The role of gender, ethnicity and *harambee* in corruption: Experimental evidence from Kenya

Thesis Presented for the Degree of
Doctor of Philosophy
in the School of Economics
University of Cape Town

by

Abraham K. Waithima

Supervisor: Ass. Prof. Justine Burns

April, 2011

Abstract

This thesis investigates the role of gender composition, ethnic heterogeneity and *harambee* on corruption. The interest is premised on the high levels of corruption in Kenya coupled with the rising ethnicization of politics and the allegation of *harambee* being one of the causes of corruption. In addition, there has been growing advocacy for the greater involvement of women in the public sector as an anti-corruption strategy. Given this, this thesis uses experimental games which are novel in the Kenyan context to examine the extent to which individual attributes such as gender and ethnicity might influence the propensity to offer or accept a bribe, or to punish individuals who engage in such activities. In addition, this thesis uses a public good game and a common pool resource game to examine the alleged link between *harambee* and corruption.

When gender identity is made salient, a potential bribe-giver is significantly more likely to offer a bribe to a bribee of the opposite gender than to a person of the same gender, especially if the third party is the same gender as the briber-giver. A possible explanation for this behavior is that the bribe-giver anticipates less punishment from a third party of the same gender especially if social norm such as chivalry exists. If such norms exist, it is possible that a manager would expect the third party of the same gender to also be aware of such norms, and thus expect the third party to be less inclined to punish the manager for offering a bribe (gift) when this act simply accords with some generally accepted norm.

In contrast, 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 ingroup 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 ingroup 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 either gender or 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.

The decision by the third party to punish corrupt behavior reveals insider-outsider distinctions in favor of insiders, both in terms of gender and ethnic identity. Punishment is less likely in single-gender and ethnically homogenous trios than other trios. A third party appears willing to invest in punishment in trios whose members he or she considers to be outsiders either in terms of gender or ethnicity but is unwilling to do so if he or she considers the beneficiaries of the corrupt act to be insiders.

To the extent that the public good and common pool resource games used in this thesis mimic the link between *harambee* and corruption, the thesis does not find support for the allegations that individuals compensate their *harambee* contributions by engaging in corruption. Instead, the thesis finds that individuals who contribute more in a public good setting extract less from the common pool resource and therefore are other-regarding. In other words, individuals who contribute towards *harambee* embezzle less. Moreover, individuals who are aware of how *harambee* has benefitted their own lives contribute more towards *harambee* and those who consider *harambee* to be one of the causes of corruption contribute less. To the extent that the institution of *harambee* is viewed as a positive force, and one that should be protected, this could be utilized to harness efforts aimed at rooting out corruption and ensure the provision of public goods.

Acknowledgement

This thesis would not have been possible without the supervision of Ass. Prof Justine Burns. She did not only introduce me to the world of experiments but also provided valuable insights and encouraged me on even when the going was very difficult.

I acknowledge the support I received from my family and particularly from my wife Charity who held the family together while I was absent and encouraged me on. I appreciate those moments when Dennis and Joy would call me and assure me of their support and prayers. That support has carried me through this project.

The comments I received from the participants in the various conferences and seminars where I presented parts of this work are greatly appreciated. I particularly acknowledge the comments I got from participants at the AERC biannual workshops in Entebbe and Nairobi, the Economic Science Association conference at the University of Haifa, Israel, the Continuing Education conference by Daystar University, the Kenya Anti-Corruption Commission seminar and the School of Economics seminars at the University of Cape Town. In this category I would like to single out valuable comments I got from Andreas Liebbrandt and Raul Lopez. The support and encouragement I got from my classmates is greatly appreciated.

I would like to acknowledge Andrew Kuria for the many hours he put in to develop the computer programme I used for conducting the experiments. The research assistants under the leadership of Stephen Ndegwa did an excellent job.

Last but not least, I acknowledge the financial assistance I received from Daystar University, AERC, Trust Africa and University of Cape Town without which this work would have been impossible

Abraham K. Waithima
Cape Town, South Africa
April, 2011

Dedication

This work is dedicated to my wife; Charity, my children; Joy and Dennis and my parents; the late Mr Karige Njuru who did not live long enough to see this work and Mrs Rebecca Wanjira Karige who instilled the value of hard work and focus into me.

Contents

List of Tables

List of Figures

Chapter 1

Introduction

"The problems that have held you back are that too many resources are lost to corruption yet not a single high level official has been held to account. Institutions lack faith... Too many times Kenya is torn apart by ethnic violence manipulated by leaders... Too many young people have hit a dead end," (Joe Biden, The Standard, June 2010)[1]

1.1 Overview

There is little doubt that corruption hinders economic growth (Mauro, 1995). Nowhere is corruption as widespread as in less developing countries. For example, in Transparency International's 2009 corruption report, of the 10 least corrupt countries, there is not a single less developing country in the list. In contrast, in the list of most corrupt countries, all are among the LDCs (Transparency International, 2009b).

On the theoretical front, the distortionary effects of corruption on investment has been demonstrated (see for example Rose-Ackerman, 1975; Rose-Ackerman, 1978; Krueger, 1974; Shleifer and Vishny, 1993; Shleifer and Vishny, 1994; Kaufmann, 1997b; Wei, 2000b). These studies find that corruption reduces welfare.

[1]Remarks by the USA vice-president, Joe Biden on corruption in Kenya, published in The Standard Newspaper of June 16th, 2010. These remarks captures the intertwined problem of corruption, ethnicity and institutional failure in Kenya. The issues raised in these remarks capture the main focus of this thesis.

Empirically, many studies show the adverse effects of corruption since it appears to hinder growth (see for example Meon and Sekkat, 2005; Kaufmann and Wei, 2000; Wei, 2000a; Tanzi, 1998; Mauro, 1995; Hines, 1995; Mukherjee and Png, 1995; Besley and McLaren, 1993). Mauro (1995) for example finds that if Banglandesh would improve the integrity and efficiency of its institutions by one standard deviation, the country's investment rate would rise by 5% while the GDP growth rate would rise by 0.5%. Others have shown how corruption undermines development by weakening institutions, the foundation upon which economic growth depends (see for example Klitgaard, 1988; Bardhan, 1997).

In 2008, Transparency International-Kenya placed the likelihood of encountering bribery when dealing with public officials in Kenya at 56%[2] (Transparency International, 2009a). In spite of the many institutions charged with the responsibility of fighting corruption, corruption is rife in Kenya and very costly to the economy. Kidombo (2007) for example places the cost of corruption on the Kenyan economy at $ 1.13 billion per annum. In a study by Kibwana et al. (1996), 86.6% of the respondents reported that there were practical reasons[3] for Kenyans to be corrupt and 78.8% reported that they would not bother reporting corrupt acts because they believed that the government was not serious in the fight against corruption.

Kenya's corruption history dates back to the 1970s. The 1971 Public Service Structure and Remuneration Commission (PSRC) recommended that civil servants could engage in private business. This recommendation is credited as one that gave legitimacy to official corruption in Kenya (see Loughran, 2010; Odhiambo-Mbai, 2003). The failure to establish the office of the Ombudsman which the commission had recommended meant lack of regulation of public servants conduct. Public servants started trading with the very government they were serving with obvious conflict of interest.

When President Moi took over the presidency in 1978 after the death of President Kenyatta, he inherited a civil service whose level of accountability was questionable. His initial resolve to eradicate corruption was weakened by the 1982

[2]The likelihood index captures corruption experienced by ordinary citizens in their interactions with officials of both public and private organizations.

[3]The practical reasons include the failure to access essential services and documents such as passports and driver's license without paying a bribe to the officer providing the service.

attempted coup (Kibwana et al., 1996). After the attempted coup, Moi resorted to the patron-client relations strategy appointing only people loyal to him to key positions. The newly appointed public servants were easy to manipulate and as a reward for their loyalty, the president turned a blind eye to their corrupt dealings (Odhiambo-Mbai, 2003). The Goldenberg scandal of 1992 epitomized corruption during president Moi's tenure and led to Kenya losing Ksh 64 billion (about 24% of the country's GDP then) through fictitious gold and diamond export compensation (Chweya, 2005).

President Kibaki first came to power in 2002 on a pledge to root out corruption that had permeated every sector of the economy. Kenyans were hopeful that the government would deliver on that pledge and restore efficiency in the public sector. The commitment to fighting corruption was evident as the government embarked on several anti-corruption strategies[4]. In the early years of Kibaki's administration, remarkable improvement in public service delivery was recorded and the incidences of corruption appeared to decline (Waithima, 2007).

These initiatives met with some success, at least initially. From a high of 67% in 2001, the reported likelihood of encountering bribery when dealing with public officials declined to 34.2% in 2004 as is shown in Table 1.1. However, this decline was short lived as the likelihood of encountering bribery rose by 13 percentage points in 2005. Perhaps the climax of corruption in the first tenure of President Kibaki was the 2004 Anglo leasing scandal in which the country lost Ksh 56 billion (about 4.38% of the country's 2004 GDP) through highly inflated or non executed security contracts (Wahome, 2007).

President Kibaki's second term in office which began in early 2008 as a result of the hotly contested 2007 presidential elections has witnessed more corruption scandals than any other time in Kenyan history. From 2008 to date, there have

[4]The various anti-corruption initiatives taken include: (a) revamping of several institutions to fight corruption, (b) creating the position of permanent secretary for ethics and governance charged with the responsibility of advising the president on corruption matters, (c) enacting the Anti-Corruption and Economic Crimes Act (ACECA) and the Public Officer Ethics Act (POEA) that requires all public officials to declare their wealth (Ringera, 2005). ACECA in particular provides for the prevention, investigation and punishment of corruption, economic crimes and related offences. It establishes the Kenya Anti-Corruption Commission (KACC) and the Kenya Anti-Corruption Advisory Board (KAAB).

Table 1.1: Likelihood of encountering bribery with public officials and CPI

Year	Likelihood of encountering bribery (%)	Aggregate Index	Average size of a bribe (Kshs)	Corruption Perception Index (CPI)
2001	67	-	-	2
2002	65	25.6	2,318	1.9
2003	40.1	18.2	3,958	1.9
2004	34.2	14.9	4,958	2.1
2005	47.2	19.2	1,703	2.1
2006	54	19.1	1,236	2.2
2007	54	19	-	2.1
2008	56	27	-	2.1
2009	-	-	-	2.2

The aggregate index is constructed based on unweighted average of six bribery indicators. These indicators are: incidence, prevalence, severity, frequency, cost and size. The index ranges from 0 to 100 (worst performance).
CPI index ranges from 0 to 10 (least corrupt). Source: Transparency International-Kenya and Transparency International, various issues.

been several corruption scandals such as the Triton case[5], maize scandal[6], the free primary education fund[7] and most recently the fertilizer scandals just to name a few. The government of national unity is not helping as the power game takes centre stage raising political stakes to the neglect of transparency and accountability.

Kenya also witnessed the ethnicization of politics that threatened to degenerate into a full-scale civil war in 2008 after the disputed 2007 presidential elections, along with a weakening of institutions and ever rising rates of corruption. Inspite of the growing advocacy of more female involvement in decision making as a way

[5]In the Triton case, between November 2007 and November 2008, Kenya Pipeline Company released 126.4 million litres of oil to Triton petroleum company without clearance from Triton's financiers as set out in the financial agreement. Through the scandal, Kenya lost 7.6 billion shilling. See the case in the Daily Nation of January 11 2009.

[6]In this case, maize valued at Kenya shillings 150 million meant to cushion the country over the rising maize prices was irregularly sold to private millers who exported it to a neighboring country when Kenya was having a severe maize shortage. See the full account on www.nation.co.ke/News/-/1056/513142/-/.../-/index.html

[7]This case came to the public when both the USA and British governments suspended free primary education funding in Kenya over an alleged misappropriation of one million US$ meant for the fund. See the full account on http://www1.voanews.com/english/news/africa/Kenya-Corruption-Scandal-Triggers-Halt-to-US-Education-Funds-82802517.html

of fighting corruption, women remain under-represented in Kenyan politics. For example, in the 2007 general elections, only 21 women were elected as members of parliament representing only 9.7% of the parliamentarians. At the same time, *harambee*[8] (Swahili word for "let us pull together") which has been very instrumental in the development of the country has been blamed as one of the causes of corruption. This is because contributions in *harambee* began to be seen as a ticket for politicians to buy their way into public offices only to compensate themselves by engaging in corruption once elected to public office (Waiguru, 2002). The alleged role of *harambee* in corruption eventually led to the enactment of the Public Officer Ethics Act (POAE) of 2003 which outlawed the personal involvement of public officers in organizing *harambees* (Chweya, 2005). These problems beg for answers.

Against Kenya's corruption backgroup is a rich and growing literature on ingroup-outgroup distinction[9] which supports the discrimination of an outgroup member by an ingroup member. The proponents of Minimal Groups Experiments (MGEs) as they are popularly known argue that the discrimination can be supported by ingroup reciprocity hypothesis (see Yamagishi and Kiyonari, 2000; Yamagishi et al., 1999; Rabbie et al., 1989) which suggests that discrimination against an outgroup represents utilitarian behavior aimed at maximizing economic reward. Ingroup members exchange favorable allocations among themselves and that reciprocity is expected from each member of an ingroup. In particular Yamagishi et al. (1999) show that subjects in MGEs do not practice ingroup favoritism in reward allocation unless they expect similar favorable treatment from ingroup members. The second hypothesis is the outgroup fear hypothesis (Ng, 1981) which proposes that the discrimination in MGEs reflects a concern for maintaining intergroup equity. The hypothesis argues that since ingroup members expect outgroup members to favour their own group, ingroup members preempt this by also favouring their own members, thus maintaining equity.

This thesis seeks to make a contribution in the quest for the answers to the influence of gender composition, ethnic heterogeneity and *harambee* as they relate

[8] *Harambee* is a uniquely Kenyan self-help initiative which helps to rally people to contribute resources towards the provision of communal goods such as building a school or a hospital. The concept is dealt with in more detail in Chapter 5.

[9] This literature is extensively reviewed in section1.3

to corruption. Specifically, this thesis seeks to investigate if individuals internalize their gender and ethnic affiliations to discriminate against outgroup members in a corruption scenario. The thesis also seeks to explore if individuals compensate their *harambee* contributions by engaging in corruption ex-post[10].

1.2 The determinants of corruption

The "grease" versus "sand" debate on the effects of corruption on commerce and economic growth is largely a settled case. The "grease hypothesis" championed by Leff (1964), Huntington (1968) and Lui (1985) argues that corruption helps to oil the wheels of commerce thus making rigid bureaucratic processes more efficient and clears the market (Egger and Winner, 2005). This argument has been challenged by what can generally be termed as the "sand hypothesis" which sees corruption as a hindrance to economic growth (Mauro, 1995).

Focus has now shifted from the effects of corruption to its determinants and the measures that a country can take to combat corrupt practices. Most studies reviewed in this area are based on cross-country surveys. At the country level the factors that determine the level of corruption include economic factors (see for example Damania et al., 2004; Person et al., 2003) and political factors such as political-civil liberties (Brunetti and Weber, 2003), the kind of electoral systems in place (see for example Person et al., 2003; Kunicova and Rose-Ackerman, 2005) the strength of government administration (see Brown et al., 2005; Chang and Golden, 2004), and political instability (Park, 2003). For example, a number of studies have found that the higher a country scores on measures of sound political institutions, strong courts, and orderly succession of power, the lower the level of corruption in that country (see for example Serra, 2006; Ali and Isse, 2003; Herzfeld and Weiss, 2003; Leite and Weidmann, 1999). Both VanRijkeghem and Weder (1997) and Gurgur and Shah (2005) report lower levels of corruption in countries

[10]It is acknowledged in this thesis that politicians view *harambee* contributions as a means to gain power in which case the contributions can be viewed as bribes in vote buying. Within the experimental design in this thesis, it is also acknowledged that not every politician contributes to *harambee* so as to engage in corruption ex-post. The experimental design is therefore a special case that seeks to determine if ones *harambee* contributions have an impact on ones extraction from a common pool resource.

with higher qualities of bureaucracy, arguing that an efficient bureaucracy denies public officials room for discretion and the chance to demand bribes. Evidence on the effect of colonial heritage on corruption is mixed. Whereas Gurgur and Shah (2005) and Tavares (2003) find countries that have been colonized to be more corrupt than those that were not colonized, Herzfeld and Weiss (2003) find former British colonies to be less corrupt a finding that is shared by Person et al. (2003). Both Herzfeld and Weiss (2003) and Person et al. (2003) argue that British colonizers left well developed institutions in their former colonies which act as a deterrent to corruption.

Another factor that has also been used to explain corruption at a country level is religion. Cross-country comparisons have shown lower rates of corruption in countries with a higher percentage of the population that professes protestant Christian faith (see for example Serra, 2006; Chang and Golden, 2004; Bonaglia et al., 2001; Treisman, 2000).

The effects of gender on corruption has attracted attention from those using survey data as well as experimental investigations. The most cited work using survey data includes Dollar et al. (2001) and Swamy et al. (2001) who used cross country survey data to show that higher participation of women in the labour force leads to lower levels of corruption. Dollar et al. (2001) for example finds the presence of female parliamentarians to significantly contribute to lower levels of corruption in a country. Specifically, they found that a one standard deviation increase in female representation resulted in a decline in corruption by 20%. The study concludes that since women behave less opportunistically than men, bringing more women into government may have significant benefits for society in general. Gender effects on corruption has also been studied using experiments (see for example Alatas et al., 2009a; Rivas, 2008; Armantier and Boly, 2008; Frank and Lambsdorff, 2008). While Rivas (2008) finds women less corrupt than men, others do not find any gender difference in an individual's propensity to act corruptly in an experimental setting.

In cross-country comparisons there is evidence that ethnic heterogeneity contributes to a country's level of corruption (see Lederman et al., 2005; LaPorta et al., 1998). It is not just that ethnic heterogeneity results in higher levels of corruption but that corruption breeds 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 and Haan, 2006).

The culture within which one socializes has been identified as a factor determining whether one acts corruptly or not. Barr and Serra (2006) carried out a bribery experiment on students drawn from 43 countries in which they observed that the amount that a student was willing to give as a bribe was positively correlated with the level of corruption in their home country. Cultural differences in tolerating corrupt behavior have been reported by Cameron et al. (2009) who compare the propensities to engage in and punish corruption in India, Singapore, Indonesia and Australia. They find more variations in the propensities to punish corrupt behavior than in the propensities to engage in corruption in the four countries. For example, they found subjects from India which has high rates of corruption to exhibit more tolerance to corruption than subjects from Australia which has low rates of corruption.

Individual characteristics have also been found to affect the propensity for corruption. Low public servants' wage has been cited as a factor that predisposes public servants to corruption (see Alt and Lassen, 2003; VanRijkeghem and Weder, 2001; Chand and Moene, 1999; Mukherjee and Png, 1995; Besley et al., 1993). However, the results of research on the effects of civil servants wages' on corruption are mixed and some studies do not find a link between the two (see for example Sosa, 2004; VanRijkeghem and Weder, 2001; Rauch and Evans, 2000). These latter studies caution against the raising of civil servants wages as an anti-corruption strategy as being counterproductive especially with regard to those who are already corrupt. Instead as a deterrence to corruption, staff rotation and better monitoring have been recommended (see for example Barr et al., 2009; Schulze and Frank, 2003; Abbink et al., 2002). Other individual factors examined include one's level of education which again has mixed effects on the propensity to corruption. Guerrero and Rodriguez-Oreggia (2005) for example found that among the Mexicans, the higher the level of education, the higher the likelihood of one paying bribes. The reason for this trend, the paper argues is the opportunity cost of time that one spends negotiating with public officials which is higher for those with higher levels of education. In contrast, Kibwana et al. (1996) found that the lower one's level of education the more susceptible one becomes to corruption in the Kenyan setting.

In the Kenyan case, the reason for the susceptibility of the poorly educated to corruption is their ignorance as to their rights.

Age has also been identified as a factor that influences an individual's propensity to become corrupt. Gatti et al. (2003) while analyzing the determinants of corruption found that older people have a lower propensity to corruption than the young. This, he argued, may be explained by the fact that older people are less involved in certain processes of daily life that are susceptible to corrupt practices such as obtaining licences and certificates.

1.3 Identity, institutions and corruption

Literature in both economics and social psychology shows that heterogeneity affects cooperation in human interactions. The Minimal Group Experiment (MGE) literature argues that even a categorization as trivial as one resulting from the splitting of a group by the tossing of a coin, with one group being the "head" outcome and the other being the "tail" outcome, is sufficient to trigger intergroup discrimination favouring the ingroup. When a member of the "head" category is asked to allocate money to members of his category as well as to members of the "tail" category, he is likely to allocate more money to an anonymous ingroup than to outgroup members (see for example Tajfel and Billig, 1974; Billig and Tajfel, 1973; Tajfel et al., 1971). Within social psychology, many different theories have been advanced to explain ingroup-outgroup distinctions. These theories include:

a) Perceived similarities and differences in attitudes and beliefs (Byrne, 1969). It was argued that people tend to like those who share similar attitudes and beliefs and dislike those who have different attitudes and beliefs. This is on the grounds that results of MGEs show that ingroup-outgroup bias emerges even when people do not perceive similarities or differences in attitudes (Tajfel and Billig, 1974).

