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## Female leaders and gender gaps within the firm: Evidence from three sub-Saharan African countries

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WIDER Working Paper 2017/63

## **Female leaders and gender gaps within the firm**

Evidence from three sub-Saharan African countries

Giulia La Mattina,<sup>1</sup> Gabriel Picone,<sup>1</sup> Alban Ahoure,<sup>2</sup> and Jose Carlos Kimou<sup>2</sup>

March 2017

**Abstract:** We study the association between the gender of the highest-ranking manager (the CEO) and gender differences in employees' outcomes using detailed linked employer–employee data from the formal sector in Cameroon, Côte d'Ivoire, and Senegal. Our empirical strategy relies on the inclusion of firm fixed effects and workers' characteristics. Our results point toward a negative correlation between female CEO and the relative wages and job satisfaction of female employees. However, female employees working under a female CEO who owns the firm are not paid less than their male colleagues.

**Keywords:** female managers, gender gaps, sub-Saharan Africa

**JEL classification:** J16, J31, M50, J28

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## 1 Introduction

Although women's education and labour force participation have increased globally in recent decades, there are still gender differences in women's earnings in the labour market. In sub-Saharan African countries, women earn between 6 and 30 per cent less than men, even though women's labour force participation rate is above 60 per cent (Nopo et al. 2011; World Bank 2012). Gender differences in the labour market may extend beyond earnings to other dimensions, including job satisfaction and opportunities for promotion (Clark 1997; Kunze and Miller 2014). Understanding the sources of gender differences in the labour market is necessary to improve women's access to income, which has been linked to children's outcomes in developing countries (Thomas 1990; Lundberg et al. 1997; Duflo 2000).

This paper first documents gender differences in wages, hours, and job satisfaction using linked employer–employee data from three French-speaking countries in sub-Saharan Africa. We focus on the formal sector, where more than half of the workers have a college degree and women make up about 30 per cent of the labour force. On average women work fewer hours and earn lower monthly income than men, but women and men receive similar wages. Additionally, female employees are more satisfied with their job and salary than men.<sup>1</sup> However, the observed gender parity in wages may mask differences in the relative performance of male and female employees across firms.

Second, we posit that role models and mentors may be a factor affecting women's progress in the labour market and test whether the gender of the highest-ranking manager (chief executive officer or CEO) is correlated with gender gaps within the firm.<sup>2</sup> The expected impact of female managers on the performance of subordinated female workers is a priori ambiguous: if women discriminated less against female workers or were more willing to mentor female employees, female managers could help to reduce gender gaps (Aigner and Cain 1977; Athey et al. 2000). Female role models and mentors may be especially important in developing countries, where gender inequalities are pronounced and discriminatory gender norms are still common.<sup>3</sup> On the other hand, female managers may act as 'queen bees' and harm the careers of their female employees (Staines et al. 1974).

The linked employer–employee survey used in this study provides detailed information on workers, CEOs, and firms' characteristics, which allows us to study the impact of the CEO's gender beyond the wage gap and look at gender differences in hours worked, earnings, and job satisfaction. Our empirical strategy rests on estimating the *association* between the CEO's gender and gender gaps within the firm by controlling for several characteristics of the worker, the CEO, and the firm to reduce omitted variable bias. In our preferred specification, we include firm fixed effects in the regression to hold constant unobservable firm characteristics that may affect both the gender of the CEO and the labour outcomes of female employees.

The results are heterogeneous across countries, but overall point toward a small negative correlation between female CEOs and the relative outcomes of female employees. In Cameroon,

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<sup>1</sup> This finding is consistent with previous research (Hodson 1989; Mason 1995; Clark 1997).

<sup>2</sup> Throughout the paper, we refer to the gender gap as the difference in outcome between male and female employees.

<sup>3</sup> For instance, Beaman et al. (2012) found that female politicians acted as role models in India and boosted girls' aspirations and human capital investment.

female CEOs are associated with a larger gender gap in hourly wage, although the effect becomes insignificant when we control for occupation dummies. In Côte d'Ivoire, female CEOs are associated with a smaller gender gap in hours worked, but this does not translate to a smaller gender gap in monthly earnings. In Côte d'Ivoire, female CEOs are associated with a greater gender gap in job satisfaction. In Cameroon and Senegal, female CEOs are associated with a greater gender gap in salary satisfaction. All in all, the results provide support for the 'queen bee' syndrome. These results are robust to the inclusion of firm fixed effects and to the exclusion of firms in which the CEO has been in his/her position for less than two years, which helps to reduce concerns about reverse causality.

However, when we look at the interaction between female CEO and an indicator for the CEO being the owner of the firm, we find that the results are more nuanced. In the pooled sample, female employees working under female CEOs who own the firm are not paid less than their male colleagues. Hence, for wages, we observe patterns that are consistent with the 'queen bee' syndrome only for female managers who are not owners. Based on these results, we speculate that when female CEOs do not have enough power within the firm, they may not be able to improve the relative performance of female employees.

Our data do not allow us to look at the association between the gender of the direct manager and the relative performance of female employees. However, we observe no correlation between the fraction of women in middle and senior management and the relative performance of female employees.

Our paper contributes to a growing literature on the determinants of the gender wage gap in sub-Saharan Africa by showing new evidence of the association between female CEO and the gender wage gap. Some of the previous studies used household and labour force surveys (Appleton et al. 1999; Nordman and Roubaud 2009; Nordman et al. 2011). Since employment segregation by gender is one of the main sources of gender differences in earnings in developing countries, and firms that employ women differ from firms that employ men, examining the role of firm characteristics is imperative to a study of the factors that contribute to the gender wage gap in developing countries (World Bank 2012; Borrowman and Klasen 2015). Those studies that used linked employer–employee data sets from developing countries focused on the role of workers' sorting across jobs and firms, cognitive skills, and personality traits, but did not look at the role of female managers (Fafchamps et al. 2009; Nordman and Wolff 2009; Nordman et al. 2015).

This paper is also related to recent studies that examined the relationship between female managers and gender pay gaps in developed countries (Cardoso and Winter-Ebmer 2010; Hirsch 2013; Flabbi et al. 2014; Gagliarducci and Paserman 2015). The findings of these papers are mixed but tend to point towards a positive association between female managers and the relative outcomes of female employees. Our results provide a different picture, as they suggest that female CEOs may be associated with a worse relative performance of female employees unless they own the firm. Since the aforementioned papers use different data and methodology from ours, more research is needed to understand whether cultural and economic factors could explain the different results.

The remainder of the paper is organized as follows. Section 2 reviews the relevant literature. Section 3 presents the empirical strategy. Section 4 describes the data. Section 5 discusses the results, and Section 6 concludes.

## 2 Literature review

This section briefly reviews research on the gender wage gap in developing countries as well as recent studies on female managers in both developed and developing countries.

An abundant literature has studied the sources of the gender gap in earnings in developed countries and has identified occupational segregation, differences in human capital, discrimination, and social norms as potential factors (see Blau and Kahn 2000 for a review). Here we focus on studies on the gender wage gap in sub-Saharan Africa, as this is the region of interest of our study. Appleton et al. (1999) found that women in Côte d'Ivoire, Ethiopia, and Uganda were more likely to work in the (better paying) public sector, thus narrowing the gender gap in earnings. Fafchamps et al. (2009) showed that women tended to sort into low-paying jobs and firms. Nordman and Roubaud (2009) showed the importance of measuring women's actual experience in estimating the portion of the gender wage gap that is explained by observable characteristics. Nordman et al. (2011) analysed the gender gap in earnings in seven cities in West Africa and found that it was larger in the informal sector than in the public and private formal sectors. As these studies showed how differences in workers, jobs, and firms' characteristics affect the gender wage gap in sub-Saharan Africa, we control for these variables in our empirical strategy.

Recent research has examined the effect of female managers on gender gaps within the firm using linked employer–employee data from European countries. Hirsch (2013) analysed a single cross-section from Germany and showed that a higher share of women in first- and second-level management is associated with a lower gender pay gap among employees. Hirsch's data and empirical strategy are the closest to ours, although his data allow him to control for occupation/plant dummies, while we can include only (coarser) firm dummies.

Three studies have investigated the effect of female managers on gender gaps within the firm using *longitudinal* linked employer–employee data. The authors exploit changes in the gender of managers over time to identify the effect of female managers on firms' and employees' outcomes holding constant unobservable time-invariant firm-level characteristics as well as observable time-varying factors. Cardoso and Winter-Ebmer (2010) found that the wages of female employees are higher in female-led firms than in male-led firms in Portugal. They define female leadership on the basis of the share of women among owners and managers. Flabbi et al. (2014) showed that female CEOs in Italy decrease the wage gap for workers at the top of the wage distribution and increase it for those at the bottom. Gagliarducci and Paserman (2015) analysed longitudinal linked employer–employee data from Germany and found that the fraction of women among top managers is associated with lower wages for both male and female workers, but this result is not robust to the inclusion of firm fixed effects and firm-specific time trends. Hence, the authors interpret the OLS estimates as evidence of the sorting of female top managers into firms characterized by lower wages, lower investment, and more female-friendly policies. Related to this literature, Tate and Yang (2015) analysed gender differences in wage losses among displaced workers. They followed men and women who worked in the same plant and were hired by the same firm after the plant closed. Women experience a larger reduction in wages relative to men, but the difference is smaller for workers who are hired by female-led firms.

A recent literature has also looked at gender quotas in corporate boards, which were recently adopted by several European countries. Bertrand et al. (2014) studied the effects of the reform in Norway on the gender wage gap in the corporate sector. They documented an increase in the observable skills of women appointed to the boards as well as an increase in the proportion of female workers in the top 5 per cent of the earnings distribution. However, in the short term they

found no evidence of improvements in the labour market outcomes or career choices of women except among those who were appointed to the boards.

