
n				3658					

Note: *(**){***} significant coefficients at 10% (5%) and {1%}. SE: linearised standard error.

Another observation related to the above result is that the OLS estimates overestimate the union wage differential compared to the PPML estimates.

Regarding the control variables, as expected, education level, training, age, marital status, gender, institutional sector, industrial sector, and occupation have a positive and significant influence on earnings as shown by the results of the exponential model estimates (Table 3, columns 2 and 4). Surprisingly, an additional year of job tenure has no significant influence on earnings regardless of the estimation method used; neither does the type of work when applying the PPML estimator.

6.2. Sensitivity analysis of the link between union presence and earnings

To test the robustness of the estimates of the union wage differential reported in Table 3, equations (1) and (2) were estimated for the public sector, formal private sector, and informal sector because there is some evidence (SHAHEN et al., 2020) to suggest that the payoffs to individual characteristics such as education, age, and work experience are different in the three sectors.[27] The results obtained are interesting (see Table 4).

Firstly, Table 4 shows that union presence affects earnings only in the informal and formal private sectors. The union wage premium in these sectors is 13.36% and 11.10%, respectively (Table 4, column 2, rows 1 and 2). These results may seem paradoxical in a context of systematic violations of workers' rights, scarcity of wage employment, and weakness of the trade union movement. Moreover, these results are more surprising for workers in unionised informal sector workplaces insofar as their exclusion from the scope of labour laws makes them more vulnerable to the denial of their rights by employers. All in all, these results seem to demonstrate the ability of trade unions and/or staff representatives in these sectors to obtain higher earnings than would prevail in their absence. It should be noted that these results are in line with those of TSAFACK NANFOSSO (2000, pp. 201-202) who found that "*union power over hourly earnings increases whenever a union is recognised and decreases whenever a union is unrecognised*" in the firm.

[27] This paper does not address the potential self-selection bias associated with the choice of the sector. To address this issue, the following exclusion restrictions are usually used in the empirical literature: dummy variables that indicate whether an individual has other household members who are employed in the public sector or who are employed in the formal private (informal private) sector (see, for example, MA, 2024; TANSEL et al., 2020; VILERTS, 2018). Unfortunately, our data do not contain such a variable. BLANCHFLOWER and BRYSON (2010), in the British context, did not also address this issue for the same reason.

Secondly, union presence does not have a significant influence on earnings in the public sector. This is not very surprising given the politicised nature of trade unions in this sector. Another reason might be that the determination of earnings in the public sector and mainly in public administration – which constitutes nearly 81% in this subsample against 19% for public or semi-public enterprises and international organisations – is more dependent on ad hoc decisions emanating from the executive power. For instance, we can cite the presidential decrees of 2008, 2014, and 2023 raising the basic monthly salary of civil and military personnel at the rates of 15%, 5% and 5.2%, respectively. In 2008, another presidential decree increased the rate of the non-accommodation allowance paid to civilian and military personnel.

Table 4. Robustness of the earnings differential related to union presence

Estimator Dependent variable	(1) **ATT with OLS** $\ln(w_i)$		(2) **ATT with PPML** w_i		(3) **ATE with OLS** $\ln(w_i)$		(4) **ATE with PPML** w_i	
	Coeff.	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**
Δ_i Informal sector# $n = 2008;\ n_{U_1} = 339;\ n_{U_0} = 1669$	0.193***	(0.067)	0.127**	(0.060)	0.207***	(0.059)	0.128**	(0.057)
Δ_i Public sector $n = 1010;\ n_{U_1} = 422;\ n_{U_0} = 588$	-0.092	(0.117)	-0.013	(0.059)	-0.065	(0.113)	-0.005	(0.063)
Δ_i Formal private sector $n = 640;\ n_{U_1} = 332;\ n_{U_0} = 308$	0.115	(0.075)	0.106**	(0.054)	0.132**	(0.064)	0.114**	(0.054)

Note: *(**){***} significant at 10% (5%) and {1%}. SE: linearised standard error. Full estimation table is available on request. # indicates $\ln(1 + w_i)$ as the dependent variable.

Finally, as found in Table 3, the estimates of the semi-log regression model overestimate the impact of union presence on the level of earnings. This finding is in agreement with those of BLACKBURN (2007, 2008) and KAISER (2016), which showed that the union wage differential is overestimated when using a log-wage equation for statistical inference.

In addition to the lessons drawn from the results in Table 4, it is also relevant to test the robustness of the results reported in Table 3 by separating the effect of the presence of trade unions from that of the presence of staff representatives (see Tables 5 and 6). The results of the PPML estimator reported in Tables 5 and 6 confirm that union presence (the presence of trade unions and/or staff representatives in the workplace) does not affect earnings in the public sector.

