

The role of ethnic heterogeneity on corruption: Experimental evidence from Kenya

Abraham Waithima¹
Daystar university

Justine Burns²
University of Cape Town

Abstract

Using a one-shot sequential-move bribery game, this paper investigates the role of ethnic heterogeneity on corruption. The interest is premised on the high levels of corruption in Kenya coupled with the rising ethnicization of politics. When ethnic identity is made salient, when a potential bribe-giver and a third party are co-ethnic, the bribe-giver is significantly less likely to offer a bribe to a non-coethnic bribee. Rather, a bribe-giver is more likely to offer a bribe to a co-ethnic bribee when the third party is also co-ethnic. A possible explanation for this behavior is the bribe-giver's expectation of in-group reciprocity from both the bribee and the third party. A bribe-giver anticipates that a bribe offered to a non-coethnic bribee might be more likely to be punished by a co-ethnic third party than a bribe offered to another co-ethnic. This would be consistent with the notion of in-group reciprocity in the sense that when a bribe is offered to a co-ethnic bribee, even though this hurts the third party, the disutility experienced is somehow less than when the bribe is offered to a non-coethnic bribee. In other words, even though the third party is adversely affected in both instances, there is some solace to be found in the fact that a fellow co-ethnic is benefitting from the bribe as opposed to a non-coethnic. The anticipation by a bribe-giver that the bribee makes a decision to accept or reject a bribe on the basis of ethnic consideration is mistaken since the bribee's decision is purely opportunistic. The bribee's decision is mainly based on the initial endowment and bribe amounts. This paper proposes the potency of ethnic balancing as a strategy in the fight against corruption.

Key words:

Bribery; Corruption; Ethnic heterogeneity; Experiment; Kenya

¹ The corresponding author can be reached via akwaithima@daystar.ac.ke. Telephone: +254 721 297 948, Fax: +254 2728338. P.O. Box 997 Karen -00502, Nairobi. Kenya. Abraham is a senior lecturer at Daystar University in Kenya.

² Justine is an Associate professor of Economics at the University of Cape Town and can be reached via jburns@uct.ac.za.

1 Introduction

There is a general perception that ethnic heterogeneity contributes to corruption (see Lederman et al., 2005, LaPorta et al., 1998, Shleifer & Vishny, 1993). It is not just that ethnic heterogeneity results in higher levels of corruption but that corruption can breed ethnic rivalry especially if perceived to be perpetrated predominantly by an elite from one ethnic group to the exclusion of others (see Githongo, 2006, Seldadyo & Haan, 2006). The resultant effect of ethnic rivalry is that each group tries to maximize its rent-seeking strategy without taking into account the effects of its actions on the other groups' rents. This is what Shleifer and Vishny (1993) term, "uncoordinated bribe-taking". Such ethnic competition leads to weakened institutions and unproductive policies coupled with wasteful distribution mechanisms. Despite the rich theoretical literature, at an empirical level, very little is known about how ethnic heterogeneity facilitates corruption.

Prior to the 2008 post election violence, Kenya was seen as a politically stable country with both a growing economy and democracy by African standards. The ethnic incitements in the build up to the general elections in 2007 and the post election violence that followed in early 2008 have however exposed the ethnic rivalry that exists, as the country nearly went into a full-scale civil war along ethnic lines. The main opponent to president Kibaki during the 2007 presidential elections, Raila Odinga had constantly raised the issue of the failure of the government to root out corruption arguing that some ethnic groups had enriched themselves through corruption and should give way to uncorrupt leaders (Wahome, 2007). Following the signing of a peace agreement between opposing political parties, the country now has to contend with an enlarged 42 member cabinet mainly to accommodate different ethnic interests.

".....corruption in Kenya, as in other African nations, takes a shape which is extremely ethnic. Politicians routinely operate as ethnic patrons, doling out favors and benefits to members of their own ethnic communities. But this behavior does not strike leaders or their constituents as improper. They only mind about corruption when they're excluded from it. It's only bad as long as it doesn't benefit your own community"³

While some of the literature argues that ethnic diversity causes civil disturbances and sometimes war, Collier and Hoeffler (1998 & 2000) finds that whereas ethnic dominance doubles the risk of civil war, heterogeneity significantly reduces the risk. What seems to raise governance issues is not heterogeneity per se but dominance of political and economic affairs by one ethnic group over others, a situation that has the potential to breed discontentment among the other ethnic groups. Indeed the violence after the 2007 election and the current uneasiness in Kenyan politics

³ These remarks are attributed to Michaela Wrong, author of "It's our turn to eat: The story of a Kenyan whistleblower" (Glimcher & Lambert, 2010).

is based on the perceived dominance of the Kikuyu ethnic group which also happen to form the highest proportion of the Kenyan population. The fear of Kikuyu dominance dates back to the post-independence jostling for power (see for example Atieno-Odhiambo, 2000, Klopp, 2002, Ndegwa, 1997) and other ethnic groups in Kenya have since then viewed the Kikuyus with suspicion.

Kenya's population of 37 million is made up of 42 ethnic groups whose ethnic composition as of 2006 is presented in table 1. Kenya's ethnic composition puts the country's Ethno linguistic Fractionalization Factor (ELF)⁴ at 0.86 which is higher than the 1960 figure of 0.83. According to the 1960 ELF measurement, Kenya was ranked among the 15 most ethnically diverse countries in the world behind such countries as Tanzania (0.93), Uganda (0.9), South Africa (0.88) and Nigeria (0.87) (Easterly & Levine, 1997). Interestingly, compared to countries that were more ethnically diverse in 1960 such as South Africa, Kenya has done worse than anyone of them as far as corruption is concerned.

Table 1: Ethnic composition of the Kenyan population

Ethnic Group	Percentage of total population
Kikuyu	22
Luhya	14
Luo	13
Kalenjin	12
Kamba	11
Kisii	6
Meru	6
Other (African)	15
Other (non-African)	1

Source: CIA World Fact book (2006 edition)

⁴ ELF is computed as:

$$ELF = 1 - \sum \left(\frac{n_i}{N}\right)^2$$

where n_i is the size of ethnic group i while N is a country's population. ELF measures the probability that two randomly drawn individuals from the population will belong to two different ethnic groups. ELF ranges from 0 (ethnically homogenous) to 1 (most ethnically heterogeneous). For more on ELF (see for example (Esteban and Ray, 1994; Montalvo and Reynal-Querol, 2002). Posner (2004) has challenged the use of ELF on the basis that summarizing ethnic diversity in a single index obscures features of ethnic diversity that may be highly relevant to the relationship between ethnic diversity and economic growth. Moreover, Posner argues that this index ignores the dynamics of inter-group competition and conveys no information about the extent of the divisions between members of different race groups.

Given Kenya's ethnic heterogeneity and the fact that Kenya ranks as one of the most corrupt countries in the world, questions that arise with regard to the extent to which ethnic heterogeneity facilitates corruption. This chapter seeks to determine whether a person who engages in corruption cares about the ethnicity⁵ of the people who are co-participants in the corruption. This chapter accomplishes this by designing a corruption experiment in which subjects' surnames⁶ are used to elicit cues about the ethnic affiliations of the subjects. The understanding of the interplay between ethnic heterogeneity and corruption is key to the development of less corruption-prone institutions especially in Africa where policies are mainly along ethnic lines.

The results show that in a corruption scenario, individuals do respond to ethnic identity in interesting ways. Individuals are less likely to offer a bribe to a non-coethnic partner when they are observed by a third party who holds the power to punish, who is a co-ethnic. In this setting, bribes are significantly more likely to be offered to a co-ethnic. Moreover, the results suggest this behavior may have been motivated by the anticipated punishment by the third party. The third party, with power to punish, was significantly more likely to punish when a bribe was offered by a co-ethnic to a non-coethnic.

Interestingly, the potential bribe recipient's decision to accept or reject a bribe is purely opportunistic and does not depend on his ethnic relationship to the giver or the third party affected by the bribe. Lower initial endowment however, significantly contributes to the likelihood of bribe acceptance.

Following this introduction the rest of the chapter is organized as follows: section 2 presents the negative effects of ethnic heterogeneity and socioeconomic outcomes, section 3 discusses the experimental design, section 4 presents the results while section 5 discusses the results and concludes.

