Corruption and the poor: Is social capital an exit option?

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Abstract

Using the sixth wave of the Afrobarometer survey between the years 2014-2015 for 36 African countries, the study tests the thesis of exit options for corruption on three subsamples of individuals, poor, non-poor, and those at-risk of poverty. Studies have shown that, against any theoretical predictions of the potential benefits of social capital for the poor, the poor are the least likely group of people to benefit from social capital as they mostly have a low convertibility factor. Therefore, fusing existing theories of corruption with Bourdieu's covertibility factor theorem in social capital research, the study contributes to existing literature in two ways.

First, we analyse heterogenous effects of social networks on corruption for the poor, vulnerable and non-poor. We find that, the non-poor are more likely to use social capital to reduce the risk associated with corrupt behaviours. We however find that;the vulnerable are also able to appropriate social capital for corruption but only when assessing basic services. Second, we assess how social capital impacts on access to public services for different poverty cohorts. Here, we find that indeed, social capital eases the access of non-poor people to monopoly social services delivered by the public sector. In all, the extreme poor are not able to convert their social capital into other valuable forms of capital which can help them access public services. The extreme poor are thus the most disadvantaged group in accessing public services.

Key words: Corruption, social networks, poverty, Africa

JEL classification: B52, D73, Z13

1 Introduction

Though corruption research has broadened over the years to include the relationship between social capital and corruption, most of the studies have focused on a particular aspect of social capital- generalised trust (Banerjee, 2016; Rothstein and Eek, 2009; Sah, 2007; Rothstein and Uslaner, 2005; Uslaner, 2004; Bjørnskov, 2003; Svendsen, 2003; Acemoglu, 1995). This one-sided view of the corruption-social capital relationship, has led to an almost generalised conclusion that social capital is good for anti-corruption, and should be inherently desired. However, there are few studies that have found a dark side to social capital, once the focus shifted to social networks and the resources within such networks (Uribe, 2014; Lipset and Lenz, 2000). When we zoom deeper into the different types of corruption, we find that bureaucratic corruption, otherwise known as petty corruption, is more prevalent in less developed regions, including in Africa (Justesen and Bjornskov, 2014). This form of corruption, like all other forms of human transactions, is highly based on relations; relations between public officials and citizens, and thus, highly embedded in social networks. We, therefore, aim to contribute to this emerging literature by focusing on the role of social networks in curbing (or not) bureaucratic corruption-hereafter referred to as corruption.

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In assessing the relevance of social networks for corruption, we distinguish between the extreme poor, the vulnerable and the non-poor. This is because, studies have found that the poor are affected by bureaucratic corruption and they tend to bear the greater burden (Seppanen and Virtanen, 2008). This could be due to their lack of exit options particularly from services provided by the government (Peiffer and Rose, 2018). Exit options in this study are defined as the ability to access other sources of service provision to avoid engaging in bribery. Such options include having access to different service providers, having a means of transportation to move from one location to another to access different service providers, being well connected to a social network that provides you with options, etc. In this study, we focus on one such exit option which could potentially be available to poor people- social capital.[1] Also, the poor are treated separately in this study because, Bourdieu (2002) introduced a critical piece of knowledge about social capital which makes it salient to not bundle the poor and non-poor together in social capital research. Bourdieu (2002) drew our attention to the convertibility factor of social capital- the ability to change social capital into other useful forms of capital. The realisation of the 'capital' within social relations depends greatly on its convertibility factor. Once the bundles of social relations cannot be redirected to achieving any form of benefit, no 'capital' can be accrued. Studies have posited, against any theoretical predictions of the potential benefits of social capital for the poor, the poor may be the least likely group of people to benefit from social capital as they are likely to have a low convertibility factor (Gertler, 2006; Cleaver, 2005). However, current corruption literature tends to ignore this crucial factor and as such, miss out on the heterogenous role social capital could play for the poor and the non-poor.

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[1]   Social capital in this study refers to 'social networks of reciprocity, trust, and cooperation that facilitate coordinated action for a mutual benefit'(Christoforou, 2011, p.).

We aim to bridge this gap in literature by assessing the heterogenous effects of social capital for the poor and non-poor, first in easing access to public services and second, in serving as an exit option out of corruption.

By focusing on social networks and its heterogenous effects on both corruption and access to public services, the study contributes to existing literature in several ways. First, studies that have focused on social networks, making a distinction between bonds and bridges, have found bridges to be corruption inhibiting and bonds to be corruption enhancing (Lipset and Lenz, 2000; Harris, 2007). However, these studies did not focus on the heteorgenous impacts of social networks for different poverty cohorts. From Bourdieu (2002)'s convertibility factor theorem, how social networks impact on individuals in different socio-economic cohorts is likely to differ. We therefore add to the existing literature by analysing these heterogenous effects.

Second, based on the convertibility factor theorem, we contribute to literature on poverty and wellbeing by assessing how social capital impacts on access to public services for different poverty cohorts. So far, little research has been conducted on the role of social capital in easing access to public services. However, knowing that the poor rely heavily on service provision by the government, it is likely to impact their general well-being. As such, a joint analysis between access to public services and bureaucratic corruption could generate better insights into the factors that affect individuals of differing socio-economic status.

Finally, we make a methodological contribution to existing corruption literature by employing a multivariate conditional mixed process approach. This methodology, employed in other strands of economic literature, offers the ability to estimate jointly both our corruption model as well as our access to public services model, improving efficiency, given that these two models are likely to be correlated in the error term (Roodman, 2011). It also allows us to correct for any selection bias in our corruption model by including a selection equation. Also, we employ a two-step methodology introduced by Guiso et al. (2004) to transform our social capital variable. This helps us to reduce any form of bi-directional causality likely to be present in the social capital-corruption analysis.

Using the sixth wave of the Afrobarometer survey between the years 2014-2015,we test the thesis of exit options for corruption on three subsamples of individuals, extreme poor, non-poor, and the vulnerable. We do this for bureaucratic corruption in general and also differentiate between certain monopoly types of public service delivery and non-monopoly types of public service delivery. For monopoly service delivery, we focus on access to official document and contact with the police. For non-monopoly services, we focus on access to healthcare, education,and water and sanitation. We also include another layer of differentiation- basic services and non-basic services for non-monopoly services: education as a non-basic service, and health and water as basic social services.

2 Review of relevant literature

Corruption, Access to public services and the Poor

The brunt of corruption, with recent empirical and theoretical evidence, has been seen to be borne largely by the poor in society (Borcan et al., 2017; Mbate, 2016; Daoud, 2015; Justesen and Bjornskov, 2014; Dong and Torgler, 2013; Hunt, 2007). Though not in raw amounts paid (Hunt and Laszlo, 2005), bribery acts as both a regressive tax [2] and as an exclusion mechanism for poor individuals or households to access certain public services (Kaufmann et al., 2008). Marquette and Peiffer (2015) argue that, anti-corruption efforts have largely failed to prevent bureaucratic corruption largely because it sometimes ease access to services in resource-poor contexts. We could argue that this "ease of access" largely benefits the rich for monopolised public services and penalises the poor who are less likely to afford private services for non-monopolised services and therefore opt for public services in accessing certain basic services. Indeed, Peiffer and Rose (2018) find that it might not entirely be the case that the poor are found to be more vulnerable because they are poor, but because of institutional differences. The inability of the poor to access private social services causes them to be more reliant on the state in the provision of their basic social services. This disproportionate reliance on public service delivery systems leaves them more vulnerable to bureaucratic corruption than the non-poor. While bureaucratic corruption might ease access to basic social services, the regressive tax it places on the poor still leaves the poor highly vulnerable.

While the notion of exit options out of corruption has been explored by Peiffer and Rose (2018), one crucial form of capital that could potentially act as an exit option is yet to be explored-Social capital. Social capital could potentially ease access to basic social services and though it might not necessarily reduce corruption, it is likely to reduce the transaction costs of having to locate a transaction partner. This will in turn reduce the burden corruption places on the poor. On the other hand, social capital might also serve as an exclusion mechanism to prevent certain sections of the population from accessing some public services because of their social network. Studies on the relationship between poverty and corruption are yet to include the importance of this crucial form of capital. This study aims to fill that gap. We explore the role of social capital for the poor for both access to social services and exit out of corruption in our analysis. In the subsequent subsection, we delve into the role of social capital for the poor.

Social capital and the poor

There are multiple characteristics that shape social identity, inclusion and exclusion. One of such characterisitics is an individual's socio-economic status. As advanced by Stewart (2002), economic inequalities can be most persistent when it is socially embedded. Such forms of economic inequalities are easily reproduced when there are inequalities in social capital endow-

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[2] Hunt and Laszlo (2005), however finds in Peru that, bribery tends to act as a progressive tax for the poor, having a greater burden on the rich than on the poor

ments. Social capital- defined here as social networks- have attracted a lot of discussion in recent years. This is as a result of the enormous positive effects this form of capital seems to accrue to its bearers. The publication of Bowling Alone: America's declining social capital by Putnam (1995) served as the catalyst that launched the global use of the word 'social capital' in contemporary research. Aside the individual positive results to the individual bearer of the capital, it also provides positive externalities to the society within which this capital is embedded. Empirical research have found enormous benefits of social capital particularly to economic growth and development (Ahlerup et al., 2009; Svendsen, 2003).

Social capital in itself is intangible, imbedded in structures of relationships. An individual must therefore relate to others in order to take advantage of the benefits others have to offer. Social capital has been seen to improve welfare and reduce poverty particularly in the presence of complementary formal institutions (Grootaert and Narayan, 2004). In assessing the relevance of social capital however, a clear distinction is made by Bourdieu (2002) between an individual's social networks and the types and value of the resources within the individual's network(s) otherwise known as the convertibility factor. Convertibility is associated with the type and value of resources embedded and accessible to a member of a particular network. Therefore, the lower the value of the resources, the lower the convertibility factor of the social capital available. These two intertwined parts of social capital as rightly pointed out by Bourdieu (2002), are very distinct in that, one's benefits from connectedness is very different from one's ability to be connected.

The social capital of the poor is more likely to not have the convertibility factor necessary to translate their social capital into a beneficial asset (Boon and Farnsworth, 2011). This is because the poor are likely to be connected to individuals of similar socio-economic status which limits the type of resources such social capital can offer. Indeed Cleaver (2005), in an ethnographic study in Tanzania, found that the poor mostly find themselves in social clusters of networks with low levels of capital within them. This creates a lock-up of poor people among themselves with little access to any form of vertical social capital which could potentially help their social mobility. Thus, contrary to mainstream development thoughts on social capital for the poor, social capital is difficult to be used as a substitution for other forms of capital by the poor, thereby making it difficult for the poor to escape the poverty trap (Cleaver, 2005). This idea is succintly captured by Loury (1977) that, presence of certain forms of inequality reduces the convertibility value of social capital particularly for the poor with no or minimal access to opportunities which produces what Lin (2000) terms as the 'inequality of social capital'. However, even among the poor, the nature of one's social network; business, political or other forms of social ties, could potentially contribute differently to welfare as they all represent different types of resources embedded within the network (Zhang et al., 2017). Therefore in this study, we employ a range of social capital variables that capture different aspects of social capital as posited by Bourdieu (2002) and Zhang et al. (2017): level of connectedness and different values of social ties- political, civic, religious and business.

In summary, there is little evidence to suggest that social capital is 'the capital of the poor'

(Gertler, 2006). However, in rare instances where social capital has been beneficial to the poor, it has helped through stabilising livelihoods without promoting any form of upward mobility (Adato et al., 2006) such as giving better access to certain opportunities or basic services. One of the likely explanations for this poor performace of social capital to reduce poverty is that, peculiar altruistic bonds might exist in groups and networks. These bonds, associated with an individual's identification within a particular social circle, are thus likely to skew access to resources and public services through partial treatments to members of particular networks.