Our paper adds to this literature by exploring the association between CEO's gender and gender gaps in developing countries. The literature on female managers in the developing world is scant and, to the best of our knowledge, there are no studies on the effects of female managers. A few recent studies looked at the determinants of female CEOs in developing countries and showed that the probability of having a female CEO is higher when there are women among board members (Flabbi et al. 2016) and the dominant stakeholder is a woman (Sekkat et al. 2015). Macchiavello et al. (2015) tried to open the black box of underrepresentation of women in leadership positions within the firm by zooming in on the selection process and the performance of female managers. After running a training programme for male and female supervisors (the lowest level of managers), they randomly assigned a female or male trainee to production lines in garment factories in Bangladesh. Their results suggest that firms that want to hire more female supervisors may incur substantial costs because female supervisors initially underperformed relative to men (although they caught up later on) and demotivated male workers.

### 3 Empirical strategy

This paper aims to estimate the association between the gender of the CEO and gender gaps within the firm. As highlighted by Flabbi et al. (2014), the main challenge to obtaining causal estimates is non-random assignment of female CEOs to firms. For instance, unobserved variables at the firm level may affect both the probability that the CEO is a woman and the relative performance of female employees. Another challenge is reverse causality. For instance, female CEOs may be hired to reverse gender gaps in firms where female employees are performing poorly.

We estimate a set of regressions similar to the following equation:

$$y_{ij} = \beta_0 + \beta_1 fem_i + \beta_2 fem\_man_j + \beta_3 fem_i \times fem\_man_j + \beta_4 X_i + \beta_5 Z_j + u_{ij} \quad (1)$$

Where  $y_{ij}$  is the outcome of interest for employee  $i$  working in firm  $j$ ;  $fem_i$  is a binary variable that takes the value of 1 if the employee is a woman;  $fem\_man_j$  is a binary variable that takes the value of 1 if the highest-ranking manager (CEO) is a woman;  $X_i$  is a vector of employee's characteristics, including age, age squared, tenure (in months), tenure squared, education (secondary and college), marital status, and occupation; and  $Z_j$  is a vector of firm's and CEO's characteristics, including firm's age and industry, and CEO's age, age squared, tenure (in months), education (secondary and college), and marital status. In our preferred specifications, we include firm fixed effects ( $v_j$ ) to control for all firms' characteristics that are correlated with both the probability of hiring a female CEO and gender gaps within the firm and are common to all employees within a firm. Finally, we estimate the regressions with and without occupation fixed effects.<sup>4</sup> We report estimates without occupation dummies in the paper and estimates with occupation dummies in Appendix A.

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<sup>4</sup> On the one hand, occupation dummies may explain part of the gender gap in earnings because women are often more likely to work in low-paying occupations than men (World Bank 2012). Hence, excluding occupation dummies may lead to overestimating the gender wage gap. On the other hand, the gender of the CEO may have a direct effect on the occupations of female employees.

$\beta_3$  is our coefficient of interest: it measures the additional effect of having a female CEO on female workers' outcomes relative to male workers' outcomes (the gender gap). We expect this coefficient to be positive (negative) if having a female CEO increases (decreases) women's outcomes relative to men's, thus reducing (widening) the gender gap. Our dependent variables include log hourly wage, log monthly labour income, hours worked, and two measures of job satisfaction.<sup>5</sup> We estimate separate regressions for each country. We use Ordinary Least Squares (OLS) and cluster the standard errors at the firm level to control for serial correlation of the errors within the firm.

Our preferred specification, using firm fixed effects, allows us to estimate the effect of female CEOs on gender gaps, holding constant some of the most obvious sources of potential omitted variable bias, namely that firms with female CEOs may be unobservably different in terms of their treatment of female employees. Although we do not have a panel of firms, our identification strategy is similar to the one used by Cardoso and Winter-Ebmer (2010) and Gagliarducci and Paserman (2015), who exploited within-firm variation in the proportion of female managers over time to identify the impact of female-led firms on the firm's wage gap. However, we cannot study the dynamics of hiring a female CEO on gender gaps, control for trends in 'firm culture' that may affect both the likelihood of having a female CEO and the gender gap, or estimate the effect of female CEOs on the levels of the dependent variables, because we have a single cross-section. Additionally, our preferred identification strategy requires the assumption that there is no reverse causality, meaning that firms do not hire a female CEO in response to pre-existing gender gaps.

Although we prefer the most conservative specification with firm fixed effects, we follow previous studies and report estimates without firm fixed effects as well, which we refer to as 'OLS estimates'. Comparing OLS and fixed effects estimates may convey useful information on whether and how female CEOs sort into firms with different characteristics (Gagliarducci and Paserman 2015).<sup>6</sup>

## 4 Data and summary statistics

### 4.1 Data

We use data from the 'Les Déterminants de la Performance des Entreprises en Afrique Subsaharienne Francophone' survey, which was conducted between November 2013 and March 2014 in Côte d'Ivoire, Cameroon, and Senegal. The data collection was funded by the International Development Research Center (IDRC) and implemented by the Centre d'Etudes et de Recherches en Economie et Gestion (CEREG) in Cameroon, the Cellule d'Analyse de Politiques Economiques du CIRES (CAPEC) in Côte d'Ivoire, and the Laboratoire de Recherches Economiques et Monétaires (LAREM) in Senegal.

For each country, the survey included firms in three cities. In Cameroon, the survey was conducted in the cities of Douala, Yaoundé, and Bafoussam, where more than 60 per cent of Cameroonian firms were located in 2009. In Côte d'Ivoire, the survey was administered in Abidjan, Daloa, and

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<sup>5</sup> Regarding job satisfaction, employees are asked how they think their salary is in comparison with their effort and whether they are satisfied with their work. We create two dummy variables that take the value of 1 if a worker thinks his/her salary is good and if he/she is satisfied with his/her work.

<sup>6</sup> Previous research using panel data showed that controlling for firm fixed effects changed the estimate of the effect of female managers on wages. Cardoso and Winter-Ebmer (2010) found that the estimated effect of female managers on female wages is negative and significant in the OLS regressions and becomes positive and significant when firm fixed effects are included. In Gagliarducci and Paserman (2015), positive and significant OLS coefficients of female managers on wages became insignificant when firm fixed effects were included as controls.



San Pedro, where 60 per cent of all formal firms in the country were located in 2012. In Senegal, the survey was run in Dakar, Saint-Louis, and Thiès.

The survey covered businesses in both the formal and informal sectors for a total of 780 firms in Cameroon, 560 firms in Côte d'Ivoire, and 480 firms in Senegal (overall, 1,820 CEOs and 2,579 employees were interviewed). Firm informality is defined as lack of fiscal identity<sup>7</sup>. Lacking fiscal identity is not equivalent to not paying any taxes, as informal firms are still obliged to pay taxes to local authorities. Although firm formality is not mechanically related to firm size, meaning that firms are not forced by law to become formal when they reach a certain threshold, firms in the informal sector tend to have fewer employees. Since about 50 per cent of firms in the informal sector have zero employees, we restrict our analysis to the formal sector.

The survey provides exceptionally rich information on CEOs, employees, and the production process, collected using three separate questionnaires. For each firm, the highest-ranking manager (CEO), the production manager, and about five randomly chosen employees were interviewed. Our final sample includes about 450 workers and 130 firms in Côte d'Ivoire, 750 workers and 160 firms in Cameroon, and 750 workers and 260 firms in Senegal.

One advantage of the data is that the manager's questionnaire was answered directly by the CEO of the firm. Having a separate module for managers allows us to identify the gender of the CEO without error. In addition, the manager's module contains basic demographic characteristics of the CEO, as well as detailed information on the firm's activities, revenues, management styles, and managers' attitudes toward women.

The employee's module contains basic demographic information on employees as well as their level of education, tenure within the company, occupation, number of hours worked, monthly labour income, and satisfaction with their job and salary. We calculate workers' hourly wage by dividing monthly labour income by the number of hours worked in the previous month.<sup>8</sup>

Finally, the production module, which was answered by the production manager, contains information on the gender composition of the workforce by rank. Employees are divided into five categories or occupations: senior managers, who are the highest-level managers right below the company's CEO; middle managers; technicians/supervisors; workers/apprentices; and other occupations. We calculate the fraction of workers in senior and middle management and estimate the correlation between women's representation in these two categories of management and the performance of female technicians/supervisors, workers/apprentices, and other occupations.

## 4.2 Summary statistics

Table 1 displays summary statistics for the main variables used in the analysis. Looking at outcome variables, nominal wages are higher in Côte d'Ivoire than in Cameroon (data on wages were not collected in Senegal), and average hours worked are similar in the three samples. The table indicates significant differences in job and salary satisfaction across countries: workers are more likely to be satisfied with their job and their salary in Côte d'Ivoire and Senegal than in Cameroon.

Looking at female representation within the firm, Figure 1 illustrates the gender composition of the workforce. The percentage of employees working under female CEOs ranges from 6 per cent

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<sup>7</sup> For example, a firm without a 'Déclaration Fiscale d'Existence' (DFE) in Côte d'Ivoire or a 'Numéro d'Identification National des Entreprises et Associations Assimilées' (NINEA) in Senegal.

<sup>8</sup> Monthly hours are defined as weekly hours times four.

in Cameroon to 10.6 per cent in Senegal. These numbers are more or less in line with those of Sekkat et al. (2015), who showed that sub-Saharan Africa is the region with the lowest percentage of female CEOs (13 per cent) in a large firm-level data set collected in 74 developing countries between 2009 and 2012. The fraction of women in middle management ranges from 19.4 per cent in Cameroon to 32.2 per cent in Côte d'Ivoire. The fraction of women in senior management ranges from 17.5 per cent in Cameroon to 19.9 per cent in Côte d'Ivoire. The fraction of female workers is highest for firms in Côte d'Ivoire (35 per cent) and lowest for firms in Senegal (27 per cent). For firms in Cameroon, 31 per cent of employees are women.