(b) Realistic conflict theory. According to this theory which was proposed by Sherif et al. (1961), negative attitudes toward outgroup members are as a result of social conflict between one's own group and another group over control of resources. This explanation has been challenged on the ground of observed ingroup-outgroup bias resulting from mere categorization even where no real conflicts are involved.

(c) Shared fate hypothesis. According to this hypothesis, ingroup-outgroup bias is strengthened when group members share the same fate. Rabbie and Horwitz (1969) conducted an experiment in which participants were split into two groups. In one situation, one of the two groups was randomly selected to receive attractive rewards. In the other, neither of the two groups received rewards. The results showed that subjects gave more favorable evaluations to ingroup members than to outgroup members only when they were to share the same fate, that is, in this case receiving or not receiving attractive rewards. Rabbie and Horwitz (1969) concluded that shared fate promoted a common identity among the members of a group. In later work however, when the sample size was increased sufficiently, it was observed that ingroup-outgroup bias exists even between the control groups (Horwitz and Rabbie, 1982).

d) Social identity theory (SIT) suggests that group membership such as ethnicity or nationality is internalized as a social identity and this identity is enhanced by distinguishing positively the ingroup from the outgroup (see for example Turner et al., 1987; Tajfel and Turner, 1979). SIT accounts for a group's preference for maximizing its relative gains against another group, rather than its absolute gains. The idea of mere categorization causing ingroup-outgroup bias has been challenged on account of the fact that MGEs as originally proposed did not isolate social categorization from outcome dependence[11]. Two hypotheses that emanate from outcome dependence have been advanced to explain the ingroup-outgroup

[11] The application of SIT to the results of MGEs required as a critical and sufficient condition for discrimination that intergroup allocation lacks utilitarian value to the person making the allocation (see Bourhis et al., 1997; Tajfel et al., 1971; Tajfel and Turner, 1979). This argument has been challenged on the basis of participants in MGEs allocate to and receive money from other ingroup and outgroup members. Social categorization is in the MGEs is confounded with outcome dependence.

Gaertner and Insko (2000), in an attempt to distinguish gender differences in outcome dependence in discrimination found that categorized males favoured ingroup in the presence, but not in the absence of dependence structure. Thus male discriminate either in response to fear of outgroup or as a means of maximizing individual economic welfare through reciprocity with ingroup. Categorized females on the other hand favoured the ingroup regardless of the dependence structure. Gaertner and Insko (2000) attributed the gender difference in discrimination to social structure theory which uses social roles played by men and women to account for the difference. Eagly and Wood (1999) argue that the roles played by women promote a pattern of interpersonally facilitative and friendly behaviors that are communal in nature, whereas the roles played by men promote a pattern of assertive and independent behaviors. Women then, have a greater dependence on social groupings than men.

bias in MGEs (see for example Rabbie and Lodewijkx, 1994; Rabbie et al., 1989).

The first hypothesis is ingroup reciprocity (see Yamagishi and Kiyonari, 2000; Yamagishi et al., 1999; Rabbie et al., 1989) which suggests that discrimination in MGEs represents utilitarian behavior aimed at maximizing economic reward. Ingroup members exchange favorable allocations among themselves and that reciprocity is expected from each member of an ingroup. In particular Yamagishi et al. (1999) show that subjects in MGEs do not practice ingroup favoritism in reward allocation unless they expect similar favorable treatment from ingroup members.

The second hypothesis is the outgroup fear hypothesis (Ng, 1981) which proposes that the discrimination in MGEs reflects a concern for maintaining intergroup equity. The hypothesis argues that since ingroup members expect outgroup members to favour their own group, ingroup members preempt this by also favouring their own members, thus maintaining equity. While some research confirms the outgroup fear hypothesis (see Jetten et al., 1996; Locksley et al., 1980), other research such as that undertaken by Diehl (1989) reported that individuals expected outgroup members to distribute resources equally across everyone without favoring members of their own group.

Against this rich tradition of analysis, using primary data generated from a corruption experiment, this thesis investigates whether an individual uses gender and ethnic identity as a basis for categorization in a corruption scenario. If this is the case, then the expectation would be to find more bribe offering and acceptance and less punishment among ingroup member as opposed to outgroup members. This interest in the effects of gender composition and ethnic heterogeneity on corruption is borne firstly, out of a growing advocacy for the inclusion of women in policy-making positions on the basis of their relative incorruptibility (see World Bank, 2001; Dollar et al., 2001; Swamy et al., 2001). Secondly, this interest is informed by the cross-country findings that links ethnic heterogeneity to higher levels of corruption (see Lederman et al., 2005; LaPorta et al., 1998). This thesis builds on the experimental work of Alatas et al. (2009a) whose objective was to determine if there are gender differences in the propensity to offer and accept a bribe and punish a corrupt act. This thesis departs from the previous experiments in two main respects. Firstly, the main objective in the previous experiments (see for example Alatas et al., 2009a; Armantier and Boly, 2008; Rivas, 2008;

Frank and Lambsdorff, 2008) has been to compare the incorruptibility of men and women, while this thesis investigates the effects of gender composition and ethnic heterogeneity in a corruption scenario. Secondly, while in most of the previous experiments, subjects did not know the gender and the ethnic identity of the person with whom they interacted, subjects who took part in the current experiment were aware of the gender composition in one treatment and ethnic identity in the other of the people with whom they transacted. To investigate the role of harambee in corruption, and following the work by Sell and Yeongi (1997) and Fehr and Leibbrandt (2008), this thesis uses a standard linear public good and a common pool resource game played one after the other to investigate if individuals compensate their public good contributions through extractions from the common pool resource ex-post.

For the gender composition and ethnic heterogeneity chapters, this thesis uses a computerized one-shot sequential move bribery game with two separate treatments involving three players. These players are denoted as manager (bribe giver) and public official (bribee) who can engage in and benefit from bribery at the expense of a citizen. The manager moves first to make a decision on whether or not to offer a bribe to the public official. The public official then moves to make a decision on whether or not to accept the bribe. If the public official accepts the bribe, both the manager and the public official benefit but this imposes a cost to the citizen. The citizen moves last by making a decision on whether or not to punish both the manager and the public official. Subjects were required to reveal their gender in one treatment and surnames in the other treatment. The gender or surnames of the members of a trio in each session of the game were displayed on each of the computer screens depending on the treatment. The experimental design is explained in detail in chapter 3.

In contrast to the findings in previous studies (see for example Rivas, 2008; Swamy et al., 2001; Dollar et al., 2001; World Bank, 2001) that have found women less corrupt than men, this thesis does not find any gender difference in the propensity to act corruptly or in the propensity to punish corruption culprits. The thesis shows that the gender difference in a corruption scenario is determined by the role that people of different gender play and the gender composition of those involved in a corrupt deal. The likelihood of bribe offering is higher when a manager faces

a public official of the opposite gender than one who is of the same gender. This is especially the case if the citizen who is hurt by the bribe is of the same gender as the manager. To the extent that a manager anticipates no punitive action from a citizen of the same gender, they are mistaken since a citizen does punish a public official of the opposite gender who accepts a bribe from a manager who is the same gender as the citizen.

However, it is the case that punishment is less likely in single-gender trios than in mixed gender trios. A citizen is willing to invest in punishment in trios whose members he or she considered to be outsiders but is unwilling to do so if he or she considers the beneficiaries of the corrupt act to be insiders. Clearly, the citizen demonstrates insider-outsider distinction in punishment since whether the corrupt act is perpetrated by insiders or outsiders, he or she bears the cost. The insider-ousider bias with regard to punishment is especially pronounced among female citizens.

In the ethnic heterogeneity and corruption chapter, ethnicity appears to be important in the decision to offer a bribe. Specifically, when a manager and a 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. 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 ingroup 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 behavior is also evident in punishment behavior. The results reveal 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 one. Moreover, punishment was more likely in completely ethnic heterogenous trios than in completely homogenous ones.

In the *harambee* and corruption chapter, the thesis shows an inverse and sig-

nificant relationship between individual level of public good contributions and the level of common pool resource extractions. To the extent that the public good and common pool resource games mimic the link between *harambee* and corruption, the thesis does not find support for the allegations that individuals compensate their *harambee* contributions by engaging in corruption ex-post. Instead the thesis finds that cooperators in a public good setting are other-regarding in common pool resource extractions. Moreover, the chapter underscores the important role that socioeconomic factors play in the management of common resources. While an individual's gender and ethnicity have insignificant effects on common resources, the gender composition and ethnic heterogeneity of a group is of importance to common resource management. Specifically, the chapter shows that an increase in the proportion of women in a group leads to a rise in *harambee* contributions. Ethnic heterogeneity in a group leads to less *harambee* contributions and overextraction of common pool resources.

Overall, this thesis finds individuals use both gender and ethnicity as a basis for categorization upon which insider-outsider distinctions are based either in offering a bribe or punishing corrupt behavior. The significant role that gender and ethnicity can play in the fight against corruption and in common resource management is underscored.

Following this introductory chapter, the rest of the thesis is organized as follows: chapter 2 presents the research methodology and the subject pool, chapter 3 presents the findings on gender composition and corruption, chapter 4 presents the findings on ethnic heterogeneity and corruption, chapter 5 presents the findings on the link between *harambee* and corruption while chapter 6 concludes the study.

Chapter 2

Research methodology and subject pool

2.1 Research methodology

Many studies on corruption including the well established Corruption Perception Index (CPI)[1] by Transparency International have relied mainly on survey data. Questions abound on the reliability of the findings of such research. The questions emanate from doubts as to whether people truthfully report their involvement in corruption. Three general concerns regarding survey data based on behavioral questions have been raised. These relate to "hypothetical bias", "idealized persona bias" and "incentive compatibility" (Carpenter, 2002).

To illustrate hypothetical bias, consider the likely response to the question "Would you ever accept a bribe offered to you?" An individual's response to this question can only be hypothetical and may not necessarily reflect what the individual would do if they were actually offered a bribe. The idealized persona bias can be illustrated by the response to the question "How many times in a week do you encounter situations where a bribe is demanded from you?" A person answering this question may either respond on the basis of what he thinks the researcher wants to hear or in relation to what the respondent would like to be. The incentive

[1] Corruption Perception Index (CPI) combines information from different expert and business surveys on the perceived level of public-sector corruption in a country. The index ranges from 0 (most corrupt) to 10 (least corrupt).

compatibility issue with survey data arises from the fact that there is no incentive in survey research for the respondent to take the survey seriously (Bertrand and Mullainathan, 2001).

The challenges with studying corruption using surveys are compounded by the secrecy of corruption involvement because of its illegality. Experiments then become a natural alternative in studying corruption. Laboratory experiments offer the possibility of overcoming the unobservability of corrupt activity by generating data from a bribery game while controlling the environment and the characteristics of the subjects involved (Roth, 1988). In an experiment, a subject is confronted by a non-trivial amount of money and his final payoff is solely dependent on his actions in the experiment. The monetary reward acts as an incentive for the subject to reveal his type. To show the different results obtained from surveys and experiments, a number of studies have compared "measure of trust" findings from both survey and experiments (see for example Glaeser et al., 2000; Burks et al., 2000; Glaeser et al., 1999; Ben-Ner and Puttermann, 1999). These studies find measures of trust from experiments to be largely uncorrelated with responses to survey questions designed to measure social capital. They find that respondents who indicate they are trusting do not exhibit this trust in an experiment with monetary stakes.

Similar discrepancies have emerged when findings from surveys and experiments on corruption are compared. A good example of this are the findings from two key surveys that show women to be less corrupt than men (see Dollar et al., 2001; Swamy et al., 2001). The findings of these two studies have been the basis for advocating for the greater involvement of women in the public service. Most experiments on gender and corruption have, however, not found gender differences in corruption (see for example Alatas et al., 2009a; Armantier and Boly, 2008; Frank and Lambsdorff, 2008)[2]. The difference in the findings may be attributed to the difference in what the two sets of studies were investigating. For example, in one of the surveys that Swamy et al. (2001) conducted, the researchers examined responses to hypothetical questions on whether one can be justified for accepting a bribe in the line of their work. A larger percentage of women (77.3%)

[2]In contrast, other experimental studies have found gender differences in the propensity to act corruptly (see for example Rivas, 2008; Frank and Schulze, 2000).

than men (72.3%) supported the statement that "someone accepting a bribe in the course of their duties can never be justified". However, the fact that a respondent does not think that accepting a bribe is justifiable does not mean that they would not act corruptly if offered an actual bribe.

There is obviously a need for being cautious in interpreting experimental findings and their general application because conditions in a laboratory differ from those in the real world with all its complexity. The second reason for the caution is the fact that experiments mainly draw their subjects from students who are not representative of the general population. Levitt and List (2007) and List (2006) have suggested the incorporation of field experiments to complement laboratory experiment findings. On this front, the evidence in relation to corruption is encouraging. Armantier and Boly (2008) conducted a bribery game combining a lab experiment in Montreal and a field experiment in Burkina Faso. While the study did not find any difference with regard to subjects acting opportunistically in both the laboratory and field set up, increasing the bribe amount was found to exacerbate corruption in the field set up but not in the laboratory situation[3].

This thesis adopts experimental games as a research methodology first because of the novelty of the methodology in the Kenyan context and secondly because all studies on corruption in Kenya have been based on surveys. Thus, not only will this work contribute to the existing work on corruption but it will also make a significant contribution in the use of experimental methodology in the Kenyan context.

2.2 Experimental design

As mentioned in the previous chapter, this thesis uses two experiments. The first experiment, the "Corruption game with punishment" experiment generates data for the chapters that focus on the influence of gender composition and ethnic heterogeneity on corruption. The second experiment the "*Harambee* and corruption

[3]The experiment involved grading of exam papers where the 11th paper had some US$ Bills and a message stating "Please find few mistakes in my exam paper". To distinguish between laboratory and field experiment, subjects in the laboratory set up were informed that they were involved in an experiment while those in the field set up were only made aware that they were in an experiment after they had graded the papers.

experiment" experiment generates data for the *harambee* and corruption chapter. A brief description of each experiment is provided in the following section, while the full description is presented in the relevant chapters.

2.2.1 Corruption game with punishment

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-shot[4] sequential-move game. These players are a manager of a firm (potential bribe-giver), a public official (potential bribee) and a citizen (potential punisher). The citizen is adversely affected by a corrupt act that privately benefits both the bribe giver and the bribee. Conceptually, the game is modelled on the corruption deterrence game by Schulze and Frank (2003) which had three players; the briber, bribee and those harmed by the corruption. 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 faces the choice to initiate 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's and the public official's payoffs increases 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 on the manager than the public official. The experiment has two treatments; in one, subjects revealed their gender while in the other they revealed their surnames. The gender or the surnames of the trio in relevant treatments in each session are displayed on each of the three computer screens.

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

2.2.2 *Harambee* and corruption experiment

To generate data for the harambee and corruption chapter, this thesis uses a two-stage experiment consisting of a standard one-shot linear public good game and a common pool resource game played one after the other. One of the allegations with regard to the alleged influence of the practice of *harambee* on corruption is that individuals compensate their *harambee* contributions by engaging in corruption ex-post, and this was tested by the experiment. The games were played by groups of 10 randomly assigned subjects. The set up in this experiment is adopted from Sell and Yeongi (1997) whose objective was to determine if public goods and common pool resources achieve the same level of cooperation. The motivation for adopting Sell and Yeongi's model is its simplicity and the fact that it uses similar payoff function in both public good and CPR games.

2.3 Recruitment and subject pool

The experiments for this research were conducted between October of 2008 and May 2009 in various universities and colleges in Kenya. The universities and colleges[5] were selected in order to take into account the geographic and demographic diversity of the Kenyan population[6]. In total, 15 universities and colleges located in the eight provinces in Kenya took part in the experiments. Table 2.1 presents the regional location of the universities and colleges as well as the demographic attributes of the sample. While the majority of the universities and colleges are government-funded, a few are privately owned. Private universities attract students from wealthier families than government-sponsored ones. On average 67 subjects in each center took part in the experiments. Except for KIA, which did not take part in the *harambee* experiment, all the other centres took part in both experiments.

Members of student governments in various universities and colleges as well

[5] In Kenya, there is a clear distinction between universities and colleges. While colleges offer diploma and certificate level programs, universities offer degree programs.

[6] Whereas conducting the experiments in one centre would have been easier, there would have been loss of information on how cultural and regional issues impact on ones propensity towards corruption.

as posters placed on notice boards were used to recruit potential participants. Those who expressed interest in the experiments by signing up were contacted telephonically by a research assistant or the principal researcher, encouraging them to participate in the experiment and to also let their friends know about the experiments. They were also encouraged to raise whatever questions they may have about the experiments on the day of the experiments. A day before the experiments, those who had signed up were contacted telephonically to remind them of the experiments.

In most centres, about 75% of those who had indicated their willingness to participate showed up for the experiments. There were cases of students who had not signed up for the experiments showing up on the day of the experiments. On the experiment day, the subjects gathered in a large hall. The principal researcher explained what the experiments were about and how they would be conducted. They were told that each subject would participate in two games. From the beginning, it was emphasized that there would not be any show-up payment and that each subject's final payment would be dependent on their actions in the two games they would take part in. After each subject had taken part in either the gender or the ethnicity treatment, they were directed to a waiting hall. When all were done with the first experiment, they were randomly grouped into ten for the harambee experiment.

In total, 1012 students took part in the experiments. This number compares well with the 1326 subjects in the experiment of Alatas et al. (2009a). Of the 1012 students, 339 (33.5%) were women. This number is small compared to the gender balance in Kenyan universities and colleges where women form almost half of the population. The low female turn out may be attributed to the fact that the experiments were advertised as requiring computer skills. This explanation is inferred from the numerous questions on the level of computer skills required for the experiments from the potential female participants contacted.

The sample is representative of the Kenyan population in most demographic aspects. There is however an obvious age distribution bias towards a younger generation which is expected given that the experiments were conducted in universities. Except for two centres in which subjects were drawn from both undergraduate and postgraduates, the rest of the universities had only undergraduate

Table 2.1: Demographic summary statistics of the sample

Aspect	Category	Number	Percent
Gender	Male	673	66.5
	Female	339	33.5
Age	18-30	972	96.0
	31-40	34	3.4
	41-50	6	0.6
Religion	Protestants	699	69.1
	Catholic	250	24.7
	Muslim	47	4.6
	Others	16	1.6
Ethnic group	Kikuyu	336	33.2
	Kalenjin	142	14.0
	Luhya	118	11.7
	Kisii	108	10.7
	Luo	117	11.6
	Kamba	95	9.4
	Others	96	9.5
University/College	Province		
Daystar Athi River	Eastern	45	4.4
Egerton	Rift Valley	64	7.3
Eldoret Polytechnic	Rift Valley	69	6.8
KIA (Nairobi)	Nairobi	42	4.2
Maseno	Nyanza	60	5.9
Masinde Murilo	Western	51	5.0
Kimathi Institute	Central	63	6.2
Moi	Rift Valley	93	9.2
KEMU	Eastern	83	8.2
UON (Lower Kabete)	Nairobi	39	3.9
Daystar Nairobi	Nairobi	63	6.2
NEP Institute	N. Eastern	93	9.2
Mt. Kenya	Central	90	8.9
Mombasa Polytechnic	Coast	66	6.5
Kabarak	Rift Valley	81	8.0

students.

In terms of religious composition, there is an under-representation of Muslims in the sample. There are two reasons for this under-representation; the first is that there are not many universities and colleges in Muslim dominated areas. Secondly some Muslims thought that the games were similar to gambling which is prohibited by the Islamic faith. In one of the colleges, this issue was raised by one of the students and inspite of lengthy explanations of the difference between the games and gambling, some Muslim students declined to participate.

The ethnic balance of the sample is a good representation of the Kenyan ethnic landscape. Note that the Kikuyu ethnic group in this sample combines the Kikuyu, Meru and Embu. The three ethnic groups have many things in common including shared names, location, language, political alignment and occupation.

The two experiments took about four hours including the waiting time. On average, a subject accumulated 5000 tokens from the two games that each subject took part in. The tokens were converted into Kenya shillings at the rate of 80 cents per token translating to Ksh 400 (about 6 US$) which is equivalent to a labourer's daily wage. Payments were made privately to each subject at the end of the experiments.

2.4 Analysis of responses from the post-game questionnaires

2.4.1 Subjects' attitudes and views on corruption in Kenya

At the end of each experiment, subjects were required to fill in an electronic questionnaire. A number of questions were designed to mainly elicit the subjects' attitudes and views on corruption in Kenya. Table 2.2 presents a summary of responses to some of the questions in the questionnaire. A high proportion of subjects (81.2%) indicated that corruption is a very serious problem in Kenya with a majority indicating that they encountered corruption cases several times in a week. On the question of where the subjects encountered corruption, evidently the majority of the subjects encountered corruption in government offices includ-

ing police stations, hospitals and the offices of the provincial administration[7]. A considerable proportion (18.2%) reported having encountered corruption in universities and schools. These findings are similar to those reported in Transparency International's Kenya Bribery Index Report (Transparency International, 2009a) which reported increasing levels of corruption in academic institutions.

An overwhelming majority of respondents (87.1%) indicated that they do not report corruption cases. The majority (41.2%) considered reporting a waste of time while 30.1% indicated the reason for not reporting corruption to be the lack of government commitment to deal with corruption. A sizeable proportion indicated fear of victimization to be the reason for not reporting (21.2%).