Defining the opposite of corruption as impartiality(Rothstein, 2014), any form of preferential treatment given to individuals as a result of their social networks can be termed as corruption. In a theoretical model, Uribe (2014) shows the need for social networks to facilitate corrupt transactions. In fact, in the proposed model, networks are a necessary condition to ensure effective corrupt transactions. This is because, corrupt transactions, like other forms of human transactions, rely on a level of interpesonal trust for its success. Therefore, once there is enough resource of trust embedded in a network of citizens and public officials, corrupt transactions are more likely to thrive. Also according to social exchange theory, social networks are seen to eliminate information assymetry in corruption exchange by reducing the amount of search time for a corrupt partner, and the existence of trust in the efficacy of the corrupt transactions (Durlauf and Fafchamps, 2004). These occur through the disclosure of opportunities in repeated interactions beneficial to all parties involved (Durlauf and Fafchamps, 2004). Different types of social networks have been found to affect corruption differently(Griesshaber and Geys, 2012). Exclusive forms of social networks encourage corrupt transactions than inclusive forms of networks while connected networks discourage corruption unlike isolated networks (Griesshaber and Geys, 2012). However, a recent study found that, though civic and inclusive forms of networks may be seen as altruistic in nature, these networks mostly face the danger of subversion by individuals with alterior motives, for their personal gains. This is achieved through exploiting the social capital resource of access and information for corrupt transactions (Kim and Whitaker, 2013). Thus, civic networks always face the danger of its altruistic nature being subverted by individuals within such networks (Kim and Whitaker, 2013).

There are two schools of thought on the potential effect of social capital on corruption. According to Seppanen and Virtanen (2008), bribery has the potential of reducing the access of the poor to public services as they mostly do not have the means to make illegal payments or bribes. However, those with some level of social capital can circumvent this hurdle and gain access to public services-this is the first school of thought. Corruption, like every form of transaction, has costs associated with it; cost of identifying an official, the cost of paying the bribe itself and the risk cost of being caught. By having someone within one's network that is willing to engage in corrupt transactions, most of these costs are reduced, sometimes, even the monetary costs of bribery. Some studies have found that due to the communal nature of societies in most less developed countries, collectivity underpins most activities people usually engage in, including corrupt activities (Seppanen and Virtanen, 2008). Therefore, socially determined networks might play a greater role in enforcing corrupt behaviours rather than acting as an exit option.

The second school of thought argues that, bribery may be reduced with the presence of social networks. This is because, individuals may reap the benefit of being in the same social network with a public official who would assist him/her to gain access to a public service without offering a bribe in return. This type could either be through a favour-type of corruption, thus acting as a substitute (Gehlbach, 2001) or in this paper, an exit-option to not engage in any corrupt activity at all. This second school of thought follows closely along the lines of the positive merits of social capital posited by several social capital theorists (Putnam, 2000).

If it is indeed a truism that corruption burdens the poor, and that social capital may not automatically be the capital for the poor, it is important to distingusih between different types of social capital and their effects on access to public services and corruption for both the poor and the non-poor, and finally, if there are any channels through which social capital could better serve the poor. In this study, we focus on the first line of inquiry; the role of different types of social capital in easing access to social services and reducing (or not) corruption for both the poor and non-poor.

3 Methodology

3.1 Data

The main dataset employed in this analysis is the sixth round of the Afrobarometer survey data. The Afrobarometer survey measures the social, political and economic perceptions of individuals in 36 countries in Africa. This is done through face-to-face interviews with a randomly selected sample of 1,200 or 2,400 people in each country.

A. Measuring corruption in Africa

The Afrobarometer has six questions pertaining to bribery in six public service deliveries; medical care, education, the police service, acquisition of public documents, courts, and water and sewage. The survey asks the following question: In the past year, how often, if ever, have you had to pay a bribe, give a gift, or do a favour to government officials in order to get: a document or permit?, water or sanitation services?, treatment at a local health clinic or hospital?, a place in a primary school?, have your case heard in court or avoid a problem with the police like passing a checkpoint or avoiding a fine or arrest? The respondents are given six response options to select from; never, once or twice, several times, many times, always, and no contact with a service in the past year.

To construct our corruption variable, we first combined the response options several times and many times into one option as the difference between these two were not clear in the questionnaire. We also treat individuals with no contact as separate as there cannot be bribe without first having contact with a public official. This left us with four response options for each

bribery question. We constructed our corruption variable by adding up, for every individual in our sample, all of his or her responses across the six public service delivery questions. This enabled us to obtain an ordered categorical variable with 0 indicating no bribery across all six public services and 23 representing always paying bribes across all six public services.[3] Our corruption variable is therefore a self-reported corruption variable encompassing not just bribery but also other acts of *quid pro quo*. We do not include respondents who had no contact with any of the services.

Out of our full sample of 53,936 respondents, 61.9% report having had to engage in a corrupt actiivty with a government official in order to gain access to a public service. Out of the 33,425 respondents who respond to having paid bribe to gain access to at least one of the six public services, 87% respond to have paid bribes to gain access to medical treatment, 70% for access to identity documents, 65% for access to schools, 36.5% for access to water and sanitation services, 35% paid bribes to the police, and 17.7% paid bribes in courts.

B. Measuring social capital

We use three variables in measuring social capital. The first social capital variable *à* la Putnam measures the civicness of individuals using their participation in voluntary non-religious groups. The variable is an ordered categorical variable measured using the question; Now I am going to read out a list of groups that people join or attend. For each one, could you tell me whether you are an official leader, an active member, an inactive member, or not a member ...Some other voluntary association or community group.

The second social capital variable measures an individual's participation in a voluntary religious group. The variable is measured using the question; Now I am going to read out a list of groups that people join or attend. For each one, could you tell me whether you are an official leader, an active member, an inactive member, or not a member ...A religious group that meets outside of regular worship services.

Our third measure of social capital is defined as the level of connectedness of an individual (either in depth or in volume). We use the frequency of mobile phone usage of an individual as a proxy for connectedness (Hampton et al., 2011; Wilken, 2011). Mobile phone usage has been seen to strengthen existing social ties and help forge new contacts outside the user's usual circles of engagement (Wilken, 2011). We therefore use the question; How often do you use a mobile phone? from the Afrobarometer. The response options range between 0-4, 0 being never and 4 being every day. The other options are (1) less than once a month, (2) A few times a month, and (3) A few times a week.

We use a fourth set of variables to measure political ties of individuals; whether an individual has had contact with individual(s) of a degree of relevance in the society (government officials,

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3   A principal component analysis (unrotated) reveals that all six variables load on to a single index with an eigen value of 3.9.

Table 1: Descriptive statistics of political ties

Variable	Category	Freq.	Percent
Contact with local council	0 No contact	39,403	76.96
	1 Contact	11,795	23.04
	Total	51,198	100.00
MP_contact	0 No contact	46,463	88.55
	1 Contact	6,008	11.45
	Total	52,471	100
Govt_official_contact	0 No contact	46,100	85.94
	1 Contact	7,539	14.06
	Total	53,639	100
Politicalparty_official_contact	0 No contact	45,070	85.93
	1 Contact	7,379	14.07
	Total	52,449	100.00

Ministers of parliament, a political party official or members of the local council).

Our civicness variable is measured using Putnam (2000)'s social capital measure - an individual's involvement in voluntary associations. However, there is a likelihood of both a self-selection bias as well as a bi-directional causality between memberships in voluntary associations and bribery. Individuals choose to become members of an association or not. Secondly, individuals may choose to be part of an association solely because of certain informal favours (partial treatments) they are likely to receive from other members (and or their networks) in accessing certain public services. To reduce these biases, we follow the two step methodology developed by Guiso et al. (2004), to create a provincial level social capital variable for non-religious memberships. This allows for variations across the 456 provinces in our dataset while reducing the individual level biases that are likely to be present in the individual level variable. We assume neighbourhood and residential effects on individual behaviour, that is, an individuals geographic location can cause the individual to behave in a particular manner (Atkinson and Kintrea, 2001; Moorer and Suurmeijer, 2001). This therefore permits us to use social capital at the provincial level to substitute for individual level social capital. To construct the province level social capital indicator, we use data on the following question from the sixth round of the Afrobarometer: Now I am going to read out a list of groups that people join or attend. For each one, could you tell me whether you are an official leader, an active member, an inactive member, or not a member. Some other voluntary association or community group. We dichotomise this variable to take a value of 1 if the individual is a member and 0 if the respondent answered otherwise. We formulate a non-linear regression equation as:

$$Regional\_Socialcapital_{ipc} = \gamma_0 + \gamma_{pc}Region_{pc} + \gamma_2 X_{ipc} + \gamma_I + \gamma_y + \gamma_c + \epsilon_{ij} \qquad (1)$$

where $Regional\_Socialcapital_{ipc}$ is a binary variable taking the value 1 if individual i in province p in country c is a member of a non-religious voluntary association and value 0 otherwise. $Region_{pc}$ is our province variable, a list of province dummies in country c. X_{ipc}, γ_P, and γ_c are vectors of all individual specific variables that explain individuals choice to become a member

of a voluntary organisation as well as province and country fixed effects.[4]

At the second level, we predict and normalise the marginal probabilities of $Region_{pc}$ from the estimation of equation (1) with individuals residing in the same region having the same level of social capital (marginal probabilities). Individuals having the lowest social capital value take on a value of 0 while the individuals with the highest level of social capital take on the value of 1. One of the provinces was used automatically as the base outcome. The normalisation is done using the min-max method below:

$$Social\_capital(Region)_{pc} = [\hat{\gamma}_{pc} - min(\hat{\gamma}_{pc})]/[max(\hat{\gamma}_{pc}) - min(\hat{\gamma}_{pc})] \tag{2}$$

where $Social\_capital(Region)_{pc}$ is the provincial social capital variable of province p in country c. $\hat{\gamma}_{pc}$ are the marginal probabilities of province p in country c. $max(\hat{\gamma}_{pc})$ and $min(\hat{\gamma}_{pc})$ are the maximum and minimum marginal probabilities respectively. Equation (2) normalises our indicator into a range between 0 and 1 where values close to 1 indicate high levels of social capital and values close to 0 indicate low levels of social capital in the province. Given that we use predicted residuals from our estimated model as the social capital variable, we bootstrap the residuals of all our models in the analysis to avoid any violations of distributional assumptions.

The second social capital variable, which measures an individual's participation in a voluntary religious group, might also face a possibility of bi-directional causality between corruption and membership. We therefore construct a social capital variable at the regional level to reduce any bi-directional causality that is likely to be present. We use the proportions of individuals in each province who respond that they are members of a voluntary religious group. Our religious social capital variable therefore ranges between 0 and 1 with 0 representing provinces with low religious social capital and 1 representing provinces with high religious social capital.

Below is the summary statistics of the three social capital variables employed.

Table 2: Descriptive statistics of social capital variables

Variable	Observations	Mean	Std. Dev.	Min	Max
Membership_Non-religious Association	48,836	.5148	.1491	0	1
Membership_Religious Association	53,007	.4799	.2119	.0089	.975
Connectedness	53,751	3.1624	1.5034	0	4

We find that on average, respondents seem to be well connected with a mean category 3- making mobile phone calls a few times a week. We, however, observe a standard deviation of 1.5 which shows that there is some variation in mobile phone use across the respondents. We also find that most of the provinces on average record a sizable number of memberships for both religious and non-religious associations with means close to 0.5 out of 1 for both forms of social capital.