Table 5. Robustness of the earnings differential related to the presence of trade unions

Estimator Dependent variable	(1) **ATT with OLS** $\ln(W_i)$		(2) **ATT with PPML** W_i		(3) **ATE with OLS** $\ln(W_i)$		(4) **ATE with PPML** W_i	
	Coeff.	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**
Δ_i Informal sector# $n = 2008;\ n_{U_1} = 207;\ n_{U_0} = 1801$	0.193**	(0.088)	0.197***	(0.071)	0.230***	(0.069)	0.199***	(0.061)
Δ_i Public sector $n = 1010;\ n_{U_1} = 294;\ n_{U_0} = 716$	0.115	(0.110)	0.085	(0.056)	0.122	(0.117)	0.091	(0.064)
Δ_i Formal private sector $n = 640;\ n_{U_1} = 217;\ n_{U_0} = 423$	0.030	(0.083)	0.057	(0.076)	0.083	(0.071)	0.099	(0.073)

Note: *(**){***} significant at 10% (5%) and {1%}. SE: linearised standard error. Full estimation table is available on request. # indicates ln (1 + w_i) as the dependent variable.

Table 6. Robustness of the earnings differential related to the presence of staff representatives

Estimator Dependent variable	(1) **ATT with OLS** $\ln(W_i)$		(2) **ATT with PPML** W_i		(3) **ATE with OLS** $\ln(W_i)$		(4) **ATE with PPML** W_i	
	Coeff.	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**
Δ_i Informal sector# $n = 2008;\ n_{U_1} = 232;\ n_{U_0} = 1776$	0.175**	(0.079)	0.097	(0.076)	0.187***	(0.071)	0.092	(0.072)
Δ_i Public sector $n = 1010;\ n_{U_1} = 339;\ n_{U_0} = 671$	-0.047	(0.136)	0.024	(0.066)	-0.008	(0.126)	0.036	(0.069)
Δ_i Formal private sector $n = 640;\ n_{U_1} = 302;\ n_{U_0} = 338$	0.125*	(0.076)	0.144**	(0.059)	0.147**	(0.063)	0.151***	(0.058)

Note: *(**){***} significant at 10% (5%) and {1%}. SE: linearized standard error. Full estimation table is available on request. # indicates ln (1 + w_i) as the dependent variable.

Furthermore, no link is found between the presence of a trade union and pay levels in the formal private sector (see Table 5). This means that the presence of a union does not have an essential impact on earnings in this sector. This is not surprising due to the fact that "*the 1992 Labour Code and its implementing regulations do not establish any special status for trade union leaders, do not organise the trade union presence in the enterprise, and barely give any indication that the trade unions can express themselves there*" (TCHAKOUA, 2010). Given that the union's ability to improve and protect members' interests also depends on their active participation in union activities (HAMMER et al., 2009), this result may also be explained by the

lack or low level of support given by union members to union officials during pay negotiations. This result also raises the question of whether the collective bargaining agreements signed in the formal private sector are actually applied.

The above two results are consistent with those obtained by OWUSU-AFRIYIE et al. (2024). Indeed, their estimates based on data from the sixth round of the Ghana Living Standards Survey (2012/2013) and the Blinder-Oaxaca decomposition technique (log-earnings regressions) show that the effect of a trade union at the workplace on real monthly earnings is not statistically significant (in the public and private sectors, respectively).

Furthermore, the estimates in Table 6 reveal that the presence of a staff representative has a significant influence on earnings in the formal private sector. From the outset, this suggests that staff representatives play a decisive role in improving workers' wage demands in this sector. On the other hand, and based on the study by LAROCHE and BERNIER (2016) on the anti-union strategies used by employers in two Canadian provinces, an increasing use of a practice of union discrimination might be suspected. This practice consists of employers in the formal private sector favouring wage negotiations with staff representatives − given that employers consider them less threatening (because less demanding) than the union − in order to achieve a sharing of added value that is less advantageous for workers.

When the analysis focusses on the informal sector, the estimates show that although the variables "presence of a trade union" and "presence of a staff representative" have the expected positive sign, this sign is only significant for the first variable according to the results obtained from the PPML estimator.

Having examined the link between union presence and earnings, we now turn to the link between union membership and earnings.