2 Ethnic heterogeneity and socioeconomic outcomes

While many researchers agree on the adverse effects of ethnic heterogeneity and socioeconomic outcomes, the literature on the channels through which the effects come is not well developed. One of the suggested explanations for adverse effects is the cost that ethnic heterogeneity

⁵ We define ethnicity as associating oneself with an ethnic group as opposed to the society as a whole. The consequence of ethnicity is that it is a basis for ingroup-outgroup categorization and thus a basis for discriminating against out-groups.

⁶ It is quite easy for a Kenyan to tell the ethnic affiliation of another from surnames.

imposes on shared common policies arising from individual preferences so that the average utility of the policies is decreases with heterogeneity (Alesina & LaFerrara, 2004).

Ethnic diversity complicates governance especially in the absence of democracy (see for example Kimenyi, 2006; Collier P. , 2000; Collier and Gunning, 1999; Collier and Hoeffler, 1998 & 2000). Etienne (2007), focusing on the interplay between ethnic diversity and democracy finds that in the presence of ethnic fractionalization, democracy comes at the cost of high levels of corruption as each ethnic group competes with others for political leadership and the distribution of national wealth. Aghion et al. (2002) argue that in a representative democracy, where the rights of minority groups are upheld, ethnic diversity may lead to a political structure that is more representative.

Both Mauro (1995) and Easterly and Levine (1997) find ethnic heterogeneity slows economic growth. Specifically, Easterly and Levine (1997) find that moving from an ethnically homogeneous country to one that is ethnically heterogeneous corresponds to a decrease in an annual economic growth rates of more than 2%. Similar effects of ethnic diversity on economic growth have been reported by Alesina et al. (2003) in which moving from a country that is complete ethnic homogenous to one that is complete heterogeneous depresses annual economic growth by 1.9%. Following Easterly and Levine (1997), it has now become almost standard for economists to include a measure of ethnic diversity in their cross-country growth regressions (see for example Rodrik, 1999; Collier and Gunning, 1999; Hall and Jones, 1999; Brock and Durlauf, 1999). Ethnic heterogeneity has also been reported to negatively impact on savings and loan repayment rates (see for example Karlan, 2002, LaFerrara, 2002, Fafchamps, 2000).

There is also considerable attention in the literature given to the effects of ethnic heterogeneity on public goods provision. Most studies in this area find ethnic heterogeneity to cause underprovision of public goods (see for example (Miguel and Gugerty, 2004; Harris et al. 2001; Miguel, 2000; Goldin and Katz, 1999; Alesina et al. 1999; Poterba, 1997). The underprovision of public goods in an ethnically heterogeneous community stems from the inability to impose social sanctions in such communities. Social sanctions are better imposed within an ethnic group rather than between groups. Miguel and Gugerty (2004) examining funding of 337 primary schools in Kenya find that local ethnic heterogeneity is negatively correlated with school funding and the quality of school facilities. The study finds that moving from a completely homogenous to a complete heterogeneous community reduces average local school funding by about 20%. Ethnic heterogeneity is also associated with poor infrastructure (see for example Alesina et al. 2003; Khwaja, 2000, Dayton-Johnson, 2000). In particular, Khwaja (2000) using original data on 132 community maintained infrastructure projects in Northern Pakistan finds that social heterogeneity measured as fragmentation into different clans, political and religious groups is negatively associated with project maintenance.

At an institutional level, if ethnicity is seen as a basis for categorization where in-group members engage in corruption, seeking ethnic balance among employees may be a potential anti-

corruption strategy. Indeed Andy (2007), using local government expenditures in Kenya finds that in local authorities where the mayor and the town clerk are drawn from the same ethnic group, expenditure per employee is US\$ 210 more than those authorities where the mayor and the town clerk are drawn from different ethnic groups.

In part, the relationship between ethnic heterogeneity and corruption may be mediated through the impact that ethnic heterogeneity has on trust. Ethnic homogeneity has been shown to be associated with trust, an essential ingredient of social capital⁷ that is helpful in overcoming costly market failure (Leigh, 2006). Trust hand has been found to be associated with less corruption (LaPorta et al. 1998). According to World Value Survey (WVS) measurements, countries with the high levels of trust such as Norway, Finland, Sweden, Denmark and Canada have a high degree of ethnic homogeneity. These countries are also among the least corrupt (Haile et al. 2004). Thus, one can infer a triangular correlation between ethnic homogeneity, trust and corruption.

Without clear empirical evidence especially at micro level, ethnic diversity both in Kenya and elsewhere has been identified as one of the causes of corruption. For example, Akivanga (2005) attributes the reemergence of corruption in Kenya after 2002 to the ethnicization of politics. In a survey conducted in Kenya in 1996 44.4% of the respondents indicated that ethnicity was a cause of corruption in Kenya (Kibwana et al, 1996). Using USA data on a number of corruption convictions and ethnic diversity, Oguzhan (2008) found a significant positive impact of ethnic diversity on corruption. Mauro (1995) using cross country data found ELF to cause corruption through its negative effect on institutional efficiency and political stability.

The relationship between ethnic heterogeneity and corruption is however not a straightforward one. As Table 2 shows, there are countries like South Africa whose populations are ethnically diverse but which continue to record low levels of corruption. On the other hand near mono-ethnic countries such as Somalia and Burundi continue to record high levels of corruption. What seems to aggravate corruption in an ethnically heterogeneous country is the perceived economic and political inequality distributed along regional or ethnic lines. The perceived inequality pits ethnic groups against each other through competition for national resources resulting in corruption as each group looks after its own (Githongo, 2006), thereby exacerbating insider-outsider distinctions along ethnic lines.

Table 2: Comparing corruption and ethnic heterogeneity levels among selected African countries

⁷ Social capital refers to aspects of network structure such as social norms and sanctions, natural obligations, trust and information transmission that encourage collaboration and coordination between friends and strangers. Social capital is thus embodied within society (Coleman, 1990)

Africa's 10 least ethnically diverse countries			Africa's 10 most ethnically diverse countries		
Country	ELF	CPI	Country	ELF	CPI
Burundi	0.04	1.8	Tanzania	0.93	2.6
Madagascar	0.06	3.0	Uganda	0.90	2.5
Somalia	0.08	1.1	DR Congo	0.90	1.9
Rwanda	0.14	3.3	Cameroon	0.89	2.2
Lesotho	0.22	3.3	South Africa	0.88	4.7
Mauritania	0.33	2.5	Nigeria	0.87	2.5
Botswana	0.51	5.6	Cote d'Ivoire	0.86	2.1
Zimbabwe	0.54	2.2	Chad	0.83	1.6
Mauritius	0.58	5.4	Kenya	0.83	2.2
Benin	0.62	2.9	Liberia	0.83	3.1

ELF figures are adopted from Posner (2004) while CPI is Transparency International's 2009 corruption perception index

More recently, experimental economists have also begun to focus on the impact of ethnicity on social interactions. Yet, there is hardly any experiment designed to investigate the effects of ethnic heterogeneity on corruption. It is this gap that this chapter seeks to fill. Previous experiments on corruption have investigated its relationship to gender (see for example Rivas, 2008; Armantier and Boly, 2008; Frank and Lamsdorff, 2008; Alatas et al. 2009a) on the one hand and cultural differences on the other (see Cameron, 2009; Barr and Serra, 2009).

Merwe and Burns (2008) for example conducted a dictator game in South Africa where surnames were used to convey information about the racial identity of partners. The study aimed at determining the effect of racial identity on generosity. White subjects exhibited signs of favoritism to co-ethnics more than black participants. On average white subjects proposed higher amounts to white partners than to black partners, while black subjects did not vary their offers on the basis of the racial identity of partners. Fershtman and Greezy (2001) used surnames to elicit ethnic identity of subjects to conduct trust, dictator and ultimatum games among Ashkenazic and Eastern Jews. The study aimed at determining the presence of discrimination between the two ethnic groups. The study reported lower transfers from Ashkenazic subjects to their Eastern Jew partners.