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[4]   The marginal coefficients from the first-level probit regression in equation (1) can be presented on request

C. Measuring poverty

Following Mattes et al. (2016), we employ Afrobarometer's lived poverty measure to categorise our data into three sub-samples; extreme poor,vulnerable and non-poor. A set of questions are asked to each respondent about how often they have had to go without certain necessities; food, water, medical care, cooking fuel and cash income. Responses range from never (0) to always (3). As the aim of the research is to have sub-samples of individuals in different poverty cohorts, we create a composite categorical variable from the five variables that capture individual basic needs. We first sum across the five response options for all our basic needs variables for each individual to get a variable ranging from 0 to 15 where 0 refers to an individual who has never gone without any basic need and 15 refers to an individual who always goes without all the basic needs. After, we create our poverty variable which is a categorical variable. We assign a value 0 to all individuals who have never gone without any of the basic needs and refer to these as non-poor. We assign a value of 2 to all individuals who have a value above 10 in the first variable we created. These are individuals who, at the minimum, have had to, at several times, gone without all the basic needs- the extreme poor. We assign a value of 1 to individuals with values greater than 0 but less or equal to 10 and classify these as the vulnerable (or those at risk of poverty).

Table 3: Social capital statistics of different poverty cohorts

Poverty	Frequency	Mean		
		Non-religious Assoc.	Religious Assoc.	Connectedness
Non-Poor	10,281	.4684	.4133	3.6393
Vulnerable	40,131	.5252	.4954	3.0867
Extreme Poor	3,523	.5325	.4958	2.6292

From our estimation sample, 19% of respondents are non-poor, 74.4% are vulnerable and the remaining 6.5% are extremely poor. We also observe differences in the level of social capital for the different poverty cohorts. The poor and vulnerable have higher percentages of civic social capital but lower levels of connectedness. This could be that our connectedness variable also somehow captures an idividual's ability to buy a phone as well as have other basic amenities such as electricity and telecommunication network before one can use this mode to connect to others.

D. Control variables

Aside our main variables, we employ other covariates that could also potentially explain bribery. We categorise them under individual characteristics, trust and access to public services.

From table 3, the data captures more respondents from the rural areas (58.1%) than from urban areas (41.9%). We also observe a youthful population with 74.5% of the population below the age of 46. Gender wise, the sample population is more balanced with slightly more females (50.3%) than males. We also observe that a large proportion of our sample (35.3%) have not completed any formal education, while 5.5% have at least a university degree. The employment

Table 4: Descriptive statistics of individual characteristics and other covariates

Variable	Categories	Freq.	Percent
Location	0 Urban	22,601	41.90
	1 Rural	31,334	58.10
	Total	53,935	100
Age Cohorts	1 18-25	13,003	24.24
	2 26-35	16,090	30.00
	3 36-45	10,869	20.26
	4 46-55	6,886	12.84
	5 56-65	4,125	7.69
	6 Over 65	2,668	4.97
	Total	53,641	100
Gender	1 Male	26,801	49.69
	2 Female	27,134	50.31
	Total	53,935	100
Education	0 No formal sch completed	18,965	35.26
	1 Primary school completed	18,012	33.49
	2 Secondary school completed	13,837	25.73
	3 University+	2,966	5.52
	Total	53,780	100
Employment status	0 No	32,724	60.95
	1 Yes	20,967	39.05
	Total	53,691	100
Trust in courts of law	0 Not at all	9,750	18.86
	1 Just a little	13,213	25.56
	2 Somewhat	14,752	28.54
	3 A lot	13,982	27.05
	Total	51,697	100
Trust in police	0 Not at all	12,625	23.88
	1 Just a little	13,284	25.13
	2 Somewhat	13,398	25.34
	3 A lot	13,557	25.65
	Total	52,864	100
Presence of School in the locality	0 No	6,694	12.46
	1 Yes	47,025	87.54
	Total	53,719	100
Presence of Police station in the locality	0 No	33,525	62.84
	1 Yes	19,822	37.16
	Total	53,347	100
Presence of Health Clinic in the locality	0 No	21,433	40.07
	1 Yes	32,062	59.93
	Total	53,495	100
Presence of Paid transport in locality	0 No	9,174	17.06
	1 Yes	44,588	82.94
	Total	53,762	100
Presence of Police in the locality	0 No	36,472	67.65
	1 Yes	17,443	32.35
	Total	53,915	100

statistics in our dataset is highly reflective of employment in Africa, with 60.9% of the sample being unemployed.

Aside our individual characterisitics, we also have other covariates namely; the presence of a number of public services in an individual's locality, and whether an individual trusts these public service delivery officers .

3.2 Empirical Strategy

Multivariate ordered probit model

We specify separate equations for our variables of interest; corruption and access to public services. Both variables are ordinal and as such, we go ahead to model ordered probit models for each of the variables (Amemiya, 1985).

We first specify a corruption econometric model to estimate the effect of social capital on corrupt behaviours as;

$$P_{ipc} = Pr[Y_{ipc} = j] = Pr[\gamma_{j-1} < Y_{ipc}^* \leq \gamma_j] \tag{3}$$

where P_{ipc} is the probability that corruption level is non-zero, that is, between 1-23 (j), $\gamma_0 = -\infty, \gamma_j = \infty$. γs are threshold parameters estimated jointly with the αs.

$$Y_{ipc}^* = Corruption_{ipc}^* = \alpha_{0pc} + \alpha_1 SocialCapital_{pc} + \alpha_2 X_{ipc} + \epsilon_{ipc} \tag{4}$$

where Y_{ipc}^* is a latent variable measuring the level of corruption of individual i in province p, in country c. Observed corruption (Y_{ipc}) is an ordered categorical variable between 0 and 23 where 0 is a non-corrupt individual and 23 is a frequently corrupt individual across all five public services recorded in the survey. $SocialCapital_{pc}$ is the set of social capital variables: provincial level civic social capital, provincial level religious social capital and political ties for each individual (i). X_{ipc} is the set of control covariates, ϵ_{ipc}, is individual specific effects. We also include country fixed effects as we are interested in individual level effects. We also cluster our standard errors at the provincial level.

After specifying our corruption model, we move on to specify a selection equation. This is because, individuals are likely to self-select into corrupt acts. Only individuals who have contact with public delivery services are likely to face (and engage in) corruption. Therefore, it is important to control for the selection bias so as to avoid capturing contact instead of bribery behavior. We therefore re-model our corruption equation with a selection equation [5] as;

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[5]   The other corruption study known to have controlled for selection bias is Peiffer and Rose (2018)

Corruption equation:

$$Y^*_{ipc} = \alpha_{0ipc} + \alpha_1 SocialCapital_{pc} + \alpha_2 X_{ipc} + \epsilon_{ipc}, \quad if \quad w^*_i > 0 \tag{5}$$

Selection equation:

$$Contact\_Public\_Services^*_{ipc} = w^*_i = \beta_0 + \beta_1 M_i + \rho ipc, \quad if \quad w^*_i > 0 \quad and \quad w_i = otherwise \tag{6}$$

$Contact\_PublicServices^*_{ipc}$ is a latent dummy which takes value 1 if individual i in country c has had contact with any public service delivery in the period of the survey. M_i is a set of control covariates that might affect individual i in country c to contact a public delivery service and vice versa. ρ_{ipc} is normally distributed error term.

Finally we specify an access to public services model as;

$$Y^*_{ipc} = Access^*_{ipc} = \alpha_{ipc} + \alpha_1 SocialCapital_{pc} + \alpha_2 X_{ipc} + \epsilon_{ipc} \tag{7}$$

There are three levels of measurement in our dataset; individuals nested in provinces, and provinces nested in countries. Though we are unable to employ a multi-level modelling approach to take care of clustering at the second and third levels due to computational difficulties, we cluster our standard errors at the provincial level and control for country fixed effects. This allows us to reduce inefficiencies of our estimates that are likely to arise from clustering at the different levels.

Estimation technique

We employ the conditional mixed process (cmp) stata command in estimating our multivariate ordered probit model with selection. This estimation technique allows us to estimate a simultaneuos multi-variate model while controlling for selection in our main model. The cmp assumes that the error terms from both the corruption equation and the selection equation can be correlated and are thus multivariate normally distributed (Roodman, 2011). The cmp uses a limited information maximum likelihood estimation procedure (liml) to simultaneously estimate both the main and selection equations and this technique has been found to be more efficient(Roodman, 2011). cmp can however be inconsistent in the presence of heteroskedasticity. We therefore use robust standard errors in all estimations to correct for heteroskedasticity.

4 Results and Discussion

4.1 Corruption in general public service delivery in Africa- The role of social capital

In all model specifications, we present results for the full sample as well as results for three poverty cohorts: non-poor, vulnerable and the poor. Table 5 presents the results of our general corruption model which captures the effects of different forms of social capital on individual corrupt behaviours as well as the selection model. We include controls for individual characteristics: age, gender, education, location, occupation, perception of corruption and living conditions. For occupation, we only assess whether an individual is a public official or not. We also include controls for level of development of an individual's locality: whether there is paid transport in the locality, primary school and a health clinic. Paid transport represents the ability to move easily from one point to the other within the locality. Educational and health facilities are also basic needs that well reflect how developed a locality is. The development of a locality in turn also helps us to access whether there are alternatives available to accessing public services for individuals in a locality. Finally we also inclue three measures of social capital and four measures of political capital. For social capital measures, we include involvement in civic association, religious association and telephone usage. For political capital, we include contact with either a member of a local council, an member of parliament (MP), a government official or a member of a political party.

On the role of social capital, results from the full sample of the corruption model in Table 5 indicate that, both civic and religious association impacts positively on corruption. Civic associations, according to Putnam (1995), are the bedrocks from which generalised trust breeds and thrives. It is therefore expected that involvement in a civic association will lead to the development of moral virtues which will in turn reduce corrupt behaviours. However, we do not observe this effect in our sample. Given that civic associations are forms of social networks, it is likely that an individual's involvement in a social network, in spite of the network's purpose being civic, could result in increased corruption. Individuals who engage in social networks are likely to develop new contacts who could link them with public officials. If these public officials are corrupt, then such social networks could reduce the cost of finding a corrupt public official, thereby easing corruption transactions. Kim and Whitaker (2013), in their study of corruption in South Korea, found that civic associations, purported to be altruistic in nature, was highly prone to subversion and thus, increased corruption. The argument of network subversion also holds, when we observe the role of religious associations. Religious associations, by their nature, possess altruistic elements which suggest a suppression of opoortunistic behaviours by members. However, such altruistic networks face the danger of manipulation of individuals' altruistic behaviour to protect opportunistic members, thereby subverting these networks (Kim and Whitaker, 2013). Letki (2006) also analysing if voluntary associations (which include both civic and religious associations) produce civic morality, does not find any evidence of this. This gives further credence to our results. An increase in an individual's usage of telephone, which

depicts greater connectivity, also impacts positively on corruption. Connectivity, either in depth or breadth, represents an individual's relational ability. Relational ability has been purported to be a necessary condition for effective corrupt transactions (Uribe, 2014). This is because, corrupt exchanges occur within dyads, where legitimacy of exchange can be established (Granovetter, 2007). Therefore, once an individual can establish connections with others with whom he or she can conduct a corrupt transaction, the corrupt exchange could then be legitimised, leading to successful corruption transactions. Finally, individuals with all forms of political ties also have a higher likelihood of being corrupt than individuals without political ties. Political ties reflect ties with potentially influential people in the society, either politically, or in the delivery of public goods and services. It is likely that such influential people may appropriate their influence to ease access to public services to individuals within their network, but at a cost. Justesen and Bjornskov (2014) find similar results when analysing bureaucratic corruption in Africa.