Many of the subjects (38.4%) cited income inequalities to be the main cause of corruption while 16.4% indicated ethnic diversity to be a major cause of corruption in Kenya. The lack of government commitment to deal with corruption was seen by 22.4% of the subjects as one of the causes of corruption in Kenya.

The views on corruption expressed by the subjects in this sample compares well with a survey conducted by Kibwana et al. (1996) in which 83.8% of the 555 respondents indicated that corruption is a very serious problem in Kenya. The respondents in Kibwana's study indicated the main causes of corruption to be ineffective laws and poor political leadership (67.7%) and poverty (15.7%). A sizeable proportion (22.2%) indicated that they would not consider reporting cases of corruption to the authorities with 78.8% indicating that the government had no commitment to fight corruption. In Kibwana's study, 44.4% of the respondents indicated ethnic affinity to be a factor in fuelling corruption.

The responses from the current sample, that of Kibwana et al. (1996) and various reports by Transparency International are a confirmation of how rife corruption is in Kenya. The findings also confirm the loss of faith by Kenyans in the government's commitment to fighting corruption. It is indeed the lack of commitment by the Kenyan government that led to the resignation of and eventual emigration from Kenya by the permanent secretary in charge of governance and ethics, John Githongo (Wrong, 2009).

[7]Provincial administration is the lowest level of government that one interacts with most frequently especially for government licenses.

Table 2.2: Summary of subjects' views on the extent of corruption in Kenya

Question	Responses	Percent
How serious is corruption in Kenya?	There is no corruption problem in Kenya	0.9
	Moderately serious	17.9
	Very serious	81.2
How frequently do you encounter corruption cases?	Daily basis	28.8
	Once a month	14.8
	Once a week	8.6
	Several times a week	30.7
	Hardly	17.1
Where do you encounter corruption cases?	Police	32.7
	Immigration officials	7.3
	Tax officials	6.7
	Land office	4.9
	Place of worship	3.1
	Universities and schools	18.2
	Hospitals	8.1
	Provincial administration	15.9
	Does not apply	3.0
Do you report corruption cases to the authorities?	Yes	12.9
	No	87.1
What is your justification for reporting or not reporting?	Government not committed to fight corruption	30.1
	It is a waste of time	41.2
	Fear of victimization	21.2
	Authorities do a good job	7.6
Which among these are causes of corruption in Kenya?	Ethnic diversity	16.4
	Lack of government commitment to fight	22.4
	Poverty	22.8
	Income inequality	38.4

2.4.2 Subjects views on the relationship between gender and corruption

Table 2.3 presents disaggregated responses to some of the general questions according to gender and corruption. In addition, the table presents a summary of responses to the questions specific to gender and corruption. The majority of the subjects regardless of gender indicated that corruption is a very serious issue in Kenya.

Most of the subjects agree with the general notion that men tend to be more corrupt than women. A larger proportion of men than women considered men to be more corrupt. A greater percentage of women than men (2.8% compared to 1.4%) considered women more corrupt than men. Interestingly, a higher percentage of women than men were of the opinion that increasing female representation in policy making positions would help in the fight against corruption in Kenya.

Table 2.3: Summary of responses on gender and corruption

Questions	Response	Proportion of men	Proportion of women
How serious is corruption in Kenya?	There is no corruption problem in Kenya	0.004	0.016
	Moderately serious	0.201	0.297
	Corruption is a very serious issue in Kenya	0.795	0.774
Are men more corrupt than women?	Yes	0.617	0.587
What is your view on corruption in relation to gender?	Men are more corrupt than women	0.600	0.532
	Women are more corrupt than men	0.014	0.028
	Both men and women are equally corrupt	0.386	0.440
Would having more women in leadership help lower corruption?	Yes	0.487	0.618

2.4.3 Subjects views on the relationship between ethnicity and corruption

Table 2.4 presents a summary of the responses to questions on ethnic heterogeneity and corruption. The summary shows that even though most subjects (66%) indicated that all ethnic groups in Kenya are equally corrupt, 28% of the subjects singled out the kikuyu ethnic group to be most corrupt. It is important to note that the kikuyus are the most populous and economically dominant group and two of the three presidents that Kenya has had since independence have come from this ethnic group. The other ethnic groups in Kenya regard the kikuyus with suspicion. So as to eliminate corruption in organizations, most subjects (97%) indicated that such organizations should hire people from different ethnic groups.

Table 2.4: Summary of responses on ethnicity and corruption

Question	Response	Proportion
Are there some ethnic groups in Kenya that are more corrupt than others?	No	0.570
	Yes	0.430
Which among these ethnic groups is most corrupt?	Kikuyu	0.280
	Luo	0.029
	Luhya	0.004
	Kalenjin	0.021
	Kisii	0.004
	Kamba	0.002
	All are equally corrupt	0.660
So as to lower levels of corruption in an organization, what should be the ethnic composition of the employees?	Same ethnic group	0.028
	Different ethnic groups	0.972

2.4.4 Subjects views on the importance of *harambee* and its role in corruption

Table 2.5 presents a summary of the responses on the subjects views on and its role in corruption. The importance of *harambee* in Kenya is underscored by the

proportion (91%) of the sample who indicated to have benefitted through it and the proportion (68.5%) that held the opinion that *harambee* is achieving its intended objective. A large proportion of respondents did not consider *harambee* to be the cause of corruption. Rather 51% of the sample thought corruption was one of the cause of abuse of the practice of *harambee*. The majority are of the opinion that banning *harambee* would not eliminate the problem of corruption in Kenya. A majority (88%) are of the opinion that *harambee* should be restricted to individual and family issues perhaps to keep politicians away from it.

Analysis of response of the post-game questionnaire revealed several important aspects of the sample. Firstly the subjects were aware of the problem of corruption in Kenya. Secondly, they hold the view that the government has failed in the fight against corruption. Thirdly they regard *harambee* as important in Kenya and think highly of the initiative. These revelations validate the need for research at a micro level to document how people in Kenya interact to perpetuate or eradicate corruption. This was the purpose of the experimental games described in this thesis. It is these results to which we now turn our attention.

Table 2.5: Summary of responses on harambee and corruption

Question	Response	Proportion of sample
Have you benefitted from *harambee*?	Yes	0.905
	No	0.095
Is *harambee* achieving its intended objective?	Yes	0.685
	No	0.315
In which community would *harambee* be effective in raising funds?	Where people are drawn from the same ethnic group	0.362
	Where people are drawn from different ethnic group	0.638
What do you think is the number one cause of abuse of *harambee* spirit?	Politicians' greed	0.191
	Provincial Administration	0.006
	Corruption	0.514
	Level of poverty	0.132
	People taking advantage of Kenyans' generosity	0.157
From where do politicians get money they give in *harambees*?	Genuine sources	0.334
	Corruption deals	0.666
Is there a relationship between *harambee* and corruption?	Yes	0.657
	No	0.343
Do you consider *harambee* to be one of the main causes of corruption	Yes	0.396
	No	0.604
Do you support the current ban on public officials involvement in *harambees*	Yes, they should concentrate on service delivery	0.597
	No, this has alienated them from the people they represent	0.403
Will the current ban on *harambee* help in reducing the level of corruption?	Yes	0.464
	No	0.536
What should be done about *harambees*?	Completely do away with	0.117
	Restrict *harambee* to individual and family issues	0.883

Chapter 3

Does gender composition matter in corruption?

"The search for a sustainable anti-corruption strategy has seen a number of reform ideas introduced into the public sector of many African countries by the development community.....Failure of previous anti-corruption strategies have led to the promotion of women in the public sector as a potential anti-corruption remedy. This nascent idea is premised on the presumption that women are more ethical than men.....Would women prove less corrupt when exposed to environments characterised by corrupt opportunities and networks?"[1]

3.1 Introduction

Gender differences in relation to corruption has of late been the subject of research (see for example Alatas et al., 2009a; Rivas, 2008; Frank and Lambsdorff, 2008; Dollar et al., 2001; Swamy et al., 2001). The findings in both survey and experimental research in this area are varied and far from conclusive. There are those that have found women less corrupt than men and therefore found a basis for advocating for more female representation in the labour force as an anti-corruption strategy (see for example World Bank, 2001; Dollar et al., 2001; Swamy et al., 2001). Others have found no significant difference between men and women as far as corruption

[1] See Alhassan-Alolo (2007)

is concerned (see Alatas et al., 2009a; Frank and Lambsdorff, 2008; Alhassan-Alolo, 2007).

Some countries are already experimenting with having more representation of women and greater involvement of women in public life as an anti-corruption strategy. For example in Uganda the majority of the positions of treasurer in the local government are filled by women (Goetz, 2007). In 1999, The Washington Post reported a similar move by the Mexico city police chief who took the authority to issue traffic tickets away from men and gave this authority to a new force consisting exclusively of female officers (Moore, 1999). A similar policy was implemented in Peru's capital Lima with a resultant decline in corruption (McDermott, 1999).

Related to the literature on gender and corruption is a body of research that shows that people treatment of each other depends on the perceived social distance between them. Specifically, this later literature show that people are more likely to favour those they perceive to be insiders compared to those they perceive to be outsiders (see for example Burns, 2004a; Burns, 2003; Dufwenberg and Muren, 2002; Fershtman et al., 2002; Bohnet and Frey, 1999; Tajfel and Billig, 1974). This chapters seeks to determine if gender composition matters in a corruption scenario. Specifically, the chapter investigates if people internalize their gender either to favour or discriminate other people on the basis of gender in a corruption scenatio.

This chapter reports results from an experimental game conducted among Kenyan students. The game involved a manager (potential briber), a public official (potential bribee) and a citizen who is adversely affected by the bribe and one who has a choice to punish the culprits. The chapter seeks not just to determine who between men and women are more corrupt but also to determine if gender composition plays any role in the likelihood that a bribe is offered or accepted and whether such behavior is punished.

Kenya offers an ideal situation for this research for two main reasons. First, the country has consistently recorded high rates of corruption over the years. In 2009 Transparency International ranked Kenya the 146th (with a Corruption Perception Index of 2.2) least corrupt country out of 180 countries (Transparency International, 2009a). Secondly, as in most developing countries, women in Kenya have been relegated to junior positions in both political leadership and policy mak-

ing processes. The gender equality crusade is slowly gaining momentum but the achievement is far from satisfactory. In 2010 the World Bank shows 52% female labour participation as a percentage of female population aged 15 years and above in Kenya. On the other hand within the same age bracket, the percentage for male labour participation is 78%. In the 2007 general elections, only 21 women were elected as members of parliament representing about 9.7% of the parliament. While this figure is an improvement from the previous parliament, it is still way below the expected representation given that women form more that 50% of the Kenyan population. These figures show a wide disparity between men and women in Kenya.

In contrast to findings in previous studies (see for example Rivas, 2008; World Bank, 2001; Dollar et al., 2001; Swamy et al., 2001) which find women less corrupt than men, this study does not find gender differences in the propensity to act corruptly or the propensity to punish corruption culprits. Rather, the results show that bribes are more likely to be offered to members of the opposite gender especially in a trio where the manager is the same gender as the citizen. The citizen on the other hand is significantly more likely to punish a public official of the opposite gender than of the same gender especially if the public official accepted a bribe from a manager who is the same gender as the citizen.

Punishment was less likely in single-gender trios than in mixed gender trios. A citizen was willing to invest in punishment in trios whose members he or she considered to be outsiders but was unwilling to do so if he or she considered the beneficiaries of the corrupt act to be insiders.

Following this introduction, the rest of the chapter is organized as follows section 3.2 reviews the literature on corruption and gender. Section 3.3 presents the experimental design, section 3.4 presents the results and section 3.5 discusses and concludes.

3.2 Gender and corruption

There is a growing body of literature that examines the link between gender and corruption. As pointed out earlier, there are a number of studies that find women

less corrupt than men[2]. The incorruptibility of women is premised on the notion that women are more relationship-oriented, have high ethical standards and are more able than men to sacrifice private profit for the common good (Rivas, 2008). Similar arguments about women's higher moral nature and the assumed propensity to bring this to bear on public life, particularly in conducting political affairs has been advanced by Goetz (2007) and Duflo (2005) and others[3]. Other reasons advanced in the literature on the incorruptibility of women compared to men are that women are intolerant of dishonest behavior and the fact that women are more risk averse than men. Corrupt behavior usually involves some probability of the risk of being caught and punished and women will be less inclined to such behavior (Croson and Gneezy, 2009). In a bribery game with two treatments, Schulze and Frank (2003) found no difference between men and women in their propensity to accept bribes in the risk free treatment. In the risky treatment, women exhibited significantly less willingness to accept bribes. In analyzing if there is a gender difference in financial risk, Eckel and Grossman (2002) found that women have a higher degree of risk aversion than men. It is this risk averse nature of women that makes them seem less corruptible than men. This conclusion supports the idea that having more women in politics would enhance good governance and business

[2]Mukherjee and Gokcekus (2004) for example advocate for the increase of female employees in public organizations if the ratio is below 1/3 since by doing so, corruption is reduced and the rate at which corruption is reported is increased. The study also finds that increasing the number beyond a certain threshold increases corruption and reduces the rate at which corruption is reported. This last finding from the study is interesting with the implication that an all female public service would be just as corrupt as an all male public service. Along this argument Rivas (2008) suggests that the late entry of women into the labor market and politics could explain women's lower propensity for corruption. The difference may therefore be due to differences in terms of accessing networks of corruption, or in knowledge about how to get involved in corrupt activities. Rivas (2008) concludes that it may just be a matter of time before women get involved in corruption. Increasing female participation is a good beginning towards the reduction of corruption but the strengthening of political, economic and civic mechanisms that promote competition, transparency and accountability in both the economy and government decision making is a prerequisite for lowering of corruption rate regardless of women's participation (Sung, 2003). Others such as Goetz (2007) see the notion of women being less corrupt as a myth and instead advocate for the involvement of women in policy making in the light of gender equality and to ensure justice and fairness.

[3]See for example Phillips (1991) who argues that women should be included in policy making since (a) they bring to politics a different set of values, experiences and expertise thus enriching political life in the direction of a more caring and compassionate society, (b) women must be present in public life to represent their interest and (c) as a matter of justice, women should not be excluded from central activities in the political realm.

trust (World Bank, 2000).

Culture and the social roles played by men and women may explain gender differences in the propensity to act corruptly. For example, Alatas et al. (2009a) using an experimental methodology undertook cross-country research in four countries; Australia, India, Singapore and Indonesia. They find gender differences in corruption in only one of the countries in the survey, that is Australia. In Australia, men were found to offer and accept bribes more often than women and the probability of men punishing corruption was significantly lower than that of women. This difference was attributed to social and cultural roles played by men and women. Guerrero and Rodriguez-Oreggia (2005) found that both men and women in Mexico showed the same willingness to pay bribes but differed in their negotiation strategies especially with the police. In this regard, men were found to be more inclined than women to pay bribes to save time. This finding is similar to the one by Bose (2004).

Cross-country research relying on survey data suggests that women are less corrupt than men (see for example World Bank, 2001; Dollar et al., 2001; Swamy et al., 2001). Dollar et al. (2001) examine the link between the International Country Risk Guide (ICRG) corruption index[4] and the proportion of parliamentary seats held by women in the lower and upper houses in each country in a sample of 100 developed and developing countries. They found that a one standard deviation increase in female representation resulted in a decline in corruption by 20%. The study concludes that since women behave less opportunistically than men, bringing more women into government may have significant benefits for society in general.

Similarly, Swamy et al. (2001) examine cross-country data drawn from Transparency International CPI, the World Value Survey and the World Bank data on corruption in Georgia to examine the effect of more involvement of women in politics and commerce on corruption. They found that an increase in the involvement of women led to a reduction in levels of corruption[5].

[4]The index captures the likelihood that senior government officials will demand special payments, and the extent to which illegal payments are expected in low levels of government.

[5]The three data sets used by Swamy et al. (2001) are: the World Value Survey (WVS) data in which a large sample of men and women in drawn from developed and developing countries were asked a series of questions on their attitudes to a hypothetical situation in which there was room

There is a challenge in interpreting the results of these studies especially those that rely on self reported involvement in corruption. The gender differences may be a reflection of differentials in acknowledgement of corruption rather than incidences of corruption. The second challenge and especially in interpreting the macro-level data is the ability to isolate the effect of gender on corruption. This is the point raised by Sung (2003) who shows that the impact of gender on corruption decreases once the rule of law, freedom of the press and democracy are controlled for. Sung (2003) concludes that these institutions simultaneously advance the position of women and increase integrity, rather than female participation lowering corruption. A third argument raised by Frank and Lambsdorff (2008) is one of reverse causality where women might find corrupt industries more repugnant than men do, and seek career opportunities in industries with higher levels of integrity. If this is the case, then female participation would not increase integrity but be the result of women choosing work environments which have lower levels of corruption.

The challenges in interpreting results reviewed so far can be overcome in experimental settings. First because experiments do not rely on self-reported responses and opinions, but on empirical data gathered from observed actions of subjects in an experiment. Secondly, in experiments, subjects face similar situations and are confronted by the need to make similar decisions to those in the real world.

The first experiment on corruption is one by Frank and Schulze (2000) which focuses on the behavior of public officials with regard to the actions by fictitious bribe payers simulated by the experimenter[6]. The experiment had both a risk

for dishonest and opportunistic behavior. A higher percentage of women than men indicated that an illegal or dishonest behavior is never justified. For example, 77.3% of women indicated that "someone accepting a bribe in the course of their duties can never be justified" as compared to 72.3% of men who indicated so. The study also used World Bank data on corruption in Georgia. The data was based on 350 firms in 4 key sectors; trade, manufacturing, service and agriculture. Firms owned or managed by women on average gave bribes 4.6% of the time they came into contact with a government agency, while the average times for firms owned or managed by men was 12.5%. The researchers also used data from cross-country Transparency International's CPI and the involvement of women in politics and commerce as measured by (a) the proportion of female legislators in national parliament, (b) the proportion of female ministers and high level government bureaucrats and (c) the proportion of women in the labour force. The study found that an increase in any of these variables is associated with lower levels of corruption.

[6]Subjects were students who attended the showing of a film organized by the student film club. Subjects were asked to make a decision on behalf of the club in the following situation: a 200DM banknote that belonged to the club had fallen down a drainpipe and will be lost unless one of ten competing plumbing firms retrieves it. Subjects were asked to make a bid comprising

free and a risky (where the bribe could be detected resulting in loss of income) treatment. The study found no gender difference in the risk free treatment, but in the risky treatment, women exhibited less willingness to accept bribes

Alatas et al. (2009a) conducted a one-shot three person corruption experiment in which a firm has a choice to offer a bribe to a public official, where this is witnessed by a third player, the citizen who can then choose at their cost to punish such behavior. This experiment was run in different countries. The study found no strong gender differences in terms of the offering and acceptance of a bribe and the punishment thereof. The study concludes that it is not gender per se that determines whether one engages in corruption but other factors such as the orientation of men and women in the different countries that play a part as well[7].

Armantier and Boly (2008) conducted a corruption experiment involving grading of examination papers both in a laboratory set-up in Canada and the field in Burkina Faso. In the experiment, a grader had a chance to take a bribe and be lenient in grading or act opportunistically[8]. Female graders were found to take the bribe much more than male graders if there was no monitoring. The study found no gender differences in the propensity to act opportunistically.

The experiment by Frank and Lambsdorff (2008) is similar in design to the one by Lambsdorff and Frank (2007) and Rivas (2008), except that the third party is not passive. Instead, the third party, *Medecins sans Frontiers,* receives a donation if the agent contracts the efficient firm instead of the corrupt one. Additionally bribers make a choice of how they frame their bribe offer. The public servant had

the price the film club would have to pay to the plumbing firm and an amount that would go to the decision maker for awarding the contract. Prices were positively linked with bribes and ranged from DM 20 (implying zero bribe) to DM 200 (implying zero rent for the film club and a bribe of DM 144).

[7]In Australia 80% of female public officials accepted a bribe while 92.1% of men did. The difference was significant. In Singapore, women were found to be more inclined to take bribes than men even though the difference was not significant. In India and Indonesia men accepted bribes more readily than women although the difference was insignificant. In Australia, female citizens were found to be significantly more likely than men to punish corruption culprits (62.2% versus 49.2%).

[8]In the field experiment in Burkina Faso subjects were made to believe that they were hired to grade exam papers. In a batch of 20 papers, the 11th paper had a post-it note saying "please find few mistakes in my exam paper". Attached to the examination paper was a bank note. The aim was to determine if those graders who took the money were more lenient in marking the particular paper.

a choice to act opportunistically in addition to the fact that both the firm and the public servant could blow the whistle at various stages in the game. The research found no gender difference with respect to whistle blowing but found women to act more opportunistically especially if they did not expect the bribing firm to whistle-blow and were less likely to reciprocate. While 31% of the men retaliated when confronted by an opportunistic public servant, only 16% of the women did[9].

Rivas (2008) conducts a two-person (firm and public official) bribery experiment in four stages. The first player (firm) could initiate a bribe which the second player (public official) could either accept or reject. In order to determine the gender effects, the two players were paired as male-male[10], male-female, female-male or female-female. When the firm chooses to propose a bribe, the public official got a chance to choose between the corrupt or the uncorrupt option. The public official ended up with a lower payoff if he or she chose the corrupt option. The author argues that if the public official chose the corrupt option, he or she would have to incur some cost of hiding some information. In addition, the corrupt option imposed some externality to all those participating in the experiment. If the public official rejected the bribe from the firm, he can chose to punish the firm for initiating a bribery act. Female firms offered bribes less frequently than male and offered lower bribes than the male firms. Women were also found more likely than men to act opportunistically. The paper concludes that women are less corrupt than men.