Burns (2004b) used photographs of counterparts in conducting trust games with high school students. The study aimed at determining the effect of race on the propensity to trust. The study reported a systematic pattern of distrust towards black partners even by black proposers, a finding that is attributed to mistaken expectations. A number of other studies have used photographs in experiments to convey the ethnic identity of subjects (see for example Glaeser et al., 2000; Eckel and Wilson, 2003). In studying the effect of ethnic diversity on public good and

trust games (Habyarimana et al., 2007a; Habyarimana et al., 2007b) use interactive computer interface of partners so as to reveal ethnic identities of the subjects.

This paper adopts the use of surnames to provide cues on the ethnic composition of individuals in a corruption chain. This paper hopes to contribute to the understanding of corruption and ethnicity by investigating how people drawn from different ethnic groups would interact to engage in corruption.

3 Experimental design

This experiment is adopted from Alatas et al, (2009a) and has been used in other studies (see Alatas et al., 2009b; Cameron et al., 2009). The experiment engages three players in a one-shot⁸ sequential-move game⁹. These players are a manager of a firm (potential bribe-giver), a public official (potential bribe-taker) and a third party; the citizen (potential punisher) who is adversely affected by a corrupt act that privately benefits both the bribe giver and the bribe-taker¹⁰. The set-up mimics a corruption scenario in which two people benefit from a corrupt transaction at the expense of a third party external to the corrupt transaction. The manager initiates the bribery transaction by offering a bribe to the public official who makes a decision on whether to accept or reject the bribe. If the public official accepts the bribe, both the manager and the public official's payoffs increase at the expense of the citizen. The citizen moves last to make a decision on whether or not to punish both the manager and the public official. The punishment is at a cost to the citizen but the punishment imposes a much bigger monetary cost to the manager and the public official.

The original experiment by Alatas and colleagues was conducted in Australia, Singapore, India and Indonesia and was aimed at determining gender differences in the propensity to act corruptly and punish a corrupt act. Subjects playing the three roles were grouped anonymously to avoid conscious or unconscious signaling.

⁸ The one-shot nature of the game is meant to eliminate any potential economic incentive for the citizen to punish. It also helps to us to avoid issues associated with repeated games such as signaling, reputation formation and serial correlation in decisions (Alatas et al., 2009a).

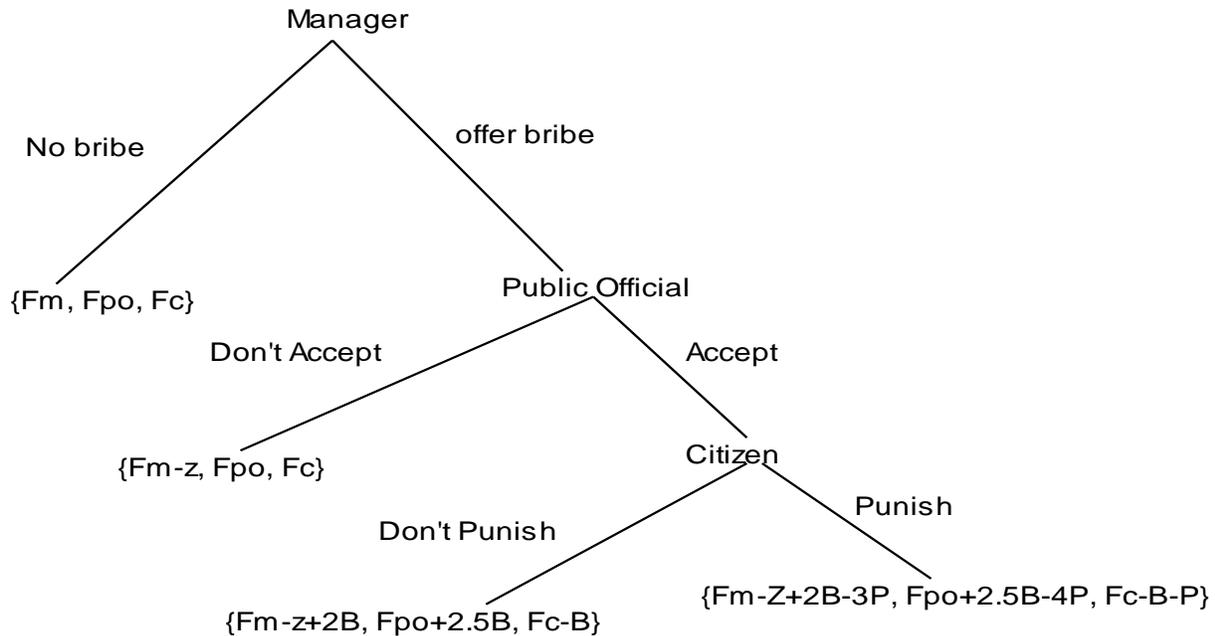
⁹ Similar set up has been adopted by Barr and Serra (2009) except that the third party in Barr and Serra's set up does not have the chance to punish.

¹⁰ Conceptually, the game is modeled along the corruption deterrence game by Schulze and Frank (2003) which had three players; the briber, bribee and those harmed by the corruption.

This paper makes an adjustment to the Alatas et al. (2009a) set up by asking subjects to reveal their surname. The surnames were displayed on the computer screens of the three players in each trio. The purpose of revealing the surnames was to determine if ethnic heterogeneity of a trio has an influence on the decisions made in the game. All other aspects of the players in each treatment remained anonymous.

Figure 1 shows the extensive form of the game where F_M, F_{PO} and F_C are the initial endowments for the manager, PO and citizen respectively. Z is the cost that the manager incurs in establishing a bribery relationship. The bribe is of an amount B which benefits the manager by $2B$ and the PO by $2.5B$; in addition, the bribe reduces the citizen's payoff by B . For the manager and the public official, their payoffs are increasing in the bribe amount. The bribe amount is $B \in [\underline{B}, \bar{B}]$ where \underline{B} and \bar{B} is respectively the minimum and maximum bribe amount allowable in the game. We assume that the citizen can observe the actions of the manager and the PO and has the option of punishing them or not. The punishment is valued at P , which reduces the manager's payoff by $3P$ and PO's payoff by $4P$. $P \in [\underline{P}, \bar{P}]$ where \underline{P} and \bar{P} is respectively the minimum and maximum punishment amount allowable in the game. For the three players, their payoffs are decreasing in the punishment amount. If the citizen chooses to punish, the final payoffs are $F_M - Z + 2B - 3P, F_{PO} + 2.5B - 4P$ and $F_C - B - P$ for the manager, PO and the citizen respectively.

Figure 1: Extensive form of the game



Since by choosing to punish, the citizen reduces his payoff by the punishment amount, the theoretical prediction of this game is that he chooses not to punish corruption culprits. Knowing the unwillingness of the citizen to punish, the manager will propose the highest allowable bribe amount B and the PO will accept it. Under the assumption that all players are selfish and only care about their own monetary reward, the subgame perfect equilibrium payoffs are, $F_M - Z + 2B$, $F_{PO} + 2.5B$ and $F_C - B$ for the manager, PO and the citizen respectively. In this game, if the citizen chooses to punish, such a decision is motivated purely by his or her intolerance towards corruption supporting findings of the third party punishment games¹¹. Likewise, a manager who does not offer a bribe and a public official who does not accept a bribe will be because of their ethical and moral persuasion about corruption.

3.1 Game Procedure

Advertisement for potential subjects for the experiment were made by placing fliers on university notice boards. Those interested signed on the notice boards and were contacted by research assistants by phone who explained what the research was about and the venue and date of the experiments. The explanation by the research assistants to potential subjects was restricted to "we are conducting an experiment in Behavioral Economics with a monetary reward depending on ones strategic moves in the experiment". If a subject had further questions, they were encouraged to raise them on the day of the experiments. On the material day, subjects assembled in a hall where the procedure of the experiment was explained by the principle researcher¹². This was deliberately done to ensure that the same information was passed on to the subjects in all the centres. In the explanation no mention was made to the effect that the research was about corruption¹³ instead subjects were told that they were going to take part in a research

¹¹ See for example Fehr and Gächter (2000) for third party punishment games. If the citizen views corruption as a violation of a social norm, he might want to restore the norm by punishing violators even when the punishment is costly to him.

¹² See the instructions to the players in appendix A.1.