In Table 5, model 1, we observe that, the aged are less likely to be corrupt than the younger cohorts. This finding is in conformity with criminology studies that find that the aged are more compliant than the youth (Hirschi and Gottfredson, 1983). Torgler and Valev (2006), in their study of age and corruption, also find similar results. Both time-variant and time-invariant explanations have been given for the age-crime relationship.[6] We also find that, females are less likely to be corrupt than males. Other studies have also found similar results when focusing on gender and corruption (Swamy et al., 2001; Chaudhuri, 2012). Studies have found that, though women are less likely to offer bribes, they are disproportionately negatively affected by corruption (Chne and Rheinbay, 2016). Comparing individuals with an educational level of primary school attainment and higer with individuals without any formal schooling, we find that having at least a primary school education increases corruption levels than not having any formal education. This implies that, possessing some degree of formal education could help reduce corruption through the development of certain non-cognitive positive elements such as increased trust and civic virtues. This finding is also observed by Truex (2011) and Kaffenberger (2012). However, caution must be taken in promoting education as an anti-corruption mechanism as highly educated individuals are also likely to have access to certain social networks which could potentially lead to increased corruption. Living in a rural area makes an individual less likely to be corrupt compared to those living in an urban area. This could be as a result of communal living which is typical of rural areas in Africa. This creates a sense of belonging in the community which then reduces amoral behaviour among inhabitants. We do not observe any significant effect of being a public official or not on an individuals'corruption likelihood. We find that indivdual's that perceive a great increase in corruption are more likely to be corrupt than those that perceive a great reduction in corruption. This is because, individuals are likely to also engage in corrupt behaviours and also justify them, when they think others around them are also corrupt (Bicchieri and Xiao, 2009; Dong et al., 2012). We also find that, individuals who see their living conditions to be above average, are less likely to be corrupt than those who perceive their living conditions to be very bad. This could be because, individuals who are

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[6]   see Rocque et al. (2015) for an in-depth discussion on the literature on age and crime.

well -off are less vulnerable to corruption as they tend to have other service provision options particularly for non-monopoly social services such as education, health an water and sanitation (Peiffer and Rose, 2018).

Table 5: Determinants of corrupt behaviours

Reference category	Other categories	Full sample (1)	Non-Poor (2)	Vulnerable (3)	Extreme Poor (4)
		Corruption Model			
Age Cohorts					
18-25	26-35	0.0790***	0.125***	0.0591	0.0668
		(0.0165)	(0.000494)	(0.0388)	(0.0675)
	36-45	0.121***	0.157***	0.115**	0.110*
		(0.0160)	(0.0126)	(0.0460)	(0.0647)
	46-55	0.0528***	0.102***	0.0655*	-0.00912
		(0.0180)	(0.0378)	(0.0359)	(0.0818)
	56-65	-0.0527***	-0.00517	-0.0644***	0.0570
		(0.0163)	(0.00966)	(0.0223)	(0.0996)
	65+	-0.178***	-0.242***	-0.186***	0.0621
		(0.0325)	(0.0574)	(0.0468)	(0.130)
Gender					
Male	Female	-0.0991***	-0.117***	-0.0963***	-0.0926*
		(0.0177)	(0.0394)	(0.0140)	(0.0531)
Education					
No formal sch	Primary sch	0.0787***	0.0596**	0.101***	-0.0237
		(0.0261)	(0.0245)	(0.0250)	(0.0592)
	Secondary sch	0.178***	0.173***	0.203***	0.0836
		(0.0248)	(0.0648)	(0.0488)	(0.0835)
	University+	0.239***	0.0918	0.352***	0.452**
		(0.0584)	(0.130)	(0.0820)	(0.176)
Location					
Urban	Rural	-0.0354*	0.0902***	-0.0606**	-0.0651
		(0.0197)	(0.00715)	(0.0241)	(0.0602)
Citizen	Public official	0.0338	0.0381***	0.0244**	0.0912
		(0.0259)	(0.000951)	(0.0114)	(0.108)
Primary sch in locality					
No	Yes	-0.00645	-0.00381	0.00458	-0.124
		(0.0425)	(0.00709)	(0.0309)	(0.0806)
Paid transport in locality					
No	Yes	0.106***	0.178**	0.126***	-0.00124
		(0.0354)	(0.0893)	(0.0406)	(0.0808)
Health clinic in locality					
No	Yes	0.00963	0.0966*	-0.00455	0.0415
		(0.0171)	(0.0497)	(0.0228)	(0.0658)
Civic Association		0.805***	1.135***	0.671**	1.224*
		(0.249)	(0.0990)	(0.323)	(0.626)
Religious Association		0.271**		0.268	0.222
		(0.117)		(0.241)	(0.429)
Telephone Usage					
Never	Less than once a month	-0.0748	0.0719	-0.0642	0.0685
		(0.0527)	(0.308)	(0.0655)	(0.185)
	Few times a month	0.200***	0.356	0.188**	0.115
		(0.0649)	(0.249)	(0.0807)	(0.145)
	Few times a week	0.113***	0.146	0.123	0.216*
		(0.0411)	(0.173)	(0.0764)	(0.113)
	Everyday	0.145***	0.338*	0.159***	0.184**
		(0.0274)	(0.173)	(0.0510)	(0.0856)
Local council contact					

Table 5 continued from previous page

Reference category	Other categories	Full sample (A)	Non-Poor (B)	Vulnerable (C)	Extreme Poor (D)
No	Yes	0.181***	0.184***	0.185***	0.123**
		(0.0214)	(0.0385)	(0.0133)	(0.0574)
MP contact					
No	Yes	0.136***		0.132***	0.142*
		(0.0346)		(0.0232)	(0.0797)
Govt official contact					
No	Yes	0.193***	0.136***	0.213***	0.137*
		(0.0294)	(0.00109)	(0.0287)	(0.0824)
Political party contact					
No	Yes	0.159***	0.247***	0.150***	0.113
		(0.0224)	(0.0261)	(0.0375)	(0.0812)
Perceived corruption					
Decreased a lot	Decreased somewhat	0.00853	-0.0455***		
		(0.0342)	(0.00444)		
	Decreased	0.0433	0.00667		
		(0.0364)	(0.0399)		
	Increased somewhat	0.0232	-0.00931		
		(0.0611)	(0.00626)		
	Increased a lot	0.127**	0.0614***		
		(0.0607)	(0.000750)		
Living conditions					
Very bad	Fairly bad	-0.0160		-0.0171	-0.0610
		(0.0327)		(0.0136)	(0.0629)
	Neither good nor bad	0.00654		0.0108	-0.0121
		(0.0257)		(0.0203)	(0.0700)
	Fairly good	-0.0807***		-0.0670**	0.00381
		(0.0254)		(0.0310)	(0.0734)
	Very good	-0.117***		-0.0742**	0.0991
		(0.0305)		(0.0366)	(0.159)

Selection Model					
Civic Association		0.489*	0.621***	0.547*	0.0898
		(0.279)	(0.0980)	(0.292)	(0.507)
Religious Association		0.0254	-0.426***		
		(0.245)	(0.0194)		
Telephone Usage					
Never	Less than once a month	0.119***	0.442***		
		(0.0382)	(0.0703)		
	Few times a month	0.171*	0.298**		
		(0.0963)	(0.127)		
	Few times a week	0.270***	0.308**		
		(0.0324)	(0.151)		
	Everyday	0.146***	0.292***		
		(0.0313)	(0.0467)		
Location					
Urban	Rural	0.0513*	0.0850***	0.0151	-0.0831
		(0.0290)	(0.000776)	(0.0481)	(0.0708)
Primary school in locality					
No	Yes	0.1000***	-0.0118	0.112***	0.292***
		(0.0372)	(0.0367)	(0.0290)	(0.0954)
Paid transport in locality					
No	Yes	0.0324	0.187***	0.0317	-0.171*
		(0.0221)	(0.00368)	(0.0383)	(0.0942)
Health clinic in locality					
No	Yes	0.0170	-0.0153	0.0220***	0.0409
		(0.0318)	(0.0151)	(0.00591)	(0.0677)
Gender					

Table 5 continued from previous page

Reference category	Other categories	Full sample (A)	Non-Poor (B)	Vulnerable (C)	Extreme Poor (D)
Male	Female	-0.0276**	-0.0337	-0.0301*	-0.140***
		(0.0135)	(0.0570)	(0.0166)	(0.0502)
Age Cohorts					
18-25	26-35	0.116***	0.0646***	0.121***	0.0672
		(0.0151)	(0.0218)	(0.0123)	(0.0723)
	36-45	0.134***	0.102***	0.160***	0.0367
		(0.0214)	(0.00235)	(0.0212)	(0.0857)
	46-55	0.0779***	0.0869***	0.0966***	0.0165
		(0.0169)	(0.0186)	(0.0191)	(0.0947)
	56-65	0.0246	0.0959	0.0152	-0.0739
		(0.0309)	(0.0645)	(0.0402)	(0.111)
	65+	-0.0761**	0.00233	-0.0955*	-0.281***
		(0.0357)	(0.0418)	(0.0500)	(0.108)
No formal sch	Primary sch	0.0966***	0.200***	0.120***	0.263***
		(0.0212)	(0.0581)	(0.0254)	(0.0721)
	Secondary sch	0.159***	0.277***	0.221***	0.212**
		(0.0378)	(0.0391)	(0.0228)	(0.0952)
	University+	0.143***	0.295**	0.248***	0.164
		(0.0327)	(0.114)	(0.0450)	(0.193)
Perceived corruption					
Decreased a lot	Decreased somewhat	0.0566			
		(0.0455)			
	Decreased	-0.0354			
		(0.0562)			
	Increased somewhat	-0.0373			
		(0.0421)			
	Increased a lot	-0.00492			
		(0.0275)			
Living conditions					
Very bad	Fairly bad	0.0113	0.196***	-0.00947	0.0403
		(0.0302)	(0.0726)	(0.0310)	(0.0767)
	Neither good nor bad	-0.00760	0.173**	0.00943	-0.0275
		(0.0372)	(0.0767)	(0.0517)	(0.108)
	Fairly good	-0.0570	0.159***	-0.0239	-0.0649
		(0.0437)	(0.0537)	(0.0456)	(0.111)
	Very good	-0.164***	0.148	-0.135	-0.136
		(0.0446)	(0.121)	(0.0897)	(0.194)
	_cons	0.669***	0.0670***	0.825***	0.799***
		(0.164)	(0.0153)	(0.0845)	(0.296)
	rho	0.911	0.939	0.993	0.004
	Wald Chi2 stat (pvalue)				10239.58 (0.00)
	No. of countries	36	36	36	36
	No. of provinces	394	372	413	325
	N	43681	9170	35255	2919

Note: This table reports both the general corruption model and selection model. Dependent variable for the corruption model is the categorical variable *Corruption* which measures how frquently an individual has had to pay a bribe or offer a favour in exchange for a public service from a public official. Response categories are "No experience," "Once or twice," "A few times," or "Often". Dependent variable for the selection model is the binary variable *Access to public services* which asks individuals whether or not they have accessed any of the five public services: education, health, water and sanitation, police, courts and permits or documents. Bootstrapped standard errors are reported for models 1-3 and replications are based on provincial clusters. We report robust clustered standard errors for model 4. All standard errors are reported in parentheses. Country dummies are included with Algeria as the reference country.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Differentiating between the poverty cohorts in our corruption model in Table 5, we assess the

effect of social capital on corruption. We observe that civic association has a positive and significant effect across all specifications albeit weakly for the poor. The weak significance of civic assoiccation on corruption for the poor, as compared to the rich, could be due to the fact that, the cost of voluntary network formation with relevant people who could contribute to the identification of a corrupt official excludes most of the poor from such links, which prevents them from using their social networks to engage in corrupt behaviours.[7] We do not observe any effect of religious association on corruption. For telephone usage, we observe everyday use to increase likelihood of corruption across all specifications.