In nearly all the experiments that have just been reviewed, except for Frank and Lambsdorff (2008) and Alatas et al. (2009a), the main focus was the gender difference in the propensity of a public official to act corruptly. The subjects in all the experiments except in Rivas (2008) did not have information on the gender composition of the people with whom they interacted in the experiments. This

[9]The experiment took place in two stations with subjects assuming the role of public servants in one and business persons (a firm) in the other. The public servant could: (a) decline the bribe, blow the whistle and award the contract to the efficient firm, (b) act opportunistically by taking the bribe and awarding the contract to the efficient firm and (c) reciprocate positively by awarding the contract to the bribing firm. If the bribing firm did not get the contract either due to opportunism or whistle blowing, no damage was done to society and this translated to a €8 donation to *Medecins sans Frontiers.*

[10]In this case the first gender denotes the gender of the firm while the second denotes the gender of the public official.

is the gap that this chapter intends to fill. Besides determining the impact of gender on corruption, this chapter seeks to determine what effect knowledge of the gender composition of those in the corruption chain would have on the choices that individuals take. This information can be important in determining the role of gender in the design of less corruption-prone institutions.

3.3 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-shot[11] sequential-move game[12]. 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-taker[13]. 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 signalling.

[11] 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).

[12] 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.

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

This thesis makes an adjustment to the Alatas et al. (2009a) set up by asking subjects to reveal their gender in one treatment (gender) and surnames in a second treatment (ethnicity). The gender or the surnames were displayed on the computer screens of the three players in each trio. The purpose of revealing the gender of the players in a trio in treatment one and surnames in treatment two was to determine if gender composition and 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 3.1 shows the extensive form of the game where F_M, F_{PO} and F_C are the initial endowments for the manager, public official and citizen respectively. Z is the cost that the manager incurs in establishing a bribery relationship. The bribe amount B which benefits the manager by $2B$ and the public official by $2.5B$; in addition, the bribe reduces the citizen's payoff by B. The payoffs for the manager and the public official increase with the bribe amount but by different magnitudes. It is assumed that the public official benefits by a larger magnitude than the manager to reflect the general perception that public servants earn less than those in the private sector and thus have a higher marginal utility of income. The bribe amount is $B \in \left[\underline{B}, \overline{B}\right]$ where $\underline{B}$ and $\overline{B}$ are respectively the minimum and maximum bribe amount allowable in the game. It is assumed that the citizen can observe the actions of the manager and the public official and has the option of punishing them or not[14]. The punishment is valued at P where $P \in \left[\underline{P}, \overline{P}\right]$. $\underline{P}$ and $\overline{P}$ are respectively the minimum and maximum punishment amount allowable in the game. Following the marginal utility of income argument, the punishment P reduces the manager's payoff by $3P$ and the public official's payoff by $4P$. The punishment is at a cost to the citizen thus his payoff reduces by P. 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, public official and the citizen respectively[15].

Since by choosing to punish, the citizen incurs a cost equal to the punishment

[14]Punishment in this experimental design is meant to capture the intolerance of the general public on those involved in corruption. Since bribery in the design can only take place if the manager proposes a bribe and the public official accepts it, to fight corruption, the citizen would have to deal with both the supply and the demand side of bribery.

[15]Note that the experimental design assumes a bribe to be both welfare enhancing and reducing. It is welfare enhancing to both the manager and the public official and welfare reducing to the citizen. Punishment is welfare reducing to the trio.

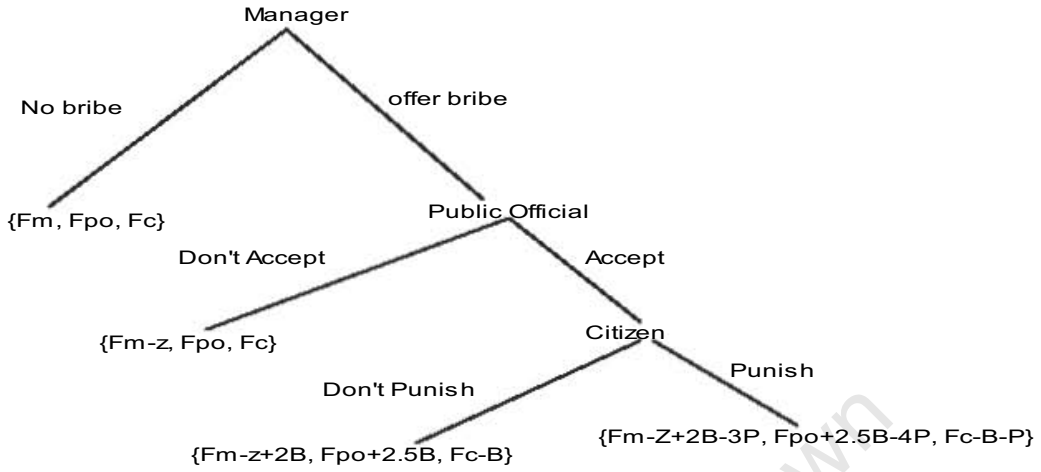

Figure 3.1: Extensive form of the game

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 $\overline{B}$ and the public official 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, $F_M - Z + 2\overline{B}$, $F_{PO} + 2.5\overline{B}$ and $F_C - \overline{B}$ for the manager, the public official and the citizen respectively. In this game, if the citizen chooses to punish, such a decision is motivated by his or her intolerance towards corruption supporting findings of the third party punishment games[16].

The initial endowment combinations, bribe and punishment amount limits are presented in Table 3.1. Note that the initial endowment combinations which were randomly assigned at the beginning of each session are different for each trio. The cost of establishing a bribery relationship (Z) was kept constant at 20 tokens.

[16]See for example Fehr and Gachter (2000) for third party punishment games. The idea behind third party punishment games in relation to the current game is that 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.

Following Alatas et al. (2009a), this thesis adopts minimum and maximum bribe and punishment amounts. The amounts were chosen carefully to ensure that no subject ended up with a zero or negative payoff.

3.3.1 Game Procedure

On the day of the experiment, the participants assembled in a large hall where the experimental procedure was explained[17]. Several illustrations especially on the payoff structure[18] were shown to be sure that people understood the experiment. After the explanation which was followed by a question and answer session[19], the participants were randomly assigned to three groups that would randomly play the three roles in the game. Each group was directed to a lecture room in which there was a research assistant and a computer. To ensure consistency, the same research assistants were used in all the centres. It was the responsibility of the research assistant to direct each subject to the computer one at a time and ensure that there was no interaction between a subject playing the game and those waiting for their turn. Note that the role that a subject played in the game was not predetermined but depended on how fast they logged into the system. A trio comprised of one individual from each of the three separate rooms. The first person in a trio to log in automatically assumed the role of the manager. The second and the third person assumed the public official and citizen roles respectively. A subject in one room played with two other anonymous subjects in the other lecture rooms.

At the beginning of a session, each subject was required to reveal their gender. The gender of the three players in each session was displayed on the three computers. Other than the subjects' gender, all other aspects of the trio remained anonymous. This was done to ensure that the strategic move that each player made was motivated only by the known gender composition of the trio. At the start of each session, the software administrator would at random assign an initial endowment combination for the trio. The move made by each was common knowledge

[17] See the instructions to the players in appendix A.

[18] See the payoffs for the three players in different scenario in Table A.1 in the appendix.

[19] The experiment did not commence until all questions were answered and everyone had understood the procedure. Once the experiment commenced, the process moved relatively smoothly an indication that the subjects had understood the procedure.

Table 3.1: Initial endowment, bribe and punishment amounts

Combination	Initial endowment (tokens)			Bribe amount		Punishment amount	
	Manager (Player 1)	Public official (Player 2)	Citizen (Player 3)	Min	Max	Min	Max
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

since each move was displayed on the screens of the other two computers[20].

Each session of the game ended with subjects filling in an electronic questionnaire. The questionnaire contained questions on demographic data of the subjects and their opinion on corruption in Kenya. After the submission of the questionnaire, each player was informed of their final payoff. After taking their turn to play the game, subjects were directed to a separate waiting room in order to rule out interactions with those who were waiting for their turns to play the game.

[20]Player one was informed that he could enhance his payoff by transferring some tokens from his initial endowment to player two. He was informed that upon player two's acceptance, he would benefit by twice the transfer amount and player two would benefit by two and a half times the transfer amount while player three's payoff would be reduced by the transfer amount. Player two who observed every move that player one made was informed that upon him accepting the transfer from player one, he would benefit by two and a half times the transfer amount while player three's payoff would be reduced by the transfer amount. Player one and two were informed that upon player two accepting a transfer, player three had the option of punishing both of them and that a punishment of P amount would reduce player one's payoff by three times while player two's payoff would be reduced by four times. Player three was able to observe the moves that player one and two made and was informed of the consequences that such moves would have on his payoff. Player three was informed that he had an option to punish both player one and two if player one had transferred and player two had accepted and the consequences that this punishment would have on each of the player's payoff.

3.3.2 Subject pool

A total of 516 students took part in the game. Their demographic characteristics are summarized in Table 3.2. One third of the sample were female. Many potential female participants made enquiries about the computer skills required in the game when they were contacted telephonically during recruitment and quite a number declined to take part in the experiment. This may perhaps be the reason for their low turnout. In term of ethnic groups, the sample is representative of the Kenya ethnic landscape with the kikuyus[21] comprising 38% of the sample. In term of religious affiliation, 71% of the sample were affiliated to the protestant movement while Muslims and other religious groups (this includes those affiliated to traditional religious groups and those who have no religious affiliation) make up 5% of the sample. For the purpose of analysis, the centres where the experiments took place were categorized into four groups, namely public universities, private universities, colleges and post graduate schools[22].

[21] As was mentioned in chapter 2, the kikuyu ethnic group in this analysis comprises of the Kikuyu, Meru and Embu ethnic groups.

[22] Students in both public and private universities are those enrolled in undergraduate programs. The main distinction between these students is that while private university students pay for their university education in full, those in public universities are partly sponsored by the government. Private universities in the sample have religious affiliations while the public universities are more liberal. The college category run diploma and certificate programs while post-graduate schools run Masters programs.

Table 3.2: Subject Pool

Category		All	Proportion
Gender	Male	347	0.672
	Female	169	0.328
Ethnic Group	Kikuyu	196	0.380
	Luo	58	0.112
	Luhya	64	0.124
	Kalenjin	75	0.145
	Kisii	27	0.052
	Kamba	59	0.114
	Others	37	0.072
Religious Group	Protestants	364	0.705
	Catholic	127	0.246
	Muslim	14	0.027
	Others	11	0.021
Centre	Gender		
Public Universities	Male	114	0.655
	Female	60	0.345
Private Universities	Male	90	0.588
	Female	63	0.412
Colleges	Male	68	0.756
	Female	22	0.244
Post-grad Schools	Male	45	0.652
	Female	24	0.348

3.4 Results

Result one: *There is no significant gender difference in the propensity to offer or accept bribe or to punish corrupt behavior*

Gender differences in the various aspects of the game are presented in Table 3.3. While men are more likely to offer a bribe than women, women are more likely to accept a bribe than men. Women are more likely to punish corruption culprits than men. These differences, however are insignificant.

Once the decision to offer a bribe was made, male managers offered significantly higher bribes that female managers, 61.39 tokens by male managers compared to 56.80 tokens by the female managers. The difference is significant (MW, z=2.06,

Table 3.3: Gender differences in proportion in various actions

		Proportion		Bribe & punishment amounts	
		Male	Female	Male	Female
Action in the game	Offer	0.8, (n=120)	0.77, (n=52)	61.38, (n=96)	56.80, (n=40)
		MW, z=0.45, p=0.65		MW, z=2.06, p=0.04	
	Accept	0.73, (n=92)	0.77, (n=44)		
		MW, z=0.55, p=0.58			
	Punish	0.67, (n=67)	0.71, (n=35)	47.96, (n=45)	49.00, (n=25)
		MW, z=-0.44, p=0.66		MW, z=-0.26, p=0.79	

Note: MW stands for Mann-Whitney score

p=0.04). Female citizens punished by slightly higher amounts than male citizens although the difference is not significant.

Thus, there does not seem to be any significant gender difference with regard to the various actions in the game. The differences only emerge when the gender combinations in the various trios are analyzed. In terms of manager-public official-citizen trios, the sample comprised 172 such trios. The gender composition and the proportion of the trios that offered and accepted a bribe and punished corrupt behavior is presented in Table 3.4. Note that the gender combination of each trio and the action taken by each subject in a trio was common knowledge to the subjects in the trio. The analysis of the trios presented in Table 3.4 forms the basis for the rest of the results in this section.

Table 3.4: Gender role in a trio

Role and gender of the subject			Number	Offer	Accept	Punish
Manager	Public official	Citizen	of trios	bribe	bribe	
Male	Male	Male	65	0.77	0.74	0.66
Male	Male	Female	25	0.72	0.67	0.75
Male	Female	Female	10	0.9	0.89	0.63
Male	Female	Male	20	0.95	0.79	0.80
Female	Female	Male	12	0.58	0.57	0.50
Female	Male	Male	14	1.00	0.71	0.60
Female	Male	Female	12	0.83	0.80	1.00
Female	Female	Female	14	0.64	0.78	0.43

Result two: *Bribes are more likely to be offered to members of the opposite*

sex

Table 3.5 compares the probability of bribe offering contingent on the gender relationship of the trio. A manager is more likely to offer a bribe to a public official of the opposite gender than to one who is the same gender as the manager, with the probability of a bribe being offered being 72% when the manager and the public official are of the same gender compared to 93% if they are of opposite gender. The difference is significant (MW, z=-3.08, p=0.002). These results hold for both male and female managers[23]. Moreover, this result holds irrespective of a citizen's gender relationship to the manager. For a manager-public official duo of the same gender, varying the gender of the citizen has insignificant impact on the possibility of a bribe (75% in a single-gender trio compared to 68% when the citizen is of opposite gender, MW, z=0.8, p=0.43).

Table 3.5: Probability that manager offers a bribe conditional on the gender composition of the trio

	Manager & public official are same gender	Manager & public official are opposite gender	Probability that bribe is offered contingent on manager-citizen duo's gender
Manager &citizen are same gender	0.75 (n=79)	0.91 (n=32)	0.79 (n=111)
Manager &citizen are opposite gender	0.68 (n=37)	0.83 (n=24)	0.79 (n=61)
Probability that bribe is offered contingent on manager-public official duo's gender	0.72 (n=116)	0.93 (n=56)	

The regression results in Table 3.6 confirm the likelihood of bribe offering to a public official of a different gender to the manager. Column (1) for example, shows a negative and significant impact on the probability of a bribe being offered if the manager and the public official are of the same gender. The negative relationship

[23]Further analysis reveals that a male manager is significantly more likely to offer a bribe to a female than a male public official (93% compared to 76%, MW, z=2.10,p=0.04). Likewise, a female manager is significantly more likely to offer a bribe to a male than a female public official (92% compared to 62%, MW, z=-2.61, p=0.04).

remains even when the gender relationship of the citizen is controlled for. For example, comparing the results in column (4) and (5) reveals that whether the citizen is of the same gender as a manager-public official duo does not alter the fact that bribes are less likely to be offered when the manager and public official are of the same gender.

Table 3.6: Probability of offering a bribe conditional on the gender composition of the trio

Variable	Full	Manager & public official are same gender	Full	Manager & citizen are same gender	Manager & citizen are opposite gender	Single-gender trio
	(1)	(2)	(3)	(4)	(5)	(6)
Endowment	0.003	-0.109	-0.012	-0.262	0.624	0.101
	(0.186)	(0.262)	(0.187)	(0.251)	(0.504)	(0.192)
Manager is male	0.085	0.091	0.082	0.170	-0.089	0.043
	(0.082)	(0.118)	(0.082)	(0.128)	(0.133)	(0.078)
Manager & public official are same gender	-0.210***		-0.272***	-0.201***	-0.280**	
	(0.055)		(0.084)	(0.068)	(0.123)	
Manager & citizen are same gender		0.071	-0.094			
		(0.099)	(0.129)			
Single-gender trio			0.140			-0.095
			(0.155)			(0.066)
Ethnic dummies	yes	yes	yes	yes	yes	yes
Religious dummies	yes	yes	yes	yes	yes	yes
Regional dummies	yes	yes	yes	yes	yes	yes
Observations	172	116	172	110	43	172

Coefficients are marginal effects. Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1. Note: The truncated regression restricting manager and public official to opposite gender needed several iterations to converge and is not included in the table

Result three: *The decision to offer a bribe is not significantly affected by the gender relationship to the citizen*

The probability of a manager offering a bribe in the presence of a citizen of the same gender is just as likely as when the citizen is of the opposite gender. The probability of a bribe in both cases being 79% as shown in Table 3.5. What makes the difference is the gender of the public official. For example, the probability of a bribe in a single-gender trio is significantly lower than when the manager is the same gender as the citizen but the public official is not (75% compared to 91%, MW, z=-1.87, p=0.06). Likewise, varying the gender relationship of the citizen to a single-gender manager-public official duo has an insignificant effect on the probability of bribe offering. The probability of bribe offering being 75% in a single-gender trio compared to 68% with a citizen of the opposite gender to the manager-citizen duo. The difference is not significant (MW, z=0.80, p=0.43). Column (2) of Table 3.6 shows a manager-citizen duo being of the same gender has insignificant effect on the probability of a bribe being offered. What emerges is that a manager is more likely to offer a bribe to a public official of the opposite gender when the manager and the citizen are of the same gender.

Result four: *Bribe amounts are not significantly related to the gender composition of a trio*

Table 3.7 presents a summary of the bribe amount conditional on the manager's gender relationship to the trio. Once a manager had made a decision to offer a bribe, his gender relationship with the trio had an insignificant effect on the bribe amount. A manager on average offered higher bribes to a public official of the same gender as the manager. Similarly, a manager offered higher bribes when faced with a citizen of the same gender. For example, when paired with a public official of the same gender, a manager on average offered 60.99 tokens compared to 58.50 tokens when paired with a public official of the opposite gender (MW, z=1.47, p=0.14). A manager on the other hand offered on average 60.68 tokens in the presence of a citizen of the same gender compared to 58.68 in the presence of a citizen of the opposite gender (MW, z=1.31, p=0.19). These differences are however insignificant. Thus, gender matters as to whether or not a bribe is offered, but not for how large a bribe is offered.

Table 3.7: Average bribe amount offered conditional on the gender composition of a trio

	Manager & public official are same gender	Manager & public official are opposite gender	Average bribe amount offered contingent on manager-citizen duo's gender
Manager &citizen are same gender	60.22 (n=59)	61.62 (n=29)	60.68 (n=88)
Manager &citizen are opposite gender	62.8 (n=25)	59.9 (n=23)	58.68 (n=48)
Average bribe amount offered contingent on manager-public official duo's gender	60.99 (n=84)	58.5 (n=52)	

Note: The comparisons in this table is based on non-zero bribe amounts

Result five: *Gender composition has no significant impact on the decision to accept or reject a bribe*

A public official's decision to accept or reject a bribe regardless of their gender was mainly opportunistic and not related to the gender relationships in the trio. Table 3.8 presents a summary of gender differences and their influence on the probability that a bribe was accepted. A public official is just as likely to accept a bribe from a manager of the same gender as from one of the opposite gender, with the probability of accepting from a manager of the same gender being 71% compared to 79% when the manager is of the opposite gender. The difference is insignificant (MW, z= 0.96, p=0.34).

A public official is also just as likely to accept a bribe in the presence of a citizen of the same gender as in the presence of one of the opposite gender, with the probability of accepting when paired with a citizen of the same gender being 76% compared to 72% when paired with one from the opposite gender. The difference is insignificant (MW, z=0.44, p=0.66).

As the regression results in Table 3.9 show, even when the gender relationship between the public official, the manager and the citizen is controlled for, gender composition remain insignificant in the decision to accept a bribe.

Instead, bribe amount turns out to be the main determinant of the probability

Table 3.8: Probability that public official accepts a bribe conditional on the gender composition of the trio

	Manager & public official are same gender	Manager & public official are opposite gender	Probability that bribe is accepted contingent on public official-citizen duo's gender
Public official & citizen are same gender	0.75	0.78	0.76 (n=82)
Public official &citizen are opposite gender	0.64	0.74	0.72 (n=54)
Probability that bribe is accepted contingent on Manager-public official duo's gender	0.71 (n=84)	0.79 (n=52)	

to accept or reject a bribe. At low bribe amount, a public official will reject a bribe up to a certain minimum amount after which the likelihood of acceptance rises with bribe amount. The opportunistic behavior of the public official is especially strong when the public official and the citizen are of the same gender as the results show in column (5). The turning point for the bribe amount is 59.14 tokens for the results in column (4) and 61.62 tokens for the results in column (5). These amounts are respectively 74% and 77% of the maximum bribe amount allowed in the game.