¹³ We figured out that there was need to neutral language given the emotive nature of corruption in Kenya and the possibility of framing. Besides Abbink and Henning-Schmidt (2006) find that the use of loaded words such as "bribe" does not make a difference in a corruption game.

about human behavior and strategic moves with monetary rewards. After the explanation which was followed by a question and answer session, the subjects were randomly assigned to three groups. Each group was directed to a lecture room in which there was a research assistant and a computer. It was the responsibility of the research assistant to direct each subject to the computer each at a time and ensured that there was no interaction between a subject playing the game and those waiting for their turns. A subject played with two other anonymous subjects in the other lecture rooms.

At the beginning of a session, each subject was required to indicate his or her surname which was displayed on each of the three computers. The displaying of the surnames was meant to give cue about the ethnic composition of the trio. Other than the subjects' surname, all other aspects of the trio remained anonymous. The position that a subject took was randomly determined by how fast each logged into the system. Instead of using manager, PO and citizen, each subject was informed that they are player one, two or three. At the start of each session, the software administrator would at random assign an initial endowment combination for the trio. Table 19 shows initial endowment combinations for various trios. The move made by each was common knowledge since each move was displayed on the screens of the other two computers. At the beginning of a session, each subject in the manager-public official-citizen trio was required to indicate his or her surname which was displayed on each of the three computers. The displaying of the surnames was meant to provide a cue about the ethnic composition of the trio. Other than the subjects' surname, all other aspects of the trio remained anonymous¹⁴.

3.2 Subject pool

The experiment was conducted with 498 students drawn from 15 universities and colleges in Kenya. Of these 171 (34.3%) were female while 327 (65.7%) were male. The demographic characteristics of the sample and the distribution of the role played in the game is presented in table 3. The ethnic composition is fairly representative of the Kenyan population. The Kikuyu ethnic group which appears disproportionately large consists of three ethnic groups i.e. Kikuyu, Meru and Embu. The three ethnic groups are grouped together because they share surnames and other ethnic groups view the three as one.

¹⁴ See the instructions to the players in appendix A.1.

Table 3: Demographic characteristics of the sample

Aspect	Category	Role played in the game			Total	Proportion
		Manager	PO	Citizen		
Ethnic group	Kikuyu	61	68	59	188	0.378
	Luo	23	18	17	59	0.118
	Luhya	17	15	24	56	0.112
	Kalenjin	23	23	24	70	0.14
	Kisii	11	7	10	28	0.056
	Kamba	17	13	8	38	0.076
	Others	14	22	24	60	0.12
Religious affiliation	Protestants	115	109	113	337	0.677
	Catholic	44	45	35	124	0.249
	Muslim	7	12	13	32	0.064
	Others			5	5	0.01
Gender	Male	109	111	107	327	0.657
	Female	57	55	59	171	0.343

The sample comprised 166 manager-public official-citizen trios ranging from an ethnically homogenous trio to a heterogeneous one where each player in the trio was drawn from a different ethnic group. Since the ethnic pairing of the trios was done randomly, there are disproportionately more trios that are completely heterogeneous than other compositions. Table 4 provides a summary of the ethnic composition¹⁵ of the trios and the various actions in the game. It is these ethnic pairings and the actions in the game that are analyzed in the results section to determine the role of ethnic composition on corruption.

Table 4: Ethnic relationship of the subjects in the trios

Ethnic Combination	Manager	Ethnic relationship of the trio		Number of trios
		Public official	Citizen	
A	co-ethnic	co-ethnic	co-ethnic	14
B	co-ethnic	co-ethnic	non-coethnic	28
C	co-ethnic	non-coethnic	co-ethnic	26
D	non-coethnic	co-ethnic	co-ethnic	35
E	non-coethnic	non-coethnic	non-coethnic	63

¹⁵ Ethnic composition implies the ethnic relationship and positioning of the 3 players in the manager-public official-citizen trio. For example, co-ethnic-co-ethnic-co-ethnic implies that the manager, public official and citizen are from the same ethnic group while non-coethnic-non-coethnic-non-coethnic implies that all the 3 players in a trio are from different ethnic groups.

4 Results

Result one: *A manager is as likely to offer a bribe to a co-ethnic public official as to a non-coethnic one*

Table 5 shows that a manager is just as likely to offer a bribe to a co-ethnic and non-coethnic public official, with a manager offering a bribe 88% of the time when paired with a co-ethnic public official, compared to 80% when paired with a non-coethnic (MW¹⁶ $z=1.2$, $p=0.23$). This result is also confirmed in the regression result presented in column (1) of Table 6.

Moreover, when a manager and public official are co-ethnic, the ethnic status of the citizen to the duo does not significantly impact on the probability of a bribe being offered, this is just as likely (93% compared to 86% with $MW=0.67$, $p=0.51$). These results can be seen in column (2) of Table 6. The fact that a manager and public official are co-ethnic does not appear to significantly determine the probability of bribe offering.

Result two: *The probability of bribe offering depends on whether manager and citizen are co-ethnic or not*

A manager is less likely to offer a bribe when paired with co-ethnic than if the citizen is non-coethnic. On average, the probability of a bribe being offered is 70% of the time if the manager and citizen are co-ethnic compared to 86% if they are not. The difference is significant (MW, $z=2.24$, $p=0.025$). However, if the manager and the citizen are co-ethnic, then the manager is significantly more likely to offer a bribe to a co-ethnic public official than a non-coethnic one (93% compared to 58%, with MW, $z=2.29$, $p=0.02$). This result is confirmed in columns (3 to 5) of Table 6. Thus, the manager is significantly less likely to offer a bribe when the citizen is co-ethnic unless the public official is also co-ethnic.

¹⁶ MW is the Mann-Whitney test of difference.

Table 5: Probability that manager offers a bribe conditional on the ethnic relationship of the trio

	Manager & public official are co-ethnic	Manager & public official are non-coethnic	Probability that bribe is offered contingent on whether Manager & citizen are co-ethnic or not
Manager & citizen are co-ethnic	0.93 (n=14)	0.58 (n=26)	0.70 (n=40)
Manager & citizen are non-coethnic	0.86 (n=28)	0.92 (n=63)	0.86 (n=126)
Probability that bribe is offered contingent on whether Manager & public official are co-ethnic or not	0.88 (n=42)	0.80 (n=124)	

Result three: *Bribes are significantly more likely to be offered in trios that are either completely homogenous or heterogeneous as opposed to other trios*

Bribe offering in a homogenous trio is slightly high than in a heterogeneous one, with the probability of bribe being offered being 93% in a homogenous trio compared to 92% in a completely heterogeneous trio. The difference is however insignificant (MW, $z=0.1$, $p=0.92$). Column (7) of Table 6 includes both co-ethnic and non-coethnic trios as independent variables in the determination of bribe offering. Both variables significantly and positively contribute to the probability of bribe offering. The coefficients are not significantly different from one another ($p=0.992$).

Table 6: Probit results on the probability to offer a bribe

Variable	All	Manager & public official are		All	Manager & citizen are		All
	(1)	co-ethnic (2)	non-coethnic (3)	(4)	co-ethnic (5)	non-coethnic (6)	(7)
Initial	0.178	0.144	0.293	0.223	0.699	0.135	0.202

endowment	(0.179)	(0.442)	(0.214)	(0.178)	(0.48)	(0.181)	(0.172)
Manager is male	0.035 (0.067)	0.001 (0.178)	0.049 (0.079)	0.032 (0.066)	0.374* (0.209)	-0.015 (0.065)	0.052 (0.066)
Manager & public official are co-ethnic	0.089 (0.061)			0.006 (0.085)	0.391** (0.122)	0.031 (0.072)	
Manager & citizen are co-ethnic		0.038 (0.153)	-0.314** (0.114)	-0.267** (0.104)			
Co-ethnic trio				0.169*** (0.047)			0.134*** (0.051)
Non-ethnic trio							0.179*** (0.054)
Religious dummies	yes	yes	yes	yes	yes	yes	yes
Regional dummies	yes	yes	yes	yes	yes	yes	yes
Obs	166	31	124	166	40	126	166

Coefficients are marginal effects. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Ethnic combinations A & B in Table 4 incorporated in column (1), C, D & E in column (3), A & D in column (5) and B, D, & E in column (6)

Result four: *Once a manager has made a decision to offer a bribe, the decision on the bribe amount is independent of the ethnic relationship of the trio*

Table 7 presents a summary of the non-zero bribe amounts conditional on the ethnic relationship of the trio. Whether paired with a co-ethnic or non-coethnic public official, the manager on average offers similar bribe amount (60.54 compared to 60.81 tokens; MW, $z=-0.145$, $p=0.89$). The bribe amount is not influenced by the ethnic relationship of the citizen to a co-ethnic manager-public official duo. If the citizen is co-ethnic to the duo, the manager offers on average 58.85 compared to 61.46 tokens if the citizen is non-coethnic to the duo. The difference is insignificant (MW, $z=-0.9$, $p=0.37$).

