

Online Appendix: State of the Fiscal Contract in Lagos' Informal Settlements

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A Additional Reporting for Main Models

A.1 *Standard Predictor Tables*

Here we include the regression tables that are presented in Figure 4 in the paper. Table 1 includes the unstandardized coefficients and all controls (RA fixed effects are also included but are not displayed). Table 2 includes the same covariates but uses logit instead of OLS for the binary outcome, paying property tax. The only substantive differences between the two models are that the poverty index and ethnic group are not significant in the logit model, and distance to a public water point is significant (and negative).

Table 1: Standard theories regression with controls (OLS)

	Pays Property Tax	Tax Morale
Age	0.003* (0.001)	0.03* (0.01)
Female	0.01 (0.02)	-0.20 (0.27)
Post-Secondary Educ	0.11 (0.07)	1.51* (0.74)
Primary Completed	0.04 (0.04)	0.78 (0.49)
Secondary Completed	0.03 (0.05)	0.83 (0.44)
Poverty	-0.05* (0.02)	-0.31 (0.21)
Christian	0.004 (0.04)	-0.03 (0.47)
Egun Tribe	-0.12* (0.05)	-0.30 (0.48)
Other Tribe	-0.09 (0.05)	0.33 (0.45)
No Party ID	-0.02 (0.04)	0.74 (0.37)
PDP Party ID (opposition)	0.03 (0.06)	0.55 (0.57)
Plank house	-0.05 (0.04)	0.31 (0.43)
Tenant	-0.17*** (0.04)	-0.32 (0.27)
Born in Lagos	0.02 (0.04)	0.20 (0.34)
Trust in Govt	-0.01 (0.005)	0.16** (0.05)
Identify with Nation	0.01 (0.02)	0.15 (0.23)
Dist. to Pub. Health Facility	0.02 (0.03)	0.39 (0.21)
Dist. to Pub. School	0.09 (0.06)	-1.49* (0.59)
Dist. to Pub. Water Point	-0.05 (0.03)	-0.39 (0.22)
Dist. to State Capital	-0.001 (0.01)	0.05 (0.05)
Dist. to Tax Office	-0.01 (0.01)	-0.09 (0.08)
Grid connection (anyone)	0.20** (0.07)	1.28 (0.63)
N	464	455
R-squared	0.28	0.32

Note: Controls for RA fixed effects. Standard errors are clustered at the community level.

*** Significant at the .001 percent level.

** Significant at the .01 level.

* Significant at the .05 level.

Table 2: Standard theories regression with controls (Logit)

Pays Property Tax: Logit	
Age	0.04* (0.02)
Female	0.01 (0.37)
Post-Secondary Educ	0.38 (0.76)
Primary Completed	0.16 (0.60)
Secondary Completed	-0.01 (0.62)
Poverty	-0.58 (0.36)
Christian	0.31 (0.40)
Egun Tribe	-1.84 (0.98)
Other Tribe	-0.83 (0.71)
No Party ID	-0.31 (0.46)
PDP Party ID (opposition)	0.71 (0.71)
Plank house	-1.59 (0.96)
Tenant	-2.15*** (0.50)
Born in Lagos	0.71 (0.37)
Trust in Govt	-0.10 (0.06)
Identify with Nation	0.13 (0.23)
Dist. to Pub. Health Facility	0.46 (0.35)
Dist. to Pub. School	0.48 (0.91)
Dist. to Pub. Water Point	-0.68* (0.33)
Dist. to State Capital	-0.04 (0.05)
Dist. to Tax Office	-0.18 (0.10)
Grid connection (anyone)	3.72*** (0.90)
N	464

Note: Controls for RA fixed effects. Standard errors are clustered at the community level.

*** Significant at the .001 percent level.

** Significant at the .01 level.

* Significant at the .05 level.

A.2 Social Predictor Tables

Here we include the regression results that are displayed in Figure 5 in the paper. Table 3 includes the unstandardized coefficients and all controls (RA fixed effects are also included but are not displayed). Table 4 includes the same covariates but uses logit instead of OLS for the binary outcome, paying property tax. The only substantive differences between the two models are that gender and having a post-secondary education are not significant in the logit model.