Table 3.9: Probability of accepting a bribe conditional on the gender relationship of the trio

Variable	Full	Manager & public official are same gender	Manager & public official are opposite gender	Full	Public official & citizen are same gender	Public official & citizen are opposite gender	Single-gender trio
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Endowment amount	9.213	0.024	68.22	9.455	23.58	8.911	8.099
	(10.43)	(0.458)	(64.08)	(10.60)	(29.55)	(28.93)	(9.396)
Endowment amount squared	-0.847	-0.001	-6.389	-0.869	-2.171	-0.822	-0.744
	(0.959)	(0.042)	(6.005)	(0.974)	(2.723)	(2.662)	(0.863)
Bribe amount	-7.465*	-0.626	-18.03	-7.797*	-9.025***	-35.150	-7.057
	(4.522)	(2.114)	(18.89)	(4.294)	(2.694)	(22.150)	(4.577)
Bribe amount squared	0.910	0.076	2.285	0.954*	1.095***	4.330	0.861
	(0.555)	(0.258)	(2.261)	(0.530)	(0.329)	(2.683)	(0.561)
Public official is male	-0.0165	-0.002	-0.038	-0.020	-0.075	0.019	-0.017
	(0.025)	(0.008)	(0.117)	(0.030)	(0.088)	(0.151)	(0.024)
Manager & public official are same gender	-0.005			-0.010	-0.044	-0.053	
	(0.025)			(0.040)	(0.084)	(0.166)	
Public official & citizen are same gender		0.008	0.024	0.030			
		(0.030)	(0.100)	(0.058)			
Single-gender trio				0.001			0.012
				(0.051)			(0.023)
Ethnic dummies	yes	yes	yes	yes	yes	yes	yes
Religious dummies	yes	yes	yes	yes	yes	yes	yes
Regional dummies	yes	yes	yes	yes	yes	yes	yes
Observations	131	77	43	131	72	49	131

Coefficients are marginal effects. Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Although the effects of the initial endowment on the probability of accepting or rejecting a bribe are insignificant, the three regressions in Table 3.9 show that a public official is likely to accept a bribe at low initial endowment up to a certain critical amount after which he or she declines.

Result six: *A citizen is significantly more likely to punish a public official of the opposite gender than one of the same gender*

While the gender of the manager does not seem to influence a citizen's decision to punish a corrupt behavior, a citizen is significantly less likely to punish in a situation where the public official is of the same gender as the citizen (62% compared to 79%, MW, z=1.85, p=0.06). This is especially the case if the manager and the citizen are of the same gender while the public official is not. The probability of punishment in a single-gender trio is 62.2% as compared to 87% where the manager and the citizen are of the same gender but the public official is not. The difference is significant (MW, z= 2.1, p=0.04). These results are presented in Table 3.10.

Table 3.10: Probability that a citizen punishes a corrupt act conditional on the gender composition of the trio

	Manager & citizen are same gender	Manager & citizen are opposite gender	Probability of punishment contingent on public official-citizen duo's gender
Public official &citizen are same gender	0.62 (n=45)	0.61 (n=18)	0.62 (n=63)
Public official &citizen are opposite gender	0.87 (n=23)	0.74 (n=16)	0.79 (n=39)
Probability of punishment contingent on manager -citizen duo's gender	0.71 (n=68)	0.65 (n=34)	

Disaggregating the decision to punish by the citizen's gender reveals that the distinction in punishment is mainly driven by the female citizen. As Table 3.11 shows, a female citizen is significantly less likely to punish a female public official. A female citizen punishes a female public official 53% of the time and a male public

official 85% of the time. The difference is significant (MW, z=-2.02, p=0.04). Further analysis shows that a female public official is significantly more likely to punish a male public official in a trio where the manager is also female. In a trio where the manager and citizen are female while the public official is male, the citizen always punishes compared to 43% of the time in an all-female trio. The difference is significant (MW, z=2.4, p=0.02).

Table 3.11: Probability that a female citizen punishes a corrupt act conditional on the gender composition of the trio

	Manager & citizen are same gender	Manager & citizen are opposite gender	Probability of punishment contingent public official-citizen duo's gender
Public official &citizen are same gender	0.43 (n=7)	0.63 (n=8)	0.53 (n=15)
Public official &citizen are opposite gender	1.00 (n=8)	0.79 (n=12)	0.85 (n=20)
Probability of punishment contingent on manager -citizen duo's gender	0.73 (n=15)	0.70 (n=20)	

As shown in Table 3.12, a male citizen does not distinguish between men and women when punishing corrupt behavior. When paired with a male manager, the probability of punishment is 69% compared to 57% when paired with a female manager. The difference is not significant (MW, z=0.89, p=0.37). When paired with a male public official, the probability of punishment is 65% compared to 74% when paired with a female citizen, the difference is not significant (MW, z=-0.71, p=0.48).

The results are further confirmed by the regression results in Table 3.13. Column (2) illustrates the fact that punishment is less likely if the public official is the same gender as the manager-citizen duo (single-gender trio). In other words, punishment is more likely if the manager and the citizen are the same gender but the public official is not. Columns (5) and (6) confirms this but the coefficients are insignificant. Column (7) also shows the low probability of punishment in a single-gender trio. Female citizens are especially unlikely to punish their fellow

Table 3.12: Probability that a male citizen punishes corruption conditional on the gender composition of the trio

	Manager & citizen are same gender	Manager & citizen are opposite gender	Probability of punishment contingent on public official-citizen duo's gender
Public official &citizen are same gender	0.66 (n=38)	0.60 (n=10)	0.65 (n=48)
Public official &citizen are opposite gender	0.80 (n=15)	0.69 (n=4)	0.74 (n=19)
Probability of punishment contingent on manager-citizen duo's gender	0.69 (n=53)	0.57 (n=14)	

female managers and public official.

Table 3.13: The probability that a citizen punishes conditional on the gender of the trio

Variable	Full	Manager & citizen are same gender	Manager & citizen are opposite gender	Full	Public official & citizen are same gender	Public official & citizen are opposite gender	Single-gender trio
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Endowment	-0.178	0.116	-1.343*	-0.164	-0.078	-0.508	-0.159
	(0.330)	(0.389)	(0.734)	(0.312)	(0.437)	(0.528)	(0.316)
Bribe	0.286**	0.387**	-0.687	0.246*	0.386**	-0.298	0.253*
	(0.143)	(0.175)	(0.689)	(0.134)	(0.196)	(0.332)	(0.136)
Citizen is male	-0.117	-0.220	-0.185	-0.106	0.082	-0.410**	-0.071
	(0.119)	(0.146)	(0.226)	(0.110)	(0.182)	(0.196)	(0.109)
Manager & citizen same gender	0.043			0.264	-0.167	0.261	
	(0.121)			(0.190)	(0.152)	(0.193)	
Public official & citizen are same gender		-0.288**	-0.303	0.020			
		(0.113)	(0.241)	(0.168)			
Single-gender trio				-0.329			-0.159
				(0.212)			(0.109)
Ethnic dummies	yes	yes	yes	yes	yes	yes	yes
Religous dummies	yes	yes	yes	yes	yes	yes	yes
Regional dummies	yes	yes	yes	yes	yes	yes	yes
Observations	101	60	34	101	62	35	101

Coefficients are marginal effects..Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Result seven: *The likelihood of punishment increases with the bribe amount*

Table 3.13 shows the positive impact of the bribe amount on the probability of punishment. Except in columns (3) and (5) that control for a single-gender manager-citizen duo and public official-citizen duo respectively, the bribe amount has a significant and positive impact on the probability of punishment. Column (3) shows the significant negative impact of initial endowment on the probability of punishment.

Result eight: *The punishment amount is independent of the gender relationship in a trio*

Once a citizen had made a decision to punish corrupt behavior, the punishment amount is not dependent on the citizen's gender relationship in the trio. Table 3.14 presents a comparison of the punishment amount contingent on the gender relationship of the citizen to both the manager and the public official. Paired with a manager of the same gender, a citizen on average punished by 49.23 tokens compared to 46.36 tokens when the manager was of the opposite gender, the difference is not significant (MW, z=1.42, p=0.16). When paired with a public official of the same gender, a citizen on average punished by 48.46 tokens compared to 48.16 when the public official was of the opposite gender, the difference is not significant (MW, z=0.27, p=0.79). So, citizens are more likely to punish a public official of the opposite gender, especially if the citizen and the manager are of the same gender but the punishment amounts are not significantly different.

Table 3.14: Punishment amount conditional on the gender relationship in the trio

	Manager & citizen are same gender	Manager & citizen are opposite gender	Average punishment amount contingent public official-citizen duo's gender
Public official &citizen are same gender	48.57 (n=28)	48.18 (n=11)	48.46 (n=39)
Public official &citizen are opposite gender	50.15 (n=20)	48.17 (n=11)	48.16 (n=31)
Average punishment amount contingent on manager-citizen duo's gender	49.23 (n=48)	46.36 (n=22)	

3.5 Discussion and Conclusion

The results in this chapter do not show a gender difference in the probability of offering or accepting a bribe or punishing corrupt behavior. These findings do not support the findings in previous research (see for example Rivas, 2008; Swamy et al., 2001; Dollar et al., 2001; World Bank, 2001) which showed women to be less corrupt than men. An individual's gender is not a significant predictor of behavior in a corruption scenario, but the difference has to do with the gender composition of those in the corruption chain.

A gender difference that is revealed in the current results is that male managers offer higher bribes than their female counterparts. This perhaps is not surprising if women are indeed more risk averse than men (Eckel and Grossman, 2002). If managers view the risk of punishment to be increasing in the size of the bribe, and if women are more risk averse than men, then it would explain why male managers offer higher bribes than their female counterparts.

The results show that bribes are more likely to be offered to members of the opposite gender especially in a trio where the manager is the same gender as the citizen. The citizen on the other hand is significantly more likely to punish a public official of the opposite gender than of the same gender especially if the public official accepts a bribe from a manager who is the same gender as the citizen.

These results seem to contrast one another. To the extent that a manager offers a bribe to a public official of the opposite gender because the manager expects the citizen of the same gender not to mete out punishment, they are mistaken. The manager could have anticipated punishment from a citizen of the same gender but at the same time expected a higher likelihood of bribe acceptance from a public official of the opposite gender precisely because they demonstrate a willingness to offer a bribe even though it will hurt a citizen of the same gender. Again, to the extent that this expectation affected behavior, this expectation is mistaken since the public official's decision to accept a bribe is purely opportunistic.

It is also possible that managers may have viewed the bribe as a gift and this may have particularly driven male managers to exhibit chivalry traits. Chivalry has been observed in dictator and ultimatum games (see for example Dufwenberg and Muren, 2002; Eckel and Grossman, 2001; Eagly and Crowley, 1986). If such norms exist, it is possible that a manager would expect a citizen of the same gender to also be aware of such norms, and thus expects the citizen to be less inclined to punish the manager for offering a bribe (gift) when this act simply accords with some generally accepted norm. This is purely speculative though since there is nothing in the game itself to suggest a bribe was a gift and nothing in the post-game questionnaire analysis to suggest that this affected the behavior of managers in the game.

Punishment is less likely in single-gender trios than in mixed gender trios. A citizen is willing to invest in punishment in trios whose members he or she considers to be outsiders but is unwilling to do so if he or she considers the beneficiaries of the corrupt act to be insiders. The insider-ousider bias in punishment is especially pronounced among female citizens. This accords with several studies in social psychology that show that individuals act to favour their in-group over those they perceive to be members of the out-group (see for example Tajfel, 1982; Turner et al., 1979). Experimental economists have also found subjects to favour insiders in allocations over those they consider to be outsiders (see for example van der Merwe,W and Burns,J., 2008; Burns, 2004b; Fershtman and Gneezy, 2001). While this chapter has examined the impact of gender composition on corruption, the next chapter investigates the impact of ethnic heterogeneity on corruption.

Chapter 4

Ethnic heterogeneity and corruption

".....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"[1].

4.1 Introduction

There is a general perception that ethnic heterogeneity contributes to corruption (see Lederman et al., 2005; LaPorta et al., 1998; Shleifer and 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 and 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

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

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.

While some of the literature argues that ethnic diversity causes civil disturbances and sometimes war, Collier and Hoeffler (2000) find 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 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 4.1. Kenya's ethnic composition puts the country's Ethno linguistic Fractionalization Factor (ELF)[2] at 0.86 which is

[2]ELF is computed as:

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

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 and 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 4.1: 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)

Given Kenya's ethnic heterogeneity and the fact that Kenya ranks as one of the most corrupt countries in the world, questions 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 ethnicity[3] of the people who are co-participants in the corruption. This chapter accomplishes this

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 heterogenous). 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.

[3]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 used as a basis for ingroup-outgroup categorization and thus a basis for discriminating against outgroups.

by designing a corruption experiment in which subjects' surnames[4] 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 driven 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 4.2 presents the negative effects of ethnic heterogeneity and socioeconomic outcomes, section 4.3 discusses the experimental design, section 4.4 presents the results while section 4.5 discusses the results and concludes.

4.2 Ethnic heterogeneity and socioeconomic outcomes

While many researchers agree on the adverse effects of ethnic heterogeneity on socioeconomic outcomes, the literature on the channels through which the effects operate is not well developed. One of the suggested explanations for adverse effects is the cost that ethnic heterogeneity imposes on shared common policies arising from individual preferences so that the average utility of the policies decreases with heterogeneity (Alesina and LaFerrara, 2004).

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

Ethnic diversity complicates governance especially in the absence of democracy (see for example Kimenyi, 2006; Collier, 2000; Collier and Gunning, 1999; Collier and Hoeffler, 1998; Collier and Hoeffler, 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 rate 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 ethnically homogenous to one that is completely heterogenous 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 result in the 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 heterogenous 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 com-

plete heterogenous 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 ingroup 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 capital[5] that is helpful in overcoming costly market failure (Leigh, 2006). At the same time, trust has been found to be associated with less corruption (LaPorta et al., 1998). According to the World Value Survey (WVS) measurements, countries with 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). Mauro (1995), using cross country data, found

[5]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)

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 4.2 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 4.2: Comparing corruption and ethnic heterogeneity levels among selected African countries

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	DRCongo	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). ELF ranges from 0 (most homogenous) and 1 (most heterogenous). CPI is Transparency International's 2009 corruption perception index. CPI ranges between 0 (most corrupt) and 10 (least corrupt).

More recently, experimental economists have also began to focus on the impact of ethnicity on social interactions. van der Merwe,W and Burns,J. (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 blacks 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 Gneezy (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 to Eastern Jews partners, especially from Ashkenazic subjects.

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 Eckel and Wilson, 2003; Glaeser et al., 2000). Eckel and Wilson (2003), for example found people's trusting behavior to be conditional on the decision context, including the characteristics of the partner. Glaeser et al. (2000) on the other hand, found both trust and trustworthiness to rise when individuals are closer socially and trustworthiness to decline when partners are of different races or nationality. In studying the effect of ethnic diversity on public good and trust games (see Habyarimana et al., 2007a; Habyarimana et al., 2007b) use interactive computer interface of partners so as to reveal ethnic identities of the subjects. They found co-ethnics to be more trusting and cooperative than non-coethnics. The trusting and cooperative behavior among co-ethnics is attributed to the norm of reciprocity which is strong within-groups.

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 Lambsdorff, 2008; Alatas et al., 2009a) on the one hand and cultural differences on the other (see Cameron et al., 2009; Barr and Serra, 2009).

This chapter adopts the use of surnames to provides cues on the ethnic composition of individuals in a corruption chain. This chapter 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.

4.3 Experimental design and subject pool

The experimental design procedure used for this chapter, including the payoff structure, is the same as the one used in chapter 3, with the exception that subjects revealed their surnames instead of their gender. 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 anonymous[6].

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 4.3. 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 besides, other ethnic groups view the three as one.

The sample comprised 166 manager-public official-citizen trios, ranging from an ethnically homogenous trio to a heterogenous 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 heterogenous than other combinations. Table 4.4 provides a summary of the ethnic composition[7] 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.

[6] See the instructions to the players in appendix B.

[7] 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.

Table 4.3: Demographic characteristics of the sample

Aspect	Category	Role played in the game			Total	Proportion of sample
		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

Table 4.4: Ethnic relationship of the subjects in the trios

Ethnic Combination	Ethnic relationship of the trio			Number of trios
	Manager	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

4.4 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 4.5 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 (MW z=1.2, p=0.23). This result is also confirmed in the regression result presented in column (1) of Table 4.6.

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 (93% compared to 86% with MW=0.67, p=0.51). These results can be seen in column (2) of Table 4.6. 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 the manager and citizen are co-ethnic or not*

A manager is less likely to offer a bribe when the citizen is 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 by the regression results in columns (3 to 5) of Table 4.6. 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.

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

Bribe offering in a homogenous trio is slightly high than in a heterogenous one, with the probability of bribe being offered being 93% in a homogenous trio compared to 92% in a completely heterogenous trio. The difference is however insignificant (MW, z= 0.1, p=0.92). Column (7) of Table 4.6 includes both co-ethnic

Table 4.5: 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=98)	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)	

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 4.6: Probit results on the probability to offer a bribe

Variable	All	Manager & public official are co-ethnic	Manager & public official are non-coethnic	All	Manager & citizen are co-ethnic	Manager & citizen are non-coethnic	All
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Initial endowment	0.178	0.144	0.293	0.223	0.699	0.135	0.202
	(0.179)	(0.442)	(0.214)	(0.178)	(0.48)	(0.181)	(0.172)
Manager is male	0.035	0.001	0.049	0.032	0.374*	-0.015	0.052
	(0.067)	(0.178)	(0.079)	(0.066)	(0.209)	(0.065)	(0.066)
Manager & public	0.089			0.006	0.391**	0.031	
official are co-ethnic	(0.061)			(0.085)	(0.122)	(0.072)	
Manager & citizen		0.038	-0.314***	-0.267**			
are co-ethnic		(0.153)	(0.114)	(0.104)			
Co-ethnic trio				0.169***			0.134***
				(0.047)			(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 4.4 incorporated in column (2), C, D & E in column (3), A & C 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 4.7 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 4.7: 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=84)	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 heterogenous 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 offered[8].

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

Table 4.8 presents a summary statistic of the probability of bribe acceptance conditional on the public official's relationship to the trio while Table 4.9 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)[9].

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)[10].

A public official is more likely to accept a bribe in a co-ethnic trio than in a non-coethnic one, with a the probability of bribe acceptance being 67% in a co-ethnic trio compared to 60% in a non-coethnic trio. The difference is however

[8] These results are confirmed in regression analysis not reported here.

[9] 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 4.9 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.

[10] 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 4.9, 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.

Table 4.8: 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=20)	0.69 (n=32)
public official & citizen are non-coethnic	0.57 (n=21)	0.60 (n=83)	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)	

insignificant (MW, z=0.45, p=0.65). Column (7) of Table 4.9, shows that both co-ethnic and non-coethnic trios contribute negatively to the probability of bribe acceptance although both coefficients are insignificant.

Table 4.9: Probit results on the probability to accept a bribe

Variable	All	Manager and public official are co-ethnic	Manager and public official are non-coethnic	All	Public official and citizen are co-ethnic	Public official and citizen are non-coethnic	All
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Initial endowment	-0.86***	-1.35*	-0.734**	-0.872***	-1.421*	-0.801**	-0.84***
	(0.291)	(0.724)	(0.332)	(0.291)	(0.828)	(0.328)	(0.298)
Bribe amount	-0.345	-0.716	-0.321	-0.35	-1.01	-0.321	-0.32
	(0.261)	(0.736)	(0.296)	(0.262)	(1.03)	(0.292)	(0.262)
Public official is male	0.073	0.156	0.018	0.07	0.032	0.077	0.062
	(0.094)	(0.226)	(0.106)	(0.096)	(0.281)	(0.107)	(0.095)
Manager & public official are co-ethnic	-0.076			-0.086	-0.074	-0.77	
	(0.104)			(0.126)	(0.241)	(0.128)	
Public official & citizen are co-ethnic		0.023	0.095	0.084			
		(0.223)	(0.128)	(0.134)			
Co-ethnic trio				-0.023			-0.076
				(0.24)			(0.178)
Non-coethnic trio							-0.101
							(0.09)
Religious dummies	yes	yes	yes	yes	yes	yes	yes
Regional dummies	yes	yes	yes	yes	yes	yes	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 4.4 incorporated in column (2), 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 4.9 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, although the coefficient for bribe amount are insignificant.

As was shown in chapter 3, 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 any 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 4.10 and 4.11.