6.3. Underpaid unionised employees in the formal private and industrial sectors

When we look at the wage differential between union members and nonunion members in workplaces where there is at least one trade union, Table 7 shows that there is no wage premium linked to union membership because the coefficient is not statistically significant. This predictable result calls into question that obtained by TSAFACK NANFOSSO (2002).[28]

[28] Following the logic of TORM (2014), we can say that the result highlighted by TSAFACK NANFOSSO (2002) probably compares hourly earnings between union members (in unionised firms) and non-union members (in unionised and non-unionised firms). However, non-union members working in non-unionised firms and union members working in unionised firms may not be directly comparable, as the former were not faced with the choice

Table 7. Union membership and earnings (pooled)

estimator dependent variable		(1) **ATT with OLS** $\ln(1+w_i)$		(2) **ATT with PPML** w_i		(3) **ATE with OLS** $\ln(1+w_i)$		(4) **ATE with PPML** w_i	
		Coeff.	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**
Δ_i		-0.059	(0.087)	-0.072	(0.067)	-0.027	(0.083)	-0.052	(0,068)
Education level	Higher	Ref.		Ref.		Ref.		Ref.	
	Not in school	-0.254	(0.208)	-0.401*	(0.210)	-0.254	(0.208)	-0.401*	(0.210)
	Primary	-0.277**	(0.140)	-0.422***	(0.124)	-0.277**	(0.140)	-0.422***	(0.124)
	Secondary	-0.166	(0.128)	-0.170**	(0.079)	-0.166	(0.128)	-0.170**	(0.079)
Job tenure		-0.0232	(0.024)	-0.0156	(0.017)	-0.0232	(0.024)	-0.0156	(0,017)
	Job tenure^2	0.00069	(0.0007)	0.00058	(0.0005)	0.00069	(0.0007)	0.00058	(0,0005)
Training	No	Ref.		Ref.		Ref.		Ref.	
	Yes	0.0186	(0.0934)	0.163**	(0.0657)	0.0186	(0.0934)	0.163**	(0,0657)
Age	15 – 34	Ref.		Ref.		Ref.		Ref.	
	35 – 54	0.173	(0.112)	0.251***	(0.084)	0.173	(0.112)	0.251***	(0,084)
	55 – 64	0.183	(0.173)	0.321***	(0.118)	0.183	(0.173)	0.321***	(0,118)
Marital status	Single	Ref.		Ref.		Ref.		Ref.	
	Married	0.141	(0.097)	0.176***	(0.063)	0.141	(0.097)	0.176***	(0,063)
	Widowed/separated	0.238	(0.169)	0.0581	(0.106)	0.238	(0.169)	0.0581	(0,106)
	Common-law	0.393***	(0.133)	0.364***	(0.125)	0.393***	(0.133)	0.364***	(0,125)
Gender	Female	Ref.		Ref.		Ref.		Ref.	
	Male	0.184*	(0.107)	0.203***	(0.072)	0.184*	(0.107)	0.203***	(0.072)
Type of work	Regular	Ref.		Ref.		Ref.		Ref.	
	Occasional	-0.178	(0.124)	-0.396***	(0.122)	-0.178	(0.124)	-0.396***	(0.122)
Institutional sector	Informal	Ref.		Ref.		Ref.		Ref.	
	Public	0.347***	(0.108)	0.295***	(0.095)	0.347***	(0.108)	0.295***	(0.095)
	Formal private	0.306***	(0.089)	0.334***	(0.093)	0.306***	(0.089)	0.334***	(0.093)
Sector	Services	Ref.		Ref.		Ref.		Ref.	
	Primary	-0.151	(0.211)	-0.126	(0.151)	-0.151	(0.211)	-0.126	(0.151)
	Industry	0.346***	(0.103)	0.301***	(0.097)	0.346***	(0.103)	0.301***	(0.097)
	Trade	-0.0680	(0.215)	0.0114	(0.196)	-0.0680	(0.215)	0.0114	(0.196)
Location	Rural	Ref.		Ref.		Ref.		Ref.	
	Urban	0.302**	(0.131)	0.177	(0.114)	0.302**	(0.131)	0.177	(0.114)
Occupation	Skilled worker	Ref.		Ref.		Ref.		Ref.	
	Unskilled worker	-0.512***	(0.120)	-0.567***	(0.131)	-0.512***	(0.120)	-0.567***	(0.131)
	Semi-skilled worker	-0.329***	(0.117)	-0.267**	(0.133)	-0.329***	(0.117)	-0.267**	(0.133)
	Middle manager	0.0897	(0.144)	0.140	(0.105)	0.0897	(0.144)	0.140	(0.105)
	Senior executive	0.585***	(0.156)	0.565***	(0.109)	0.585***	(0.156)	0.565***	(0.109)
Union membership*job tenure_centered		0,061**	(0.027)	0.027	(0.021)	0.061**	(0.027)	0.027	(0.021)
Union membership*job tenure^2_centered		-0.00198*	(0.0011)	-0.00077	(0.0007)	-0.00198*	(0.00108)	-0.00077	(0.0007)
Constant		10.83***	(0.207)	4.076***	(0.177)	10.80***	(0.196)	4.055***	(0.173)
R^2		0.395				0.395			
n		718							

Note: *(**){***} significant at 10% (5%) and {1%}. SE: linearised standard error.

