Opening the Black Box - Determinants of Tax Morale in Africa

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1 Introduction

A country's ability to efficiently mobilize its national resources is a topic that has recently been gaining traction in the discussion surrounding development. Since the Monterrey Consensus was adopted in 2002, in which countries recognized the importance of raising domestic revenues, development aid has been increasingly shifting from direct financial assistance to improving tax system and national resource management. This shift in strategy was officially stated in 2008, in the Doha Declaration on Financing for Development, which pledged to enhance national tax revenues; one of the recognized strategies pledged to achieve this was combating tax evasion.

High levels of tax evasion lead to a misallocation of resources and hinder the ability of the government to invest in the provision of public goods. Therefore, understanding the rationale behind tax evaders becomes essential to national development and state building. Traditionally, the standard way to explain tax compliance has been the economics-of-crime approach, which assumes a rational taxpayer maximizing his or her utility by balancing the risk of detection and punishment with the benefit of tax evasion. Today, this approach is increasingly regarded as too narrow to fully explain tax compliance, and many argue for the need to include social factors, which are said to explain why people conform to paying taxes even in the absence of strong deterrence mechanisms. These social factors constitute and influence the individual's "intrinsic motivation to pay taxes", hereafter referred to as tax morale, by increasing moral costs of tax evasion and thus increasing tax compliance.

Against this background, the purpose of our research paper is to identify the determinants of tax morale in African countries, thereby opening the door for new policies fostering tax morale and thus tax compliance and increased public revenues in African countries. Using data from the Afrobarometer, we conduct a regression analysis using the commonly identified determinants of tax morale to test whether these also hold in developing countries; or more specifically, in African countries. Generally, the few studies that do look inside the black box of tax morale find that factors such as trust in government, the level of corruption, interactions with other taxpayers and tax administrators, tax burden, perception about benefits of public spending, social norms, detection, and punishment, gender all determine tax morale and hence influence tax compliance. Our conceptual framework is therefore based on the determinants of tax morale in developed countries, whereby:

$$\begin{aligned} TaxMorale_i = &\alpha_i + \beta_1 TrustinGovernment/PublicOfficials_i + \beta_2 LevelofCorruption_i \\ &+ \beta_3 interactionswithothertaxpayers_i + \beta_4 taxburden_i \\ &+ \beta_5 detectionandpunishment_i + \beta_5 SocialNorms_i + \epsilon_i \end{aligned} \tag{1}$$

This paper briefly outlines the design, operationalization and data selection, before conducting a first regression analysis and briefly describing its results. More extensive information will be available in the final report.

2 Method

2.1 Data Selection and Operationalization

As outlined in Assignment 1, we make use of the Afrobarometer Surveys to investigate the determinants of tax morale in African countries. We merged the survey results from Round 3, 4 and 5, resulting in a data set that spans the years 2005-2006, 2008-2010 and 2011-2013. For a step-by-step protocol please consult this R-file.

2.2 Descriptive Statistics of Our Data

Our dependent variable asks respondents, whether or not they agree with the statement "The tax department always has the right to make people pay taxes" and is measured from "Strongly Disagree", "Disagree",

"Neither Agree or Disagree", "Agree" to "Strongly Agree". As depicted below, the majority either agree or strongly agree with the question, 45.448 and 24.765 observations respectively.

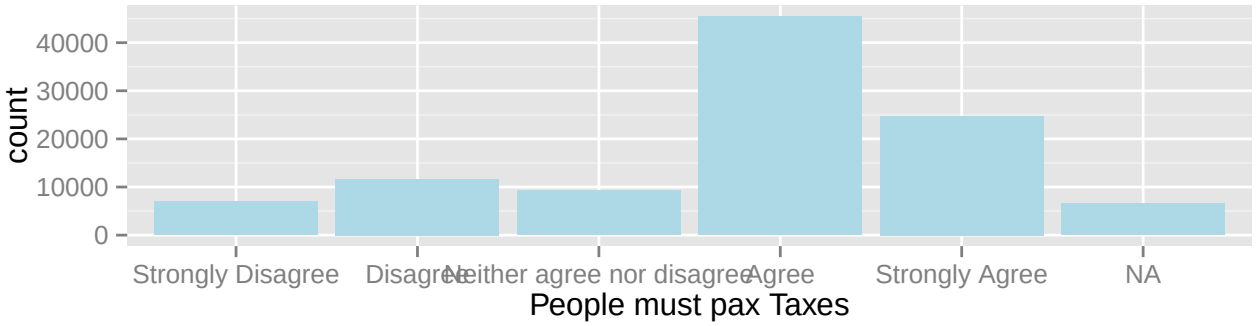


Figure 1: Summary Statistics of Dependent Variable: The tax department always has the right to make people pay taxes

In the fifth round of the Afrobarometer survey, the respondents were asked directly what they think, "is the main reason that some people avoid paying government the taxes and fees that they owe?" Since it was only asked in the most recent round and not in the two preceding ones, we cannot use the answers directly for our analysis, but nevertheless it is informative to our research question. Figure 2 shows how respondents answered the question with a majority of people saying that they think it is because people cannot afford to pay the taxes. Another big group of respondents mentioned that they think the reason is that taxes are too high. It will be interesting to see if these opinions will be reflected in the results of our final analysis. Following from the impression of this frequency distribution one could assume the effect of the personal economic situation of the respondent to be relatively large.