Table 4.10: 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=50)	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 4.11. 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 4.11 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 accepting 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). However, once the initial endowment and bribe amounts are controlled for in the regression results in column (4) of Table 4.11, it becomes clear that a citizen is significantly 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 heterogenous 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 heterogenous in column (6), of Table 4.11, a completely heterogenous trio contributes positively to the probability of punishment while a completely homogenous trio's contribution is negative. The coefficients are however insignificant

Table 4.11: Probit results on the probability of punishment

Variable	All	Manager and citizen are co-ethnic	Manager and citizen are non-coethnic	All	Public official and citizen are non-coethnic	All
	(1)	(2)	(3)	(4)	(5)	(6)
Initial endowment	-0.487	-0.834	-0.539	-0.554*	-0.59*	-0.547*
	(0.316)	(0.735)	(0.374)	(0.326)	(0.361)	(0.329)
Bribe amount	-0.107	-0.64	-0.277	-0.107	0.16	-0.125
	(0.332)	(0.719)	(0.403)	(0.334)	(0.379)	(0.334)
Citizen is male	-0.152	-0.629**	-0.027	-0.169	-0.201	-0.156
	(0.107)	(0.129)	(0.131)	(0.106)	(0.122)	(0.107)
Manager & citizen	-0.111			0.001	0.016	
are co-ethnic	(0.121)			(0.141)	(0.15)	
Public official & citizen		-0.544	0.162	0.182		
are co-ethnic		(0.324)	(0.141)	(0.147)		
Co-ethnic trio				-0.444*		-0.249
				(0.254)		(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 4.4 incorporated in column (2), B, D & E in column (3), B, C & E in column (5)

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

Table 4.12 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 4.12: 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=32)	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 4.13 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 4.14 presents the regression results of the tobit, probit and OLS (non-zero punishment amounts) models. The results show the negative impact of initial endowment on the probability of punishment (column 2). Punishment amounts in the OLS regression reveals the significant impact of the bribe amount on the punishment amount that is, for those citizens who decide to punish, the amount spent on punishment is increasing in the size of the bribe. Both the probit and tobit results in columns (2) and (4) respectively show less likelihood of punishment and a significantly lower punishment amount in a ethnically homogenous trio.

Table 4.13: Tobit results on the determinants of punishment amount

Variable	All	Manager and citizen are co-ethnic	Manager and citizen are non-coethnic	All	Public official and citizen are co-ethnic	Public official and citizen are non-coethnic	All
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Initial endowment	-0.168*	-0.009	-0.189*	-0.176*	-0.066	0.20*	-0.181*
	(0.099)	(0.224)	(0.113)	(0.099)	(0.164)	(0.11)	(0.1)
Bribe amount	0.167	0.225	0.083	0.151	-0.67	0.49	0.123
	(0.374)	(0.617)	0.442	(0.373)	(0.60)	(0.43)	(0.375)
Citizen is male	-10.0	-34.37**	-3.28	-11.23	16.08	-12.55	-9.88
	(8.146)	(15.24)	(9.49)	(8.11)	(13.91)	(9.26)	(8.07)
Manager & citizen	-11.397			-3.40	-5.20	-5.27	
are co-ethnic	(10.55)			(9.93)	(11.43)	(10.36)	
Public official &		-11.59	8.58	9.99			
citizen are co-ethnic		(18.12)	(10.97)	(11.08)			
Co-ethnic trio				-29.52			-21.06*
				(19.31)			(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 4.4 incorporated in column (2), B, D & E in column (3), A & D in column (5) and B,C, & E in column (6)

Table 4.14: Tobit results on the determinants of punishment amount

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

4.5 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 ingroup 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 heterogenous 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 heterogenous 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 cooperation between co-ethnics required to facilitate corrupt transactions.

Chapter 5

The role of *harambee* contributions in corruption

"But you must know that Kenyatta alone cannot give you everything. All things we must do together to develop our country, to get education for our children, to have doctors, to build roads, to improve or provide all day-to-day essentials. I give you the call: Harambee!" (Jomo Kenyatta, 1963)[1]

5.1 Introduction

Harambee (Swahili word for "let us all pull together") is a self-help initiative in Kenya that is used to bring people together to contribute towards the provision of communal goods. So important has been the initiative that over the period 1980-1984, 12% of all national capital formation was through harambee (Ngau, 1987) while by the end of 1980s, about 50% of all secondary schools were built through the initiative (Transparency International, 2003). With time, politicians found *harambee* to provide an appropriate avenue to sell their candidature to the electorates. *Harambee* contributions began to be seen as a ticket for politicians to buy their way into public offices only for them to compensate themselves by

[1]Kenyatta (1964)p. 8. This remark was made by Kenya's first president, Jomo Kenyatta in his first address to the nation in 1963 after independence. Kenyatta is credited to have popularised the harambee intiative in the country.

engaging in corruption once elected to public office (Waiguru, 2002). Because of its alleged link to corruption, the Public Officer Ethics Act (POAE) of 2003, outlawed the personal involvement of public officers in organizing *harambees* (Chweya, 2005). This chapter makes a contribution by using experimental games to investigate the alleged link between *harambee* and corruption by examining whether individuals compensate their public good contributions (akin to *harambee* contributions) by their level of extraction from a common pool resource ex-post[2].

The original spirit of *Harambee* was that individuals would voluntarily contribute their resources in form of cash, although labour and other materials were also welcome towards the provision of a communal good (Ngau, 1987). Several factors have been cited as contributing factors to the success of *harambee* which include the local nature of the goods financed through *harambee* where each donor sees their direct benefit from the good (Wilson, 1992). Secondly, the projects funded through *harambee* are mainly in the rural areas which is characterized by a stable population who are closely-knit together (Barkan and Holmquist, 1986). In a stable population, those who contribute towards a project can see their long-term benefits from the project.

With time, *harambee* became a way of life in Kenya (Ng'ethe, 1979) and a traditional custom of Kenyans (Government of Kenya, 1997). The gains made in Kenya through *harambee* cannot be overstated. Through the *harambee* initiatives, dispensaries, churches and especially schools have been built (Chieni, 1998).

Towards the end of the 1980s, *harambee* had transformed itself into a lubricant of political corruption as *harambee* contributions became a measuring rod of the performance and suitability of political candidates especially towards a general election (Kibwana et al., 1996). From voluntary contributions, *harambee* contributions effectively became mandatory mainly enforced by the provincial administration, where public servants such as chiefs would decline rendering a service to a common citizen until they made a contribution towards a *harambee*. The

[2]It is acknowledged in this thesis that politicians view *harambee* contributions as a means to gain power in which case the contributions can be viewed as bribes in vote buying. Within the experimental design in this thesis, it is also acknowledged that not every politician contributes to *harambee* so as to engage in corruption ex-post. The experimental design is therefore a special case that seeks to determine if ones *harambee* contributions have an impact on ones extraction from a common pool resource.

harambee contributions were not just enforced on the citizens but they almost became a prerequisite for businessmen getting government contracts especially if the *harambee* was presided over by politicians (Chweya, 2005). Professionalism in execution of government contracts was in turn replaced by the level of generosity of businessmen's *harambee* contributions (Kibwana et al., 1996). At the provincial administration level, in a number of cases government service would only be rendered at the exchange of *harambee* contributions (Transparency International, 2003). Without proper accountability of the funds raised in *harambees*, those charged with the responsibility of overseeing the utilization of the funds began to misappropriate the funds and as a consequence, many Kenyans came to view *harambee* as a source of bribery and extortion (Kibwana et al., 2001). In politics, *harambees* had become an auction where poor voters sell political offices to the highest bidder, and politicians buy occupancy of local councils, parliament and even presidency (Transparency International, 2003). While the poor in Kenya view *harambee* as a means of uplifting their conditions, to the politicians it is an avenue of selling themselves to the public. In a sense, *harambee* has led to the commercialization of leadership and power, making it impossible for less endowed people to compete with the rich for leadership positions. Towards the end of 1990s, politicians from the opposition were already calling for the banning of *harambees* because of its alleged link to corruption.

Even though *harambees* have been linked to corruption, there has not been any empirical work to establish the relationship between the two. It is this gap that this chapter seeks to fill by exploring the role of harambee in corruption using experimental methodology. Previous work on public good games in Kenya is scant. A widely cited study on the effects of social norms on contributions to a public good game is Henrich et al. (2001). Using subjects from 15 small-scale societies to run ultimatum, dictator and public good game, the study found the Orma community from Kenya to double their contributions in the public good game once they understood the game to be a *harambee* one. This finding shows the entrenchment of the harambee spirit in the minds of Kenyans.

Using a set up similar to the one by Sell and Yeongi (1997) and Fehr and Leibbrandt (2008), this chapter uses a two-stage experiment consisting of a one-shot public good game in the first stage and a one-shot common pool resource

game in the next. Sell and Yeongi's paper sought to determine if public goods and common pool resources generate equivalent levels of cooperation when payoffs are the same. The interest was driven by the social dilemmas presented by public goods and common pool resources. The dilemmas are generated by different decisions that individuals have to make. In a public good game, the dilemma arises from the fact that a player is asked to give up some of his resources in order to create a common resource to be shared by all. On the other hand, in a common-pool resource game, a player is asked to restrain from extracting from a resource he has a stake in jointly with others in his group. Sell and Yeongi (1997) found more cooperation in common pool resource extraction than in public good contributions, which they attributed to loss aversion and endowment effects[3].

Fehr and Leibbrandt (2008) used a similar procedure by combining a public good game and a common pool resource field experiment. They sought to examine the role of other-regarding and time preference for cooperation among fishermen in Brazil. They conducted a public good experiment followed by a field experiment to examine the mesh sizes of the fishnets used by fishermen. They found fishermen who were more cooperative in the public good experiment used nets with bigger mesh sizes thus exploiting the fishing ground less and imposing fewer future negative externalities on others and themselves.

This chapter presents evidence of an inverse and significant relationship between individual levels of public good contributions and the level of common pool resource extractions. To the extent that public good contributions approximates *harambee* contributions, this chapter does not find support for the allegations that individuals compensate their *harambee* contributions by overextraction ex-post. Instead, this chapter finds cooperators in *harambee* to be other-regarding in common pool resource extractions. Consistent with the endowment effect and loss aversion, the results show more cooperation in subjects' restraint from taking from a common pool resource than in public good contribution. This accords with

[3]In the case of public good provision, a member of a group is required to give up some of their endowment to acquire a public good to be shared by all members of the group. Both loss aversion and endowment effect work against cooperation in public good provision. In the sustenance of a common pool resource, a member is asked to restrain from extracting from an endowment that he owns jointly with the other members of his group. Both loss aversion and endowment effect work to maintain cooperation in the sustenance of a common pool resource.

the findings by Sell and Yeongi (1997).

The findings also support the important role that socioeconomic factors play in the management of common resources. In line with the vast literature that shows the adverse effects of heterogeneity on common resource management, this chapter finds both ethnic and gender heterogeneity within groups to have significant negative effects on common resource provision and maintenance.

Following this introduction, the rest of the chapter is organized as follows: section 5.2 presents the social dilemma arising from common resources, section 5.3 presents the experimental design, section 5.4 reports the results while section 5.5 offers some discussions and concludes.

5.2 Social dilemma arising from common resources

Non-excludability makes public goods and common pool resources prone to the problem of free-riding and overexploitation respectively. The difference between public goods and common pool resources lies in their level of subtractability (Camerer, 2003). While public goods are considered low in subtractability and one person's use does not appreciably limit the use by the other, a common pool resource, is high in subtractability in that one person's use limits another's.

Taylor and Ward (1982) highlight several conditions under which a public good game will take the form of a prisoner's dilemma. Among these conditions is if each player does best for himself by free riding while the others contribute[4]. Without compulsory contributions, harambee fits perfectly into a prisoner's dilemma case. If a single harambee initiative is able to raise the funds required for a particular public good, this then would be like an n-player one-shot public good game. Some studies such as Marwell and Ames (1981) and Gintis (2000) found that in a one-shot public good game, most subjects contribute half of their initial endowment towards the public good and therefore shows that not everyone behaves purely selfishly in a one-shot public good game.

Free riding becomes evident with repeated public good games with the level of contributions decaying as the game progresses. The decay in contributions has

[4]Other conditions are (a) if no player can profitably provide any of the good by himself and (b) if all players contribute, each player's welfare is improved.

been attributed to learning and strategies hypotheses (Andreoni, 1988). Utilizing games where individuals were matched as partners in some groups and strangers in others, Andreoni (1988) found both hypotheses to be insufficient in explaining the decay in contributions, and argues that the decay is rather brought about by a group's attempt to establish a social norm of punishing free-riders. Further explanation of the decay in public good contributions is "regret theory" (Loomis and Sugden, 1982). The theory posits that if a subject in one round of play discovers that he did better by free riding, he becomes "elated" and is likely to free ride more in the next round. On the other hand if a subject discovers that he did worse in one round (contributed more than other group members), he has "regret" and will cut down his contributions in consequent rounds. The combined effects of the formerly "elated" and "regret" subject is a decay in contributions as the game progresses.

A common pool resource consists of a natural or humanly created resource which is large enough to make it costly to exclude potential beneficiaries (Carpenter, 1998). The common pool resource dilemma was first identified by Gordon (1954) in the fisheries sector. The difficulty of exclusion and the high subtractibility of a common pool resource leads to the common pool resource dilemma that Hardin terms as "the tragedy of the commons" (Hardin, 1968). The unsustainability of common pool resource stems from the conflict between individual and collective interests. Cooperation in common pool resource is measured by an individual's measure of restraint in extraction from the common pool resource. Ostrom et al. (1992) show that communication among group members immediately following a session of interaction can be an effective tool in boosting cooperation. They specifically found the net yield from a common pool resource to rise to an average of 74% of the maximum yield directly after allowing communication. However, even with communication, net yield declines to an average of 55% as the game progresses over subsequent rounds. Sell and Yeongi (1997) using a one-shot public good and common pool resource game and a simple payoff structure found cooperation in the common pool resource extraction to be 62.8% on average compared to 49.6% in the public good game.

Just as with a public good, the social dilemma arises because an individual's payoff is higher when they defect than when they cooperate. Yet all users of

the common pool resource get lower payoffs if all defect than if they cooperate (Dawes, 1980). The dominant strategy in a common pool resource game is for a subject to extract more than their fair share of the resource. Laboratory experiments show voluntary cooperation among subjects in order to sustain common pool resources or public goods (see Camerer, 2003; Croson, 2008; Fehr and Gachter, 2000; Ledyard, 1995) especially if other subjects cooperate (see Fischbacher et al., 2001; Frey and Meier, 2004; Shang and Croson, 2008). In contributing to a public good and maintaining a common pool resource, some studies have shown that subjects care about the welfare of others (other-regarding preferences) (see Andreoni, 1988; Bolton and Ockensfels, 2000; Charnes and Rabin, 2002; Dufwenberg and Kirchsteiger, 2004; Falk and Fischbacher, 2006).

5.2.1 Socioeconomic factors and common resources

Heterogeneity, whether in the form of ethnicity, gender or income, has been shown to affect cooperative behavior. Individuals are likely to cooperate more when there is a sense of group identity, which is stronger in more homogenous groups where members develop a group identity based on what they are, do or have (Kramer and Brewer, 1984). Cardenas (2003) shows that participants' wealth and inequality within a community reduces cooperation in the usage of a common resource when groups were allowed to have face-to-face communication between rounds. LaFerrara (1998) found a similar relationship between a community's income inequality and the degree of participation in groups which provide economic benefits or informal insurance to their members in Tanzania.

Ethnic heterogeneity has also been shown to impact on public good provision. Banerjee et al. (2005) shows that more caste or religious fractionalization across Indian states is associated with lower levels of public good provision. Across communities in Northern Pakistan, Khwaja (2000) found that infrastructure is better maintained where there is less heterogeneity in terms of clan, religion and political division. Using school records in western Kenya, Miguel and Gugerty (2004) try to determine if ethnicity enforces social sanctions, and find that where a greater percentage of parents of a particular school are drawn from the same ethnic group, such schools tend to be better funded than where parents are drawn

from diverse ethnic groups. These results are similar to Goldin and Katz (1997) who finds that public secondary schooling expanded slowly in ethnically diverse U.S. school districts from 1910 to 1940. For U.S. school funding, similar results were found by Alesina et al. (1999) and Poterba (1997).

The reason for better funding of a school where parents are ethnically homogenous, as Miguel and Gugerty (2004) argue, is that such parents are better able to impose social sanctions so as to minimize free-riding. This result is supported by Besley et al. (1993) and Habyarimana et al. (2007a). Habyarimana et al. (2007a) for example, using experimental games among subjects drawn from slums in the neighborhood of Kampala, identify three mechanisms that link ethnic heterogeneity to public good underprovision namely "preferences", "technology" and "strategy selection". Successful public good provision in a homogeneous ethnic community is attributed to a strategy selection mechanism in which co-ethnics play cooperative equilibria whereas non-coethnics do not. Besley et al. (1993) find no evidence for a prominent preference mechanism that emphasizes the commonality of tastes within ethnic groups. This is in contrast to the finding by Bates (1973) who finds ethnic groups that are geographically concentrated may have divergent interests over outcomes that have a geographical component, especially the location of public investments. Co-ethnics are willing to bear the cost of providing a public good if they believe that most of the beneficiaries will be co-ethnic, and this may account for the high rate of provision for public goods in a homogeneous community (see for example Vigdor, 2004; Poterba, 1997).

While there is consensus about the negative effects of ethnic heterogeneity on public good provision, the evidence on gender is far more mixed. Women have been found to be more cooperative in contributing towards public goods than men (see for example Kleiman and Rubinstein, 1996; Seguino and Lutz, 1996; Nowell and Tinkler, 1994). This finding is attributed to the difference in how men and women perceive moral problems. While women perceive the moral problem as being about care and relationships, men think about morality in terms of rights and rules (Gilligan, 1982). Other researchers have, however, found women to contribute significantly less than men towards public good provision (see for example Brown-Kruse and Hummels, 1993; Sell and Wilson, 1991; Rapoport and Chammah, 1965). Cadsby and Maynes (1998) using the same experimental design as Brown-Kruse

and Hummels (1993) do not find significant difference between men and women's contribution towards public good. Both Cadsby and Maynes (1998) and Nowell and Tinkler (1994), however, found higher cooperation in an all-female group which they attributed to the tendency of females to behave more like each other.

These studies differ in their experimental design in several respects such as whether they are repeated or one-shot games, the freedom given to the subjects regarding the amount to contribute, with some allowing subjects to contribute any amount while others required subjects to contribute all or nothing, the ability of the subjects to monitor the actions of the other group members, and finally the level of interaction allowed between subjects. The differences in experimental design, to a large extent might account for the differences in the findings.

Just like the effects of gender and gender composition on common resources are varied, so is the effect of group size. Kollock (1998) and Poteete and Ostrom (2004) for example show that group size can have adverse effects on common resource management coming through its effect on group trust. As group size increases, so does the degree of divergence in interest, thus eroding the opportunities for frequent interactions to build reputation. This in turn erodes cooperative behavior. There is, however, no consensus that group size increases free riding, Bonacich et al. (1976) using an N-person prisoner's dilemma tasks reported mixed results on the effect of group size and cooperation[5].

Isaac and Walker (1988) clarify that it is not the pure "number effect" that leads to free riding. Rather it is the decline in marginal per capita return (MPCR) as the group size grows. When MPCR to investment in a public good is adjusted to compensate for the increase in group size, the conventional hypothesis that free riding is exacerbated in large groups is not supported (Isaac and Walker, 1988). It is only when MPCR declines with group size that the conventional hypothesis is supported. The effects of group size on common resources is also dependent on the marginal cost of individual contributions. If the marginal cost is sufficiently high, the probability of success increases with group size in which case larger groups achieve higher levels of collective provision than smaller ones (Esteban and Ray, 2001).

[5]Similarly, Gaube (2001) and Lipford (1995) show that contributions by church members does not decline with an increase with membership.

5.3 Experimental design

The experimental design used in this chapter attempts to mimic the allegations that *harambee* contributors compensate their contributions to *harambee* by engaging in corruption ex-post[6]. The two-stage experiment consist of a public good game played first followed by common pool resource game[7]. The games were played in groups of 10 randomly assigned subjects. The set up, as pointed out earlier, is adopted from Sell and Yeongi (1997)[8], whose objective was to determine if levels of cooperation are similar in respect of public goods and common pool resources. The motivation for adopting Sell and Yeongi's model is its simplicity and the fact that it uses similar payoff functions in both the public good and common pool resource games. The public good game set up fits into what is generally referred to as a simple linear public good game adopted from Isaac and Walker (1988)[9]. For the common pool resource game, Ostrom et al. (1992) use a more complicated

[6]It is acknowledged in this design that politicians view *harambee* contributions as a means to gain power in which case the contributions can be viewed as bribes in vote buying. Within this design, it is also acknowledged that not every politician contributes to *harambee* so as to engage in corruption ex-post. The design in this chapter is therefore a special case that seeks to determine if ones *harambee* contributions have an impact on ones extraction from a common pool resource.

[7]It would have been informative if the games could have been played in reverse order as well to provide clarity on the direction of causality. This was not possible mainly because of two reasons. First is the objective of the chapter is to investigate if individuals compensate their public good contributions by their extractions from the common pool resource. Secondly, is the budgetary constraint.

[8]Sell and Yeongi's experiment consisted of groups of four. In the public good game each member was endowed with 25 tokens which he could invest in either a private account earning one cent per token or a group account earning three cents. The group earning would then be shared equally among the group members regardless of individual member's investment. In the common pool resource game, each individual was given a chance to withdraw from a group account to invest in a private account. The earnings in the private account was one cent and whatever remained in the group account earned three cents per token which would be shared equally among the group members irrespective of what an individual had withdrawn from the group account to invest in the private account. Both the public and common pool resource had similar payoff function with MPCR equal to 0.75.

[9]The payoff for the i^{th} player in group j in Isaac and Walker's set up is determined as:

$$p_{ij} = W_i - x_i + (1/n)G(x_i + \Sigma x_j) \tag{5.1}$$

Where W_i is the initial endowment for player i, x_i is his contribution to public good, n is the group size, G is the pool's growth factor and Σx_j is the sum of the other players contribution to public good.

payoff function where the yield from the common pool resource reaches a maximum when individuals invest some but not all of their endowment in the common pool resource[10].