Turning to CEO's characteristics, Table 1 shows that CEOs have been working in the current firm for longer in Cameroon and Senegal (10.5 and 11 years, respectively) than in Côte d'Ivoire (7.2 years), which may be explained by the fact that firms have been in business for longer in Cameroon and Senegal than in Côte d'Ivoire. In Côte d'Ivoire, 67.7 per cent of workers work in a firm where the CEO is also the owner. This fraction is lower in Cameroon and Senegal (55 per cent).

We next turn to gender differences in various labour market outcomes, which are illustrated in Figures 2a–2e. Table 2 reports p-values for tests of equality of means (one-tailed and two-tailed). Figure 2a indicates that male and female workers earn similar hourly wages in Côte d'Ivoire and Cameroon. Figure 2b shows that monthly labour income is higher for men than for women in Cameroon, which is explained by men working three hours longer on average. Men work longer hours in Senegal as well, but not in Côte d'Ivoire (Figure 2c). Job satisfaction is similar for men and women in Côte d'Ivoire and Cameroon, while in Senegal female workers are more satisfied with their job (Figure 2d). The pattern observed in Senegal is consistent with previous findings by Hodson (1989), Mason (1995), and Clark (1997). Finally, in all three countries women are more likely to be satisfied with their salary than men (Figure 2e).

## 5 Results

### 5.1 Main results

#### *Female CEOs and the gender gap in wages and income*

We first estimate the association between female CEOs and gender difference in hourly wage and monthly income. Table 3 presents estimates of equation (1) based on data from Côte d'Ivoire and Cameroon using log hourly wages as dependent variables. The interaction term between female CEO and female employee is negative for both countries, but it is statistically significant only for Cameroon. In terms of magnitude, working under a female CEO instead of a male CEO is associated with an increase in the gender gap in hourly wage of about 50 per cent in Cameroon. Controlling for firm fixed effects reduces the interacted coefficient by about 6 per cent, suggesting the existence of unobserved time-invariant firm characteristics that are correlated with both the CEO's gender and the gender gap in hourly wages. Interestingly, the effect of female CEOs on the gender wage gap becomes smaller and insignificant after controlling for occupation fixed effects (Appendix A, Table A1). Table 4 gives the results for monthly labour income. The gender gap is greater for employees working under a female CEO, but the effect is not statistically significant when firm fixed effects are included (Table 4 and Appendix A, Table A2). In both Tables 3 and 4, other variables appear to have the expected sign. In particular, the worker's education and tenure are positively correlated with wages and monthly income.

### *Female CEOs and the gender gap in hours worked*

Table 5 shows the results for hours worked. In all three countries, women tend to work fewer hours per week than men: the difference is 4.3 hours in Côte d'Ivoire, 2.8 hours in Cameroon, and 2.7 hours in Senegal. The positive coefficient on the interaction term between female CEO and female employee indicates that female CEOs are associated with more hours worked by female employees than by male employees. The results are statistically significant only for Côte d'Ivoire. In terms of magnitude, female CEOs in Côte d'Ivoire are associated with 9.7 more hours worked by female employees than by male employees. Controlling for occupation fixed effects does not significantly change the results (Appendix A, Table A3).

### *Female CEOs and the gender gap in satisfaction with job and salary*

Finally, we estimate the association between female CEOs and gender differences in workers' satisfaction with their job and salary. Table 6 reports regression estimates for job satisfaction. The negative coefficient on the interaction term between female CEO and female employee indicates that female CEOs are associated with a greater gender gap in job satisfaction. However, the coefficient is statistically significant only for the Côte d'Ivoire sample when firm fixed effects are included in the regression. In terms of magnitude, a female CEO in Côte d'Ivoire is associated with a 12.5 per cent decline in the probability that women are satisfied with their job relative to men. This effect is equivalent to 15 per cent of the sample mean. Interestingly, female CEOs are associated with greater levels of job satisfaction among both males and females in Cameroon and Senegal ('OLS columns' in Table 6), but the net effect is a widening of the gender gap. Controlling for occupation fixed effects does not affect the results (Appendix A, Table A4).

Table 7 presents regression estimates when salary satisfaction is used as the dependent variable. The coefficient on the interaction term between female CEO and female employee is negative, suggesting that female CEOs are associated with a greater gender gap in salary satisfaction. The coefficient is statistically significant for Cameroon and Senegal when firm fixed effects are included. The association is meaningful, as having a female CEO is associated with an increase in the gender gap in salary satisfaction of 46 percentage points in Cameroon and 35 percentage points in Senegal. This result is consistent with the negative correlation between female managers and women's wages relative to men's (Table 3). The results are very similar when we include occupation fixed effects (Appendix A, Table A5).

## **5.2 Heterogeneity by manager's characteristics**

In this section, we examine how the correlation between female CEO and gender gaps within the firm varies with managers' characteristics such as their tenure in the job and whether they own the firm. Additionally, we estimate the correlation between the fraction of women in middle and senior management and gender gaps within the firm. Due to statistical power limitations and for brevity, we report these results for the pooled sample firm fixed effect specification without controlling for occupational dummies.

One of the main concerns for our estimation strategy is that the negative correlation between female CEOs and the relative outcomes of female employees may reflect reverse causality. For instance, if female employees were performing poorly relative to male employees, the owner of the firm might decide to hire a woman as a CEO with the intention of improving the relative outcomes of female workers. Thus, we would observe a negative correlation even though female CEOs may have the potential to reverse the gender gaps.

To understand whether our results could be exclusively driven by reverse causality, we restrict our analysis to firms where the highest-ranking manager has been working as CEO for at least two years. The rationale is that, even if a female CEO was hired *as a consequence* of large gender gaps, in two years she would have had enough time to try to reverse those gender gaps if she wanted to. If that were the case, we would expect the coefficient on the interaction term between female CEO and female employee to become zero or even positive (recall that on average we do not observe any gender gap in our sample). The results are reported in column 2 of Table 8.

For wages, the coefficient becomes slightly smaller and marginally insignificant but it is not statistically different from the baseline result in column 1 (Panel A) of Table 8. Women who work under female CEOs who have been in their position for at least two years tend to work longer hours (Panel C). The estimated correlation between female CEOs and gender gaps in monthly income, job satisfaction, and salary satisfaction does not vary with the CEO's tenure in the firm. Although these results do not allow us to rule out reverse causality with certainty, they suggest that reverse causality is not the only driver of our findings.

Next, we hypothesize that female CEOs may not have enough decision-making power to improve the relative outcomes of female employees. We explore this possibility in column 3 of Table 8, where we test whether the estimated association between a female CEO and gender gaps is different for female CEOs that are also owners of the firm. Interestingly, we find that the estimated negative correlation between a female CEO and the gender gap in wages is significantly attenuated for female CEOs who are also owners (Panel A): the coefficient on the triple interaction term between indicators for female employee, female CEO, and CEO who is also owner is positive, large, and statistically significant. For income, hours, and salary satisfaction, the triple interaction term is positive but insignificant (Panels B, C, and E).

In sum, women working under female CEOs who are also owners are paid as much as their male colleagues. This result suggests that the 'queen bee' syndrome effect of female CEOs on the gender wage gap is driven by female CEOs who do not own the firm. We speculate that female CEOs who own the firm have more power than female CEOs who are not owners, and therefore are able to reduce gender wage gaps for their employees. On the contrary, female CEOs who are not owners may not have enough power to reduce gender wage gaps even if they wanted to.

Finally, it would be interesting to examine the association between the gender of the direct manager and female employees' relative performance within the firm, but our data do not allow us to do so. Instead, we restrict the sample to those employees who are not managers—that is, technicians/supervisors, workers/apprentices, and others—and examine the correlation between the share of women in senior and middle management and gender gaps.<sup>9</sup> Column 4 of Table 8 reveals no meaningful association between the fraction of women among senior and middle managers and gender gaps in wages, income, hours, and job and salary satisfaction. However, the results are not definitive because of the small sample size.

### 5.3 Hierarchical model

As a robustness check, we follow Nordman et al. 2015 and apply a hierarchical model to examine the association between female CEOs and gender gaps within the firm (Bryk and Raudenbush 1992; Meng 2004; Nordman and Wolff 2009). As described by Nordman et al. (2015), this method

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<sup>9</sup> This restriction reduced the sample significantly (from 961 to 384 observations). The results we have presented so far were for a sample of employees that included senior and middle managers. This was the relevant sample because we were looking at the gender of the highest-ranking manager or CEO.

consists of two steps. In the first step, we run regressions with labour market outcomes as dependent variables and worker's characteristics and firm fixed effects as explanatory variables. We run these regressions separately for men and women. The difference between the estimated firm fixed effects in the men's and women's regressions provides an 'estimate of the within firm gender gap' (Nordman et al. 2015: 15). In the second step, we run a regression with the 'estimate of the within firm gender gap' as the dependent variable and numerous firm characteristics as explanatory variables. To apply this method, we need to restrict the sample to firms where at least two female employees and two male employees responded to the employee's questionnaire. This restriction reduces the sample considerably (by about 95 per cent).

The results, which are presented in Table 9, reveal that, in this analysis, the gender of the CEO matters only for workers' satisfaction with their salary. The positive coefficient estimate indicates that a female CEO is associated with a greater gender gap in salary satisfaction, and it is consistent with the results presented in Table 7. The sign of the estimate of the association between a female CEO and wages, hours, and job satisfaction is consistent with the results of the regressions but it is not precisely estimated, possibly because of the small sample size. Overall, the results of the hierarchical model are in line with the estimates obtained using firm fixed effects. However, they should be interpreted with caution due to the small number of observations, which causes low statistical power and may lead to selection issues.