On the effect of political capital on corruption, contact with a government official is seen to positively impact on corruption across all poverty cohorts. Having a contact with a political party positively impacts on corruption for all cohorts except the poor. Having a contact with an MP positively impacts on corruption for the vulnerable and poor. Across all four variables measuring political contact, we only observe weak to no positive significance of political capital on corruption for the poor. Again, given the high level of relevance of people in political networks, the poor are least likely to benefit from such networks (Chantarat and Barrett, 2012). The rich and vulnerable with some level of wealth however, can take advantage of such contacts to engage in corrupt behaviour.

On our covariates, we observe age matters more for non-poor and the vulnerable than for the poor. The non-poor or vulnerable aged are less likely to engage in corrupt behaviours than the non-poor or vulnerable young. However, expect for the 36-45 years cohort where we observe a slightly significant positive effect, age does not seem to matter for the poor in corruption. We observe a negative and significant effect of being female on corruption across all poverty cohorts. Comparing educated poor versus non-poor in models B and D, we observe that for the extreme poor, only individuals educated at university level and above are more likely to be corrupt. As education serves as an avenue for network formation, it is likely that poor individuals with very high levels of education are able to gain value for their social capital, which they can then appropriate for corupt gains. We do not observe any effect of education on corruption for the poor at lower levels of education. We, however, observe the opposite effect for the non-poor. We observe education to have a positive and significant impact on corruption only at lower levels of education (primary and secondary levels) and not at higher educational levels (university and higher) for the non-poor. For the vulnerable cohort, we observe positive and significant effect of education on corruption for all educational levels compared to individuals with no formal education. We do not observe any effect of locality of the poor on their corrupt behaviours. We, however, observe heterogenous effects between the the non-poor and the vulnerable. For the non-poor, being in a rural area reduces the likelihood of being corrupt compared to a non-poor living in an urban area. However, a vulnerable individual living in a rural area is more likely to be corrupt than a vulnerable individual living in an urban locality. We observe the effects of perceived corruption only for the non-poor and similar to the full sample, we observe

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[7] Chantarat and Barrett (2012) simulate voluntary link formations and their impact on poverty traps. They find that, the voluntary nature of network formation creates an exclusionary mechanism for the poor which prevents them from benefitting from social networks.

that indivdiuals who perceive corruption to have increased a lot are more to be corrupt than individuals who perceive corruption to have reduced. We are able to only access the impact of living conditions on corruption for the vulnerable and the poor. We only observe living conditions to have an impact for the vulnerable. We find that vulnerable people who have good living conditions are less likely to be corupt than individuals who have very bad living conditions.

Results from the full sample specification of the selection model in Table 5 indicates that, individuals aged 65 and above are less likely to access public services than individuals between the ages of 18 and 25 years. Females are less likely to access public services than males. Individuals with some level of formal education are also more likely to access public services than individuals without any formal education. Individuals living in rural areas are also more likely to access public services than individuals in urban areas. We do not observe any effect of perceived corruption on access to public services. We also observe that individuals who report very good living conditions are less likely to access public services than individuals who report very bad living conditions.

In the selection model of Table 5, we observe that poor individuals in the age cohort of 65 and above are less likely to access public services than those in the age cohort of 18 to 25. For the non-poor and vulnerable cohorts, we observe a positive and significant impact of age on access to public services for individuals aged 18 to 55. We also finally assess the effect of living conditions on access to public services. We observe these effects only for the non-poor. Non-poor individuals who have do not have very good living conditions are more likely to access public services compared to those are at the extreme ends of the spectrum: those that have very bad living conditions or very good living conditions.

We go on to differentiate between different types of public services: Basic, non-basic and monopoly services. Basic services are services that are necessary for human survival. In this research, we focus on health and water and sanitation services as basic services. We consider education to be a non-basic service and police, and access to official documents as monopoly services.

4.2 Non-Basic public service delivery and corruption in Africa-The role of social capital

We assess the role of social capital on easing access to public primary schools as a non-basic service and also on corruption in public primary school access.

In Model A, we analyse determinants of corrupt behaviours. Here, we do not observe any impact of an individual's location on his or her corrupt behaviour. We find a positive and significant effect of civic association on corruption. However, when we analyse the heterogenous effect of civic association for the different poverty cohorts, we observe a significant and positive impact only for the vulnerable group. Firstly, the government does not have monopoly in the provision

of primary education. As such, the non-poor do not need to incur an additional cost-corruption cost- in accessing primary education. Thus, they are able to avoid using their social network for corruption purposes. The extreme poor, however, do not also use their social networks in asessing primary education, not because it is a non-monopoly, but because it is a non-basic good. The extreme poor are mostly concerned about survival. Hence, if they are required to bear an additional burden, by leveraging whatever little social capital they have, to gain access to primary eduaction, they are more likely to reserve the use of their social capital to gain access to basic services, even if it involves corruption. Also, most public primary education is free and compulsory (Banerjee and Duflo, 2007; Emran et al., 2013). As such, difficulty in access can be surmounted by paying a small corruption fee, and may not require social networks to do so. The vulnerable cohort, however, caught in-between the non-poor and the extreme poor, do not always only care about survival, but also about other needs such as primary education. They, however, may not have the means to access private education as they tend to be costlier than public education provision. They, therefore, become the preys of corruption, and hence, may have to use their social capital for corrupt purposes. Public officials may also charge higher corruption fees, given that the vulnerable are of a slightly higher socio-economic status than the extreme poor and thus, may be perceived to have the means to pay higher corruption fees. We, therefore, find evidence of network subversion for the vulnerable in accessing non-basic public services.

We also observe differential impacts of telephone usage (level of connectivity) between the non-poor and the vulnerable. We observe that, for the non-poor, increased telephone usage, which represents increased connectivity, leads to a lesser likelihood of corruption. However, for the vulnerable, we observe a positive and significant impact of telephone usage on corruption at all levels of connectivity. It is likely that, the non-poor are able to use the value within their social capital to ease access to primary education, without subverting their networks. This is because, with a level of socio-economic status comes a higher value of social capital. The vulnerable, however, as mentioned earlier, may not be able to convert their social capital to a form of capital which will allow them to benefit from easier access to primary education, without offering their capital in exchange as a form of *quid pro quo*.

On the effects of political capital, aside local council contact where we find no effect, we observe a positive and significant relationship between political capital and corruption in the full sample. This finding, however, no longer holds when we differentiate between the different poverty cohorts. We observe a positive and significant impact of perceived corruption on corrupt behaviours in the full sample for individuals who perceive corruption to have increased a lot. This impact however is not observed for any of the poverty cohorts. For individuals who report to have difficulty in accessing primary schooling, we observe a positive and significant impact of accessing primary school on corruption. When we differentiate between the different poverty cohorts, we observe an increasing positive effect of accessing primary school on corrupt behaviours as access becomes more difficult. We observe this effect for both the non-poor and the vulnerable but not for the extreme poor.

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In Model B, we analyse access to primary schooling. Here, the only variable seen to affect access to primary schooling for the extreme poor is the presence of a primary school in the locality. Here, we find that, individuals with a primary school in their locality have less likelihood of facing difficulties in accessing primary education than individuals without. This finding reinforces the importance of infrastructure in localities. Location is seen to have a negative and significant impact on access to primary schooling for the non-poor and the vulnerable but not for the extreme poor. Non-poor and vulnerable individuals who use telephones at the lowest intensity (less than once a month), compared to those who never use telephones, access primary schools easier. We do not find any evidence of higher intensities of telephone usage on access to primary schooling for the non-poor and the vulnerable. We also do not find any evidence of telephone usage's impact on access to primary schooling for the extreme poor in our sample. Here, we find some evidence that indeed, as Bourdieu (2002) mentioned, the ability to connect to other individuals or groups might not depict the value within such networks, neither does it adequately inform us of the convertibility of such networks. Therefore, relying on connectivity alone does not give a good picture of the role of social networks in easing access to primary education. On political social capital, we find that individuals who have had contact with a government official have easier access to primary schooling than individuals who have not had any contact with a government official. This finding holds in the full sample, but also for the non-poor and the vulnerable, but not for the extreme poor. This shows that even with valuable social capital, the poor might still not benefit from such capital due to a low convertibility factor (Bourdieu, 2002), particularly in countries where inequality of opportunities exist (Adato et al., 2006). We also find that having an MP contact rather increases difficulty in accessing primary schooling for the non-poor and the vulnerable. Here, we find that as social capital becomes more valuable, it has the potential of becoming more burdensome for those at upper ends of the poverty cohorts. Finally, we find the presence of a primary school in a locality to ease access to primary schooling for the vulnerable and the extreme poor, but not for the non-poor and the presence of a paved road increases difficulty in accessing primary education for the vulnerable.

Table 6: Education: Effect of social capital on corruption and ease of access for public primary schools

		Corruption Model (A)				Access Model (B)			
		(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Reference category	Other categories	Full sample	Non-Poor	Vulnerable	Extreme Poor	Full sample	Non-Poor	Vulnerable	Extreme Poor
Location									
Urban	Rural	-0.0803	0.00724	0.0727	-0.0670	-0.0847	-0.0954**	-0.105***	-0.0559
		(0.0584)	(0.0735)	(0.0521)	(0.145)	(0.0787)	(0.0419)	(0.0127)	(0.0664)
Civic Association		1.073***	0.568	0.888**	2.179	-0.154	-0.365	-0.218	0.913
		(0.360)	(0.440)	(0.353)	(2.450)	(0.709)	(0.354)	(0.232)	(0.564)
Religious Association		-0.140	0.103	0.0535	-0.819	-0.0588	-0.205	-0.0289	-0.516
		(0.266)	(0.511)	(0.244)	(1.490)	(0.101)	(0.269)	(0.143)	(0.384)
Telephone Usage									
Never	Less than once a month	-0.0181	0.564***	0.115**	-0.0817	-0.120	-0.377***	-0.156*	0.304
		(0.157)	(0.215)	(0.0461)	(0.584)	(0.0874)	(0.124)	(0.0849)	(0.205)
	Few times a month	0.173***	-0.180	0.140***	-0.118	0.0160	0.196	-0.0249	0.227
		(0.0516)	(0.237)	(0.0467)	(0.400)	(0.0565)	(0.204)	(0.122)	(0.207)
	Few times a week	0.0670	-0.245*	0.105***	0.0916	-0.0104	-0.0551	-0.0242	0.0516
		(0.111)	(0.141)	(0.0311)	(0.274)	(0.104)	(0.125)	(0.0532)	(0.130)
	Everyday	-0.107	-0.329**	0.0426**	0.156	-0.0437	0.109	-0.0545	0.00600
		(0.0863)	(0.160)	(0.0196)	(0.175)	(0.100)	(0.105)	(0.0442)	(0.0979)
Local council contact									
No	Yes	0.0125	-0.103	0.0148	-0.104	0.0235	0.0603	0.000597	0.0860
		(0.0499)	(0.0797)	(0.0110)	(0.146)	(0.0292)	(0.0369)	(0.00439)	(0.0867)
MP contact									
No	Yes	0.124***	-0.0253	0.0377	-0.138	0.0326	0.0462**	0.0379***	0.0361
		(0.0327)	(0.151)	(0.0644)	(0.172)	(0.0256)	(0.0216)	(0.00258)	(0.113)
Govt official contact									
No	Yes	0.0625**	0.105	0.0833	0.384	-0.0849*	-0.137***	-0.0741***	0.0432
		(0.0319)	(0.126)	(0.0636)	(0.257)	(0.0454)	(0.0461)	(0.00679)	(0.119)
Political party contact									
No	Yes	0.0372*	0.0500	0.000474	0.00723	0.0221**	-0.0304	0.0297	-0.0733
		(0.0205)	(0.151)	(0.0402)	(0.168)	(0.0111)	(0.0708)	(0.0356)	(0.102)
Perceived corruption									
Decreased a lot	Decreased somewhat	-0.0308	-0.00505	-0.0242	0.217				
		(0.0869)	(0.195)	(0.127)	(0.311)				
	Decreased	0.0757	0.119	0.0183	0.259				