The two stages of the experiment are explained below.

Stage one: The public good game

The public good game began with each member of a group getting an initial endowment W (100 tokens). From their endowment, each member was given a chance to privately and anonymously make a contribution $X_i \in [0, 100]$ to their group kitty which grew at rate h where $1 < h < n$. At the end of the game, the common kitty was shared equally among the group members regardless of one's contribution. Under these general rules, a subject's utility function is of the form:

$$U_i = f\{h(X_i, X_{-i})\} \tag{5.3}$$

Where h is the growth factor

X_i = the amount contributed by the i^{th} member to the group kitty.

X_{-i} = the amount contributed by other members.

For the i^{th} member, $\frac{\partial U_i}{\partial X_i} > 0$, $\frac{\partial U_i}{\partial X_{-i}} > 0$, $\frac{\partial U_i}{\partial (W - X_i)} > 0$ while $\frac{\partial U_i}{\partial (W - X_{-i})} < 0$. A

[10] As such the payoff function for individual i in Ostrom et al. (1992) is given as:

$$\begin{aligned} u_i(x) &= we \text{ if } x_i = 0 \\ &= w(e - x_i) + (x_i / \Sigma x_i) F(\Sigma x_i) \text{ if } x_i > 0 \end{aligned} \tag{5.2}$$

where e is an individual's resource endowment, x_i is individual i's investment in common pool resource and $0 \leq x_i \leq e$. w is the normalized marginal payoff when investment is outside of common pool resource. $F(\Sigma x_i)$ is a production function that specifies the group return to investment in the common pool resource. F is a concave function, with $F(0) = 0$, $F'(0) > w$ and $F'(ne) < 0$. n is the group size.

Equation 5.2 reflects the fact that if individuals invest all their endowments in the outside alternative, they get a sure payoff (we), whereas if they invest some of their endowments in the common pool resource, they get a sure payoff $w(e - x_i)$ plus a payoff from the common pool resource, which depends on the total investment in that resource $F(\Sigma x_i)$ multiplied by their share in the group investment $(x_i / \Sigma x_i)$. The set up in Ostrom et al. (1992) deals with a man-made common pool resource which depends on individual contributions for its sustenance. The common pool resource adopted in this thesis is a natural resource such as a fishery from which individuals extract and where an individual's contribution to its sustenance is in their restraint in extraction.

player's payoff is increasing in the amount of his contributions but each token contributed to the public good provides a private return that is less than the contribution (Hofmeyr et al., 2007). For example, assuming $h = 5$ and $n = 10$ then the marginal per capita return (MPCR) is 0.5[11]. A group member faces a dilemma as to how much to contribute to the public good and how much to keep for himself. An individual's payoff in group j at the end of the game is:

$$P_{ij} = W - X_i + \frac{h(\sum_{i=1}^{n} X_i)}{n_j} \tag{5.4}$$

Let $h(\sum_{i=1}^{n} X_i) = \Omega_j$ so that $P_{ij} = W - X_i + \frac{\Omega_j}{n_j}$. Table 5.1 shows payoffs in a two-player public good game where Ω_{jmk} is the group's kitty when both players cooperate, Ω_{jm} and Ω_{jk} are respectively the kitty when only player M or K cooperates while the other defects.

Table 5.1: Payoffs for a two-player public good game

Player M	Player K	
	Cooperate	Defect
Cooperate	$W_m - X_m + (\frac{\Omega_{jmk}}{2})$	$W_m - X_m + (\frac{\Omega_{jm}}{2})$
	$W_k - X_k + (\frac{\Omega_{jmk}}{2})$	$W_k + (\frac{\Omega_{jm}}{2})$
Defect	$W_m + (\frac{\Omega_{jk}}{2})$	W_m
	$W_k - X_k + (\frac{\Omega_{jk}}{2})$	W_k

From the payoffs, it is Pareto efficient for both players to cooperate and contribute their entire endowment to the public good since their payoffs would be higher than any other payoff. The set up of the game presents one dominant strategy; that of defection since each individual can do better by free riding on the other members' contributions. Just as in a prisoner's dilemma (PD), defection in public good games is a Pareto inferior strategy even though a dominant one. If all members defected, everyone would end up getting their initial endowment equal to W.

[11]For group j, $MPCR_j = \frac{h}{n_j}$. In the true sense of public good, the public good described here does not fit a "pure" public good which is characterized as having perfect nonrivalry in consumption. For a pure public good, increasing group size does not reduce the marginal benefit of the public good to other consumers. The public good described here fits into the "impure" public good which can be jointly consumed but in which increases in group size tend to diminish the marginal benefit to all consumers (Isaac and Walker, 1988).

In the current set up, if all members of a group defected, everyone ended up with 100 tokens. At the other extreme, if every member cooperated by contributing their entire endowment, each would end up with 500 tokens.

Stage Two: The common pool resource game

At this stage, each group was given an initial endowment $G = 1000$ tokens and each member of a group was given a chance to independently and anonymously extract an amount $R_i \leq G$ from the pool. Each subject kept to himself the amount he extracted from the pool. The amount that each left in the pool grew by a factor g where $1 < g < n$. So as to avoid retaliation in extractions, each member of a group found the pool with similar amount i.e. G. In this set up the i^{th} player in group j faces a utility function of the form:

$$U_i = f\{R_i, R_{-i}, g(G - R_i, G - R_{-i})\} \tag{5.5}$$

Where R_i is the i^{th} player's level of extraction.

R_{-i} is the level of extraction by the other players.

$G - R_i$ is the amount left in the resource pool by the i^{th} player

$G - R_{-i}$ is the amount left in the resource pool by the other players

For the i^{th}player $\frac{\partial U_i}{\partial R_i} > 0$, $\frac{\partial U_i}{\partial R_{-i}} < 0$, $\frac{\partial U_i}{\partial (G-R_i)} > 0$ and $\frac{\partial U_i}{\partial (G-R_{-i})} > 0$. The payoff for i^{th} player in group j is:

$$F_{ij} = R_i + \frac{g\{\sum_{i=1}^{n}(G - R_i)\}}{n_j} \tag{5.6}$$

For a player, the marginal utility derived from the amount extracted is higher than the amount he leaves in the pool, thus $\frac{\partial U_i}{\partial R_i} > \frac{\partial U_i}{\partial (G-R_i)}$ since whatever he leaves in the pool is shared equally by all the group members. Just as in the public good game, in the common pool resource game, a player faces a dilemma of how much to extract for himself and the amount to leave in the common pool. A player's utility is increasing in the amount left in the common pool as well as in the amount extracted. However, the net yield of a unit left in the common pool yields to the player less than a unit he extracts. Assuming $g = 5$ and $n = 10$ then the MPCR from a one unit resource left in the pool is 0.5 and an individual can always do

better by extracting more than their fair share of the common pool resource.

In the common pool resource game, cooperation is measured by the level of restraint from extracting. If all members of a group cooperated fully, each would end up with a payoff of 5,000 tokens. Using the notations of the utility function in equation 5.5, Table 5.2 presents the payoffs for a two-person common pool resource game. But just like in the prisoner's dilemma whose equilibrium is defection, the equilibrium in this game is to extract the full amount of the common pool resource. In equilibrium then, each player ends up with a payoff less than the Pareto efficient one[12]. A potential hypothesis is that an individual who is concerned about fairness and equity could only extract for himself $R_i \leq \underline{R}_j = \frac{G}{n_j}$ while one who is selfish would extract $R_i > \underline{R}_j$.

Table 5.2: Payoffs for a two-player common pool resource game

Player M	Player K	
	Defect	Cooperate
Defect	G	$G + \frac{g}{2}(G - \underline{R}_j)$
	G	$\underline{R} + \frac{g}{2}(G - \underline{R}_j)$
Cooperate	$\underline{R}_j + \frac{g}{2}(G - \underline{R}_j)$	$\underline{R}_j + g(G - 2\underline{R}_j)$
	$G + \frac{g}{2}(G - \underline{R}_j)$	$\underline{R}_j + \frac{g}{2}(G - 2\underline{R}_j)$

5.3.1 Game procedure

On the day of the experiments, subjects gathered in a large hall and the principal researcher explained that in groups of 10 people they would take part in a two-stage experiment.

In the first stage each member would receive an initial endowment of 100 tokens from which each would have a chance to voluntarily and independently make a contribution to a common kitty. The experimenter would then multiply the sum of a group's contributions by five and the proceeds would be shared equally among the group members, irrespective of an individual member's contribution. In the second part of the game, subjects were informed that each member of a group would be given a chance to privately extract resources from a common pool (1000

[12]Note that $G < (\underline{R}_j + g(G - \underline{R}_j))$ since $1 < g < n$. Most groups had a membership of 10 subjects and $g = 5$. The value of g and G was common knowledge to all the subjects.

tokens for each group). A subject would keep for themselves the amount they extracted. Whatever remained in the common pool after each member of a group had their chance to extract something for themselves would be multiplied by 5 and thereafter be shared equally among the group members irrespective of what an individual member appropriated to himself.

Subjects were informed that no member would get to know how much the other members of the group had either contributed in the first game or extracted in the second game. A member's payoff would be dependant on his own actions in the game and that of the other members of his group. Examples of how individual actions in the game impacted individual and group payoffs were worked out in addition to the time allocated for questions.

After the explanations, subjects were randomly grouped into groups of ten[13] and allowed time to interact, get to know each other and lay strategies to maximize their group payoffs. Each group was given the opportunity to independently clarify whatever was unclear with the principal researcher. Once the procedures were clear, each group was directed into a classroom in which there was a computer and a research assistant[14]. Each group sat facing away from the computer. This was done to ensure that each subject's decisions in the games were strictly private. The computer interactive interface displayed on each subject's computer screen is presented on table C.1 in the appendix[15]. Once a subject had had his chance to play the game, he was requested to fill in an electronic questionnaire. Note that no subject got to know his payoff until each member of a group had played the game. The questions in the questionnaire were about bio-data and a subject's opinion

[13]In a number of centres, the number of participants were not exactly divisible by 10. In addition, not everyone who took part in the first two games took part in this game. As such, some groups ended up with fewer or more subjects than ten. See Table 5.4 for a summary of the group sizes. Since the growth factor remained the same, MPCR decilned with the group size. The growth factor mainly to keep the games simple and the fact that the games were pre-programmed.

[14]To ensure consistency of instructions, the same research assistants were used in all the universities.

[15]Note that each subject made their decision on how much to extract from the common pool resource directly after their decision on how much to contribute to the public good. Only once an individual had completed both decisions, was the next member of the group invited to play the game. A subject only got to know the combined payoff when every member of the group had had their chance to contribute towards the public good and extract from the common pool resource.

about harambee and corruption. To avoid interaction between those who had had their chance to play the game and those who were waiting for their turns, once a subject was done, he/she was directed to a waiting hall.

5.3.2 Subject pool

The experiment was conducted among 941[16] undergraduate and postgraduate students drawn from 14 universities and colleges spread all over Kenya. The universities are located in the various Kenyan provinces. On average 67 students from each university or college took part in the experiment. Of the 941 students, 644 (representing 68.4%) were male and the majority (98%) of the subjects were in the age bracket 18-30 years. The ethnic and religious distribution of the sample is presented in Table 5.3.

Table 5.3: Demographic distribution of the sample

Gender composition	
	Percent
Male	68.4
Female	31.6
Ethnic composition	
Kikuyu	36.7
Luhya	12.3
Luo	11.7
Kalenjin	14.6
Kisii	5.7
Kamba	9.14
Others	9.78
Religious composition	
Protestant	69.9
Catholic	24
Muslim	4.6
Others	1.5

In total, there were 99 groups with group sizes ranging from six to twelve. Table 5.4 presents a summary of the group sizes and the mean public good contribution

[16]This is a subsample of the 1012 full sample described in Chapter 2. As pointed out earlier, a few subjects who took part in the gender or ethnicity games did not take part in this game.

and common pool resource extraction per each group size.

Table 5.4: Public good contributions and common pool resource extractions on the basis of group size

Group size	Proportion of sample	Average proportion of endowment contributed in public good	Average proportion of common pool resource extracted
6	0.01	1.00	0.001
7	0.02	0.48	0.600
8	0.08	0.71	0.192
9	0.35	0.64	0.254
10	0.42	0.63	0.229
11	0.10	0.43	0.096
12	0.02	0.59	0.117

5.4 Results

Result one: *Only a small percentage of the sample chose to free-ride.*

Table 5.5 compares public good contributions and common pool resource extractions on the basis of various demographic aspects of the sample. Regardless of social categorization, the data shows strong departure from the game theoretic prediction of free riding in public good provision. On average, subjects contributed 61.3% of their initial endowment to the public good which is consistent with the findings in one-shot public good games that subjects on average contribute between 40% to 60% of their endowment (Dawes and Thaler, 1988). Moreover, the mean contributions compare well with the contributions made by the Orma participants in Henrich et al. (2001) who contributed 58% of their initial endowment in the public good game. Approximately half of the subjects contributed more than 50% of their initial endowment. Contrary to the game theoretic prediction of free riding in a public good game, only 1.3% of the sample contributed nothing while a fifth of the sample acted in true altruistic manner by contributing their entire initial endowment of 100 tokens.

Table 5.5: Comparing contributions in public good and extractions from the common pool resource on several categories

Category		Contributions in the public good game			Common pool resource extractions			
			Proportion that contributed			Proportion that extracted:		
		Proportion contributed	Zero tokens (free-riders)	100 tokens (entire endowment)	Proportion extracted	Less than $\underline{R}_j$	$\underline{R}_j$	More than $\underline{R}_j$
Gender	Male	0.60	0.017	0.201	0.225	0.380	0.266	0.354
	Female	0.64	0.003	0.194	0.216	0.446	0.231	0.323
Religion	Protestants	0.62	0.012	0.213	0.222	0.400	0.260	0.340
	Catholic	0.58	0.018	0.158	0.213	0.405	0.239	0.356
	Muslim	0.60	0.000	0.214	0.262	0.405	0.262	0.333
	Other-rel	0.62	0.000	0.133	0.257	0.333	0.267	0.400
Ethnicity	Kikuyu	0.64	0.020	0.227	0.192	0.472	0.233	0.294
	Luo	0.61	0.009	0.162	0.244	0.324	0.279	0.396
	Luhya	0.54	0.009	0.165	0.247	0.278	0.339	0.383
	Kalenjin	0.63	0.007	0.179	0.265	0.400	0.190	0.410
	Kisii	0.59	0.000	0.167	0.260	0.260	0.260	0.480
	Kamba	0.56	0.023	0.191	0.220	0.404	0.292	0.303
	Other-ethn	0.64	0.000	0.236	0.192	0.461	0.258	0.281
All		0.613	0.013	0.199	0.222	0.401	0.255	0.344

On average, subjects extracted 22.2% of the common pool. While 3.19% of the sample chose not to extract anything from the common pool resource, 2.66% extracted the entire 1000 tokens. The measure of overextraction from common pool resource used here is $C_i = R_i - \underline{R}_j$ where R_i as earlier defined is the amount that an individual i in group j extracts from common pool resource and $\underline{R}_j$[17] is the equitable amount of common pool resource to each member in group j. $C_i < 0$ if an individual extracted less than $\underline{R}_j$, $C_i = 0$ if an individual only extracts $\underline{R}_j$ and $C_i > 0$ where an individual extracted an amount greater than $\underline{R}_j$. Contrary to the game theoretical prediction of overexploitation of common pool resource, 40.1% of the sample extracted less than $\underline{R}_j$, 25.5% extracted exactly $\underline{R}_j$ and only 34.4% extracted more than $\underline{R}_j$.

On average women contributed a higher proportion of their initial endowment in the public good game than men. The difference is marginally significant (MW, z=1.52, p=0.12). The proportion of male free-riders in the public good game is significantly higher than that of women, with the proportion of male free-riders being 1.7% compared to 0.3% female free-riders (MW, z=1.72, p=0.09). Even though men on average extracted more in the common pool resource than women, the difference is not statistically significant (MW, z=1.28, p=0.20).

The average contribution in the public good and the extraction in common pool resource game compares well across ethnic and religious groups, with no significant differences.

Result two: *Individuals who make low public good contributions are significantly more likely to overextract in common pool resource game.*

Table 5.6 uses $\underline{R}_j$ as a separation point and reveals that the amount of common pool resource extractions decreases with the amount of contributions towards the public good. The table also shows that the highest proportion of free riders in the public good game is among those who extracted more than their fair share from the common pool resource. For example, while 4.5% of the free-riders extracted more than their fair share, 1.7% extracted less than their fair share. Finally the results in the table reveals that the proportion of the subjects that contributed

[17] $\underline{R}_j = \frac{G}{n_j}$ where G is the size of the common pool resource and n_j is the size of group j. Note that irrespective of the group size G was held constant at 1000 tokens.

their entire initial endowment decline with the amount of common pool resource extractions. For example, of those who contributed their entire endowment in the public good game, 22.3% extracted less $\underline{R}_j$ in the common pool resource game and only 16.2% extracted more than $\underline{R}_j$.

Table 5.6: Comparisons of subjects action in both the public good and common pool resource game

	Extraction in the common pool resource game		
	Extracts less than $\underline{R}_j$	Extracts $\underline{R}_j$	Extracts more than $\underline{R}_j$
Mean contribution in the public good game	64.26	62.48	51.81
Proportion of free riders in the public good game	0.017	0.00	0.045
Proportion that contributed 100% of endowment	0.223	0.196	0.162

These results are confirmed by the regression results presented in Table 5.7 in which both OLS and Hierarchical Linear Model (HLM) regression are presented. HLM[18] helps to conceptualize decisions taken in multiple levels and takes into account nesting at both the individual and group levels (Raudenbush and Bryk, 1986). Group is the unit of interest and the subjects are nested within groups[19]. Table 5.7 presents OLS and HLM regression results on the determinants of individual extractions in the common pool resource.

[18]The basic concept behind HLM are presented section C.2 in the appendix, for fuller understanding (see for example Velez et al., 2006; Baltagi et al., 2001; Singer, 1998; Raudenbush and Bryk, 1986; Lindley and Smith, 1972) and for application (see for example Burns and Visser, 2008; Ruppert et al., 2003; Diggle et al., 2002).

[19]If only individual decisions and actions are taken into account in the analysis as in column (1) of Table 5.7, this would leave out some valuable information and decisions that were taken within each group. HLM takes the group characteristics into account.

Table 5.7: Determinants of factors that influence an individual's common pool resource extractions

Variable	Pooled OLS		Pooled OLS adjusted for group clustering		HLM	
	(1)	(2)	(3)	(4)	(5)	(6)
Proportion of initial		-0.149***		-0.149*		-0.240***
endowment contributed		(0.042)		(0.088)		(0.040)
Ethnic heterogeneity	0.129	0.110	0.129	0.110	0.150	0.111
(ELF)	(0.081)	(0.080)	(0.147)	(0.143)	(0.190)	(0.194)
MPCR	0.557***	0.586***	0.557	0.586	0.564	0.645
	(0.178)	(0.177)	(0.463)	(0.463)	(0.405)	(0.412)
Proportion of women	0.419***	0.433***	0.419***	0.433***	0.409***	0.436***
in the group	(0.063)	(0.063)	(0.138)	(0.139)	(0.147)	(0.150)
Subject is male	0.030	0.0321	0.030*	0.032**	0.030**	0.031**
	(0.021)	(0.021)	(0.016)	(0.016)	(0.014)	(0.014)
Subject has benefitted	-0.011	-0.001	-0.011	-0.001	-0.011	0.008
from harambee	(0.031)	(0.031)	(0.032)	(0.032)	(0.021)	(0.021)
Harambee is achieving	-0.025	0.029	-0.025	0.029	-0.066***	-0.014
objective	(0.022)	(0.027)	(0.032)	(0.034)	(0.018)	(0.019)
Harambee is a cause of	0.030	0.002	0.030	0.002	0.046***	0.015
corruption	(0.021)	(0.023)	(0.028)	(0.023)	(0.016)	(0.017)
Ethnic dummies	yes	yes			yes	yes
Religious dummies	yes	yes			yes	yes
Regional dummies	yes	yes			yes	yes
Constant	-0.229*	-0.173	-0.229	-0.173	-0.220	-0.128
	(0.130)	(0.131)	(0.302)	(0.301)	(0.288)	(0.293)
Observations	941	941	941	941	941	941
R-squared	0.115	0.127	0.115	0.127		
Number of groups			99	99	99	99

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

OLS with cluster and HLM take care of the clustering at the group level

The results show the proportion of the initial endowment contributed in public good game to have a negative and significant impact on the proportion of the common pool resource extracted. These results suggest that those who cooperate in public good provision did not compensate themselves by overextracting from the common pool resource. Rather, those who contribute a lot in the public good game extracted less in the common pool resource game.

Result three: *There is more cooperation in the restraint from common pool resource extraction than in public good contributions.*

Following the work by Sell and Yeongi (1997), individual cooperation in the public good game is measured in terms of the proportion of initial endowment contributed towards the public good ($\frac{X_i}{100}$), while cooperation in the common pool resource game is measured by the proportion of the pool that each individual member leaves in the pool ($\frac{G-R_i}{1000}$)[20]. The mean cooperation in the public good contribution is 0.613 while cooperation as measured by the restraint from extraction is 0.778. There is therefore more cooperation in the restraint from taking from the common pool than in contributions to the public good. The difference is significant ($t = -12.44, \rho = 0.00$). The levels of cooperation reported here in both public good contribution and restraint from taking are higher than those reported by Sell and Yeongi (1997). In Sell and Yeongi (1997), the measure of cooperation in the public good game was 49.6% as compared to 62.8% in the restraint from taking from the common pool resource.