Table 7: Bribe amounts that manager offers conditional on the ethnic relationship of the trio

	Manager & public official are co-ethnic	Manager & public official are non-coethnic	Average bribe amount offered contingent on whether Manager & citizen are co-ethnic or not
Manager & citizen are co-ethnic	58.85 (n=13)	61.60 (n=15)	60.32 (n=28)

Manager & citizen are non-coethnic	61.46 (n=24)	61.66 (n=58)	60.84 (n=108)
Average bribe amount offered contingent on whether Manager & public official are co-ethnic or not	60.54 (n=37)	60.81 (n=99)	

Faced by a co-ethnic citizen, a manager on average offers a similar bribe to when the citizen is non-coethnic, 60.32 as compared to 60.84 tokens (MW, $z=-0.276$, $z=0.78$). The bribe amount is not dependent on the ethnic relationship of the public official to the manager-citizen duo. When a co-ethnic manager-citizen duo is paired with a co-ethnic public official, the manager offers 58.85 compared to 61.6 tokens if the public official is non-coethnic to the duo. The difference is not significant (MW, $z=-0.87$, $p=0.38$).

Similarly, a manager offers similar bribe amounts in completely homogenous and completely heterogeneous trios (58.85 compared to 61.66 tokens; MW, $z=-1.08$, $p=0.28$). In sum, the ethnic composition of a trio does not have any significant impact of the size of a bribe offered¹⁷.

Result five: *A public official's decision to accept or reject a bribe is independent of his ethnic relationship to the trio.*

Table 8 presents a summary statistic of the probability of bribe acceptance conditional on the public official's relationship to the trio while Table 9 presents the probit regression results on the probability of bribe acceptance. Both tables show the insignificance of the ethnic relationship of the trio in the decision to accept or reject a bribe. For example when a public official is offered a bribe by a co-ethnic manager, he is just as likely to accept it as when the manager is non-coethnic. The probability of accepting a bribe from a co-ethnic manager is 61% compared to 66% if the bribe was offered by a non-coethnic manager. The difference is insignificant (MW, $z=0.56$, $p=0.57$)¹⁸.

¹⁷ These results are confirmed in regression analysis not reported here.

¹⁸ The ethnic relationship of the citizen to a co-ethnic manager-public official duo has insignificant effect on the decision to accept a bribe. If the citizen is co-ethnic to the manager-public official duo, the probability of bribe acceptance is higher than if the citizen is non-coethnic, 67% compared to 57%, however the difference is insignificant (MW, $z=0.53$, $p=0.59$). Column (2) and (3) of Table 9 show the negative but insignificant effect of co-ethnic citizen on the probability of bribe acceptance controlling for the ethnic relationship of the manager-public official duo.

Table 8: Probability of bribe acceptance conditional on the ethnic relationship of the trio

	Manager & public official are co-ethnic	Manager & public official are non-coethnic	Probability of bribe acceptance contingent on whether public official & citizen are co-ethnic or not
Public official & citizen are co-ethnic	0.67 (n=12)	0.71 (n=4)	0.69 (n=32)
Public official & citizen are non-coethnic	0.57 (n=21)	0.60 (n=67)	0.64 (n=104)
Probability of bribe acceptance contingent on whether Manager & public official are co-ethnic or not	0.61 (n=33)	0.66 (n=103)	

When paired with a co-ethnic citizen, a public official is more likely to accept a bribe than if the citizen was non-coethnic, with the public official accepting a bribe 69% of the time when the citizen is co-ethnic compared to 64% when the citizen is non-coethnic. The difference is however insignificant (MW, $z=0.535$, $p=0.593$)¹⁹.

¹⁹ The ethnic relationship of the manager to a co-ethnic public official-citizen duo does not seem to play a part in the decision to accept a bribe. If the manager is co-ethnic to the public official-citizen duo, the probability of bribe acceptance is lower than if the manager is non-coethnic to the duo (67% compared to 71.4%). The difference is however insignificant (MW, $z=-0.257$, $p=0.797$). Column (5) and (6) of Table 9, control for both a co-ethnic and non-coethnic public official-citizen duo. The regressions confirm the insignificance of the ethnic relationship of the manager to a public official-citizen duo in the decision to accept or reject a bribe.

A public official is more likely to accept a bribe in a co-ethnic trio than in a non-coethnic one, with the probability of bribe acceptance being 67% in a co-ethnic trio compared to 60% in a non-coethnic trio. The difference is however insignificant (MW, $z=0.45$, $p=0.65$). Column (7) of Table 9 shows that both co-ethnic and non-coethnic trios contribute negatively to the probability of bribe acceptance although both coefficients are insignificant.

Table 9: Probit results on the probability to accept a bribe

Variable	Manager & public official are co-ethnic			Public official & citizen are co-ethnic			All
	All	co-ethnic	non-coethnic	All	co-ethnic	non-coethnic	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Initial endowment	-0.86*** (0.291)	-1.35* (0.724)	-0.734** (0.332)	-0.872*** (0.291)	-1.421* (0.828)	-0.801** (0.328)	-0.84*** (0.298)
Bribe amount	-0.345 (0.261)	-0.716 (0.736)	-0.321 (0.296)	-0.35 (0.262)	-1.01 (1.03)	-0.321 (0.292)	-0.32 (0.262)
Public official is male	0.073 (0.094)	0.156 (0.226)	0.018 (0.106)	0.07 (0.096)	0.032 (0.281)	0.077 (0.107)	0.062 (0.095)
Manager & public official are co-ethnic	-0.076 (0.104)			-0.086 (0.126)	-0.074 (0.241)	-0.77 (0.128)	
Public official & citizen are co-ethnic		0.023 (0.223)	0.095 (0.128)	0.084 (0.134)			
Co-ethnic trio				-0.023 (0.24)			-0.076 (0.178)
Non-coethnic trio							-0.101 (0.09)
Religious dummies	yes	yes	yes	yes	yes	yes	yes

Regional dummies	yes						
Obs	136	32	103	136	23	110	136

Coefficients are marginal effects. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Ethnic combinations A & B in Table 4 incorporated in column (1), C, D & E in column (3), A & D in column (5) and B,C, & E in column (6)

Result six: *A high initial endowment contributes to the probability of bribe rejection by the public official*

Table 9 shows a significant negative relationship between initial endowment and the probability of bribe acceptance. The bribe amount has a negative influence on the public official's decision to accept a bribe, the coefficients for bribe amount are however insignificant. The decision by the public official to accept a bribe is purely opportunistic. It is driven by his or her initial endowment; ethnic composition of the trio does not have significant impact on that decision.

Result seven: *A citizen is as likely to punish a non-coethnic manager as a co-ethnic one*

When the citizen decides to punish, he does so at his own cost and both the manager and the public official bear the consequence of the punishment. To understand the effect of the ethnic relationship of the trio on the decision to punish, it is necessary to look at the citizen's ethnic relationship to the manager and the public official individually in relation to the decision to punish. The decision by the citizen to punish and his ethnic relationship to the manager and the public official is summarized in Tables 10 and 11.