Table 6 continued from previous page

		Corruption Model (A)				Access Model (B)			
		(0.0802)	(0.295)	(0.167)	(0.327)				
	Increased somewhat	-0.0797	0.160	-0.0650	-0.0720				
		(0.0842)	(0.235)	(0.119)	(0.306)				
	Increased a lot	0.0916**	0.130	0.0326	0.164				
		(0.0428)	(0.289)	(0.133)	(0.290)				
Accessing primary educ									
Very easy	Easy	0.188	1.075***	1.037**	0.630				
		(0.169)	(0.388)	(0.479)	(1.227)				
	Difficult	0.891***	2.556***	2.309***	1.472				
		(0.332)	(0.729)	(0.870)	(2.394)				
	Very difficult	1.136**	3.765***	3.323**	2.044				
		(0.536)	(1.145)	(1.302)	(3.649)				
Paid transport in locality									
No	Yes	0.0509				0.0187			
		(0.0373)				(0.0306)			
Primary school in locality									
No	Yes					-0.0937	-0.0573	-0.0874***	-0.291**
						(0.0752)	(0.0423)	(0.0151)	(0.119)
Paved road in locality									
No	Yes					0.0242	0.0340	0.0291***	-0.00745
						(0.0190)	(0.0628)	(0.0100)	(0.101)
Constant						2.206**	1.866***	2.555***	3.087***
						(1.049)	(0.246)	(0.0417)	(0.453)
Wald Chi2 stat (pvalue)									
No. of Countries		36	36	36	36				
N		47084	8983	35179	2981				

Note: This table reports both the corruption model and access model for public primary schools. Dependent variable for the corruption model is the categorical variable *Corruption* which measures how frquently an individual has had to pay a bribe or offer a favour in exchange for a public service from a public official.
Response categories are "No experience," "Once or twice," "A few times," or "Often". Dependent variable for the access model is the categorical variable
Access to primary schooling which asks individuals how difficult it is to access primary schooling. We include controls for Age, gender and education.
Bootstrapped standard errors are reported for models 1-3 and replications are based on provincial clusters.
We report robust clustered standard errors for model 4. All standard errors are reported in parentheses.
Country dummies are included with Algeria as the reference country.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4.3 Basic public service delivery and corruption in Africa-The role of social capital

We assess the role of social capital on access to basic services as well as on corruption in the delivery of basic public services. We focus on public provision of two services: healthcare and water and sanitation.

In Table 7 model A,we assess the role of social capital on corruption in public health service delivery. Fot the full sample of individuals, we find civic association, contatc with an MP, contact with a political party official, low perception of corruption and ease of access to medical treatment to be relevant for corruption. We find in Table 7 model 1 that, an increase in civic association leads to an increase in corrupt behaviour. We, however, find this finding to hold true for only the vulnerable and extreme poor in our sample. Having contact with an MP is seen to be positively associated with increasing corrupt behaviours. This finding however, holds for the vulnerable subsample and not the extreme poor or the non-poor. Having contact with a political party official increases the likelihood of being corrupt as seen in model 1 Table 7. When the sample is broken into the different cohorts however, this finding holds only for the extreme poor. Individuals that perceive corruption to have decreased somewhat are less likely to be corrupt and individuals who find it difficult to access medical treatment,are more likely to be corrupt than those who find it very easy to access medical treatment. We also find that, across all poverty cohorts, living in a rural location reduces the likelihood of being corrupt than living in an urban location. We also find the presence of a health clinic in a locality to also reduce the likelihood of corruption for the vulnerable and the presence of paid transport to increase corruption likelihood for the vulnerable.

In Table 7 model B, we assess the role of social capital in easing access to medical treatment. Here, we find tehe likelihood of easy access to medical treatment to be higher for individuals living in rural areas than for those living in urban areas. This finding holds across all sub-samples. For the non-poor, we find frequent use of telephones (everyday) to increase the difficulty in accessing healthcare. Having access to a government official is associated with easier access to healthcare, albeit only for the vulnerable. Knowing a political party official is associated with a more difficult access to healthcare for the extreme poor. A health clinic in a locality reduces the difficulty of accessing health care for the full sample. However, only the non-poor and the vulnerable seem to benefit from having a health clinic in their locality as we do not find any evidence of easier access for the extreme poor with a health clinic in their locality.

Table 7: Healthcare: Effect of social capital on corruption and ease of access to public healthcare services

		Corruption model (A)				Access model (B)			
		(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Reference category		Full sample	Non-Poor	Vulnerable	Extreme Poor	Full sample	Non-Poor	Vulnerable	Extreme Poor
Location									
Urban	Rural	-0.000996	-0.123*	-0.105***	-0.325***	-0.130***	-0.158***	-0.142***	-0.116*
		(0.0684)	(0.0652)	(0.0340)	(0.0839)	(0.0323)	(0.0567)	(0.0501)	(0.0622)
	Civic association	0.839*	0.647	0.563*	2.267*	-0.318	-0.169	-0.383	0.240
		(0.480)	(0.710)	(0.328)	(1.191)	(0.372)	(0.384)	(0.466)	(0.420)
Telephone Usage									
	Never	-0.128	0.203	-0.180	0.0443	0.0256	-0.00272	0.0284	0.212
		(0.0926)	(0.250)	(0.165)	(0.237)	(0.0417)	(0.167)	(0.185)	(0.213)
	A few times a month	0.123	-0.0346	0.187***	-0.0783	0.0144	-0.159	-0.00835	0.216
		(0.0881)	(0.140)	(0.0332)	(0.223)	(0.0525)	(0.141)	(0.111)	(0.155)
	A few times a week	0.0113	-0.0992	0.0143	0.194	0.0112	0.113	0.00815	0.00175
		(0.0700)	(0.186)	(0.0497)	(0.160)	(0.0131)	(0.0784)	(0.0479)	(0.0778)
	Everyday	-0.0254	0.00243	-0.00414	0.0264	-0.00510	0.0939***	0.0114	0.0843
		(0.0417)	(0.137)	(0.0611)	(0.132)	(0.0219)	(0.0257)	(0.0246)	(0.0611)
Local council contact									
No	Yes	0.0530	0.0118	0.0781		0.0256	0.0167	0.0128	
		(0.0378)	(0.0871)	(0.0487)		(0.0246)	(0.0346)	(0.0200)	
MP contact									
No	Yes	0.0714**	-0.140	0.0843**	0.150	-0.0140	-0.0897	0.0144	-0.0748
		(0.0278)	(0.175)	(0.0365)	(0.148)	(0.0269)	(0.108)	(0.0446)	(0.0853)
Govt official contact									
No	Yes	0.0995	0.0622	0.0291	-0.118	-0.0745**	-0.0309	-0.0868***	-0.0513
		(0.0682)	(0.142)	(0.0545)	(0.133)	(0.0306)	(0.0754)	(0.0267)	(0.0924)
Political party contact									
No	Yes	0.0506***	-0.0476	0.0815	0.146*	0.00208	-0.0819	0.00283	0.119*
		(0.0127)	(0.0622)	(0.0514)	(0.0860)	(0.0149)	(0.0703)	(0.0158)	(0.0691)
	Rel	-0.0838	-0.324	0.0859	-0.655	0.0739	0.0781	0.0493	0.466
		(0.317)	(0.564)	(0.327)	(0.757)	(0.181)	(0.347)	(0.325)	(0.335)
Health clinic in locality									
No	Yes	0.0261	-0.0284	-0.0976***	-0.136	-0.102***	-0.142***	-0.103***	0.0216
		(0.0437)	(0.0762)	(0.0256)	(0.0947)	(0.0125)	(0.0385)	(0.0352)	(0.0500)
Paid transport in locality									

Table 7 continued from previous page

		Corruption model (A)				Access model (B)			
No	Yes	-0.0931	0.120***	0.134					
		(0.134)	(0.0345)	(0.120)					
Perceived corruption									
Decreased a lot	Decreased somewhat	-0.0523*		0.281					
		(0.0293)		(0.223)					
	Decreased	-0.0647		0.222					
		(0.0441)		(0.222)					
	Increased somewhat	-0.0645		0.122					
		(0.0411)		(0.225)					
	Increased a lot	0.0276		0.218					
		(0.0347)		(0.214)					
Access to medical treatment									
Very easy	Easy	0.998							
		(0.622)							
	Difficult	2.111*							
		(1.142)							
	Very difficult	2.994*							
		(1.696)							
School in locality									
No	Yes					-0.0176	0.0983	-0.0279	-0.00726
						(0.0382)	(0.0678)	(0.0307)	(0.0784)
atanhrho_12									
Constant		-0.731	0.485***	0.449***	0.291***				
		(0.669)	(0.0572)	(0.0328)	(0.101)				
atanhrho_13									
Constant		-0.0187	-0.108	-0.0496	0.892**				
		(0.455)	(0.105)	(0.585)	(0.373)				
atanhrho_23									
Constant		-0.0315	-0.291	0.0328	-0.257				
		(0.295)	(0.277)	(0.169)	(0.202)				
Wald Chi-squared2 (pvalue)					56375.58				
No. of Countries		34	34	34	34				
Observations		52904	10145	39396	3421				

Note: This table reports both the corruption model and access model for public medical treatment. Dependent variable for the corruption model is the categorical

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Table 7 continued from previous page

	Corruption model (A)	Access model (B)

variable *Corruption* which measures how frequently an individual has had to pay a bribe or offer a favour in exchange for a public service from a public official.

Response categories are "No experience," "Once or twice," "A few times," or "Often". Dependent variable for the access model is the categorical variable

Access to medical treatment which asks individuals how difficult it is to access medical treatment. We include controls for Age, gender and education.

Bootstrapped standard errors are reported for models 1-3 and replications are based on provincial clusters.

We report robust clustered standard errors for model 4. All standard errors are reported in parentheses.

Country dummies are included with Algeria as the reference country.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

In Table 8, we analyse corruption and access to water and sanitation services as a public service. Model A is our corruption model and model B is our access model. In the corruption model, We do not find any determinants of corruption in water and sanitaion for the extreme poor. We find civic association to be positively associated with corruption in the full sample. This finding holds for the non-poor and the vulnerable but not for the extreme poor. We also find telephone usage to positively influence corruption but for people who use telephones a few times a month compared to those who never use telephones. We also find this for the non-poor and the vulnerable. In the ful sample, contact with an MP is positively associated with being corrupt. This finding is also present for only the vulnerable cohort. Being a non-poor individual in a rural area also positively impacts on corruption.

In the access model, individuals living in rural areas are more likely to easily access water and sanitation services than individuals in urban areas. When we test for heterogenous impacts, we observe this finding for the vulnerable and the extreme poor but not for the non-poor. We also find civic association to worsen access to water and sanitation services for the non-poor. Telephone usage also leads to a worsening of access to water and sanitation services for the pooor and the vulnerable. MP contact leads to a worsening of access to water and sanitation. this finding holds for the vulnerable and the extreme poor. We also find vulnerable indviduals who have contact with a government official to find it difficult accessing water and sanitation services. Having contact with a political party contact is associated with a difficulty in accessing water and sanitation services for the non-poor and the vulnerable.