Table 3: Social theories regression with controls (OLS)

	Pays Property Tax	Tax Morale
Age	0.001 (0.001)	0.02 (0.01)
Female	0.05* (0.02)	-0.05 (0.27)
Post-Secondary Educ	0.14* (0.07)	1.78* (0.67)
Primary Completed	0.03 (0.04)	0.56 (0.45)
Secondary Completed	0.03 (0.05)	0.81 (0.42)
Poverty	-0.04 (0.02)	-0.26 (0.17)
Christian	-0.07 (0.05)	-0.59 (0.46)
Egun Tribe	-0.11* (0.04)	-0.21 (0.49)
Other Tribe	-0.09 (0.04)	0.43 (0.43)
No Party ID	-0.01 (0.04)	0.50 (0.36)
PDP Party ID (opposition)	0.03 (0.05)	0.18 (0.50)
Plank house	-0.06 (0.03)	0.09 (0.38)
Tenant	-0.15** (0.04)	-0.09 (0.25)
Born in Lagos	0.001 (0.03)	0.10 (0.34)
Donated	-0.002 (0.02)	0.97** (0.31)
Respect Tax Payers	0.01* (0.01)	0.23*** (0.06)
Taxes Help Community	-0.03 (0.01)	0.10 (0.12)
Group Membership	0.05** (0.02)	0.55** (0.17)
N	494	483
R-squared	0.22	0.36

Note: Controls for RA fixed effects. Standard errors are clustered at the community level.

*** Significant at the .001 percent level.

** Significant at the .01 level.

* Significant at the .05 level.

Table 4: Social theories regression with controls (Logit)

Pays Property Tax: Logit	
Age	0.02 (0.02)
Female	0.36 (0.26)
Post-Secondary Educ	1.26 (0.67)
Primary Completed	0.31 (0.63)
Secondary Completed	0.46 (0.66)
Poverty	-0.53 (0.27)
Christian	-0.53 (0.38)
Egun Tribe	-1.96** (0.65)
Other Tribe	-0.92 (0.61)
No Party ID	0.20 (0.43)
PDP Party ID (opposition)	0.38 (0.51)
Plank house	-1.25 (0.67)
Tenant	-1.44*** (0.42)
Born in Lagos	0.14 (0.39)
Donated	0.004 (0.25)
Respect Tax Payers	0.16* (0.08)
Taxes Help Community	-0.29 (0.15)
Group Membership	0.41** (0.15)
N	494

Note: Controls for RA fixed effects. Standard errors are clustered at the community level.

*** Significant at the .001 percent level.

** Significant at the .01 level.

* Significant at the .05 level.

B Other Models

B.1 Full Model

When we include all of the standard predictors and social variables in a single model to predict paying property tax and tax morale many of the conclusions are the same (see Table 5). We opt for the simpler models in the paper given ease of interpretation. Here we discuss the results from the full model, including all independent variables.

For the outcome of property tax payment, that anyone in the community is connected to the grid remains a statistically significant positive predictor of tax payment, consistent with the interpretation in the paper. While perceived respect for taxpayers is not significant in the full model, it remains positive. Group membership, on the other hand, is still significantly positively associated with payment. In terms of demographics, Eguns remain less likely to pay than Yoruba respondents and tenants less likely than landlords.

For tax morale, having a post-secondary education is a significant predictor of having higher tax morale, at least relative to those with less than a primary education. Neither of the standard predictors that were significant in the paper – trust in government and distance to a public school – are statistically significant in the full model. This may be due to collinearity between trust and the social predictors. On the other hand, the social predictors — donated, perceived respect for tax payers, and group membership — remain statistically significant predictors of tax morale.

Table 5: Regression with all predictors and controls (OLS)

	Pays Property Tax	Tax Morale
Age	0.002 (0.001)	0.02 (0.01)
Female	0.03 (0.02)	-0.05 (0.26)
Post-Secondary Educ	0.12 (0.07)	1.52* (0.70)
Primary Completed	0.05 (0.04)	0.63 (0.47)
Secondary Completed	0.04 (0.05)	0.69 (0.44)
Poverty	-0.05 (0.02)	-0.22 (0.17)
Christian	-0.01 (0.03)	-0.36 (0.44)
Egun Tribe	-0.10* (0.05)	0.08 (0.53)
Other Tribe	-0.08 (0.05)	0.54 (0.45)
No Party ID	-0.02 (0.04)	0.70 (0.38)
PDP Party ID (opposition)	0.02 (0.05)	0.39 (0.54)
Plank house	-0.05 (0.04)	0.33 (0.42)
Tenant	-0.16*** (0.04)	-0.30 (0.25)
Born in Lagos	0.02 (0.03)	0.15 (0.32)
Trust in Govt	-0.01 (0.01)	0.10 (0.06)
Identify with Nation	0.004 (0.02)	0.04 (0.21)
Dist. to Pub. Health Facility	0.02 (0.03)	0.38 (0.21)
Dist. to Pub. School	0.10 (0.05)	-1.20 (0.58)
Dist. to Pub. Water Point	-0.05 (0.03)	-0.39 (0.20)
Dist. to State Capital	-0.001 (0.01)	0.03 (0.06)
Dist. to Tax Office	-0.01 (0.01)	-0.09 (0.07)
Donated	0.001 (0.02)	1.07*** (0.30)
Respect Tax payers	0.01 (0.01)	0.20** (0.06)
Taxes help community	-0.02 (0.01)	0.07 (0.11)
Group Membership	0.04* (0.02)	0.47* (0.17)
Grid connection (anyone)	0.18* (0.07)	1.04 (0.59)
N	464	455
R-squared	0.31	0.38