Table 10: Probability of punishment conditional on the ethnic relationship of the trio

	Manager & citizen are co-ethnic	Manager & citizen are non-coethnic	Probability of punishment contingent on whether public official & citizen are co-ethnic or not
Public official & citizen are co-ethnic	0.50 (n=8)	0.83 (n=12)	0.70 (n=20)
Public official & citizen are non-coethnic	0.61 (n=18)	0.68 (n=41)	0.63 (n=68)
Probability of punishment contingent on whether manager & citizen are co-ethnic or not	0.58 (n=26)	0.68 (n=62)	

If a bribe is offered by a co-ethnic manager, the citizen is less likely to punish than if the bribe was offered by a non-coethnic manager, with the probability of punishment being 58% if the manager is co-ethnic compared to 68% if the bribing manager is non-coethnic. The difference is however not significant (MW, $z=0.90$, $p=0.37$). This result is confirmed in the regression result in column (1) of Table 11. If the public official is co-ethnic to the manager-citizen duo the probability of punishment is less than if the public official was non-coethnic to the duo, 50% compared to 61%. The difference is not significant (MW, $z=0.52$, $p=0.6$). Column (2) of Table 11 shows the insignificance of the ethnic relationship of the public official to a manager-citizen duo in the decision to punish.

Result eight: *A citizen is more likely to punish a co-ethnic public official than a non-coethnic one for accepting a bribe from a non-coethnic manager*

When a citizen observes a co-ethnic public official accept a bribe, he is more likely to punish him than if the public official was non-coethnic, 70% compared to 63%. The difference is however insignificant (MW, $z=0.554$, $p=0.58$). However, if the public official and citizen are co-ethnic, and public official accepts a bribe from a non-coethnic manager, the citizen punishes 83.3% of the time compared to 50% if the manager is co-ethnic to the duo. The difference is marginally significant (MW, $z=1.55$, $p=0.12$). If the initial endowment and bribe amounts are controlled for in the regression results in column (4) of Table 11, it becomes clear that a citizen is less likely to punish in a homogenous trio.

A corrupt act is less likely to be punished in a completely homogenous trio compared to a completely heterogeneous one, 50% compared to 68.3%. The difference is however not significant (MW, $z=-0.984$, $p=0.325$). Controlling for both completely homogenous and completely heterogeneous in column (6), of Table 11, a completely heterogeneous trio contributes positively to the probability of punishment while a completely homogenous trio's contribution is negative. The coefficients are however insignificant

Table 11: Probit results on the probability of punishment

Variable	All	Manager & citizen are		All	Public official & citizen are	All
	(1)	co-ethnic (2)	non-coethnic (3)	(4)	non-coethnic (5)	(6)
Initial endowment	-0.487 (0.316)	-0.834 (0.735)	-0.539 (0.374)	-0.554* (0.326)	-0.59* (0.361)	-0.547* (0.329)
Bribe amount	-0.107 (0.332)	-0.64 (0.719)	-0.277 (0.403)	-0.107 (0.334)	0.16 (0.379)	-0.125 (0.334)
Citizen is	-0.152	-0.629**	-0.027	-0.169	-0.201	-0.156

male	(0.107)	(0.129)	(0.131)	(0.106)	(0.122)	(0.107)
Manager & citizen are co-ethnic	-0.111 (0.121)			0.001 (0.141)	0.016 (0.15)	
Public official & citizen are co-ethnic		-0.544 (0.324)	0.162 (0.141)	0.182 (0.147)		
Co-ethnic trio				-0.444* (0.254)		-0.249 (0.22)
Non-ethnic trio						0.058 (0.117)
Religious dummies	yes	yes	yes	yes	yes	yes
Regional dummies	yes	yes	yes	yes	yes	yes
Obs	88	26	62	88	68	88

Coefficients are marginal effects. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Ethnic combinations A & C in Table 4 incorporated in column (1), B, D & E in column (3), B, C & E in column (5) and B,C, & E in column (6)

Result nine: *Punishment amounts are significantly lower in ethnically homogenous trios*

Table 12 summarizes the non-zero punishment amounts conditional on a citizen's ethnic relationship to the trio. The average punishment amount when a citizen faces a co-ethnic bribing manager is less than if the manager is non-coethnic, 46.33 compared to 50.05 tokens. The difference is only marginally significant (MW, $z=-1.52$, $p=0.13$). If the public official is co-ethnic to the manager-citizen duo, the punishment amount is less than if the public official was non-coethnic, 42.50 compared to 47.73 tokens. The difference is however insignificant (MW, $z=-0.89$, $p=0.37$).

Table 12: Average punishment amount conditional on the ethnic relationship of the trio

	Manager & citizen are co-ethnic	Manager & citizen are non-coethnic	Average punishment amount contingent on whether public official & citizen are
--	---------------------------------	------------------------------------	---

			co-ethnic or not	
Public official & citizen are co-ethnic	42.50 (n=4)	48.40 (n=10)	46.71 (n=14)	
Public official & citizen are non-coethnic	47.73 (n=11)	50.46 (n=28)	49.84 (n=43)	
Average punishment contingent on whether manager & citizen are co-ethnic or not	46.33 (n=15)	50.05 (n=42)		

As in the probability to punish, a citizen raises the punishment amount if a co-ethnic public official accepts a bribe from a non-coethnic manager. The citizen punishes by a higher amount, 48.4 compared to 42.5 tokens if the manager was co-ethnic to the public official-citizen trio. The difference is only marginally significant MW, $z=1.30$, $z=0.19$). The citizen seems to react to the acceptance of a bribe by a co-ethnic public official from a non-coethnic manager by increasing the punishment amount.

The average punishment amount in a non-coethnic trio is significantly higher than in a co-ethnic trio, 50.47 compared to 42.5 tokens (MW, $z=1.71$, $p=0.09$). Column (6) of Table 13 shows that while a co-ethnic trio leads to a significantly lower punishment amount, a non-ethnic trio contribute to an increase in the punishment amount but the coefficient is insignificant. Table 14 presents the regression results of the tobit, probit and OLS (non-zeroes punishment amounts) models. The results show the negative impact of initial endowment on the probability to punish and the punishment amount. Controlling for the non-zeroes punishment amounts in the OLS regression reveals the significant impact of the bribe amount on the punishment amount. Both the probit and tobit results in columns (2) and (4) respectively show less likelihood of punishment and a significantly lower punishment amount in an ethnically homogenous trio.

Table 13: Tobit results on the determinants of punishment amount

Variable	All	Manager & citizen are		All	Public official & citizen are		All
		co-ethnic	non-coethnic		co-ethnic	non-coethnic	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Initial endowment	-0.168* (0.099)	-0.009 (0.224)	-0.189* (0.113)	-0.176* (0.099)	-0.066 (0.164)	0.20* (0.11)	-0.181* (0.1)
Bribe amount	0.167 (0.374)	0.225 (0.617)	0.083 (0.442)	0.151 (0.373)	-0.67 (0.60)	0.49 (0.43)	0.123 (0.375)

Citizen is male	-10.0 (8.146)	-34.37** (15.24)	-3.28 (9.49)	-11.23 (8.11)	16.08 (13.91)	-12.55 (9.26)	-9.88 (8.07)
Manager & citizen are co-ethnic	-11.397 (10.55)			-3.40 (9.93)	-5.20 (11.43)	-5.27 (10.36)	
Public official & citizen are co-ethnic		-11.59 (18.12)	8.58 (10.97)	9.99 (11.08)			
Co-ethnic trio				-29.52 (19.31)			-21.06* (12.88)
Non-ethnic trio							5.87 (8.02)
Religious dummies	yes	yes	yes	yes	yes	yes	yes
Regional dummies	yes	yes	yes	yes	yes	yes	yes
Obs	88	26	62	88	20	68	88

Coefficients are marginal effects. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Ethnic combinations A & C in Table 4 incorporated in column (1), B, D & E in column (3), A & D in column (5) and B,C, & E in column (6)

Table 14 also shows a significant and negative influence of initial endowment to the determination of the punishment amount. The bribe amount positively contributes to the punishment amount but the coefficient is insignificant.