## 6 Discussion and conclusions

This study investigates the association between female leadership, as measured by having a female CEO, and gender gaps within the firm in Cameroon, Côte d'Ivoire, and Senegal. We observe a small negative correlation between a female CEO and the relative labour outcomes of female workers. These findings are consistent with the 'queen bee' syndrome and stand in contrast to recent evidence from developed countries showing that female managers improve outcomes for female employees (Cardoso and Winter-Ebmer 2010; Kunze and Miller 2014; Tate and Yang 2015).

Possible explanations for the 'queen bee' syndrome are that, in male-dominated fields, women in high positions may compete harder against other women and take on masculine traits to fit in with their male counterparts and legitimize their rights to their positions. Another possibility is that 'queen bees' may prevent the advancement of women in lower positions to reduce the number of competitors and facilitate their own career advancement (Johnson and Mathur-Helm 2011).

However, looking at heterogeneity by CEO's characteristics gives a more nuanced picture. Our results indicate that the 'queen bee' syndrome on wages is driven by female CEOs who are not owners of the firm, and female employees in firms where the female CEO is also the owner are paid similarly to their male colleagues. This result suggests that female CEOs who are not owners may not have enough power to improve the relative wages of female employees.

One limitation of this study is the lack of longitudinal data, which are necessary to determine whether female CEOs sort into firms with larger gender gaps. Another caveat is that, by concentrating on the formal sector, we focus on high-skill workers and ignore the gender wage gap among unskilled workers. Despite these limitations, this paper provides a first attempt to analyse the association between the gender of the highest-ranking manager and gender gaps within the firm in sub-Saharan Africa.

As more women join the labour force in sub-Saharan Africa, identifying the factors that contribute to gender gaps is important to reduce gender disparities. In this paper, we focused on a small set of outcomes due to data limitations. A richer data set is needed to study the association between female leaders and other outcomes such as gender differences in promotion rates and the adoption of female-friendly policies (Kunze and Miller 2014; Gagliarducci and Paserman 2015). Future research is needed to pin down the mechanisms through which female CEOs may harm female employees in sub-Saharan Africa.

Finally, the analysis in this paper does not speak to the association between manager's gender and the performance of male employees. Descriptive evidence from Cameroon suggests that female managers may be aggressive toward male employees, who in turn may deliberately undermine the firm's performance (Achtenhagen and Brundin 2016). Future work will explore the effect of female managers on male employees in sub-Saharan Africa.

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## Figures

Figure 1: Female representation within firms

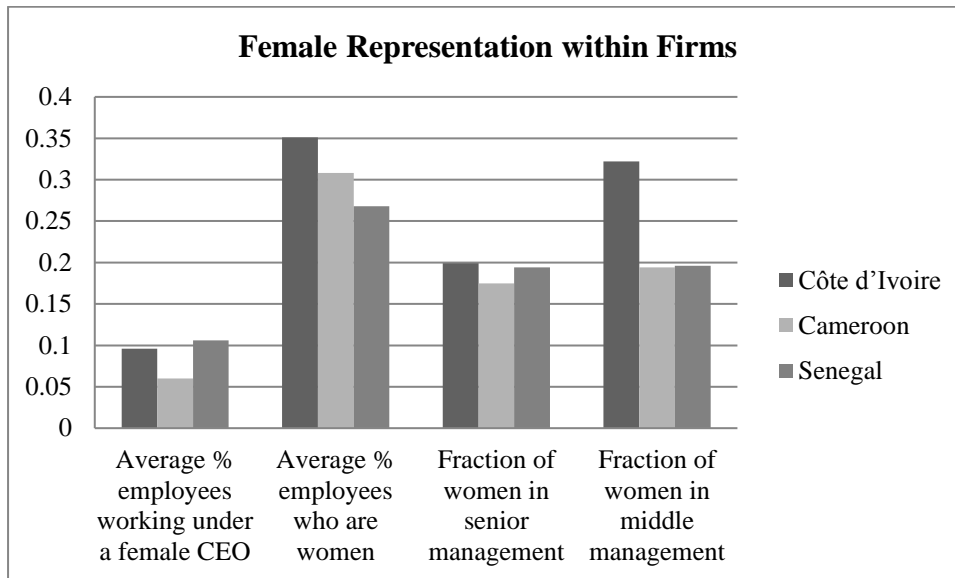


Figure 2a: Hourly wage ('000)

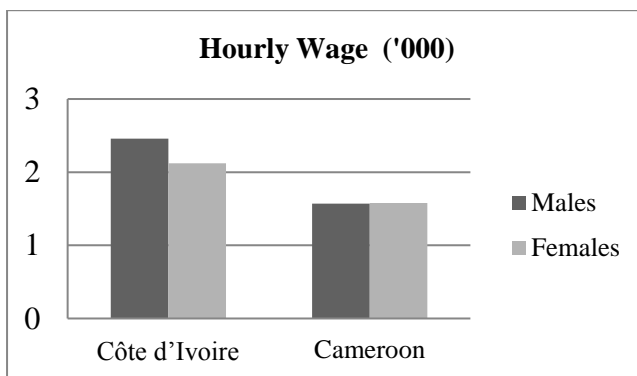


Figure 2b: Monthly income ('000)

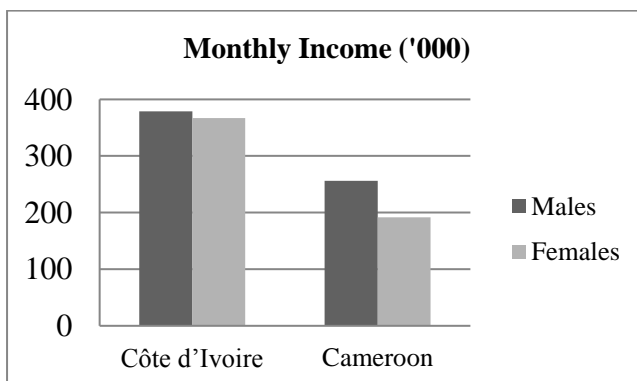


Figure 2c: Hours per week

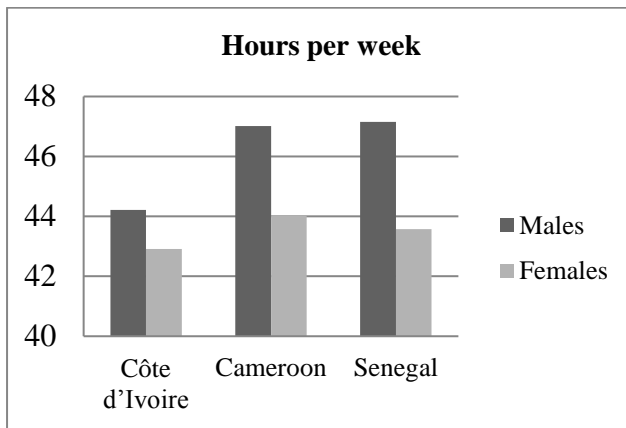


Figure 2d: Job satisfaction

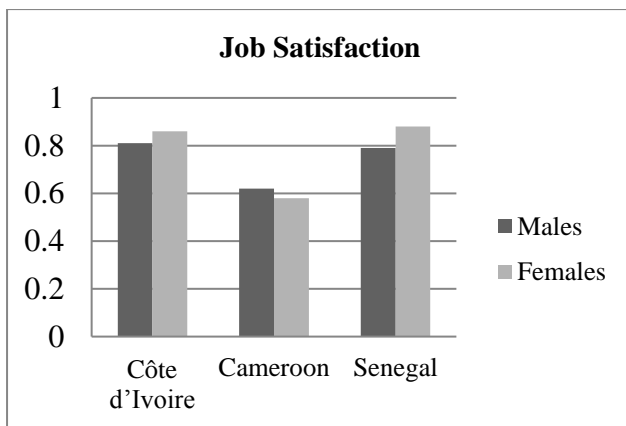
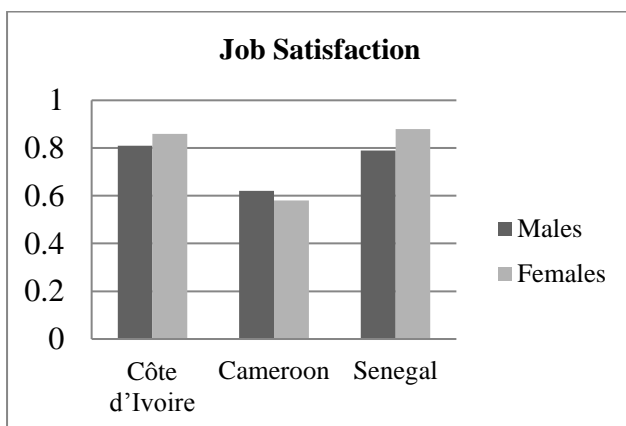