Consequently, non-membership in a trade union would be, as in most developed countries, the most economically rational individual strategy (SANDI, 2006) since the product of trade union action is a collective good in the Cameroonian context. This then tends to encourage "free-rider" behaviour[29] and limit the results of strategies to recruit new members. In accordance with

of becoming union members unless they deliberately chose to work in a non-unionised firm. Consequently, the reported wage gap may merely reflect the differential between being employed in a unionised vs. a non-unionised firm rather than the individual wage gain associated with union membership.

[29] Faced with this so-called "*free rider*" problem, GARELLO et al. (1990, p. 50) ask "*how can we still recruit members and subscribers, apart from a few fanatics or eternal professional protesters?*"

the result obtained here, LIU et al. (2020), using an employer-employee matched database from a survey conducted in 2012 in 10 Chinese cities, demonstrated that the effect of union membership on monthly wages, monthly allowances, and yearly bonuses is insignificant. It should also be noted that the absence of a wage premium associated with union membership, as shown in Table 7, may explain the low union membership rate observed in Cameroon today.

6.4. Sensitivity analysis of the link between union membership and earnings

In order to test the robustness of the results reported in Table 7, Table 8 reproduces the estimates of equations (1) and (2) by each institutional sector and the industrial sector. The results indicate the absence of a significant effect of union membership on the level of individual earnings in unionised workplaces in the informal and public sectors. In the industrial sector, and contrary to the insignificant result obtained by THOMAS and VALLÉE (1996) in a context of economic crisis with poor recruitment prospects, we find a negative and significant result. Indeed, union members earn approximately 29.05% less than their non-union counterparts (Table 8, column 4, row 4).

Table 8. Robustness of the earnings differential related to union membership

Estimator Dependent variable	(1) **ATT with OLS** $\ln(w_i)$		(2) **ATT with PPML** w_i		(3) **ATE with OLS** $\ln(w_i)$		(4) **ATE with PPML** w_i	
	Coeff.	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**	**Coeff.**	**SE**
Δ_i Informal sector $n = 207;\ n_{U_1} = 69;\ n_{U_0} = 138$	-0.285	(0.174)	-0.189	(0.139)	-0.206	(0.133)	-0.116	(0.120)
Δ_i Public sector $n = 294;\ n_{U_1} = 108;\ n_{U_0} = 186$	0.120	(0.143)	0.038	(0.078)	0.147	(0.141)	0.054	(0.084)
Δ_i Formal private sector $n = 217;\ n_{U_1} = 91;\ n_{U_0} = 126$	-0.372**	(0.151)	-0.321***	(0.102)	-0.278**	(0.133)	-0.270***	(0.100)
Δ_i Industrial sector $n = 145;\ n_{U_1} = 67;\ n_{U_0} = 78$	-0.221	(0.146)	-0.325***	(0.110)	-0.230*	(0.135)	-0.337***	(0.108)

Note: *(**){***} significant at 10% (5%) and {1%}. SE: linearised standard error. Full estimation table is available on request.

In the formal private sector, there is also a negative and significant influence of union membership on earnings, regardless of the estimation method used. The logarithm of union members' earnings is on average 0.321 lower than the logarithm of non-union members' earnings (Table 8, column 2, row 3). This represents a wage penalty of 27.87%. This is not

surprising given the reports of the International Trade Union Confederation (ITUC), which classify Cameroon among the countries that systematically violate workers' rights. Similar results, reported by BREDA (2014) and BOURDIEU and BREDA (2016), highlight wage differentials to the disadvantage of union workers compared to their non-union colleagues in the French case.

Even before discussing the causes of the wage penalty suffered by union workers, this finding already seems to indicate hostility towards trade unionists and trade union freedoms in unionised workplaces in the formal private and industrial sectors. Such a finding also seems to indicate that union commitment represents a significant occupational risk in these sectors. In such circumstances, it is difficult for unions to maintain or increase their membership on the one hand, and to encourage members to participate in union activities on the other hand.

