

# Replication: WOMEN BUREAUCRATS AND PETTY CORRUPTION. EXPERIMENTAL EVIDENCE FROM GHANA.

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Due: March 31, 2024

## Abstract

More women in the public and private institutions are related or correlated to lowest degree of corruption. Nevertheless, this relationship is thought to be in specific context and the processes that lead to this phenomenon it remains unclear. The author of the original studies has carried out two survey experiments to investigate whether and why end users expect women bureaucrats to be less corrupt in Ghana. The studies have showed that the Ghanaian do not expect the women bureaucrats to be less likely to request for bribes than men.

## EXPLANING THE ORIGINAL STUDY

The study has two main goals:

- To assess the claim that citizens expect women bureaucrats to be less likely to extract bribes than their male counterpart.
- In the context of Ghana where the corruption is understudied despite being a central obstacle to development (Gyimah-Boadi, 2015).
- Second, the study conducted has investigate potential mechanism that could explain a possible relationship (positive or negative) between gender and corruption, therefore the study has detected three mechanisms:
- Women are expected to have inherent or socially induced traits that make them less corrupt
- Women are expected to be less corrupt because they have fewest opportunities to engage in the corruption since the men dominate mostly the top position of hierarchical management

- The women are expected to be less corrupt because they are facing less external financial pressure to support their extended families or kinship groups

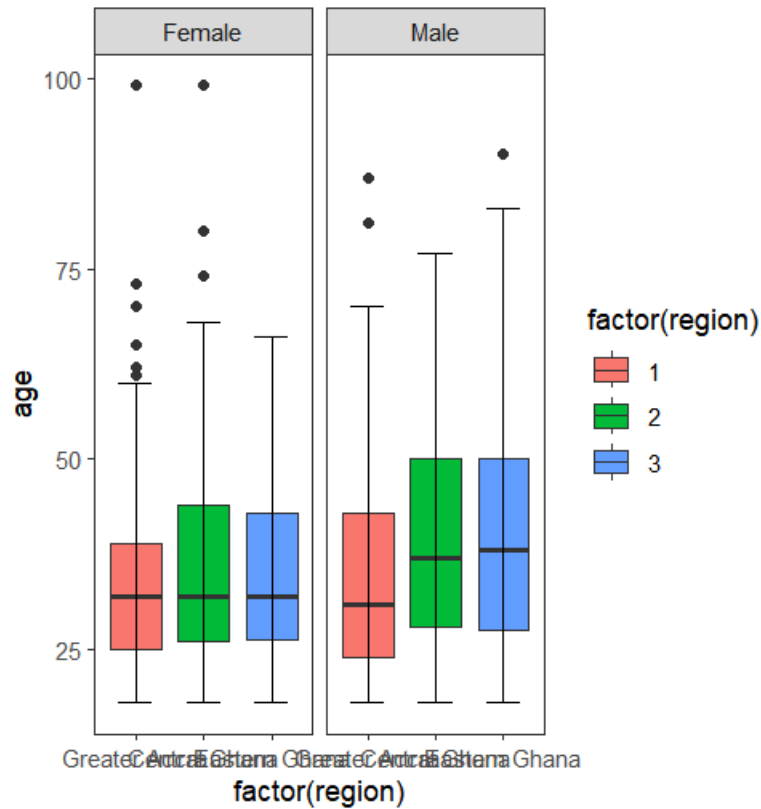
Social pressure to donate to group members is a well-established source of bureaucrat's corruption in developing countries (Ekeh, 1975; Price 1975). The study showed that to measure, it was conducted the enquire among the people that has been asked to pay the bribes to bureaucrats' workers/employees, the data shows that 33% of people that was sampled had paid for the bribe in the previous 12 months. In this particular study the analysis shows the results are consistent because its included mostly the public servant who has experience in receiving bribes.