Figure 2e: Salary satisfaction



## Tables

Table 1: Descriptive statistics

	Côte d'Ivoire		Cameroon		Senegal	
	Mean	SD	Mean	SD	Mean	SD
<b>Dependent variables</b>						
<i>Wage ('000)</i>	2.343	7.074	1.57	2.72	n.a.	n.a.
<i>Monthly income ('000)</i>	374.2	1,173.2	236.4	290.9	n.a.	n.a.
<i>Hours worked</i>	44.15	12.10	46.34	12.41	46.28	14.51
<i>Job satisfaction</i>	0.831	0.376	0.608	0.489	0.818	0.386
<i>Salary is good</i>	0.304	0.460	0.217	0.413	0.464	0.499
<b>Explanatory variables</b>						
<i>CEO's characteristics</i>						
Female	0.096	0.296	0.060	0.238	0.106	0.308
Age (years)	47.08	10.12	49.30	9.17	43.17	20.02
Tenure (months)	86.61	85.70	125.3	90.87	132.66	110.21
Has secondary education	0.768	0.423	0.767	0.423	0.653	0.476
Has college education	0.649	0.478	0.687	0.463	0.543	0.498
Is owner	0.677	0.467	0.553	0.497	0.550	0.498
<i>Senior and middle management</i>						
Fraction of women in senior management	0.199	0.273	0.175	0.242	0.194	0.201
Fraction of women in middle management	0.322	0.314	0.194	0.209	0.196	0.238
<i>Employee's characteristics</i>						
Female	0.351	0.478	0.308	0.462	0.268	0.443
Age (years)	36.07	8.28	36.08	8.70	37.30	10.39
Married	0.301	0.450	0.527	0.500	0.677	0.468
Tenure (months)	68.97	83.06	92.21	127.92	93.60	80.44
Has secondary education	0.422	0.494	0.582	0.494	0.375	0.484
Has college education	0.197	0.399	0.036	0.187	0.262	0.440
Occupation: senior manager	0.125	0.331	0.137	0.344	0.121	0.327
Occupation: middle manager	0.235	0.424	0.220	0.414	0.226	0.418
Occupation: technician/supervisor	0.325	0.469	0.315	0.465	0.306	0.461
Occupation: worker/apprentice	0.232	0.423	0.304	0.460	0.338	0.473
Occupation: in other occupations	0.083	0.276	0.024	0.153	0.009	0.094
<b>Firm</b>						
<i>0–5 years old</i>	0.265	0.441	0.061	0.239	0.053	0.230
<i>6–10 years old</i>	0.290	0.454	0.213	0.410	0.309	0.556
<i>11 or more years old</i>	0.445	0.498	0.726	0.446	0.638	0.799
Observations	405		700		705	

Notes: Hourly wage and monthly income are in CFA Francs. Job satisfaction is a binary indicating whether the employee is satisfied with the job. 'Salary good' is a binary indicating whether the employee thinks that his/her salary relative to his/her effort is fair or good.

Table 2: Raw comparison between males and females employees

	Côte d'Ivoire				Cameroon				Senegal			
	Males	Females	Diff-1t	Diff-2t	Males	Females	Diff-1t	Diff-2t	Males	Females	Diff-1t	Diff-2t
Hourly wage ('000)	2.46 (0.46)	2.12 (0.63)	0.33	0.66	1.57 (0.10)	1.58 (0.26)	0.47	0.95	n.a.	n.a.		
Monthly income ('000)	378.81 (69.55)	367.08 (119.85)	0.46	0.93	256.21 (15.66)	191.38 (13.15)	0.01	0.01	n.a.	n.a.		
Hours per week	44.22 (0.76)	42.91 (0.90)	0.14	0.29	47.01 (0.56)	44.02 (0.79)	0.00	0.00	47.15 (0.68)	43.57 (0.81)	0.00	0.00
Job satisfaction	0.81 (0.02)	0.86 (0.03)	0.11	0.22	0.62 (0.02)	0.58 (0.03)	0.14	0.28	0.79 (0.40)	0.88 (0.32)	0.00	0.00
Salary good	0.27 (0.03)	0.37 (0.04)	0.01	0.03	0.21 (0.02)	0.24 (0.03)	0.22	0.44	0.44 (0.02)	0.53 (0.03)	0.01	0.02

Notes: Hourly wage and monthly income are in CFA Francs. Job satisfaction is a binary indicating whether the employee is satisfied with the job. 'Salary good' is a binary indicating whether the employee thinks that his/her salary relative to his/her effort is fair or good. Standard errors are reported in parentheses.

Table 3: Log hourly wages

	Côte d'Ivoire		Cameroon		Senegal	
	OLS	FE	OLS	FE	OLS	FE
Female employee	0.012 (0.1200)	0.091 (0.1114)	-0.052 (0.0675)	-0.051 (0.0718)		
Female CEO	-0.1482 (0.1986)		0.2181 (0.2006)			
Female employee x Female CEO	-0.3627 (0.2866)	-0.2530 (0.2860)	-0.4983* (0.2712)	-0.4419* (0.2318)		
Age	-0.0177 (0.0522)	0.0090 (0.0669)	0.0452** (0.0204)	0.0216 (0.0206)		
Age squared	0.0002 (0.0006)	0.0001 (0.0008)	-0.0003 (0.0002)	-0.0001 (0.0002)		
Married	0.3019* (0.1745)	0.1880 (0.2326)	-0.0928 (0.0748)	0.0104 (0.0738)		
Tenure	0.0006 (0.0018)	-0.0004 (0.0017)	0.0040*** (0.0009)	0.0037*** (0.0010)		
Tenure squared	0.0000* (0.0000)	0.0000 (0.0000)	-0.0000*** (0.0000)	- (0.0000)		
Secondary education	0.5031*** (0.1261)	0.4143** (0.1974)	0.6380*** (0.0791)	0.6380*** (0.0923)		
College education	0.2594** (0.1189)	0.5277 (0.3391)	0.3298** (0.1582)	0.4116** (0.1949)		
CEO's age	0.0442 (0.0359)		0.0790 (0.0564)			
CEO's age squared	-0.0003 (0.0003)		-0.0007 (0.0005)			
CEO's tenure	-0.0020 (0.0026)		-0.0024** (0.0012)			
CEO's tenure squared	0.0000 (0.0000)		0.0000** (0.0000)			
CEO has secondary education	0.3098 (0.2635)		-0.0261 (0.2066)			
CEO has college education	0.0132 (0.1624)		0.4141** (0.1975)			
Constant	5.069*** (1.311)	6.065*** (1.156)	-4.681*** (1.600)	-1.396*** (0.415)		
Observations	348	348	597	613		
# of firms		119		155		
R-squared	0.2675	0.6272	0.4029	0.6945		

Notes: Standard errors in parentheses are robust to clustering at the firm level \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. OLS results control for industry fixed effects and age of the firm. FE results control for firm fixed effects. Hourly wage is measured in CFA francs.

Table 4: Log monthly income

	Côte d'Ivoire		Cameroon		Senegal	
	OLS	FE	OLS	FE	OLS	FE
Female employee	-0.0073 (0.1010)	0.0140 (0.1003)	-0.1592** (0.0633)	-0.1581** (0.0637)		
Female CEO	-0.2367 (0.1666)		0.3195* (0.1925)			
Female employee × Female CEO	-0.0993 (0.2579)	-0.0699 (0.3230)	-0.4445* (0.2495)	-0.2809 (0.2067)		
Age	0.0121 (0.0409)	0.0131 (0.0616)	0.0493*** (0.0181)	0.0417** (0.0180)		
Age squared	-0.0001 (0.0004)	0.0001 (0.0008)	-0.0003* (0.0002)	-0.0003 (0.0002)		
Married	0.2721* (0.1594)	0.2639 (0.2175)	-0.0348 (0.0705)	0.0427 (0.0744)		
Tenure	0.0009 (0.0018)	0.0006 (0.0019)	0.0022*** (0.0008)	0.0015* (0.0008)		
Tenure squared	0.0000 (0.0000)	0.0000 (0.0000)	-0.0000** (0.0000)	-0.0000* (0.0000)		
Secondary education	0.4916*** (0.1192)	0.4626** (0.2010)	0.5990*** (0.0718)	0.5966*** (0.0846)		
College education	0.2424** (0.1208)	0.4332 (0.3462)	0.4137** (0.1627)	0.3489* (0.1914)		
CEO's age	0.0167 (0.0313)		0.0968** (0.0484)			
CEO's age squared	-0.0001 (0.0002)		-0.0009* (0.0005)			
CEO's tenure	-0.0011 (0.0021)		-0.0026** (0.0011)			
CEO's tenure squared	0.0000 (0.0000)		0.0000** (0.0000)			
CEO has secondary education	0.3025 (0.2342)		-0.0426 (0.1646)			
CEO has college education	-0.0157 (0.1324)		0.3145** (0.1558)			
Constant	10.4418*** (1.0438)	11.0724*** (1.0439)	0.4451 (1.3117)	3.4541*** (0.3709)		
Observations	348	348	602	618		
# of firms		119		155		
R-squared	0.2684	0.5794	0.4328	0.7221		

Notes: Standard errors in parentheses are robust to clustering at the firm level \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. OLS results control for industry fixed effects and age of the firm. FE results control for firm fixed effects. Monthly income is measured in CFA francs.