Based on the work of BREDA (2014) and BOURDIEU and BREDA (2016), the most convincing explanation of the wage penalty suffered by unionised employees would result less from their lack of skills, their low productivity, their failure to individually negotiate higher earnings than their non-union colleagues, or pure aversion on the part of employers to them, rather than a "strategic discrimination situation" on the part of employers, whose aim would then be to dissuade employees from joining unions and supporting union actions.[30]

Before concluding, it is important to stress that the data used for this study do not allow us to examine how the wage penalty varies when an employee (whether a union member or not) performs the duties of a staff representative.

7. Conclusion

"The continent where union wage effects are potentially least well understood is Africa. There is only sparse evidence for some selected countries, when looking at high-quality academic field journals" (BRÄNDLE, 2024). In order to partially fill this gap, this paper has examined, for the first time on a nationally representative cross-sectional survey, the average effect of union presence and union membership on earnings in Cameroon.

The following two conclusions were drawn from the PPML estimator. First, union presence (the presence of a trade union and/or a staff representative in the workplace) has a positive and

[30] Because of this situation of injustice or discrimination to which they are subjected, union workers could participate more in union activities (e.g., strike action and related activities) in order to improve their situation (see BUTTIGIED et al., 2008).

significant influence on earnings over the whole sample, and particularly over the informal and formal private sector subsamples. Nevertheless, the robustness analysis revealed that the presence of staff representatives has only a significant effect in the formal private sector. Regarding the presence of trade unions, the effect is only significant in the informal sector. It thus appears that the presence of trade unions in public and formal private sector workplaces does not have an essential impact on earnings in Cameroon.

Second, the effect of union membership on earnings is not significant over the whole sample, and particularly in the informal and public sector subsamples; whereas unionised employees are paid less than their non-union counterparts in the formal private sector. This wage gap may indeed reflect discrimination against unionised employees. This discrimination may be rational on the part of employers who have an interest in avoiding the establishment of unions and wage bargaining (BREDA, 2014).

From a practical point of view, the results found here plead for trade unions to be effectively the main representatives of workers in the collective bargaining process and for the legal provisions concerning the protection of workers against trade union discrimination to be effectively respected. These results should also encourage union officials to find ways of making union membership more attractive to workers because there is no financial incentive to join a union.

Finally, it would be interesting to use the data from the third wave of the EESI for future research on the subject.

References

Balkin, D. B. (1989). Union influences on pay policy: A survey. *Journal of Labor Research, 10*(3), 299-310.

Barth, E., Bryson, A., & Dale-Olsen, H. (2020). Union density effects on productivity and wages. *The Economic Journal, 130*(631), 1898-1936.

Bellégo, C., Benatia, D., & Pape, L. (2022). *Dealing with logs and zeros in regression models* (CREST Working Paper No. 08).

Bhorat, H., Goga, S., & Van der Westhuizen, C. (2012). Institutional wage effects: Revisiting union and bargaining council wage premia in South Africa. *South African Journal of Economics, 80*(3), 400-414.

Blackburn, M. L. (2007). Estimating wage differentials without logarithms. *Labour Economics, 14*(1), 73-98.

Blackburn, M. L. (2008). Are union wage differentials in the United States falling? *Industrial Relations: A Journal of Economy and Society, 47*(3), 390-418.

Blackburn, M. L. (2021). Are US teacher salaries competitive? Accounting for geography and the retransformation bias in logarithmic regressions. *Economics of Education Review, 84*(C), 1-14.

Blanchflower, D. G., & Bryson, A. (2010). The wage impact of trade unions in the UK public and private sectors. *Economica, 77*(305), 92-109.

Blaug, M. (1986). *La pensée économique: origine et développement* (4e ed.) : Economica.

Blunch, N.-H., & Verner, D. (2004). Asymmetries in the union wage premium in Ghana. *The World Bank Economic Review, 18*(2), 237-252.

Booth, A. L. (1995). *The economics of the trade union*: Cambridge University Press.

Bourdieu, J., & Breda, T. (2016). Des délégués syndicaux sous-payés : une situation de discrimination stratégique? Une analyse économétrique à partir de l'enquête REPONSE de 2010. *Travail et emploi, 1*(145), 31-58.

Brändle, T. (2024). Unions and collective bargaining: The influence on wages, employment and firm survival: GLO Discussion Paper.

Breda, T. (2014). Les délégués syndicaux sont-ils discriminés ? *Revue économique, 65*(6), 841-880.

Breda, T. (2015). Firms' rents, workers' bargaining power and the union wage premium. *The Economic Journal, 125*(589), 1616-1652.