## Dataset

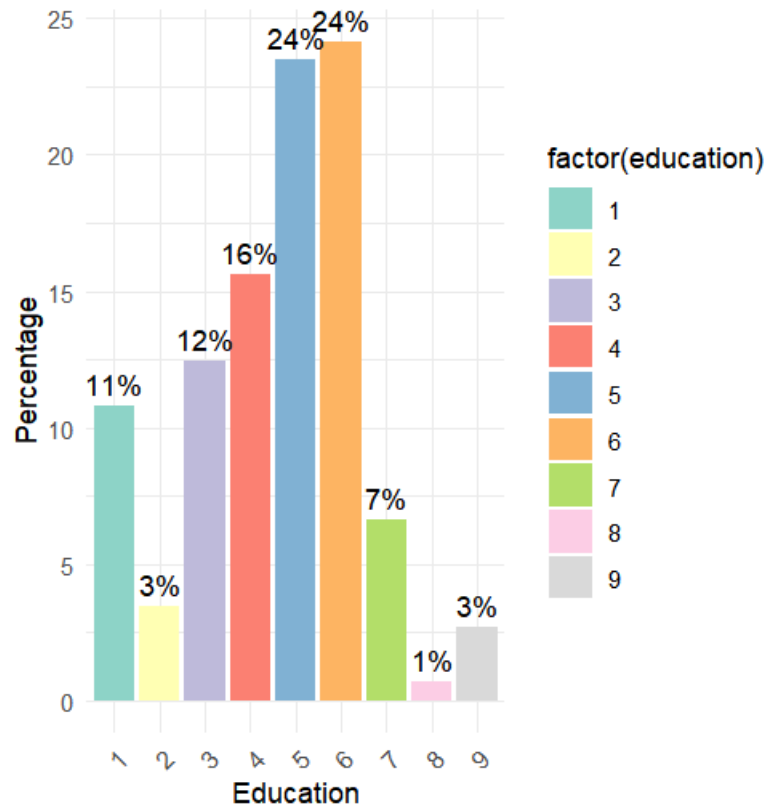
The data set was collected from Ghana by two researchers (Sarah Brierley and Miguel M. Pereira) and publish their study on Harvard Data-verse, the title of their study/articles is: Women Bureaucrats and Petty Corruption Experimental Evidence from Ghana. The data set was collect from September 18th 2017 to October 5th 2017 with 1268 observations/rows and 43 variables/columns. For my personal point of the view the most important variables that could be used to perform statistics regression models and contingency tables are the following: region, sex/gender, marital status, children, religion. I could rise a question such as: What is the relationship of public servant been a Christian, Married having a children but he is engaging in the petty corruption (bribe) soliciting to the public for providing the state services (i.e., renewal of driving licence, passport, etc)

## My Contribution

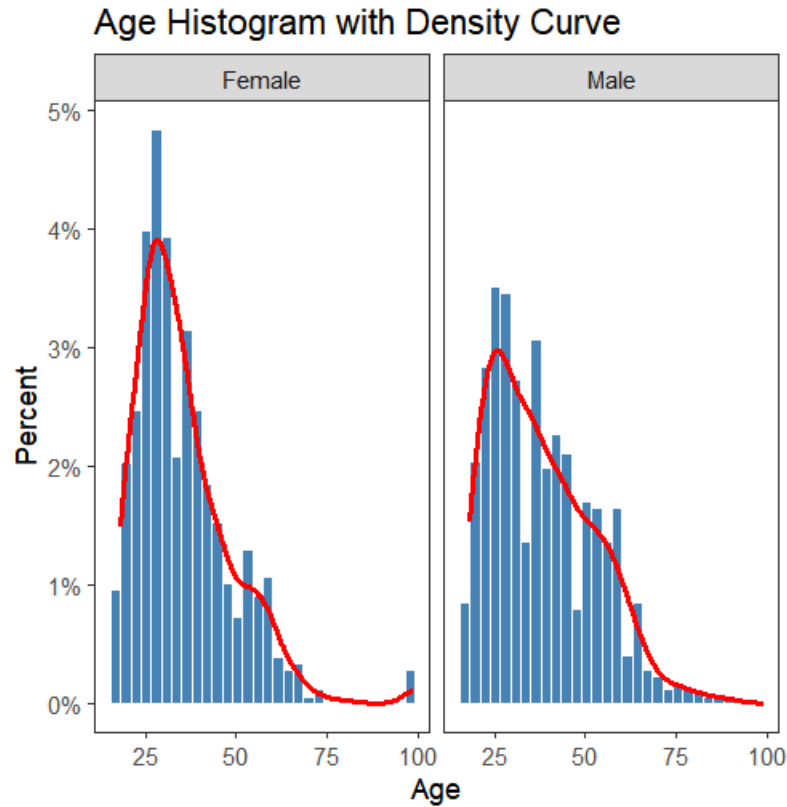
By analysing the dataset especially finding the relationship among variables of interest I have decided performing some data visualization using box plot by considering the following variables: x=region that is categorical variable that have three component/factors: Greater Accra, Central Ghana and Eastern Ghana and y=age (continuous variables) and I have applied the facet wrap for sex (female and male ) this will allow me to visualize and analyse data, from the box plot I can conclude that female living in Greater Accra with average 30 year old are less likely to be corrupt comparing to their male counterpart of the same age living and working at the same region (Greater Accra) . In all three regions from Ghana that come in the dataset showing that the women are less likely to solicit bribe from users of the State Services provider from Ghana.