Note: Controls for RA fixed effects. Standard errors are clustered at the community level.

*** Significant at the .001 percent level.

** Significant at the .01 level.

* Significant at the .05 level.

B.2 Distance to Services

The lack of a consistent relationship between distance to services and tax outcomes reported in the paper is further demonstrated by considering the pairwise correlations between distance to each service type – water, health, and schools – and each outcome. This alleviates concerns about insignificance due to collinearity (Figure 1). The only significant bivariate relationship is that tax morale is negatively associated with distance to public school, which we report in the main paper.

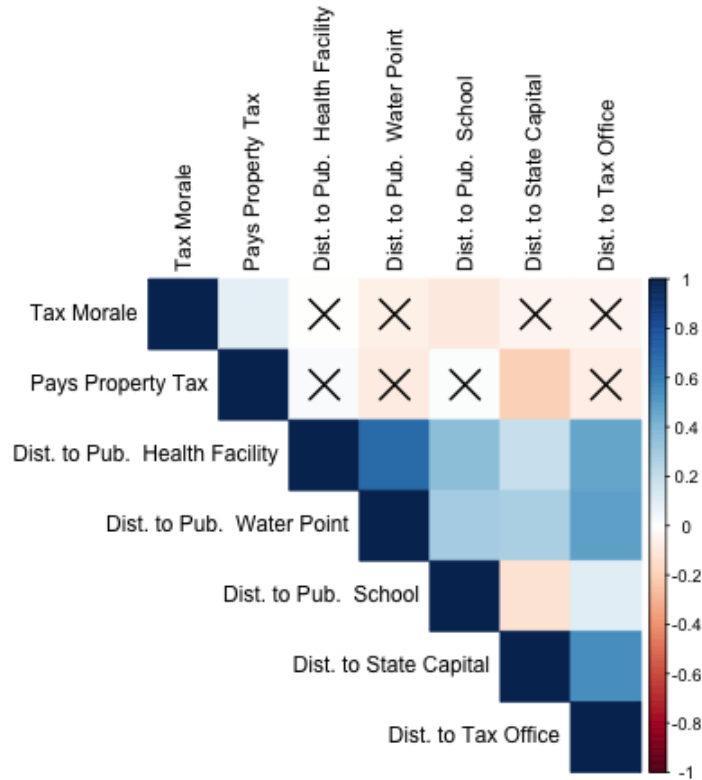


Figure 1: Pairwise correlations. ‘X’s indicate an insignificant relationship at the 95% level.

We also check the measures of distances to government offices – both the state administrative capital and the nearest tax office. Here we find that distance from the state capital is negatively associated with actual payment of property tax, providing additional evidence of the role of enforcement.

Finally, for robustness we include higher order terms for these distance measures (Tables 6 and 7). The conclusions remain unchanged.

Table 6: Standard theories regression with squared distances

	Pays Property Tax	Tax Morale
Trust in Govt	-0.01 (0.01)	0.15* (0.06)
Identify with Nation	0.01 (0.02)	0.18 (0.22)
Dist to Health Facility	0.06 (0.08)	-0.10 (0.85)
Squared	-0.01 (0.02)	0.09 (0.16)
Dist to School	0.02 (0.16)	-2.64 (1.70)
Squared	0.05 (0.08)	1.14 (0.92)
Dist. to Water Point	-0.22 (0.10)	-1.06 (0.78)
Squared	0.05 (0.03)	0.21 (0.22)
Dist. to State Capital	0.01 (0.02)	0.06 (0.15)
Squared	-0.0003 (0.001)	-0.001 (0.005)
Dist. to Tax Office	-0.01 (0.02)	0.08 (0.20)
Squared	0.0004 (0.001)	-0.01 (0.01)
Grid connection (anyone)	0.19* (0.08)	1.14 (0.68)
N	464	455
R-squared	0.30	0.32

Note: Control variables include age, gender, education, poverty, religion, ethnic group, partisanship, landlord or tenant, whether born in Lagos, and RA fixed effects. Standard errors are clustered at the community level.