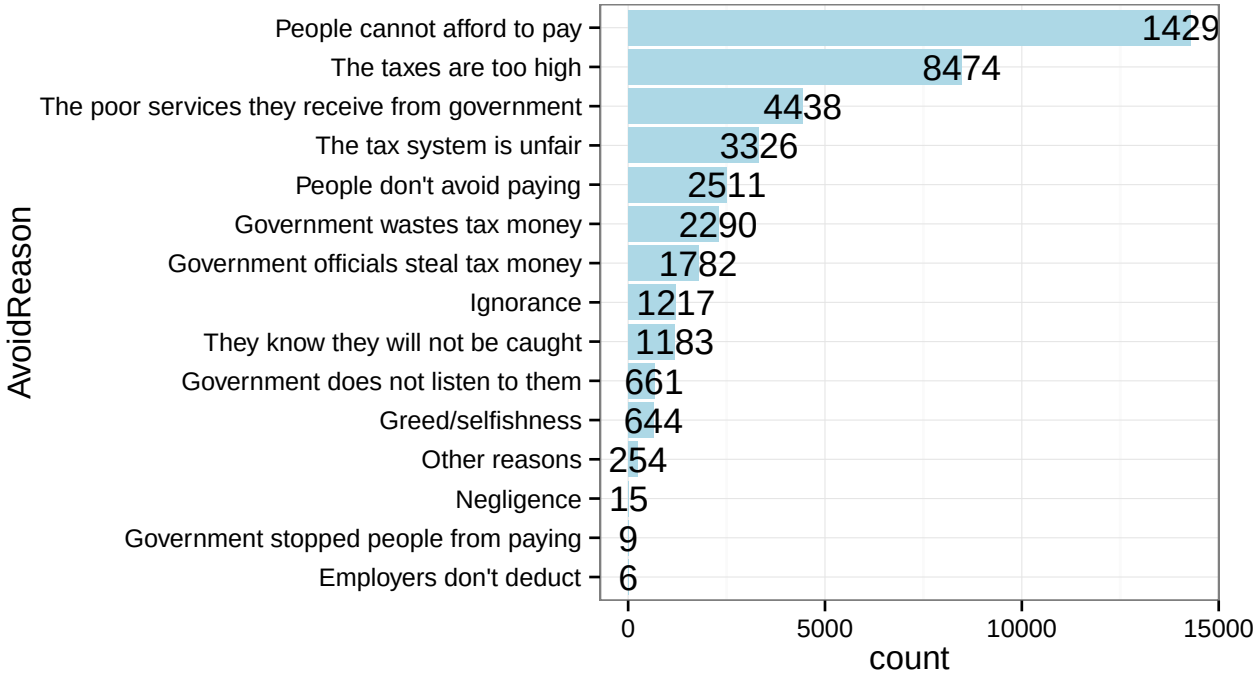


Figure 2: What is the main reason that some people avoud paying government the taxes and fees that they owe?

2.3 Inferential Statistics

A regression analysis is used to investigate the determinants of tax morale in African countries, using R Studio (R Core Team 2015; Hlavac 2015; Xie 2015) . Since our dependent variable[1] is measured from "Strongly Disagree", "Disagree", "Neither Agree or Disagree", "Agree", "Strongly Agree", we believe that the "distances" between these five points are not equal, an OLS regression in this case is problematic because the assumptions of OLS are violated when used with a non-interval outcome variable. Instead, we opted for an ordinal logistic regression.

In order to use an ordinal logistic regression the following four assumptions need to hold:

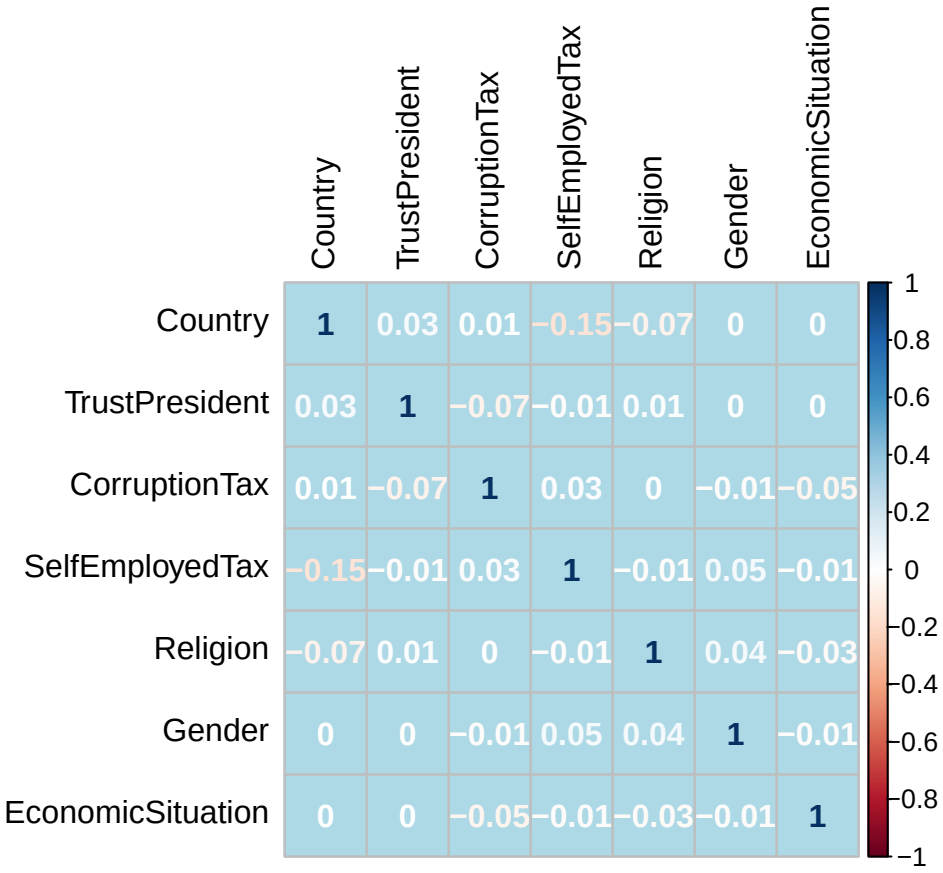
1. The dependent variable is measured at the ordinal level.
2. One or more independent variables that are continuous, ordinal, or categorical
3. There is no multicollinearity
4. Ordinal odds

As indicated above, the first assumption holds true; our tax morale variable is measured at the ordinal level. The second assumption also holds true; all of our independent variables, are continuous, ordinal or categorical. To test for multicollinearity, we applied the variance inflation factor; the result are shown in the table below. Since all numbers exept year are very close to 1, we can assert that there is no multicollinearity.

Variables	VIF
Country	1.03
TrustPresident	1.01
CorruptionTax	1.01
SelfEmployedTax	1.02
Religion	1.01
Gender	1.01
EconomicSituation	1.01

We also created a simply correlation matrix to test for multicollinearity, whose results are depicted in the figure below. As a rule of thumb, any correlation with a value of .5 and above will present multicollinearity, when 1 is perfect correlation. As seen in the correlation matrix, not a singly correlation yields a value above .5. The highest correlation, between country and paying taxes as a self-employed person is only -0.15, far from close to a high, multicollinear correlation.

[1] For Round 3 (Codebook 2005) it is variable Q52D, for Round 4 (Codebook 2008) it is Q44C, and for Round 5 (2015) it is Q48C.



We had some difficulties to test for ordinal odds and as a consequence we have not yet decided which test or approach to chose, but will resolve this for the final project. Essentially the assumption of ordinal logistic regression is that the "relationship between each pair of outcome groups is the same" (UCLA –). There are some statistical test available but their weakness is said to lay in the tendency to reject the null hypothesis, "and hence, indicate that there the parallel slopes assumption does not hold, in cases where the assumption does hold" (UCLA –).

Nevertheless, we went ahead and created two models using ordinal logistic regression, whose output is shown in table 2.

Table 2: Ordinal Logistic Regression Results of Tax Morale

	Dependent variable:	
	TaxMorale	
	(1)	(2)
CorruptionPresidentMost of them	0.03	0.04***
	(0.03)	(0.01)
CorruptionPresidentNone	0.16***	0.16***
	(0.03)	(0.01)
CorruptionPresidentSome of them	0.13***	0.13***
	(0.03)	(0.01)
CorruptionTaxMost of them	0.14***	0.13***
	(0.02)	(0.01)
CorruptionTaxNone	0.39***	0.38***
	(0.03)	(0.01)
CorruptionTaxSome of them	0.24***	0.23***
	(0.02)	(0.01)
EconomicSituationFairly good	0.19***	0.20***
	(0.02)	(0.02)
EconomicSituationNeither good nor bad	−0.003	0.01
	(0.02)	(0.02)
EconomicSituationVery bad	0.06***	0.07***
	(0.02)	(0.02)
EconomicSituationVery good	0.30***	0.32***
	(0.03)	(0.01)
Year		0.02***
		(0.0000)
Gendermale		0.10***
		(0.01)
Age		0.002***
		(0.0005)
Observations	73,878	73,381
Note:	*p<0.1; **p<0.05; ***p<0.01	

3 Discussion & Open Questions

We need to spend more time on ensuring that an ordinal logistic regression is indeed the way to go; in a next step we first and foremost need to test for ordinal odds in order to ensure that all necessary assumptions hold. In our final project we will further create more models than the ones presented here and find ways to present the predicted probabilities in a meaningful way, since β's in logistic regression are a bit weird; this can be accomplished for example by generating a confusion table.

In addition to our general model of explaining determinants of tax morale in Africa overall, we will also look in more detail into single countries and whether they differ significantly from each other with regards to the level of tax morale as well as the determinants tax morale.

References

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