On the other hand I have decided to plot a bar plot choosing the variable education. I have found that public servant that are most likely to ask for bribe are those who have education levels 5th and 6th both with 24% expected to solicit a bribe from public. On the other hand the bar plot showed that the public servant with highest level of the education (7th, 8th and 9th) are less likely to solicit a bribe.



To finalize data visualization I have selecting the histogram with the density curve by choosing the variable age and facet wrap sex(female and male) in order to compare the distribution between female and male, I have found that both showing the density curve skewed to the right.



## 1 My Contribution in Term of Statistical Analysis Modelling

In term of statistical regression modelling I have decided to choose ordered and unordered Multinomial Logistic regression model by choosing the response variable region with reference category Greater Accra.

The research question is the following: How do factors such as gender, religion and number of the children influence the likelihood of bureaucrats public servant residing and working in regions other than Greater Accra in Ghana are most likely to solicit a bribe from the public?

```

1 # Performing an ordered Multinomial logistic regression where the response
  variable is region and reference category is
2 # "Greater Accra"
3 pc$region <- relevel(pc$region, ref="Greater Accra")
4 #
5 ## (a) Perform an ordered (proportional odds) logistic regression
6 #
7 multinom_ordered_replic <- polr(region ~ sex + married + children + christ,
  data = pc, Hess = TRUE)
8 summary(multinom_ordered_replic)
9 ##
10 ### Answer:
11 #Call:

```

Table 1: Coefficients and Intercepts

Variable	Value	Std. Error	t value
sexMan	0.03533	0.10399	0.3397
marriedMarried	0.38971	0.11342	3.4358
children	0.01656	0.01594	1.0392
christChristian	0.71835	0.17909	4.0112

Intercepts	Value	Std. Error	t value
Greater Accra—Central Ghana	0.3664	0.1971	1.8587
Central Ghana—Eastern Ghana	1.7058	0.2028	8.4106

Table 2: Model Summary

<b>Residual Deviance:</b>	2749.378
<b>AIC:</b>	2761.378

```

1 # My Method of calculating p-value:
2
3 ctable3 <- coef(summary(multinom_ordered_replic)) # Extract coefficient
  summary
4 p <- 2 * (1 - pnorm(abs(ctable3[, "t value"]))) # Calculate the p-value
5 ctable3 <- cbind(ctable3, "p-value" = p) ## Combine coefficient summary and p-
  values
6 print(ctable3) # Print the results

```

Since all p-values of the coefficients estimates/predicted are very small ( $p\text{-value} < 0.05$ ) than the coefficients estimated are statistically significant.

```

1 # Calculate confidence intervals
2 (ci <- confint(multinom_ordered_replic))
3 ## Answer:

```

Table 3: Regression Coefficients and Intercept

Variable	Value	Std. Error	t value	p-value
sexMan	0.03533	0.10399	0.33972	$7.340711 \times 10^{-1}$
marriedMarried	0.38971	0.11342	3.43585	$5.907084 \times 10^{-4}$
children	0.01656	0.01594	1.03923	$2.986996 \times 10^{-1}$
christChristian	0.71835	0.17909	4.01120	$6.041017 \times 10^{-5}$
Intercepts				
Greater Accra Central Ghana	0.36641	0.19713	1.85873	$6.306539 \times 10^{-2}$
Central Ghana Eastern Ghana	1.70582	0.20282	8.41064	$0.000000 \times 10^{-0}$

Table 4: 95% Confidence Intervals

Variable	2.5%	97.5%
sexMan	-0.1685	0.2392
marriedMarried	0.1671	0.6120
children	-0.0126	0.0500
christChristian	0.3701	1.0731

Convert to odds ration  $\exp(\text{cbind}(\text{OR}=\text{coef}(\text{multinom}_{ordered\_replic}), ci))$

Table 5: Odds Ratios and 95% Confidence Intervals

Variable	OR	2.5%	97.5%
sexMan	1.035959	0.8449455	1.270285
marriedMarried	1.476552	1.1818669	1.844066
children	1.016698	0.9875200	1.051272
christChristian	2.051051	1.4478367	2.924500

```

1 # Performing an un-ordered Multinomial logistic regression where the response
  variable is region and reference category is
2 # "Greater Accra"
3 ##
4 # Run the model:
5
6 multinom_unordered_replic <- multinom(region ~ sex + married + children +
  christ, data = pc)
7 ## Answer:
8 ## weights: 18 (10 variable)
9 #initial value 1393.040382
10 #iter 10 value 1372.307421
11 #final value 1369.869609
12 #converged
13 #####
14 ##
15 summary(multinom_unordered_replic)

```

Table 6: Coefficients and Standard Errors					
Region	(Intercept)	sexMan	marriedMarried	children	christChristian
Central Ghana	-1.223695	0.08455734	0.5397034	0.03295569	0.7281511
Eastern Ghana	-1.269220	0.06643425	0.4744520	0.02588328	0.8771846
<b>Std. Errors</b>					
Central Ghana	0.2545010	0.1391078	0.1520061	0.02288734	0.2282220
Eastern Ghana	0.2610204	0.1382507	0.1509181	0.02326092	0.2365248
<b>Residual Deviance</b>			2739.739		
<b>AIC</b>			2759.739		

```

1 exp(coef(multinom_unordered_replic))
2 ## Answer:

```

Table 7: Coefficients					
Region	(Intercept)	sexMan	marriedMarried	children	christChristian
Central Ghana	0.2941414	1.088235	1.715498	1.033505	2.071248
Eastern Ghana	0.2810507	1.068691	1.607133	1.026221	2.404122

```

1 # get p values
2 z <- summary(multinom_unordered_replic)$coefficients/summary(multinom_unordered_replic)$standard.errors
3 (p <- (1 - pnorm(abs(z), 0, 1)) * 2)

```

Table 8: Coefficients					
Region	(Intercept)	sexMan	marriedMarried	children	christChristian
Central Ghana	$1.52 \times 10^{-6}$	0.5432839	0.0003844455	0.1498931	0.0014200775
Eastern Ghana	$1.16 \times 10^{-6}$	0.6308473	0.0016678561	0.2658216	0.0002083777

## Main results

The result of this study based on real data collection has shown that the petty corruption is a big issue for Ghana and developing countries. The data point that the women are less likely to engage in the corruption because they are facing less external financial pressure to support their extended families.

## Conclusion

Previous studies has showed a negative correlation between the adherence of women in public and private sector and practices of corruption acts. This facts should encourage more companies to recruit women to integrate the labour market with aim to reduce corruption.



## Limitation

The data set was collected in short period of the time i.e., from September 18th 2017 to October 15th 2017, the size of dataset should larger in order to have better representation, more reliable generalization, to accommodates complex analysis, facilitate the subgroup analysis and increasing precision of study.

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