Table 8: Water and sanitation: Effect of social capital on corruption and ease of access to water and sanitation services

Reference category	Other categories	Corruption Model (A)				Access Model (B)			
		(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
		Full sample	Non-Poor	Vulnerable	Extreme Poor	Full sample	Non-Poor	Vulnerable	Extreme Poor
Location									
Urban	Rural	-0.0611	0.157*	-0.0861	-0.143	-0.0937***	-0.0133	-0.116***	-0.137*
		(0.0536)	(0.0879)	(0.0633)	(3.433)	(0.0289)	(0.0840)	(0.0171)	(0.0789)
Pipewater in locality									
No	Yes	0.0893	0.0686	0.0787	0.250	0.00856	0.0281	0.0135	-0.00393
		(0.0709)	(0.139)	(0.0562)	(1.096)	(0.00828)	(0.0323)	(0.0112)	(0.175)
Sewage system in locality									
No	Yes	-0.00555	-0.118	0.0250	0.0206	-0.00275	-0.0296	0.0115	0.0291
		(0.0484)	(0.0805)	(0.0646)	(0.832)	(0.0117)	(0.0273)	(0.0117)	(0.222)
Civic Association		1.459***	2.424***	1.262**	1.456	0.108	0.257*	0.0484	0.260
		(0.259)	(0.869)	(0.607)	(.)	(0.137)	(0.135)	(0.144)	(0.488)
Telephone Usage									
Never	Less than once a month	0.0950	0.564	0.0956	-0.0997	-0.000753	0.197*	-0.0249	0.0247
		(0.149)	(0.976)	(0.163)	(0.426)	(0.0362)	(0.116)	(0.0252)	(0.117)
	A few times a month	0.388**	0.605**	0.418***	0.161	0.0458***	0.182***	0.0182	0.145
		(0.171)	(0.258)	(0.107)	(0.869)	(0.0156)	(0.0381)	(0.0235)	(0.405)
	A few times a week	0.168	0.406	0.209**	-0.0116	0.0569***	0.131***	0.0494**	0.0752
		(0.130)	(0.425)	(0.0941)	(2.471)	(0.0165)	(0.0473)	(0.0201)	(0.372)
	Everyday	0.0432	0.476	0.0959	-0.114	0.0664***	0.166***	0.0648***	0.0676
		(0.0949)	(0.304)	(0.101)	(2.183)	(0.0160)	(0.0554)	(0.00691)	(0.123)
Religious Association		-0.352	-1.221	-0.0798	-0.737	0.134	0.166	0.149	0.0179
		(0.319)	(0.885)	(0.481)	(3.785)	(0.0965)	(0.193)	(0.130)	(0.757)
MP Contact									
No	Yes	0.262***	0.220	0.260***	0.332	0.0397***		0.0397**	0.0824*
		(0.0487)	(0.202)	(0.0411)	(0.415)	(0.00849)		(0.0161)	(0.0478)
Gov't official contact									
No	Yes	0.0980	0.0780	0.102**	0.0191	0.0342	-0.00226	0.0525***	-0.0669
		(0.0871)	(0.0622)	(0.0446)	(1.103)	(0.0230)	(0.0288)	(0.00859)	(0.425)
Political party contact									
No	Yes	0.0312	-0.0532	0.0399	0.148	0.0609***	0.137***	0.0458***	0.0692
		(0.0680)	(0.0760)	(0.0508)	(0.150)	(0.0133)	(0.0216)	(0.0110)	(0.260)
Local council contact									

Table 8 continued from previous page

		Corruption Model (A)				Access Model (B)
No	Yes	0.0261	0.0676	0.0382	-0.262	
		(0.0419)	(0.135)	(0.0315)	(1.231)	
Perceived corruption						
Decreased a lot	Decreased somewhat	-0.0370	0.162	-0.0833	-0.269	
		(0.0821)	(0.310)	(0.124)	(5.554)	
Decreased		0.119**	0.222	0.0875	-0.116	
		(0.0492)	(0.170)	(0.133)	(5.666)	
Increased somewhat		0.0160	0.363***	-0.0452	-0.442	
		(0.0878)	(0.111)	(0.135)	(4.848)	
Increased a lot		0.150**	0.314	0.121	-0.194	
		(0.0642)	(0.234)	(0.130)	(5.819)	
	atanhrho_12					
	Constant	0.398***	0.415***	0.338***	0.400	
		(0.0737)	(0.0646)	(0.106)	(12.73)	
	atanhrho_13					
	Constant	1.623***	1.623***	1.623***	1.623	
		(0.0000372)	(0.0000478)	(0.0000452)	(.)	
	atanhrho_23					
	Constant	0.225***	0.146	0.162	0.170	
		(0.0841)	(0.109)	(0.159)	(17.39)	
	Wald Chi$\hat{2}$ (pvalue)					
	No. of Countries	36	37	36	36	
	Observations	53349	10200	39732	3419	

Note: This table reports both the corruption model and access model for water ans sanitation services. Dependent variable for the corruption model is the categorical variable *Corruption* which measures how frquently an individual has had to pay a bribe or offer a favour in exchange for a public service from a public official. Response categories are "No experience," "Once or twice," "A few times," or "Often". Dependent variable for the access model is the categorical variable *Access to water and sanitation* which asks individuals how difficult it is to access public household services such as water and sanitation. We include controls for Age, gender and education.
Bootstrapped standard errors are reported for models 1-3 and replications are based on provincial clusters.
We report robust clustered standard errors for model 4. All standard errors are reported in parentheses.
Country dummies are included with Algeria as the reference country.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4.4 Monopoly public service delivery and corruption in Africa-The role of social capital

The final analysis is on the role of social capital in the access of services monopolised by the government. These are provision of national documents and permits, police services and courts.

Table 9 presents the role of social capital in the acquisition of documents or permits. In model A, we assess determinants of corrupt behaviours. In the full model, civic association is seen to increase the likelihood of corrupt behaviors. Increased telephone usage is also seen to increase the likelihood of an individual to be corrupt. Having contact with an MP, a government official or a political party official is seen to increase likelihoods of corruption. Perception of increasing corruption also leads to increased likelihoods of corruption.

Differentiating between poverty cohorts, we find extremely poor individuals living in rural areas to be less likely to be corrupt. We also find the presence of a paved road in a locality to erduce the likelihood of corruption for extreme individuals. Civic association leads to corrupt behaviours of the vulnerable. we do not find this result for the non-poor and the extreme poor. We also find the increasing usage of telephones to also increase the likelihood of corruption for the vulnerable but not for the non-poor and the poor. Local council contact only impacts on the non-poor, increasing the likelihood of corruption for this cohort. An MP contact increases the corruption likelihood for the vulnerable, while a government official contact or political party official increases the likelihood of corruption for the vulnerable and the extreme poor but not for the non-poor. Perceptions of increasing corruption increases the likelihood of corruption for all cohorts.

In model B, where ease of access of documents and permits are analysed, we find presence of a paved road in locality to be the only variable which improves access to documents and permits (evidence of infrastructure). All other significant variables increase the likelihood of havng difficulty in acquiring documents and permits. Having paid transport in the locality increases difficulty in acquiring permits and documents. Differentiating between the poverty cohort reveals this finding to hold only for the vulnerable. An increase in telelphone usage also leads to an increase in difficulty in acquiring documents and permits for the full sample. This finding is more prominent for the non-poor and the vulnerable. Extremely poor individuals with highest telephone usage are seen to also have difficulty in acquiring documents and permits. Individuals with local council contact or a political party official contact are more likely to face difficulties acquiring documents and permits. These findings hold for the vulnerable but not for the non-poor or the extreme poor.

Table 9: Document or permit acquisition:The role of social capital in document and permit acquisition

Reference category	Other categories	Corruption model (A)				Access model (B)			
		(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
		Full sample	Non-Poor	Vulnerable	Extreme Poor	Full sample	Non-Poor	Vulnerable	Extreme Poor
Location									
Urban	Rural	-0.0107	0.0674	-0.0178	-0.135***	-0.0392	-0.0568	-0.0401	-0.0344
		(0.0226)	(0.0975)	(0.0319)	(0.0414)	(0.0277)	(0.0350)	(0.0247)	(0.0708)
Paid transport in locality									
No	Yes	0.0643	0.155	0.0750	-0.0164	0.0983***	0.107	0.125***	-0.0892
		(0.0741)	(0.148)	(0.0504)	(0.101)	(0.0346)	(0.0823)	(0.0257)	(0.0854)
Paved road in locality									
No	Yes	-0.0300	0.0311	-0.0243	-0.101**	-0.0319**	-0.0384*	-0.0231**	-0.0527***
		(0.0232)	(0.129)	(0.0413)	(0.0469)	(0.0126)	(0.0225)	(0.0113)	(0.0200)
Civic Association		1.041**	0.863	0.984***	1.907	0.0295	0.0782	0.00148	0.280
		(0.471)	(0.732)	(0.341)	(1.358)	(0.109)	(0.134)	(0.0888)	(0.263)
Religious Association		-0.252	-0.433	-0.137	-1.079	0.105	0.124	0.0930	-0.00180
		(0.265)	(0.417)	(0.277)	(0.989)	(0.129)	(0.197)	(0.0921)	(0.241)
Telephone Usage									
Never	Less than once a month	0.00644	-0.0874	0.0489	-0.0656	0.000662	0.0351	0.0116	-0.0634
		(0.117)	(0.303)	(0.170)	(0.393)	(0.0582)	(0.0764)	(0.0279)	(0.157)
	A few times a month	0.353***	0.327	0.379***	0.219	0.0457	0.113*	0.0404	-0.0113
		(0.0554)	(0.287)	(0.0673)	(0.145)	(0.0312)	(0.0589)	(0.0364)	(0.0751)
	A few times a week	0.153***	0.0468	0.160***	0.185	0.0681***	0.0949**	0.0650***	0.0279
		(0.0517)	(0.144)	(0.0495)	(0.138)	(0.0215)	(0.0436)	(0.0202)	(0.0434)
	Everyday	0.112***	-0.0472	0.147***	0.176	0.0632***	0.135***	0.0611***	0.0548*
		(0.0418)	(0.134)	(0.0547)	(0.201)	(0.0229)	(0.0523)	(0.0115)	(0.0294)
Local council contact									
No	Yes	0.0282	0.111*	0.0202	-0.126	0.0524***	0.00967	0.0561***	0.0567
		(0.0379)	(0.0606)	(0.0250)	(0.103)	(0.0107)	(0.0156)	(0.00865)	(0.0372)
MP contact									
No	Yes	0.0831**	0.0179	0.0937*	0.0463	-0.0148	-0.00136	-0.0202	0.0349
		(0.0351)	(0.180)	(0.0565)	(0.0761)	(0.0169)	(0.0411)	(0.0158)	(0.0380)
Govt official contact									
No	Yes	0.0992***	-0.0114	0.104***	0.267***	0.0173	0.0234	0.0161	0.0361
		(0.0184)	(0.134)	(0.0322)	(0.0666)	(0.0141)	(0.0245)	(0.0143)	(0.0489)
Political official contact									