Bryson, A. (2007). The effect of trade unions on wages. *Reflets et perspectives de la vie économique, 46*(2-3), 33-45.

Bryson, A. (2014). Union wage effects. *IZA World of Labor*, *35*, 1-10.

Bryson, A., Dale-Olsen, H., & Nergaard, K. (2020). Gender differences in the union wage premium? A comparative case study. *European Journal of Industrial Relations, 26*(2), 173-190.

Buttigieg, D. M., Deery, S. J. & Iverson, R. D. (2008). Union mobilization: A consideration of the factors affecting the willingness of union members to take industrial action. *British Journal of Industrial Relations*, *46*(2), 248-267.

Cahuc, P. (1990). La théorie des négociations salariales : une revue de la littérature. *Économie & prévision, 92*(1), 21-30.

Choi, H., & Ramos, R. (2023). The union wage premium in a segmented labor market: new evidence from Korea. *Journal of the Asia Pacific Economy, 28*(1), 242-260.

Creedy, J., & McDonald, I. M. (1991). Models of trade union behaviour: A synthesis. *Economic Record, 67*(4), 346-359.

Dunlop, J. T. (1944). *Wage determination under trade unionism*. New York: Macmillan Company.

Eren, O. (2007). Measuring the union–nonunion wage gap using propensity score matching. *Industrial Relations: A Journal of Economy and Society, 46*(4), 766-780.

Fang, T., & Hartley, J. (2022). Evolution of union wages and determinants. *Handbook of Labor, Human Resources and Population Economics* (pp. 1-40): Springer.

Farber, H. S. (1983). The determination of the union status of workers. *Econometrica, 51*(5), 1417-1437.

Fisher, P. (2016). British tax credit simplification, the intra-household distribution of income and family consumption. *Oxford Economic Papers, 68*(2), 444-464.

Forth, J., & Bryson, A. (2019). State substitution for the trade union good: the case of paid holiday entitlements. *Journal of Participation and Employee Ownership, 2*(1), 5-23.

Freeman, R. B. (2010). Labor regulations, unions, and social protection in developing countries: Market distortions or efficient institutions? *Handbook of development economics* (Vol. 5, pp. 4657-4702).

Garello, J., Lemennicier, B., & Lepage, H. (1990). *Cinq questions sur les syndicats*. Paris : Presses Universitaires de France.

Ge, Y. (2014). Do Chinese unions have "real" effects on employee compensation? *Contemporary Economic Policy, 32*(1), 187-202.

Gutiérrez Rufrancos, H. (2019). Are there gains to joining a union? Evidence from Mexico. *British Journal of Industrial Relations, 57*(3), 676-712.

Hammer, T. H., Bayazit, M., & Wazeter, D. L. (2009). Union leadership and member attitudes: A multi-level analysis. Journal of Applied Psychology, *94*(2), 392.

Hirsch, B. T. (2003). Reconsidering union wage effects: Surveying new evidence on an old topic. *Journal of Labor Research, 25*(2), 233-266.

Hirsch, B. T., & Schumacher, E. J. (2012). Underpaid or overpaid? Wage analysis for nurses using job and worker attributes. *Southern Economic Journal, 78*(4), 1096-1119.

INS. (2011). *Rapport principal de la deuxième enquête sur l'emploi et le secteur informel au Cameroun* (Phase 1 : Enquête sur l'emploi). Yaoundé : Institut national de la statistique.

Jan Van Garderen, K., & Shah, C. (2002). Exact interpretation of dummy variables in semilogarithmic equations. The Econometrics Journal, *5*(1), 149-159.

Kaiser, B. (2016). Decomposing differences in arithmetic means: a doubly robust estimation approach. *Empirical Economics, 50*(3), 873-899.

Kennedy, P. (1981). Estimation with correctly interpreted dummy variables in semilogarithmic equations [the interpretation of dummy variables in semilogarithmic equations]. *American Economic Review, 71*(4), 801-801.

Kuhn, P. (1998). Unions and the economy: what we know; what we should know. *Canadian Journal of Economics, 31*(5), 1033-1056.

Laroche, P. (2004). Présence syndicale et performance financière des entreprises : une analyse statistique sur le cas français. *Finance Contrôle Stratégie, 7*(3), 117-145.

Laroche, M., & Bernier, M.-È. (2016). Employeurs et anti-syndicalisme au Canada : une étude juridique des stratégies mobilisées. *Travail et emploi,* (146), 51-74.

Lewbel, A. (2012). Using heteroscedasticity to identify and estimate mismeasured and endogenous regressor models. *Journal of business & economic statistics, 30*(1), 67-80.