*** Significant at the .001 percent level.

** Significant at the .01 level.

* Significant at the .05 level.

Table 7: Standard theories regression with squared and cubed distances

	Pays Property Tax	Tax Morale
Trust in Govt	-0.01 (0.01)	0.15* (0.06)
Identify with Nation	0.01 (0.02)	0.14 (0.22)
Dist to Health Facility	-0.12 (0.18)	0.23 (1.51)
Squared	0.12 (0.14)	-0.28 (1.27)
Cubed	-0.02 (0.03)	0.06 (0.22)
Dist to School	0.09 (0.44)	-3.35 (4.59)
Squared	-0.10 (0.71)	2.40 (8.40)
Cubed	0.06 (0.28)	-0.45 (3.53)
Dist. to Water Point	-0.34 (0.16)	-1.12 (1.62)
Squared	0.14 (0.12)	0.29 (1.14)
Cubed	-0.02 (0.03)	-0.004 (0.23)
Dist. to State Capital	0.03 (0.10)	-0.55 (0.89)
Squared	-0.002 (0.01)	0.03 (0.05)
Cubed	0.0000 (0.0001)	-0.001 (0.001)
Dist. to Tax Office	-0.07 (0.05)	-0.18 (0.51)
Squared	0.01 (0.01)	0.02 (0.07)
Cubed	-0.0003 (0.0002)	-0.001 (0.003)
Grid connection (anyone)	0.19* (0.08)	1.35 (0.85)
N	464	455
R-squared	0.31	0.33

Note: Control variables include age, gender, education, poverty, religion, ethnic group, partisanship, landlord or tenant, whether born in Lagos, and RA fixed effects. Standard errors are clustered at the community level.

*** Significant at the .001 percent level.

** Significant at the .01 level.

* Significant at the .05 level.

C Interviews

Table 8 lists the qualitative interviews conducted that informed this research.

Table 8: List of Interviews

Interview ID	Community ID	Gender	Occupation	Date
A-1	A	Male	Cobbler	November 20, 2018
A-2	A	Male	Phone Repairman	October 4, 2018
A-3	A	Male	Food vendor	November 20, 2018
B-1	B	Male	CDA Secretary	January 16, 2018
B-2	B	Male	Landlord	January 27, 2018
B-3	B	Male	Teacher/Tutor	January 19, 2018
B-4	B	Male	Butcher	January 27, 2018
B-5	B	Female	Food seller	January 25, 2018
B-6	B	Male	CDA Chairman	January 19, 2018
C-1	C	Male	Civil Servant	October 26, 2018
C-2	C	Female	Civil Servant	October 26, 2018
D-1	D	Male	Pastor	October 19, 2018
D-2	D	Female	Unemployed	October 19, 2018
E-1	E	Male	Artisan/Trader	November 28, 2018
F-1	F	Female	Apprentice	November 15, 2018
F-2	F	Female	Trader	November 15, 2018

D Comparing Payment Amounts

Not only would we expect informal residents to pay *fewer* taxes, but we might also expect them to pay lower amounts, at least in a progressive tax system. Among our respondents, the median amount of property taxes paid per year is 5,500 Nigerian Naira (NGN), approximately \$15 USD at the time of the survey. Interestingly, this amount is lower than that reported by Nigerians overall but slightly higher than the Lagos-specific sample (see Table 9).¹ In one community in which houses were built on a swampy area that had been infilled with trash – a seemingly “least likely” candidate for property taxation – a local leader reported that residents there pay between 1,200 to 5,200 NGN yearly for Land Use Charge. Compare this to income tax, where the median reported yearly payment is much higher at 14,700 NGN (mean = 76,998).² Because payments are lower on average, and collected directly rather than through employers, property taxes are arguably more “accessible” to people living in informal settlements. The Lagos State Government estimates that the majority of residents would pay the minimum LUC rate because their properties would be valued at less than 10 million NGN.³

Table 9: Reported annual property tax payments

	Median	Mean	Min.	Max.	n
Nigeria	6,000	23,255	100	1,152,000	1,361
Lagos	4,500	16,783	500	500,000	138
Lagos - Informal	5,500	11,802	500	70,000	30