Table 5: Hours

	Côte d'Ivoire		Cameroon		Senegal	
	OLS	FE	OLS	FE	OLS	FE
Female employee	-2.2239 (1.5025)	-4.3738** (1.9045)	-2.7746*** (1.0235)	-2.8772** (1.1714)	-3.1735*** (1.2120)	-2.7090** (1.3720)
Female CEO	-3.8954 (3.6531)		2.1082 (2.1791)		-1.3316 (2.8720)	
Female employee x Female CEO	12.1617*** (2.8757)	9.7430** (4.3981)	-0.2490 (2.3497)	1.2805 (2.5069)	6.6830** (3.1555)	2.7866 (3.6177)
Age	1.4827** (0.5803)	0.6226 (0.5971)	-0.1271 (0.3132)	0.2621 (0.3416)	0.0096 (0.2263)	-0.1093 (0.2836)
Age squared	-0.0168** (0.0071)	-0.0068 (0.0072)	0.0016 (0.0034)	-0.0020 (0.0036)	-0.0003 (0.0019)	0.0012 (0.0027)
Married	-1.4197 (1.6494)	1.4882 (1.8995)	1.3408 (1.1710)	0.6540 (1.4017)	1.2335 (1.1547)	1.1607 (1.3204)
Tenure	-0.0017 (0.0155)	0.0077 (0.0198)	-0.0273** (0.0126)	-0.0451*** (0.0152)	0.0109 (0.0213)	0.0235 (0.0272)
Tenure squared	-0.0000 (0.0000)	-0.0000 (0.0000)	0.0000** (0.0000)	0.0000*** (0.0000)	-0.0000 (0.0000)	-0.0001 (0.0001)
Secondary education	-2.0097 (1.8007)	1.9713 (2.2196)	-1.6886 (1.1277)	-2.2347* (1.3429)	-3.1264* (1.7155)	-4.0735 (2.6116)
College education	0.9137 (1.7363)	-1.4351 (2.3781)	-0.3436 (2.6538)	-1.3143 (3.4643)	-0.5178 (1.8407)	1.5686 (2.4650)
CEO's age	-0.9478** (0.4101)		-0.0401 (0.6162)		0.2291 (0.3741)	
CEO's age squared	0.0066** (0.0031)		0.0001 (0.0059)		-0.0019 (0.0033)	
CEO's tenure	0.0257 (0.0254)		0.0116 (0.0174)		0.0150 (0.0209)	
CEO's tenure squared	-0.0000 (0.0001)		-0.0000 (0.0000)		0.0000 (0.0000)	
CEO has secondary education	-0.4565 (2.8928)		-2.0682 (3.4577)		-3.3181 (2.7505)	
CEO has college education	-1.5752 (2.1737)		-2.2951 (3.2151)		1.5186 (2.3727)	
Constant	46.3443*** (16.2421)	30.7063** (11.8255)	49.2043*** (17.2424)	44.4333*** (6.9455)	41.7286*** (11.5068)	48.2419*** (6.2334)
Observations	405	405	700	717	705	705
# of firms		130		165		266
R-squared	0.1437	0.5880	0.1129	0.4480	0.1365	0.6817

Notes: Standard errors in parentheses are robust to clustering at the firm level \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. OLS results control for industry fixed effects and age of the firm. FE results control for firm fixed effects.

Table 6: Job satisfaction

	Côte d'Ivoire		Cameroon		Senegal	
	OLS	FE	OLS	FE	OLS	FE
Female employee	0.0504 (0.0384)	0.0703 (0.0558)	-0.0538 (0.0408)	-0.0542 (0.0469)	0.0657* (0.0345)	0.0203 (0.0495)
Female CEO	-0.0135 (0.1322)		0.1332* (0.0704)		0.0908* (0.0521)	
Female employee x Female CEO	-0.0765 (0.1024)	-0.1250* (0.0663)	-0.0545 (0.1487)	-0.0776 (0.1685)	-0.0082 (0.0802)	-0.0553 (0.0994)
Age	0.0013 (0.0183)	0.0118 (0.0272)	-0.0201 (0.0126)	-0.0016 (0.0111)	-0.0129** (0.0057)	-0.0064 (0.0106)
Age squared	-0.0000 (0.0002)	-0.0002 (0.0003)	0.0002 (0.0002)	-0.0000 (0.0001)	0.0001*** (0.0000)	0.0001 (0.0001)
Married	-0.0194 (0.0496)	0.0439 (0.0681)	0.0482 (0.0410)	-0.0030 (0.0471)	0.0264 (0.0340)	0.0157 (0.0513)
Tenure	-0.0012* (0.0006)	-0.0008 (0.0008)	0.0014*** (0.0004)	0.0010* (0.0006)	-0.0011** (0.0005)	-0.0008 (0.0008)
Tenure squared	0.0000* (0.0000)	0.0000 (0.0000)	-0.0000** (0.0000)	-0.0000 (0.0000)	0.0000*** (0.0000)	0.0000 (0.0000)
Secondary education	-0.0551 (0.0508)	-0.0360 (0.0847)	0.1143** (0.0498)	0.0706 (0.0587)	0.1314*** (0.0388)	0.1289* (0.0763)
College education	-0.0527 (0.0559)	-0.0707 (0.0803)	0.1137 (0.1083)	-0.0443 (0.1289)	-0.1136*** (0.0417)	-0.0894 (0.0690)
CEO's age	0.0172* (0.0091)		-0.0209 (0.0242)		-0.0104 (0.0115)	
CEO's age squared	-0.0001 (0.0001)		0.0001 (0.0002)		0.0001 (0.0001)	
CEO's tenure	0.0007 (0.0007)		-0.0006 (0.0007)		0.0008* (0.0004)	
CEO's tenure squared	-0.0000* (0.0000)		0.0000 (0.0000)		-0.0000 (0.0000)	
CEO has secondary education	-0.0874 (0.0856)		0.0177 (0.1410)		0.0737 (0.0583)	
CEO has college education	0.1154 (0.0747)		0.0688 (0.1288)		0.0075 (0.0508)	
Constant	0.3770 (0.4383)	0.7372 (0.5192)	1.6756*** (0.6368)	0.5809** (0.2340)	1.2450*** (0.2940)	0.9299*** (0.2308)
Observations	399	399	696	713	718	718
# of firms		129		165		267
R-squared	0.1079	0.4702	0.1199	0.4679	0.0873	0.5283

Notes: Standard errors in parentheses are robust to clustering at the firm level \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 OLS results control for industry fixed effects and age of the firm. FE results control for firm fixed effects. Job satisfaction is a binary indicating whether the employee is satisfied with the job.



Table 7: Salary good

	Côte d'Ivoire		Cameroon		Senegal	
	OLS	FE	OLS	FE	OLS	FE
Female employee	0.1287** (0.0552)	0.0387 (0.0785)	0.0549 (0.0406)	0.0831 (0.0514)	0.1133** (0.0461)	0.0426 (0.0589)
Female CEO	0.1230 (0.1444)		0.2523* (0.1398)		0.1362 (0.0914)	
Female employee x Female CEO	-0.0916 (0.2213)	-0.0470 (0.2638)	-0.2561 (0.2295)	-0.4598* (0.2478)	-0.3945*** (0.1365)	-0.3460* (0.1777)
Age	0.0090 (0.0219)	0.0088 (0.0302)	-0.0214* (0.0121)	-0.0042 (0.0109)	-0.0137 (0.0093)	-0.0180 (0.0111)
Age squared	-0.0001 (0.0003)	-0.0001 (0.0004)	0.0002 (0.0001)	0.0001 (0.0001)	0.0001 (0.0001)	0.0001 (0.0001)
Married	-0.0128 (0.0606)	0.0678 (0.0683)	0.0552 (0.0361)	0.0292 (0.0418)	0.1033** (0.0486)	0.1317** (0.0666)
Tenure	-0.0003 (0.0007)	0.0002 (0.0011)	0.0004 (0.0005)	-0.0001 (0.0005)	-0.0015* (0.0008)	-0.0021* (0.0011)
Tenure squared	-0.0000 (0.0000)	-0.0000 (0.0000)	-0.0000 (0.0000)	0.0000 (0.0000)	0.0000* (0.0000)	0.0000* (0.0000)
Secondary education	0.0853 (0.0719)	0.0832 (0.0833)	0.0143 (0.0389)	0.0092 (0.0518)	-0.0638 (0.0607)	-0.0437 (0.0840)
College education	-0.1667** (0.0835)	-0.0867 (0.1072)	-0.0260 (0.0963)	-0.1452 (0.1293)	0.0663 (0.0708)	0.1144 (0.0953)
CEO's age	0.0000 (0.0134)		-0.0224 (0.0160)		-0.0170 (0.0140)	
CEO's age squared	-0.0000 (0.0001)		0.0002 (0.0002)		0.0002 (0.0001)	
CEO's tenure	0.0001 (0.0009)		0.0003 (0.0007)		0.0001 (0.0006)	
CEO's tenure squared	-0.0000 (0.0000)		-0.0000 (0.0000)		0.0000 (0.0000)	
CEO has secondary education	-0.0517 (0.1255)		0.0212 (0.1215)		0.0903 (0.0858)	
CEO has college education	0.0104 (0.1024)		0.0371 (0.1149)		-0.0079 (0.0772)	
Constant	0.0915 (0.6536)	0.0986 (0.5855)	1.1243** (0.4385)	0.2623 (0.2353)	1.1355*** (0.3724)	0.9243*** (0.2592)
Observations	399	399	565	577	713	713
# of firms		130		148		267
R-squared	0.0912	0.5397	0.0564	0.4433	0.0887	0.5835

Notes: Standard errors in parentheses are robust to clustering at the firm level \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. OLS results control for industry fixed effects and age of the firm. FE results control for firm fixed effects. 'Salary good' is a binary indicating whether the employee thinks that his/her salary relative to his/her effort is fair or good.