Liu, J., Xing, C., & Ge, Y. (2020). Does union membership reduce gender earnings differentials? Evidence from employer–employee matched data in China. *Pacific Economic Review, 25*(1), 102-117.

Ma, X., & Zhan, P. (2024). Trade unions and the gender wage gap: evidence from China. *Journal of Applied Economics, 27*(1), 2369430.

Mac Flynn, P. (2020). *The impact of collective bargaining on pay in Northern Ireland* (NERI Working Paper No. 66).

Maillefert, M. (2004). *L'économie du travail : concepts, débats et analyses* (2 ed.) : Studyrama.

McDonald, I. M., & Solow, R. M. (1981). Wage bargaining and employment. *The American Economic Review, 71*(5), 896-908.

Melstrom, R. T. (2017). Estimating a model of sportfishing trip expenditures using a quasi-maximum likelihood approach. *Tourism Economics, 23*(2), 448-459.

Morikawa, M. (2010). Labor unions and productivity: an empirical analysis using Japanese firm-level data. *Labour Economics, 17*(6), 1030-1037.

Nickell, S. J., & Andrews, M. (1983). Unions, real wages and employment in Britain 1951-79. *Oxford Economic Papers, 35*(supplement), 183-206.

Nilsson, B. (2021). *Do Egyptian Trade Unions Have Any Bargaining Power?* (ERF Working Paper No. 1529).

Okamoto, H., & Matsuura, T. (2020). The influence of unions on wages in Japan: Taking into account factors related to corporate governance. *Annual Report of the Institute of Economic Research No. 52* (pp. 361－375): Chuo University.

Owusu-Afriyie, J., Twumasi Baffour, P., & Baah-Boateng, W. (2023). Union wage effect: Evidence from Ghana. *Cogent Economics & Finance, 11*(2), 2231208.

Owusu-Afriyie, J., Baffour, P. T., & Baah-Boateng, W. (2024). Estimating public and private sectors' union wage effects in Ghana: is there a disparity? *International Journal of Social Economics, 51*(9), 1109-1122.

Petersen, T. (2017). Multiplicative models for continuous dependent variables: estimation on unlogged versus logged form. *Sociological Methodology, 47*(1), 113-164.

Powell, D., & Seabury, S. (2018). Medical care spending and labor market outcomes: Evidence from workers' compensation reforms. *American Economic Review, 108*(10), 2995-3027.

Pucci, M., & Zajdela, H. (2003). Théeories des néegociations salariales et des syndicats. *Encyclopédie des Ressources Humaines* (pp. 952-966). Paris : Vuibert.

Rios-Avila, F., & Hirsch, B. T. (2014). Unions, wage gaps, and wage dispersion: New evidence from the Americas. *Industrial Relations: A Journal of Economy and Society, 53*(1), 1-27.

Rosenthal, M. (1985). The impact of unions on salaries in public libraries. *The Library Quarterly, 55*(1), 52-70.

Salmon, C. (1999). Les syndicats dans les pays en développement : leur action sur le rnarché du travail. *Canadian Journal of Development Studies/Revue canadienne d'études du développement, 20*(4), 661-688.

Salmon, C. (2000). Syndicalisme et relations du travail dans un pays en développement, enquête dans quatre secteurs industriels de Dhaka, Bangladesh. *Revue d'économie du développement, 8*(3), 83-112.

Sandi, M. (2006). Explication du choix d'adhésion aux syndicats par l'approche coûts-bénéfices. *Revue d'économie industrielle, 4*(116), 127-152.

Santos Silva, J.M.C., & Tenreyro, S. (2006). The log of gravity. *The Review of Economics and statistics, 88*(4), 641-658.

Santos Silva, J.M.C., & Tenreyro, S. (2011). Further simulation evidence on the performance of the Poisson pseudo-maximum likelihood estimator. *Economics Letters, 112*(2), 220-222.

Santos Silva, J.M.C., & Tenreyro, S. (2022). The log of gravity at 15. *Portuguese Economic Journal, 21*(3), 423-437.

Sauviat, C., & Lizé, L. (2018). *La crise du modèle social américain* : Presses universitaires de Rennes.

Shahen, M. E., Kotani, K., Kakinaka, M., & Managi, S. (2020). Wage and labor mobility between public, formal private and informal private sectors in a developing country. *Economic Analysis and Policy, 68*, 101-113.

Sim, R. (2007). *Le délégué du personnel : une institution démocratique en droit du travail*. Yaoundé : Presses de l'UCAC.