Table 9 continued from previous page

		Corruption model (A)				Access model (B)			
No	Yes	0.119***	0.0717	0.107***	0.302***	0.0399***	0.0390	0.0375***	0.0424
		(0.0263)	(0.116)	(0.0238)	(0.0632)	(0.00833)	(0.0477)	(0.0101)	(0.0277)
Perceived corruption									
Decreased a lot	Decreased somewhat	0.0495	0.288*	0.00591	0.337				
		(0.0805)	(0.169)	(0.0478)	(0.233)				
	Decreased	0.147*	0.305	0.101***	0.479***				
		(0.0785)	(0.187)	(0.0266)	(0.0781)				
	Increased somewhat	0.104	0.494***	0.0310	0.247*				
		(0.0834)	(0.189)	(0.0530)	(0.137)				
	Increased a lot	0.160*	0.378**	0.108***	0.411***				
		(0.0880)	(0.192)	(0.0417)	(0.154)				
	atanhrho_12								
	Constant	0.605***	0.625***	0.570***	0.678***				
		(0.186)	(0.183)	(0.0481)	(0.132)				
	atanhrho_13								
	Constant	0.345	0.366	0.302***	0.379***				
		(0.215)	(0.235)	(0.0526)	(0.144)				
	atanhrho_23								
	Constant	1.623***	1.623***	1.622***	1.622***				
		(0.0000400)	(0.0000379)	(0.0000191)	(0.0000347)				
	Wald Chi2 (pvalue)								
	No. of Countries	36	36	36	36				
	Observations	53210	10191	39619	3400				

Note: This table reports both the corruption model and access model for document/permit acquisition. Bootstrapped standard errors are reported for models 1-3 and replications are based provincial clusters. We report robust clustered standard errors for model 4. All standard errors are reported in parentheses. Country dummies are included with Algeria as the reference country

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 10 presents results for corruption in the police service in model A, and ease of access to police service in model B. [8] In model A, we find presence of police officers in a locality to increase the likelihood of corruption in the ful sample. Civic association is also positively associated with corruption. Using telephones few times a month, compared to never using a telephone, is positively associated with increasing corruption. Having an MP contact, government official contact or political party official contact is positively associated with increasing corruption. Indivduals who perceive all police officers as corrupt, are more like to be corrupt. Finally, high levels of trust in the police is seen to reduce corrupt behaviours.

Differentiating between poverty cohorts, we find vulnerable individuals living in rurals areas to be less likely to be corrupt than those living in urban areas. Presence of police officers in a locality is also seen to affect only the vulnerable when a differentiation is made between the poverty cohorts. Existence of roadblocks in a locality makes extreme poor less corrupt. The positive effect of civic association on corruption is evidenced only for the vulnerable. We observe a positive effect of telephone usage on corruption at low levels of usage for the non-poor and for the vulnerable, but not for the extreme poor. We find contact with a local council member to lessen the likelihood of an extremely poor individual being corrupt, while having contact with an MP increases the likelihood of an extremely poor person being corrupt. We observe for the vulnerable that, having contact with an MP, a government official or a political party official increases the ikelihood of being corrupt. Assessing the role of perceived corruption reveals that, the non-poor and vulnerable who perceive all police officers to be corrupt, are more likey to be corrupt than those who perceive non of the police officers as corrupt. For the non-poor, even those who perceive most (not all) police officers as corrupt, are also more likely to be corrupt. Finally, vulnerable individuals who trust somehwat or trust a lot police officers are less likely to be corrupt than those who do not tust police officers. We however find that, non-poor individuals who trust police officers a lot are rather more likely to be corrupt than those who do not trust police officers.

In Table 10 model B, access to police services is analysed. Here, we find that presence of police officers in a locality as the only variable which helps ease access of the extreme poor to police services. For the full sample, living in a rural area eases access to police services. This finding, however, is only evidenced for the vulnerable. Both the non-poor and the vulnerable who engage in civic associations are more likely to face difficulties in accessing police services. This evidence is only observed after decomposing our full sample into poverty cohorts. Telephone usage is seen to increase difficulties in accessing police services for the non-poor and the extreme poor but not for the vulnerable. In the full sample, having a local council contact is seen to increase difficulties in accessing police services. This finding, however, holds only for the vulnerable and the extreme poor. We find having an MP contact to increase difficulty in having access to police services. We, however, do not find this evidence in any of our sub-sample decompositions. Having a government official contact or a political party contact increases difficulty in accessing

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[8] The variable used to measure corruption in the police service measures paying a bribe or giving a favour to the police in order to avoid having problems. This therefore, does not reflect victimised corruption as the other forms of corruption explored in this paper.

police service for the non-poor and the vulnerable but not for the extreme poor.

Table 10: Police service: The role of social capital in police service delivery

Reference Category	Other categories	Corruption model (A)				Access model (B)			
		(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
		Full sample	Non-Poor	Vulnerable	Extreme Poor	Full sample	Non-Poor	Vulnerable	Extreme Poor
Location									
Urban	Rural	-0.0458	-0.0297	-0.0703**	0.0921	-0.0374**	0.0195	-0.0648***	-0.0648
		(0.0606)	(0.0428)	(0.0349)	(0.1464)	(0.0155)	(0.0462)	(0.0197)	(0.0641)
Police in the locality									
No	Yes	0.151**	0.190	0.126**	0.229	0.0231	0.00810	0.0255	-0.10029*
		(0.0672)	(0.217)	(0.0492)	(0.157)	(0.0151)	(0.0117)	(0.0157)	(0.0570)
Police station in the locality									
No	Yes	-0.0565	-0.0263	-0.0724	0.0514	0.0197	0.0118	0.0182	0.0973
		(0.0597)	(0.0900)	(0.0447)	(0.1533)	(0.0149)	(0.0131)	(0.0123)	(0.0519)
Roadblocks by police/army in locality									
No	Yes	-0.0354	0.120	0.00858	-0.476***				
		(0.0435)	(0.0820)	(0.0517)	(0.154)				
Paved road in locality									
No	Yes					0.0121	0.00577	0.0200*	
						(0.0141)	(0.0592)	(0.0116)	
	Civic association	1.135*	1.608	1.132***	-0.865	0.0778	0.191***	0.0210	0.825**
		(0.592)	(1.319)	(0.428)	(1.352)	(0.128)	(0.0448)	(0.199)	(0.324)
	Religious association	-0.542	-0.825	-0.478	-0.502	0.0475	-0.0308	0.0615	0.243
		(0.361)	(0.848)	(0.393)	(0.569)	(0.110)	(0.0978)	(0.136)	(0.233)
Telephone usage									
Never	Less than once a month	0.161	0.515*	0.0755	0.410	-0.0357	0.0298	-0.0570	0.174
		(0.156)	(0.300)	(0.117)	(0.368)	(0.0477)	(0.0233)	(0.0449)	(0.174)
	A few times a month	0.275***	0.526**	0.262**	-0.026	0.00222	0.0787	-0.0220	0.166
		(0.0763)	(0.256)	(0.128)	(0.332)	(0.0323)	(0.166)	(0.0587)	(0..1207)
	A few times a week	0.0471	0.0766	0.0469	0.0412	0.0310*	0.113***	0.0114	0.192**
		(0.0527)	(0.311)	(0.0838)	(0.201)	(0.0183)	(0.0386)	(0.0255)	(0.0778)
	Everyday	-0.0101	0.198	-0.0270	-0.0685	0.0305	0.164***	0.0220	0.144***
		(0.0413)	(0.193)	(0.0782)	(0.202)	(0.0206)	(0.00926)	(0.0255)	(0.0544)

<div align="center">Table 10 continued from previous page</div>

		Corruption model (A)				Access model (B)			
Local council contact									
No	Yes	0.00240	0.132	-0.00529	-0.256*	0.0581***	0.0298	0.0575***	0.1095**
		(0.0180)	(0.0876)	(0.0451)	(0.138)	(0.0165)	(0.0337)	(0.0177)	(0.0460)
MP contact									
No	Yes	0.0766*	-0.00732	0.0848*	0.289*	0.0246*	0.0279	0.0243	-0.0451
		(0.0450)	(0.185)	(0.0498)	(0.169)	(0.0144)	(0.0219)	(0.0171)	(0.0584)
Govt official contact									
No	Yes	0.124**	-0.0777	0.149***	0.113	0.0275	0.0693***	0.0210*	0.0453
		(0.0498)	(0.0819)	(0.0507)	(0.154)	(0.0189)	(0.00407)	(0.0121)	(0.0654)
Political party official contact									
No	Yes	0.0838**	0.0318	0.0905***	0.213	0.0483***	0.0601***	0.0487***	-0.0336
		(0.0409)	(0.0984)	(0.0256)	(0.170)	(0.0170)	(0.0164)	(0.0144)	(0.0619)
Perceived police corruption									
None	Some of them	-0.0585	0.215*	-0.0510	-0.309				
		(0.0780)	(0.117)	(0.0990)	(0.478)				
	Most of them	0.0556	0.513***	0.0315	-0.153				
		(0.0665)	(0.141)	(0.0903)	(0.499)				
	All of them	0.239***	0.653***	0.232**	-0.014				
		(0.0761)	(0.103)	(0.0919)	(0.486)				
Trust in Police									
Not at all	Just a little	-0.0421	-0.0214	-0.0572	-0.053				
		(0.0480)	(0.0617)	(0.0394)	(0.160)				
	Somewhat	-0.102**	0.0429	-0.149***	0.3117				
		(0.0461)	(0.118)	(0.0394)	(0.195)				
	A lot	-0.170***	0.0522*	-0.230***	-0.120				
		(0.0535)	(0.0301)	(0.0627)	(0.204)				
atanhrho_12									
	Constant	0.402***	0.493***	0.380***	0.144				
		(0.111)	(0.0683)	(0.0654)	(0.578)				
atanhrho_13									
	Constant	1.623***	1.622***	1.622***	1.623				
		(0.0000526)	(0.0000267)	(0.0000417)	(.)				
atanhrho_23									
	Constant	0.173	0.330***	0.134*	-0.0023				
		(0.129)	(0.0886)	(0.0685)	(0.745)				

Table 10 continued from previous page

	Corruption model (A)				Access model (B)		
Wald Chi squared statistic (pvalue)				43896.89			
No. of Countries	33	33	33	33			
Observations	52470	10066	39080	3383			

5   Conclusion

Difficulty in access to public services serves as a blockade for most people in less developed economies in their path to development and enhanced well-being. Corruption has been, and continues to be, one of the major hinderances for accessing public services. Studies have shown that the poor are mostly disproportionately affected by corruption when they access public services (Justesen and Bjornskov, 2014; Mbate, 2016). This is largely due to institutional factors which prevent the poor from accessing privately provided services due to financial constraints (Justesen and Bjornskov, 2014). This study, however, introduces another dimension where the poor are disadvantaged-social networks. We show that, the non-poor are able to appropriate their social capital in accessing monopoly provided services by the public sector but not the extreme poor. This is because the non-poor possess the convertibility factor to convert the value within their social networks into other useful forms of capital (Bourdieu, 2002). In accessing non-essential services such as education, the vulnerable appropriate their social capital through corruption, to access public services, which they otherwise would not be able to access. The vulnerable and non-poor, aside using the social networks to ease access to public services, also subvert civic and religious networks for corruption purposes, all in the bid to ease their access to public services. The poverty cohort with no resources to leverage are the extreme poor. They are, in most circumstances, unable to leverage their social networks for ease of access to public services. In this study, three major elements are observed in how social networks work for the non-poor, the vulnerable and the extreme poor in the access of publicly provided services: network subversion for corruption, convertibility factor of social networks, and finally, the type of service being provided. In all, the extreme poor, though affected by corruption demands, are not able to appropriate their social and political networks to ease their access to publicly provided services. Anti-poverty strategies should therefore take cognisance of the disadvantaged position of the extreme poor particularly in urban areas and how certain network formations can keep the extreme poor locked in poverty traps which might be difficult to climb out of. Anti-corruption strategies should also take into cognisance the fact that there is not a clear dichotomy between civic networks which have altruistic characteristics and closed networks with amaoral charactersitics. Usually what exists, is the potential of network subversion in both types of networks for corruption purposes.

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