Table 8 Additional results: manager's tenure, ownership, and share of women in upper and middle management

Specification	Baseline	Long tenure	Ownership	Female share managers
Dependent variable			A: Log wages	
Female employee	0.0025 (0.0621)	0.0006 (0.0676)	0.0594 (0.0953)	0.2168* (0.1293)
Female employee × Female CEO	-0.3311* (0.1750)	-0.2460 (0.1795)	-0.8388*** (0.2613)	-0.6570** (0.2982)
Female employee × CEO is owner			-0.1029 (0.1204)	
Female employee × CEO is owner × Female CEO			0.6145** (0.3012)	
Female employee × Female share upper managers				0.0185 (0.4541)
Female employee × Female share middle managers				-0.4930 (0.5732)
Observations	961	796	961	384
R-squared	0.9705	0.9695	0.9705	0.9825
Dependent variable			B: Log monthly income	
Female employee	-0.0982* (0.0557)	-0.1075* (0.0627)	-0.1122 (0.0810)	0.1025 (0.1196)
Female employee × Female CEO	-0.1396 (0.1856)	-0.0322 (0.1958)	-0.5113* (0.2947)	-0.5329** (0.2288)
Female employee × CEO is owner			0.0262 (0.1078)	
Female employee × CEO is owner × Female CEO			0.4110 (0.3390)	
Female employee × Female share upper managers				0.3203 (0.5202)
Female employee × Female share middle managers				-0.8961 (0.7020)
Observations	966	801	966	388
R-squared	0.9747	0.9729	0.9747	0.9859
Dependent variable			C: Hours	
Female employee	-2.9432*** (0.8155)	-2.6166*** (0.8913)	-3.3629** (1.3887)	-2.9267 (1.9627)
Female employee × Female CEO	3.6874* (2.2023)	5.1128** (2.3323)	3.5412 (4.1715)	3.9496 (2.7232)
Female employee × CEO is owner			0.7124 (1.6308)	
Female employee × CEO is owner × Female CEO			0.0348 (4.9089)	
Female employee × Female share upper managers				-1.2695 (4.8543)
Female employee × Female share middle managers				3.5352 (7.3722)
Observations	1,827	1,534	1,827	624
R-squared	0.5809	0.5761	0.5810	0.6747

(cont.)

Table 8 (continues)

Specification	Baseline	Long tenure	Ownership	Female share managers
<b>Dependent variable</b>				
<b>D: Job satisfaction</b>				
Female employee	0.0007 (0.0294)	-0.0039 (0.0318)	0.0170 (0.0459)	-0.0121 (0.0865)
Female employee × Female CEO	-0.0616 (0.0706)	-0.0767 (0.0862)	0.0471 (0.1046)	0.0746 (0.2418)
Female employee × CEO is owner			-0.0280 (0.0596)	
Female employee × CEO is owner × Female CEO			-0.1418 (0.1350)	
Female employee × Female share upper managers				-0.1195 (0.2322)
Female employee × Female share middle managers				-0.0733 (0.2342)
Observations	1,830	1,537	1,830	621
R-squared	0.5088	0.5142	0.5093	0.6010
<b>Dependent variable</b>				
<b>E: Salary good</b>				
Female employee	0.0601* (0.0351)	0.0308 (0.0377)	0.0906* (0.0539)	-0.0003 (0.0889)
Female employee × Female CEO	-0.3082** (0.1305)	-0.2850* (0.1477)	-0.3314 (0.2086)	-0.4197 (0.3456)
Female employee × CEO is owner			-0.0526 (0.0696)	
Female employee × CEO is owner × Female CEO			0.0435 (0.2616)	
Female employee × Female share upper managers				0.0552 (0.4051)
Female employee × Female share middle managers				0.2800 (0.3365)
Observations	1,689	1,414	549	384
R-squared	0.5490	0.5592	0.6001	0.9825

Notes: Standard errors in parentheses are robust to clustering at the firm level \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. All regressions control for firm fixed effects. 'Salary good' is a binary indicating whether the employee thinks that his/her salary relative to his/her effort is fair or good. The sample includes firms from Côte d'Ivoire, Cameroon, and Senegal (pooled sample).

Table 9: Hierarchical model

Dependent variables	Log wages	Log income	Hours	Job satisfaction	Salary satisfaction
Female CEO	0.0141 (0.3026)	-0.0947 (0.2706)	-0.7249 (5.4932)	0.1239 (0.1563)	0.4398** (0.2120)
CEO is owner	0.3871** (0.1846)	0.1606 (0.1629)	-2.0791 (2.9114)	0.0090 (0.0840)	-0.0228 (0.1426)
Age	0.0009 (0.0038)	0.0103*** (0.0033)	0.1425** (0.0562)	0.0021 (0.0017)	0.0018 (0.0027)
Tenure	-0.0006 (0.0010)	-0.0009 (0.0009)	0.0067 (0.0125)	-0.0002 (0.0004)	0.0003 (0.0006)
Secondary education	0.3211 (0.3365)	0.0370 (0.3023)	-2.7372 (4.9345)	0.0799 (0.1424)	-0.1368 (0.2330)
College education	-0.1662 (0.3194)	-0.3144 (0.2860)	1.8207 (4.6372)	-0.0555 (0.1337)	0.1252 (0.2274)
Constant	-0.2934 (0.3188)	-0.2779 (0.2865)	-4.1053 (5.1178)	-0.0810 (0.1510)	-0.1920 (0.2329)
Observations	57	58	95	94	76
R-squared	0.1517	0.2900	0.0878	0.0658	0.0720

Notes: Standard errors in parentheses \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . The dependent variable is the difference between the estimated firm fixed effects in the men's regression and the women's regression. The explanatory variables refer to manager's characteristics. Controls include country dummies. The sample includes firms from Côte d'Ivoire, Cameroon, and Senegal (pooled sample).

## Appendix A

Table A1: Log hourly wages

	Côte d'Ivoire		Cameroon		Senegal	
	OLS	FE	OLS	FE	OLS	FE
Female employee	-0.0202 (0.1139)	0.1224 (0.1167)	-0.0643 (0.0632)	-0.0509 (0.0634)		
Female CEO	-0.0847 (0.2096)		0.1494 (0.1708)			
Female employee x Female CEO	-0.3476 (0.2751)	-0.2549 (0.3053)	-0.2676 (0.2552)	-0.1941 (0.2271)		
Age	-0.0075 (0.0521)	0.0124 (0.0719)	0.0374** (0.0164)	0.0154 (0.0168)		
Age squared	0.0001 (0.0006)	0.0001 (0.0009)	-0.0003* (0.0002)	-0.0001 (0.0002)		
Married	0.2870 (0.1931)	0.1559 (0.2518)	-0.0937 (0.0669)	-0.0055 (0.0654)		
Tenure	0.0008 (0.0018)	-0.0003 (0.0015)	0.0030*** (0.0009)	0.0028*** (0.0010)		
Tenure squared	0.0000* (0.0000)	0.0000* (0.0000)	-0.0000*** (0.0000)	-0.0000*** (0.0000)		
Secondary education	0.3904** (0.1775)	0.3508 (0.2934)	0.2538*** (0.0844)	0.2303** (0.0972)		
College education	0.2826* (0.1675)	0.4958 (0.3858)	0.1095 (0.1368)	0.2551 (0.1710)		
Age of the CEO	0.0494 (0.0335)		0.0127 (0.0518)			
Age of the CEO squared	-0.0004 (0.0003)		-0.0001 (0.0005)			
Tenure of the CEO	-0.0023 (0.0026)		-0.0027** (0.0012)			
Tenure of the CEO squared	0.0000 (0.0000)		0.0000** (0.0000)			
CEO has secondary education	0.2321 (0.2524)		0.0588 (0.1798)			
CEO has college education	0.0350 (0.1574)		0.2919* (0.1744)			
Constant	4.773*** (1.331)	6.831*** (1.432)	-2.496 (1.582)	-0.547 (0.708)		
Observations	348	348	597	613		
# of firms		119		155		
R-squared	0.2787	0.6321	0.5236	0.7535		

Notes: Standard errors in parentheses are robust to clustering at the firm level \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. OLS results control for industry fixed effects and age of the firm. FE results control for firm fixed effects. Both OLS and FE results control for occupation fixed effects.

Table A2: Log monthly income

	Côte d'Ivoire		Cameroon		Senegal	
	OLS	FE	OLS	FE	OLS	FE
Female employee	-0.0106 (0.0969)	0.0505 (0.1131)	-0.1674*** (0.0620)	-0.1501*** (0.0575)		
Female CEO	-0.2148 (0.1778)		0.2610 (0.1700)			
Female employee × Female CEO	-0.0885 (0.2570)	-0.0667 (0.3558)	-0.1696 (0.2188)	-0.0509 (0.1984)		
Age	0.0168 (0.0407)	0.0169 (0.0665)	0.0443*** (0.0139)	0.0360*** (0.0138)		
Age squared	-0.0001 (0.0004)	-0.0000 (0.0009)	-0.0003** (0.0002)	-0.0003* (0.0001)		
Married	0.2598 (0.1747)	0.2305 (0.2336)	-0.0370 (0.0617)	0.0271 (0.0627)		
Tenure	0.0009 (0.0018)	0.0006 (0.0018)	0.0014* (0.0008)	0.0007 (0.0008)		
Tenure squared	0.0000 (0.0000)	0.0000 (0.0000)	-0.0000* (0.0000)	-0.0000 (0.0000)		
Secondary education	0.4018** (0.1641)	0.4038 (0.2824)	0.2523*** (0.0705)	0.2141*** (0.0691)		
College education	0.2324 (0.1624)	0.3617 (0.3918)	0.1690 (0.1465)	0.1912 (0.1688)		
Age of the CEO	0.0214 (0.0297)		0.0427 (0.0482)			
Age of the CEO squared	-0.0002 (0.0002)		-0.0004 (0.0005)			
Tenure of the CEO	-0.0010 (0.0021)		-0.0026** (0.0011)			
Tenure of the CEO squared	0.0000 (0.0000)		0.0000** (0.0000)			
CEO has secondary education	0.2897 (0.2251)		0.0298 (0.1501)			
CEO has college education	-0.0363 (0.1294)		0.2163 (0.1453)			
Constant	9.9482*** (1.0101)	11.1568*** (1.1737)	1.9290 (1.3011)	3.7220*** (0.4511)		
Observations	348	348	602	618		
# of firms		119		155		
R-squared	0.2756	0.5846	0.5561	0.791		

Notes: Standard errors in parentheses are robust to clustering at the firm level \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. OLS results control for industry fixed effects and age of the firm. FE results control for firm fixed effects. Both OLS and FE results control for occupation fixed effects.