Sinane, A.M. (1995). *Une étude économétrique des déterminants des salaires et de l'offre de travail : le cas de Yaoundé – Cameroun* (DIAL, Document de travail Nº. 1995-15/T).

Song, Y., Yang, J., & Yang, Q. (2016). Do firms' political connections depress the union wage effect? Evidence from China. *China Economic Review, 38*(C), 183-198.

Svarstad, E., & Nymoen, R. (2022). Wage inequality and union membership at the establishment level: An econometric study using Norwegian data. *Oxford Economic Papers* (advance article), 1-22.

Tansel, A., Keskin, H. I., & Ozdemir, Z. A. (2020). Public-private sector wage gap by gender in Egypt: Evidence from quantile regression on panel data, 1998–2018. *World Development, 135*, 105060.

Tchakoua, J.-M. (2010). Les tendances de la négociation collective de l'ère nouvelle au Cameroun. *Laboratoire de recherche sur le Droit du travail et le Développement*. Canada : Faculté de droit de l'université McGill.

Thomas, M., & Vallée, L. (1996). Labour market segmentation in Cameroonian manufacturing. *The Journal of Development Studies, 32*(6), 876-898.

Tjouen, A.-F. (1996). De la participation du personnel à la gestion des entreprises en droit camerounais : la problématique des comités d'entreprise. *Revue internationale de droit comparé, 48*(2), 457-470.

Torm, N. (2014). The role of trade unions in Vietnam: A case study of small and medium enterprises. *Journal of International Development, 26*(2), 207-221.

Torm, N. (2020). Does union membership pay off? Evidence from Vietnamese SMEs. In J. Rand & F. Tarp (Eds.), *Micro, small, and medium enterprises in Vietnam* (pp. 230-252): Oxford University Press.

Tsafack Nanfosso, R. A. (2000). *Syndicats et performances économiques : analyse et réfutation au Cameroun.* (Thèse pour le doctorat d'Etat), Université de Yaoundé II.

Tsafack Nanfosso, R. A. (2002). Union Wage Differential Cameroon. *Journal of Development Alternatives and Area Studies, 21*(3/4), 104-133.

Tzannatos, Z. (2008). The impact of trade unions: what do economists say? In J. Berg and D. Kucera (Ed.), *defence of labour market institutions: cultivating justice in the developing world* (pp. 150-191).

Vilerts, K. (2018). The public–private sector wage gap in Latvia. *Baltic Journal of Economics, 18*(1), 25-50.

Wang, W., & Lien, D. (2018). Union membership, union coverage and wage dispersion of rural migrants: Evidence from Suzhou industrial sector. *China Economic Review, 49*, 96-113.

Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*: MIT press.

Yao, Y., & Gunderson, M. (2021). Do local union strategies explain the (unexpected) union pay premium in China? *International Journal of Manpower, 42*(6), 1124-1143.

Yogo, U. T. (2011). Social network and wage: Evidence from Cameroon. *Labour, 25*(4), 528-543.

Appendix

Table A1. Mean-comparison test between earnings of workers in unionised and non-unionised workplaces (pooled)

n: 3 658
Strata: 32
Primary sampling unit: 657
Population: 1 809 853

	Average monthly earnings (in thousands of CFA francs)	Prob > F
Non-unionised workplaces	73.11205	0.0000
Unionised workplaces	130.3789	

Source: Author's calculations using data from the second *Survey on Employment and the Informal Sector* (2010).

Table A2. Mean-comparison test by presence of a trade union (pooled)

n: 3 658
Strata: 32
Primary sampling unit: 657
Population: 1 809 853

	Average monthly earnings (in thousands of CFA francs)	Prob > F
Absence of a trade union	77.420	0.0000
Presence of a trade union	143.370	

Source: Author's calculations using data from the second *Survey on Employment and the Informal Sector* (2010).

Table A3. Mean-comparison test by presence of a staff representative (pooled)

n: 3 658
Strata : 32
Primary sampling unit: 657
Population : 1 809 853

	Average monthly earnings (in thousands of CFA francs)	Prob > F
Absence of a staff representative	76.270	0.0000
Presence of a staff representative	133.684	

Source: Author's calculations using data from the second *Survey on Employment and the Informal Sector* (2010).

Table A4. Mean-comparison test between earnings of union workers and non-union workers (pooled)

n: 718
Strata : 32
Primary sampling unit : 361
Population : 354 141, 73

	Average monthly earnings (in thousands of CFA francs)	Prob > F
Non-union members	136.4241	0.2482
Union members	153.7339	

Source: Author's calculations using data from the second *Survey on Employment and the Informal Sector* (2010).