Table 14: Tobit results on the determinants of punishment amount

Variable	Tobit (1)	Probit (2)	OLS if punish>0 (3)	Tobit (4)
Initial endowment	-0.176* (0.099)	-0.554* (0.326)	-0.16 (0.14)	-0.181* (0.1)
Bribe amount	0.151 (0.373)	-0.107 (0.334)	0.4** (0.15)	0.123 (0.375)
Citizen is male	-11.23 (8.11)	-0.169 (0.106)	0.01 (0.05)	-9.88 (8.07)
Manager & citizen are co-ethnic	-3.40 (9.93)	0.001 (0.141)	-0.08 (0.06)	
Public official & citizen are co-ethnic	9.99 (11.08)	0.182 (0.147)	-0.03 (0.06)	
Co-ethnic trio	-29.52 (19.31)	-0.444* (0.254)	-0.06 (0.12)	-21.06* (12.88)

Non-ethnic trio				5.87 (8.02)
Constant			3.21*** (0.98)	
Religious dummies	yes	yes	yes	yes
Regional dummies	yes	yes	yes	yes
Obs	88	88	57	88

Coefficients for Probit and Tobit are marginal effects. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

5 Discussion and conclusion

Ethnicity appears to be important in the decision to offer a bribe. Specifically, when a manager and citizen are co-ethnic, the manager is significantly less likely to offer a bribe to a non-coethnic public official. Rather, a manager is more likely to offer a bribe to a co-ethnic public official when the citizen is also co-ethnic.

Why might this be? One possible explanation is an expectation on the part of the manager that a bribe offered to a non-coethnic public official might be more likely to be punished by a co-ethnic citizen than a bribe offered to another co-ethnic. This would be consistent with the notion of in-group reciprocity in the sense that when a bribe is offered to a co-ethnic public official, even though this hurts the citizen, the disutility experienced is somehow less than when the bribe is offered to a non-coethnic public official. In other words, even though the citizen is adversely affected in both instances, there is some solace to be found in the fact that a fellow co-ethnic is benefitting from the bribe as opposed to a non-coethnic. This pattern is also evident in punishment behavior. These results suggest that a citizen is indeed more likely to punish a co-ethnic public official for accepting a bribe from a non-coethnic manager as opposed to a co-ethnic manager.

A second finding is that bribes are as likely to be offered in ethnically homogenous trios as in completely heterogeneous trios. In other words, the probability of a bribe being offered is lower in trios comprising a mix of co-ethnics and non-coethnics. One possible explanation for this is that in trios comprising a mix of co-ethnics and non-coethnics, players may be unsure of what the expected norms of behavior might be, given the presence of individuals from other ethnic groups. In ethnically homogenous trios, subjects may have shared expectations and norms about appropriate or acceptable behavior. Similarly, in completely heterogeneous trios, it is assumed there are no common norms or values shared by members of the trio, thus making anything possible. However, when two members of a trio share a common ethnic identity, different to that of the third, it is plausible that this introduces doubt as to what constitute acceptable behavior and this affects subjects' decisions accordingly

Unlike the manager's and the citizen's decision to offer a bribe and punish corrupt behavior respectively in which the ethnic composition of the trio matters, for a public official, the decision to accept or reject a bribe was purely opportunistic. When a bribe was offered to a public official, he or she saw an opportunity to improve his welfare regardless of his ethnic relation to those in the trio. The main factor that the public official took into account in the decision to accept or reject a bribe was his initial endowment. The higher the initial endowment, the lower were his chances of accepting a bribe.

Taken together, these results suggest that ethnic balance and variety matter in reducing corruption. While ethnic heterogeneity has been shown to have adverse effects on several socioeconomic outcomes including trust (see for example Burns, 2004b; Eckel and Wilson, 2003; Fershtman and Gneezy, 2001) public good provision (see for example Miguel and Gugerty, 2004; Harris et al., 2001; Alesina et al., 1999) and economic growth (see Easterly and Levine, 1997; Mauro, 1995), at an institutional level ethnic balancing may help in breaking the trust required for a corrupt transaction thus reducing corruption.

References

- Abbink, K., & Henning-Schmidt, H. (2006). Neutral versus loaded instructions in a bribery experiment. *Experimental Economics*, 9(2), 103-121.
- Aghion, P., Alesina, A., & Trebbi, F. (2002). Endogenous political institutions. *Unpublished*. Harvard University.
- Akivanga, S. (2005). Anti-corruption politics in post-Kanu era. In L. Chweya, J. Tuta, & S. Akivanga, *Control of Corruption in Kenya: Legal-Political Dimensions 2001-2004* (pp. 243-283). Claripress Ltd.
- Alatas, V., Cameron, L., Chaudhuri, A., Erkal, N., & Gangadharan, L. (2009a). Gender and corruption: Insights from experimental analysis. *Southern Economic Journal*, 75(3), 663-680.
- Alatas, V., Cameron, L., Chaudhuri, A., Erkal, N., & Gangadharan, L. (2009b). Subject pool effects in a corruption experiment: A comparison of Indonesian public servants and Indonesian students. *Experimental Economics*, 12, 113-132.
- Alesina, A., & LaFerrara, E. (2004). Ethnic diversity and economic performance. *NBER Working Paper No. 10313*.
- Alesina, A., Baqir, R., & Easterly, W. (1999). Public goods and ethnic divisions. *Quarterly Journal of Economics*, 114, 1243-1284.

- Alesina, A., Devleeschauwer, A., Easterly, W., Kurlat, S., & Wacziarg, R. (2003). Fractionalization. *Journal of Economic Growth*, 8, 155-194.
- Andy, H. (2007). Mayors and clerks: Ethnicity and corruption in Kenya. *Harvard University Working Paper*.
- Armantier, O., & Boly, A. (2008). Can corruption be studied in the lab? Comparing field and lab experiment. *Scientific Series*.
- Atieno-Odhiambo, E. (2000). Hegemonic enterprises and instrumentalities of survival: ethnicity and democracy in Kenya. *Unpublished paper presented at Queen's University*. Kingston.
- Barr, A., & Serra, D. (2009). The effects of externalities and framing on bribery in a petty corruption experiment. *Experimental Economics*, 12, 488-503.
- Brock, W., & Durlauf, S. (1999). What have we learned from a decade of empirical research on growth? growth empirics and reality. *World Bank Economic Review*, 15, pp. 229-72.
- Burns, J. (2004b). Race and trust in post-apartheid South Africa. *CSSR Working Paper No. 78*.
- Cameron, L., Chaudhuri, A., Erkal, N., & Gangadharan, L. (2009). Propensities to engage in and punish corrupt behavior: Experimental evidence from Australia, India, Indonesia, and Singapore. *Journal of Public Economic*, 93, 843-851.
- Coleman, J. (1990). *Foundations of Social Theory*. Cambridge: Harvard University Press.
- Collier, P. (2000). Ethnicity, politics and economic performance. *Economics and Politics*, 12, 225-45.
- Collier, P., & Gunning, W. (1999). Explaining African economic performance. *Journal of Economic Literature*, 37, 64-111.
- Collier, P., & Hoeffler, A. (1998). On the economic causes of civil war. *Oxford Economic Papers*.
- Collier, P., & Hoeffler, A. (2000). Greed and grievance in civil war. *Policy Research, Working Paper 2355*. Washington DC: World Bank.
- Dayton-Johnson, J. (2000). The determinants of collective action on the local commons: A model with evidence from Mexico. *Journal of Development Economics*, 62(1), 181-208.
- Easterly, W., & Levine, R. (1997). Africa's growth tragedy: Policies and ethnic divisions. *The Quarterly Journal of Economics*, 1203-1250.
- Eckel, C., & Wilson, R. (2003). Conditional trust: sex, race and facial expressions in a trust game. *Discussion Paper*.