Table A3: Hours

	Côte d'Ivoire		Cameroon		Senegal	
	OLS	FE	OLS	FE	OLS	FE
Female employee	-1.2402 (1.4266)	-3.8895** (1.8673)	-2.5825** (1.0474)	-2.6941** (1.1933)	-3.0464** (1.2815)	-2.4935* (1.4350)
Female CEO	-5.2304 (3.5005)		2.4149 (2.2377)		-1.2939 (2.8951)	
Female employee x Female CEO	11.8654*** (2.9519)	9.4336** (4.4995)	-0.7035 (2.5671)	0.8413 (2.9078)	6.5356** (3.1313)	2.7281 (3.3924)
Age	1.2910** (0.5550)	0.6158 (0.6177)	-0.0585 (0.3044)	0.3206 (0.3243)	-0.0312 (0.2330)	-0.1419 (0.2931)
Age squared	-0.0145** (0.0067)	-0.0069 (0.0074)	0.0012 (0.0033)	-0.0025 (0.0034)	0.0001 (0.0019)	0.0015 (0.0027)
Married	-1.4382 (1.6580)	1.3463 (1.9439)	1.3927 (1.1629)	0.7094 (1.3870)	1.1990 (1.1592)	1.1303 (1.3264)
Tenure	-0.0078 (0.0151)	0.0048 (0.0190)	-0.0259** (0.0130)	-0.0454*** (0.0163)	0.0109 (0.0213)	0.0230 (0.0273)
Tenure squared	-0.0000 (0.0000)	-0.0000 (0.0000)	0.0000* (0.0000)	0.0000*** (0.0000)	-0.0000 (0.0000)	-0.0001 (0.0001)
Secondary education	-1.2499 (1.9366)	2.1896 (2.5564)	0.1391 (1.1122)	-0.7836 (1.2627)	-3.3863** (1.7047)	-4.1312 (2.5917)
College education	-0.4684 (1.7989)	-2.5861 (2.4023)	-0.2560 (2.8241)	-2.1063 (3.7676)	-1.1655 (2.0305)	0.5990 (2.6823)
Age of the CEO	-0.9075** (0.4310)		0.2306 (0.6300)		0.2622 (0.3699)	
Age of the CEO squared	0.0064* (0.0033)		-0.0027 (0.0060)		-0.0023 (0.0033)	
Tenure of the CEO	0.0351 (0.0246)		0.0125 (0.0173)		0.0139 (0.0208)	
Tenure of the CEO squared	-0.0000 (0.0001)		-0.0000 (0.0000)		0.0000 (0.0000)	
CEO has secondary education	1.2455 (2.9245)		-2.2653 (3.3554)		-3.3971 (2.7457)	
CEO has college education	-2.4427 (2.2450)		-2.0429 (3.1171)		1.6080 (2.3723)	
Constant	43.6573** (17.7481)	20.9729 (15.5496)	33.1661* (18.1230)	34.1323*** (11.3222)	39.0200*** (11.7904)	51.1609*** (7.3019)
Observations	405	405	700	717	705	705
# of firms		130		165		266
R-squared	0.1841	0.5966	0.1325	0.4609	0.1382	0.6835

Notes: Standard errors in parentheses are robust to clustering at the firm level \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. OLS results control for industry fixed effects and age of the firm. FE results control for firm fixed effects. Both OLS and FE results control for occupation fixed effects.

Table A4: Job satisfaction

	Côte d'Ivoire		Cameroon		Senegal	
	OLS	FE	OLS	FE	OLS	FE
Female employee	0.0645 (0.0427)	0.0687 (0.0560)	-0.0542 (0.0403)	-0.0535 (0.0469)	0.0738** (0.0340)	0.0167 (0.0511)
Female CEO	-0.0304 (0.1343)		0.1167* (0.0683)		0.0978* (0.0542)	
Female employee × Female CEO	-0.0844 (0.1050)	-0.1382** (0.0693)	-0.0023 (0.1471)	-0.0242 (0.1684)	-0.0164 (0.0788)	-0.0600 (0.0958)
Age	-0.0004 (0.0190)	0.0128 (0.0269)	-0.0213* (0.0119)	-0.0027 (0.0110)	-0.0159*** (0.0060)	-0.0075 (0.0106)
Age squared	-0.0000 (0.0002)	-0.0002 (0.0003)	0.0002 (0.0001)	-0.0000 (0.0001)	0.0002*** (0.0000)	0.0001 (0.0001)
Married	-0.0184 (0.0510)	0.0459 (0.0699)	0.0476 (0.0407)	-0.0061 (0.0472)	0.0232 (0.0336)	0.0139 (0.0505)
Tenure	-0.0012* (0.0006)	-0.0008 (0.0009)	0.0012*** (0.0004)	0.0008 (0.0006)	-0.0011** (0.0005)	-0.0008 (0.0008)
Tenure squared	0.0000* (0.0000)	0.0000 (0.0000)	-0.0000** (0.0000)	-0.0000 (0.0000)	0.0000*** (0.0000)	0.0000 (0.0000)
Secondary education	-0.0500 (0.0565)	-0.0774 (0.0943)	0.0599 (0.0561)	-0.0172 (0.0676)	0.1055** (0.0437)	0.0968 (0.0774)
College education	-0.0538 (0.0570)	-0.0418 (0.0792)	0.0542 (0.1104)	-0.0949 (0.1310)	-0.1612*** (0.0463)	-0.1097 (0.0721)
Age of the CEO	0.0184** (0.0090)		-0.0286 (0.0240)		-0.0080 (0.0114)	
Age of the CEO squared	-0.0001* (0.0001)		0.0002 (0.0002)		0.0000 (0.0001)	
Tenure of the CEO	0.0009 (0.0007)		-0.0006 (0.0007)		0.0007 (0.0005)	
Tenure of the CEO squared	-0.0000* (0.0000)		0.0000 (0.0000)		-0.0000 (0.0000)	
CEO has secondary education	-0.0687 (0.0876)		0.0279 (0.1423)		0.0682 (0.0577)	
CEO has college education	0.0941 (0.0764)		0.0516 (0.1301)		0.0125 (0.0500)	
Constant	0.1728 (0.4841)	0.6615 (0.5164)	1.7153*** (0.6242)	0.5936** (0.2851)	1.2993*** (0.3244)	0.8735*** (0.2724)
Observations	399	399	696	713	718	718
# of firms		129		165		267
R-squared	0.1167	0.4812	0.1357	0.4813	0.0964	0.5353

Notes: Standard errors in parentheses are robust to clustering at the firm level \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. OLS results control for industry fixed effects and age of the firm. FE results control for firm fixed effects. Both OLS and FE results control for occupation fixed effects.



Table A5: Salary good

	CIV		Cameroon		Senegal	
	OLS	FE	OLS	FE	OLS	FE
Female employee	0.1334** (0.0563)	0.0517 (0.0772)	0.0632 (0.0400)	0.0911* (0.0506)	0.1248*** (0.0464)	0.0566 (0.0583)
Female CEO	0.1164 (0.1496)		0.2349* (0.1397)		0.1375 (0.0926)	
Female employee x Female CEO	-0.0934 (0.2216)	-0.0466 (0.2695)	-0.2060 (0.2255)	-0.4315* (0.2488)	-0.4038*** (0.1402)	-0.3597* (0.1829)
Age	0.0084 (0.0221)	0.0103 (0.0311)	-0.0220* (0.0115)	-0.0040 (0.0107)	-0.0151 (0.0093)	-0.0176 (0.0108)
Age squared	-0.0001 (0.0003)	-0.0001 (0.0004)	0.0002* (0.0001)	0.0001 (0.0001)	0.0001 (0.0001)	0.0001 (0.0001)
Married	-0.0124 (0.0609)	0.0597 (0.0655)	0.0590 (0.0360)	0.0333 (0.0419)	0.1006** (0.0490)	0.1324* (0.0674)
Tenure	-0.0004 (0.0007)	0.0001 (0.0011)	0.0002 (0.0005)	-0.0003 (0.0006)	-0.0015** (0.0008)	-0.0021* (0.0011)
Tenure squared	-0.0000 (0.0000)	-0.0000 (0.0000)	-0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000* (0.0000)
Secondary education	0.0872 (0.0755)	0.0797 (0.0943)	-0.0239 (0.0455)	-0.0343 (0.0585)	-0.0713 (0.0638)	-0.0587 (0.0850)
College education	-0.1682* (0.0857)	-0.1178 (0.1126)	-0.0984 (0.0935)	-0.1768 (0.1299)	0.0318 (0.0756)	0.0870 (0.0943)
Age of the CEO	0.0005 (0.0135)		-0.0263 (0.0168)		-0.0158 (0.0140)	
Age of the CEO squared	-0.0000 (0.0001)		0.0002 (0.0002)		0.0001 (0.0001)	
Tenure of the CEO	0.0001 (0.0010)		0.0003 (0.0007)		0.0000 (0.0006)	
Tenure of the CEO squared	-0.0000 (0.0000)		-0.0000 (0.0000)		0.0000 (0.0000)	
CEO has secondary education	-0.0452 (0.1292)		0.0476 (0.1244)		0.0873 (0.0854)	
CEO has college education	0.0034 (0.1061)		0.0076 (0.1179)		-0.0026 (0.0770)	
Constant	0.0210 (0.6649)	0.1385 (0.7002)	1.0233** (0.4440)	-0.0396 (0.2955)	1.3653*** (0.4417)	1.2318*** (0.3860)
Observations	399	399	565	577	713	713
# of firms		130		148		267
R-squared	0.0919	0.5442	0.0858	0.4545	0.0925	0.5880

Notes: Standard errors in parentheses are robust to clustering at the firm level \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. OLS results control for industry fixed effects and age of the firm. FE results control for firm fixed effects. Both OLS and FE results control for occupation fixed effects.