- Esteban, J., & Ray, D. (1994). On the measurement of polarization. *Econometrica*, 62(4), 819-851.
- Etienne, B. Y. (2007). Ethnic diversity, democracy and corruption. *IMF Working Paper WP/07/218*.
- Fafchamps, M. (2000). Ethnicity and credit in african manufacturing. *Journal of Development Economics*, 61, 205-235.
- Fehr, E., & Gächter, S. (2000). Cooperation and punishment in public goods experiments. *American Economic Review*, 114(3), 980-994.
- Fershtman, C., & Gneezy, U. (2001). Discrimination in a segmented society: An experimental approach. *The Quarterly Journal of Economics*, 116(1), 351-377.
- Frank, B., & Lamsdorff, J. (2008). Gender effects in laboratory corruption experiments.
- Githongo, J. (2006). Inequality, ethnicity and the fight against corruption in africa: A kenyan perspective. *Institute of Economic Affairs*.
- Glaeser, E., Laibson, D., Scheinkman, J., & Scoutter, C. (2000). Measuring trust. *Quarterly Journal of Economics*, 115(3), 811-846.
- Glimcher, I., & Lambert, T. (2010). Cycle of corruption. *Harvard Political Review*.
- Goldin, C., & Katz, L. (1999). Human capital and social capital: The rise of secondary schooling in america, 1910 to 1940. *Journal of Interdisciplinary History*, 29(4), 683-723.
- Habyarimana, J., Humphreys, M., Posner, D., & Weinstein, J. (2007a). Why does ethnic diversity undermine public goods provision? *The American Political Science Review*, 101(4).
- Habyarimana, J., Humphreys, M., Posner, D., & Weinstein, J. (2007b). Why are co-ethnics believed to be more trustworthy? *Working Paper*.
- Haile, D., Sadrieh, K., & Verbon, H. (2004). Trust in a segmented south african society: An experimental investigation. *Working Paper Tilburg University*.
- Hall, R., & Jones, C. (1999). Why do some countries produce so much more output per worker than others? *Quarterly Journal of Economics*, 114, 83-116.
- Harris, A., Evans, W., & Schwab, R. (2001). Education spending in an aging america. *Journal of Public Economics*, 81(3), 449-72.
- Karlan, D. (2002). Social capital and group banking. *mimeo*.

- Khawaja, A. (2000). Can good projects succeed in bad communities? collective action in the himalayas. *mimeo*.
- Kibwana, K., Wanjala, S., & Okech-Owiti. (1996). *The Anatomy of Corruption in Kenya: Legal, Political and Socio-Economic Perspectives*. Claripress Ltd.
- Kimenyi, M. (2006). Ethnicity, governance and the provision of public goods. *Journal of African Economies*, 15, 62-99.
- Klopp, J. (2002). Can moral ethnicity trump political tribalism? the struggle for land and nation in kenya. *African Studies*, 61(2).
- LaFerrara. (2002). Self-help groups and income generation in the informal settlements of nairobi. *Journal of African Economies*, 11(1), 61-89.
- LaPorta, R., Lopez-Silenes, S., Andrei, S., & Vishney, R. (1998). The quality of government. *Journal of Law Economics and Organization*, 45, 222-279.
- Lederman, L., & Rodrigo, S. (2005). Accountability and corruption: Political. *Economics and Politics*, 17, 1-35.
- Leigh, A. (2006). Trust, inequality and ethnic heterogeneity. *The Economic Record*, 82, pp. 268-280.
- Mauro, P. (1995). Corruption and growth. *The Quarterly Journal Economics*, 681-712.
- Merwe, W., & Burns, J. (2008). What's in a name? racial identity and altruism in post-apartheid south africa. *South Africa Journal of Economics*, 76(2).
- Miguel, E. (2000). Ethnic diversity and school funding in kenya. *mimeo*.
- Miguel, E., & Gugerty, M. (2004). Ethnic diversity, social sanctions, and public good in kenya. *Working Paper*.
- Montalvo, & Reynal-Querol. (2002). Ethncity, political systems and civil wars. *Journal of Conflict Resolution*, 46(1), 29-54.
- Ndegwa, S. (1997). Citizenship and ethnicity: An examination of two transition moments in kenyan politics. *American Political Science Review*, 91(3), 599-616.
- Oguzhan, C. D. (2008). Ethnic and religious diversity and corruption. *Economic Letters*, 99, pp. 98-102.
- Posner, D. N. (2004). Measuring ethnic fractionalization in africa. *American Journal of Political Science*, 48(4), 849-863.

- Poterba, J. (1997). Demographic structure and political economy of public education. *Journal of Policy Analysis and Management*, 16(1), 48-66.
- Rivas, F. (2008). An experiment on corruption and gender. *University of Granada Working Paper*.
- Rodrik, D. (1999). Where did all the growth go? external shocks, social conflict and growth collapses. *Journal of economic growth*, 4, 385-412.
- Schulze, G., & Frank, B. (2003). Deterrence versus intrinsic motivation: Experimental evidence on the determinants of corruptibility. *Economic of Governance*, 4, 143-160.
- Seldadyo, H., & Haan, J. (2006). The determinants of corruption: A literature survey and a new evidence.
- Shleifer, A., & Vishny, R. (1993). Corruption. *The Quarterly Journal of Economics*, 108, 599-617.
- Wahome, G. (2007). *Kenya State of Corruption Report*. Claripress Ltd.

Appendix

A.1 General instructions to players

Thank you all for taking your time to participate in this research. As you are already aware, this research is in Behavioral Economics. The research is conducted using a 3 persons sequential move game in which ones strategic moves and those of the other players will determine a player's monetary reward. The research will use interactive computer games as a methodology. There are important points to note about the game:

- A player is required to indicate their gender (male or female)
- The gender of the 3 players will be displayed on each of the players' screen.
- The display of gender helps player to know the gender of those they are playing with.
- Whoever logs-in first becomes player 1, 2nd is player 2 and 3rd is player 3.
- Player 1 moves first, then player 2 and finally player 3
- Each player starts with an initial endowment which is predetermined. Each player will only be informed about his or her initial endowment. Player 1 and 2 will have an opportunity to enhance their payoffs.

- Player 1 has a choice to either transfer some of his token to player 2. The transfer amount B is any amount between 50 and 80.
- If player 1 chooses not to transfer, the game ends with each player getting his or her initial endowment as final payoff.
- If player one chooses to transfer some token to player 2, player 2 will then decide whether to accept or not. If player 2 declines the transfer, the game ends.
- Whether player 2 accepts the transfer or not, he or she incurs some cost $Z=20$ tokens.
- If player 2 accepts the transfer, player 1 benefits by 2 times the transfer amount while player 2 benefits by 2 and a half the amount.
- By player 2 accepting the transfer, the transfer reduces player 3's payoff by the transfer amount.
- Player 3 has the opportunity to either punish player 1 and 2 or not to. The punishment amount P is any amount between 40 and 65 tokens.
- If player 3 chooses not to punish, the game ends.
- The punishment is at a cost to player 3
- If player 3 chooses to punish player 1 and 2 by P amount, this reduces player 1's payoff by $3P$ while player 2 suffers by $4P$.
- There are several stages at which the game will end:

a) If player 1 does not transfer

b) If player 1 transfers and player 2 declines

c) If player 2 transfers, player 2 accepts but player 3 does not punish

d) If player 1 transfers, player 2 accepts and player 3 punishes

At each stage that the game ends, each player will be required to fill in an electronic questionnaire before he or she can know his or her final payoff. Note that all questions must to be answered otherwise the computer will report an error. Table 15 gives a summary of payoffs for the various players in different scenario.

Table 15: Payoffs in different scenario

Scenario	Payoffs for the three players		
	Player One (Manager)	Player Two (Public Official)	Player Three (Citizen)
Player 1 does not transfer (bribe)	F_M	F_{PO}	F_C
Player 1 transfer and			

player 2 rejects	$F_M - Z$	F_{PO}	F_C
Player 1 transfers, player 2 accepts while player 3 does not punish	$F_M - Z + 2B$	$F_{PO} + 2.5B$	$F_C - B$
Player 1 transfers, player 2 accepts player 3 punishes	$F_M - Z + 2B - 3P$	$F_{PO} + 2.5B - 4P$	$F_C - B - P$

Each player's final payoff will be converted into Kenya Shillings and paid out at the end of the game.

When all the subjects were clear on how the game is played, they were randomly split into 3 equal groups and placed in different classrooms. In most stations, we had 60 subjects making up 20 trios in each.

Table 19: Initial endowment, bribe and punishment amounts

Groups	Initial Endowment (tokens)			Transfer (bribe) amount (tokens)		Punishment amount (tokens)	
	Manager	Public official	Citizen	Min	Max	Min	Max
	(Player 1)	(Player 2)	(Player 3)				
1	330	250	260	50	80	40	65
2	200	180	190	50	80	40	65
3	280	230	240	50	80	40	65
4	240	190	180	50	80	40	65
5	300	250	210	50	80	40	65
6	290	280	270	50	80	40	65
7	310	290	280	50	80	40	65
8	305	300	280	50	80	40	65
9	220	210	200	50	80	40	65
10	260	280	310	50	80	40	65

Note that initial endowment, bribe and punishment amount were set in such a way that no player would end up with zero or negative payoff.