Result four: *Individuals in an ethnically heterogenous group contributed less towards a public good and extracted more from a common pool resource.*

Using an ELF[21] of 0.5 as a separating point, the groups whose ELF is 0.5 and less on average contributed significantly more than a group whose ELF was greater than 0.5. The group whose ELF was less than 0.5 on average contributed 75.91 compared to 59.43 tokens for groups whose ELF is above 0.5. The difference is significant (MW, z=4.88, p=0.00). Similarly, in the common pool resource game, on average, the more ethnically diverse groups extracted significantly more com-

[20] $\frac{G-R_i}{1000}$ measures the level of restraint by an individual from extracting the CPR.

[21] Ethno-linguistic Fractionalization Factor (ELF) ranges between 0 (most ethnically homogenous) and 1 (most ethnically heterogenous).

Table 5.8: Determinants of factors that influence an individual's public good contributions

Variable	Pooled OLS	OLS adjusted for group clustering	HLM
	(1)	(2)	(3)
Ethnic heterogeneity	-0.128**	-0.128	-0.166
(ELF)	(0.063)	(0.138)	(0.160)
MPCR	0.195	0.195	0.312
	(0.138)	(0.268)	(0.340)
Proportion of women in	0.093*	0.093	0.124
a group	(0.049)	(0.085)	(0.124)
Subject is male	0.014	0.014	0.005
	(0.016)	(0.013)	(0.011)
Subject has benefitted	0.068***	0.068**	0.082***
from harambee	(0.024)	(0.029)	(0.017)
Harambee is achieving	0.363***	0.363***	0.216***
its objective	(0.017)	(0.032)	(0.014)
Harambee is one of	-0.187***	-0.187***	-0.129***
the causes of corruption	(0.017)	(0.027)	(0.013)
Ethnic dummies	yes	yes	yes
Religious dummies	yes	yes	yes
Regional dummies	yes	yes	yes
Constant	0.379***	0.379*	0.392
	(0.101)	(0.212)	(0.241)
Observations	941	941	941
R-squared	0.567	0.567	
Number of groups		99	99

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

OLS with cluster and HLM take care of the clustering at the group level

pared to the more ethnically homogenous groups (233.56 compared to 130.71,MW, z=-5.68, p=0.00). See Table 5.9 for the comparisons.

Table 5.9: Public good contributions, common pool resource extractions and ELF comparisons

Measure of ELF	Mean public good contribution	Mean common pool resource extraction
Less or equal to $\frac{1}{2}$	75.91	130.71
Greater than $\frac{1}{2}$	59.43	233.56

These results are supported by the regression results of Tables 5.7 and 5.8, albeit the regression coefficients are insignificant. Individuals in ethnically heterogenous groups contributed less in the public good game (Table 5.8) and extracted more from the common pool resource (Table 5.7)[22].

Result five: *Gender composition matters in both public good provision and in common pool resource extraction.*

As the proportion of women in a group increases, the proportion of initial endowment contributed towards the public good rises (Table 5.8) although the coefficient is not significant. At the same time, extraction from the common pool resource rises significantly. This is a puzzle. Note also that male subjects are more likely to contribute to the public good and extract from the common pool resource[23].

Result six: *A subject's attitude and experience with harambee is significantly correlated with their level of public good contribution.*

[22]The insignificance of the measure of ethnic heterogeneity on the level of contribution in the public good and the common pool resource games is not surprising given that ethnic heterogeneity is a group specific characteristic. Given that subjects had time before the game to discuss what they should do, the correlation between decisions made by individual group members would be inextricably tied to the demographic profile of the group.

[23]It was speculated that as gender heterogeneity (proportion of women) increases, men tended to extract more from the common pool resource. To validate this speculation, a regression was run with an interaction term between male subject and the proportion of women in a group. The coefficient of the term (male subject*proportion of women in a group) was insignificant both as a determinant of public good contributions and extraction from the common pool resource. Results of this regression are not reported here.

As results in Table 5.8 show, the three dummies on ones attitude and experience with harambee have a significant impact on ones public good contributions. The results show that if one has benefitted from harambee which is the majority of the subjects in the sample, they contributed significantly more than those who indicated not to have benefitted. If a subject was of the opinion that harambee is achieving its objective, they contributed more towards public good. Those who were of the opinion that harambee is one of the causes of corruption contributed significantly less than those who do not consider harambee to be a cause of corruption. Interestingly, the regression presented in Table 5.7 suggest that individuals who indicated that harambee was a cause of corruption extracted more in the CPR game, albeit the coefficient is insignificant once one accounts for contribution in the public good game.

5.5 Discussion and conclusion

The results show an inverse relationship between public good contributions and common pool resource extractions, in that cooperators in public good contributions extract less from the common pool resource. To the extent that the experiments mimic the alleged link between contributions to *harambee* and corrupt acts of embezzlement ex-post, the basis for blaming harambee on corruption is not established by the results. This result is similar to the one by Fehr and Leibbrandt (2008) who conducted both field and laboratory experiments to determine the relationship between the size of mesh on fishing net and contributions in a public good experiment among a fishing community in Brazil. The study found that those who cooperated in the public good game used fishing nets with bigger mesh sizes. A smaller mesh size indicates a higher likelihood of catching smaller fish before they reach maturity thus imposing negative externality on other fishermen as well as themselves.

The analysis of the responses from the post-game questionnaire supports the results of the experiments. The subjects do not see *harambee* as the cause of corruption. Instead, they see corruption as the cause of abuse to the *harambee* spirit. If this is true, banning harambee based on the allegation that it causes corruption will not reduce corruption and this has proved to be true. Since the

enactment of POEA in 2003, barring politicians and public officials from actively participating in *harambees*, this move has not contributed to lowering the level corruption in Kenya.

The results show that an increase in the gender diversity in a group, measured by the proportion of women in a group leads to an increase in public good contributions but also an increase in common pool resource extractions. Gender diversity thus has a positive impact in enhancing cooperation in contributions but at the same time it seems to introduce competition in common pool resource extractions thereby reducing cooperation in the restraint from taking. This is in contrast to the findings by Cadsby and Maynes (1998) and Nowell and Tinkler (1994) who found higher cooperation in an all-female group which they attributed to the tendency of females to behave more like each other. This is a puzzle and it is not immediately clear why this result occurs.

Ethnic heterogeneity in a group reduces cooperation in both public good contributions and common pool resource maintenance. These results are similar to those obtained by other researchers (see for example Banerjee et al., 2005; Miguel and Gugerty, 2004; Goldin and Katz, 1997; Habyarimana et al., 2007a). The low contributions and high extractions in an ethnically heterogenous group is attributed to the inability of members of such groups to impose sanctions on non cooperators (for example Miguel and Gugerty, 2004; Habyarimana et al., 2007a). As a policy issue, policy makers need to be aware of the negative effects of a group's ethnic composition in the management of common resources. This is especially true in Kenya in the wake of the proposed devolution of government funds.

Consistent with the findings by Sell and Yeongi (1997) and Brewer and Kramer (1986), this chapter finds more cooperation in the restraint from extraction than in contributions. The greater cooperation in common pool resource extraction than in public good contribution is attributed to loss aversion and endowment effects. This finding is of policy relevance. In part, it points to the fact that cooperation can be achieved in the sustenance of common resources and points to the fact that sustaining a common pool resource should be prioritized since creating one through initiatives such as *harambee* is difficult once one is destroyed. A case in point is the destruction of the largest water-catchment area in Kenya that is Mau forest. The government is currently finding it difficult in getting people to cooperate in

its rehabilitation.

Finally, consistent with the findings documented in Henrich et al. (2001) which showed that Kenyan subjects brought their everyday experience of *harambee* into the public good setting, this chapter also documents the fact that participants in the games brought their real life experience of *harambee* to bear on their decisions. This highlights the important and potentially positive reinforcing role that social norms and institutions can have on individual decisions.

Chapter 6

Conclusion

This thesis investigated the role of gender composition, ethnic heterogeneity and *harambee* on corruption. The interest is premised on the high levels of corruption in Kenya coupled with the rising ethnicization of politics and the allegation of *harambee* being one of the causes of corruption in Kenya. In addition, there has been growing advocacy for the greater involvement of women in the public sector as an anti-corruption strategy. Given this, this thesis used experimental games to examine the extent to which individual attributes such as gender and ethnicity might influence the propensity to offer or accept a bribe, or to punish individuals who engage in such activities. In addition, this thesis used a public good game and a common pool resource game to examine the alleged link between *harambee* and corruption.

Premised on the doubts as to whether individuals can truthfully report their involvement in corruption, this thesis adopted experimental games as a research methodology first because of the novelty of the methodology in the Kenyan context, and secondly because all previous research on corruption in Kenya has been based on surveys. This thesis therefore does not only contribute to the existing work on corruption but in addition makes a significant contribution in the use of experimental methodology in the Kenyan context.

Obviously there are a number of caveats and qualifications that should be kept in mind when considering the results in this thesis. The experiments in this thesis were conducted among students who may lack the real encounters with corruption.

This limitation may be a cause for legitimate concern on how well the findings can apply to the general public. In future it would be important to extend the sample to incorporate people who are constantly confronted with corruption in their line of work. Cameron et al. (2009) has showed that subjects who encounter corruption more frequently in the course of their duty exhibit more tolerance towards corrupt behavior.

The experiments used neutral as opposed to loaded language as such instead of using the word "bribe", "transfer" was used. Neutral language was adopted to avoid the risk of subjects framing during the experiment. Even though there is evidence that the use of loaded or neutral language does not affect results (see Abbink and Henning-Schmidt, 2006; Jacquemet, 2006) it would be important in future to see if loaded versus neutral language would make a difference in the Kenyan context. This is especially important to validate if all subjects understood the experiments to be about corruption. The sample was made up of about 66.5% male subjects which presented a problem of gender balance among the trios, in future it may be necessary to be purposeful in recruitment to achieve a gender balance on the sample.

This thesis is a first step in investigating the role of *harambee* on corruption. The findings do not support the allegations of *harambee* contributors compensating themselves by engaging in corruption., instead *harambee* contributors are found to extract less from the common pool resource. Moreover, results of the analysis of the post-game questionnaire revealed that subjects see corruption to be a cause of abuse on *harambee*. It would be interesting to run common pool resource game first followed by a public good game, this way it would be possible to test the reverse causality between *harambee* and corruption.

Following the suggestion by Levitt and List (2007) and List (2006) of combining lab and field experiment to validate results, this thesis proposes a survey of Kenyan organizations be conducted to determine how well they fair on corruption in relation to the gender composition and ethnic heterogeneity of their workforce. Such survey would help to validate the findings in this thesis.

Finally, running computerized games in Kenya was both exciting and challenging. Computerised games provided instant interaction among the three players in a trio without the need for a third party. In addition they provided a way of

ensuring that all participants answered all the questions in the post-game questionnaire[1]. An obvious challenge encountered is the computer literacy skills especially among potential female participants, as already pointed out earlier, potential female participants were particularly apprehensive about their ability to participate on account of the computer skills required. The other challenging issue was the aspect of having to carry and assemble a mobile lab in form of computers from centre to centre. The lessons learnt in the excise were however worth the challenges.

Having pointed out the caveats and limitations in this thesis, a number of broad results emerge from this thesis, these are discussed below:

Gender and ethnic identity do not affect the propensity to offer a bribe in a uniform way

The impact of gender composition on bribe offering reveals that the likelihood of bribe offering was higher when a potential bribe-giver faced a potential bribee of the opposite gender, as opposed to one who is of the same gender. This is especially the case if the third party who is hurt by the bribe is of the same gender as the bribe-giver. Why might this be? A possible explanation is that the bribe-giver anticipated less punishment from a third party of the same gender especially if social norms such as chivalry exists. That is, the expectation that one favours a person of the opposite gender and the expectation that the third party also accepts this norm. Chivalry traits have been observed in both dictator and ultimatum games (see for example Dufwenberg and Muren, 2002; Eckel and Grossman, 2001; Eagly and Crowley, 1986).

In contrast, 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 expectations of ingroup 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

[1]The games were set in such a way that a subject could not submit their electronic questionnaire unless all questions were answered. The system would also highlight unanswered questions.

the notion of ingroup 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.

Bribe acceptance is purely opportunistic

The anticipation by the bribe-giver that the bribee would make a decision to accept or reject a bribe on the basis of either gender or ethnic consideration is mistaken since the bribee's decision was purely opportunistic. In both corruption games, the bribee's decision was mainly based on the initial endowment and bribe amounts. Specifically, lower initial endowment and higher bribe amounts led to a higher likelihood of bribe acceptance One policy implication that can be drawn here is that of raising civil servants wages as a strategy to dissuade them from demanding and accepting bribes. This is an anti-corruption strategy advocated by many (see for example Sosa, 2004; VanRijkeghem and Weder, 2001; Rauch and Evans, 2000). Other researchers are, however, more cautious on the effects of using public servants wages as an anti-corruption strategy, and have instead suggested staff rotation and monitoring as better anti-corruption strategies (see for example Barr et al., 2009; Schulze and Frank, 2003; Abbink et al., 2002).

Gender and ethnic identity do affect the likelihood that a corrupt act is punished

The decision by the third party to punish corrupt behavior reveals insider-outsider distinctions in favor of insiders, both in terms of gender and ethnic identity. Punishment was less likely in single-gender and ethnically homogenous trios than other trios. A third party, was willing to invest in punishment in trios whose members he or she considered to be outsiders either in terms of gender or ethnicity but was unwilling to do so if he or she considered the beneficiaries of the corrupt act to be insiders. This has clear policy implications for anti-corruption strategies, if it is the case that individuals will not punish those perpetrators of corruption whom they consider insiders. Indeed politicians in Kenya and elsewhere care about corruption only when they are excluded from it or when it doesn't benefit their own community (Glimcher and Lambert, 2010).

These results suggest that gender and ethnic balance are important factors in the design of less corruption-prone institutions. Contrary to the advocacy for the involvement of women in the labour force on the basis of their lower propensity to corruption, this thesis advocates for the greater involvement of women in the labour force for their role in anti-corruption strategies by shattering male dominated networks. And contrary to the cross country studies that show ethnic heterogeneity to contribute to corruption, the thesis notes that at a micro level, its ethnic homogeneity and not heterogeneity that perpetuates corruption. Ethnic mixing in the workplace can therefore be an effective tool in providing checks and balance in the fight against corruption. What is key is that no single ethnic group should hold all the decision making power. It also requires an active citizenry who are willing to punish corrupt behavior.

Some countries are already experimenting with having more female representation and involvement in public life as an anti-corruption strategy. For example Uganda has the majority of the positions of treasurer in the local government being filled by women (Goetz, 2007). In 1999, The Washington Post reported a similar move by the Mexico city police chief who took away the authority of traffic ticket writing from men to a new force consisting exclusively of female officers (Moore, 1999). A similar policy was implemented in Peru's capital, Lima and as a result, there was a reported decline in corruption (McDermott, 1999). Given the high levels of corruption, the low female representation in public life and the ethnicization of politics in Kenya, it is worth promoting gender and ethnic balance in institutional design as an anti-corruption strategy.

Local institutions and social norms may be utilized in the fight against corruption

To the extent that the public good and common pool resource games used in this thesis mimic the alleged link between *harambee* and corruption, the thesis does not find support for the allegations that individuals compensate their harambee contributions by engaging in corruption ex-post. Instead, the thesis finds that individuals who contribute more in a public good setting extracted less from the common pool resource and therefore are other-regarding. This finding is not surprising since the analysis of the post-game questionnaire showed that subjects

considered corruption to be the cause of the abuse of *harambee* and not *harambee* causing corruption. Hence, subjects own lived experiences of *harambee* and their views on corruption may well have framed their approach to the game. Moreover, the importance of *harambee* in Kenya is underscored by the proportion of the sample who have benefitted from the initiative and who would like to see *harambee* continue albeit without political interferences. Individuals who are aware of how *harambee* has benefitted their own lives contributed more towards *harambee* and those who consider harambee to be one of the causes of corruption contributed less. To the extent that the institution of *harambee* is viewed as a positive force, and one that should be protected, this could be utilized to harness efforts aimed at rooting out corruption and ensure the provision of public goods.

References

Abbink, K. and Henning-Schmidt, H. (2006). Neutral versus loaded instructions in a bribery experiment, *Experimental Economics* **9**(2): 103–121.

Abbink, K., Irlenbusch, B. and Renner, E. (2002). An experimental bribery game, *Journal of Law, Economics and Organization* **18**: 428–454.

Aghion, P., Alesina, A. and Trebbi, F. (2002). Endogenous political institutions, *Unpublished, Harvard University* .

Akivanga, S. (2005). Anti-corruption politics in post-kanu era, *in* L. Chweya, J. Tuta and S. Akivanga (eds), *Control of Corruption in Kenya: Legal-Political Dimensions 2001-2004*, Claripress Ltd, pp. 243–283.

Alatas, V., Cameron, L., Chaudhuri, A., Erkal, N. and Gangadharan, L. (2009a). Gender and corruption: Insights from experimental analysis, *Sourthen Economic Journal* **75**(3): 663–680.

Alatas, V., Cameron, L., Chaudhuri, A., Erkal, N. and 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., Baqir, R. and Easterly, W. (1999). Public goods and ethnic divisions, *Quarterly Journal of Economics* **114**: 1243–1284.

Alesina, A., Devleeschauwer, A., Easterly, W., Kurlat, S. and Wacziarg, R. (2003). Fractionalization, *Journal of Economic Growth* **8**: 155–194.

Alesina, A. and LaFerrara, E. (2004). Ethnic diversity and economic performance, *NBER Working Paper No. 10313* .

Alhassan-Alolo, N. (2007). Gender and corruption: testing the new consensus, *Public Administration and Development* **27**: 227–237.

Ali, J. and Isse, H. (2003). Determinants of economic corruption: A cross-country comparison, *Cato Journal* **22**: 449–466.

Alt, J. and Lassen, D. (2003). The political economy of corruption in american states, *Journal of Theoretical Politics* **15**: 341–365.

Andreoni, J. (1988). Why free ride? strategies and learning in public goods experiments, *Journal of Public Economics* **37**: 291–304.

Andy, H. (2007). Mayors and clerks: Ethnicity and corruption in kenya, *Harvard University Working Paper* .

Armantier, O. and Boly, A. (2008). Can corruption be studied in the lab? comparing field and lab experiment, *Scientific Series* .

Atieno-Odhiambo, E. (2000). Hegemonic eterprises and instrumentalities of survival: ethnicity and democracy in kenya, *Unpublished paper presented at Queens's University, Kingston,* (March).

Baltagi, B., Song, S. and Jung, B. (2001). The unbalanced nested error component regression model, *Journal of Econometrics* **101**: 357–381.

Banerjee, A., Iyer, L. and Somanathan, R. (2005). History, social divisions and public goods in rural india, *Journal of the European Economic Association* **3**: 639–647.

Bardhan, P. (1997). Corruption and development: A review of issues, *Journal of Economic Literature* **35**: 1320–1346.

Barkan, J. and Holmquist, F. (1986). Politics and peasantry in kenya: The lessons of harambee, *Working Paper number 440, Institute for Development Studies, University of Nairobi* .

Barr, A., Lindelow, M. and Serneels, P. (2009). To serve the community or oneself: The public servant's dilemma, *Journal of Economic Behavior and Organization* **72**: 225–239.

Barr, A. and Serra, D. (2006). Culture and corruption, *Economic and Social Research Council, Working Paper Number GPRG-WPS-040* .

Barr, A. and Serra, D. (2009). The effects of externalities and framing on bribery in a petty corruption experiment, *Experimental Economics* **12**: 488–503.

Bates, R. (1973). Ethnicity in contemporary africa, *Programs in East African Studies* .

Ben-Ner, A. and Puttermann, L. (1999). Reciprocity in a two part dictator game, *mimeo* .

Bertrand, M. and Mullainathan, S. (2001). Do people mean what they say? implications for subjective survey data, *American Economic Review Papers and Proceedings* **91**: 67–72.

Besley, T., Coate, S. and Loury, G. (1993). The economics of rotating savings and credit associations, *American Economic Review* **83**: 792–810.

Besley, T. and McLaren, J. (1993). Taxes and bribery: the role of wage incentives., *The Economic Journal* **103**: 119–41.

Billig, G. and Tajfel, H. (1973). Social categorization and similarity in intergroup behavior, *European Journal of Social Psychology* **3**: 27–51.

Bohnet, I. and Frey, B. (1999). Social distance and other-regarding behavior in dictator games: comments, *American Economic Review* **89**: 335–39.

Bolton, G. and Ockensfels, A. (2000). A theory of equity, reciprocity and competition, *American Economic Review* **90**: 166–193.

Bonacich, P., Shure, G., Kahan, J. and Meeker, R. (1976). Cooperation and group size in the n-person prisoner's dilemma, *Journal of Conflict Resolution* **20**: 687–706.

Bonaglia, Federico, Macedo and Bussolo, M. (2001). How globalization improves governance, *Discussion Paper 2992* .

Bose, G. (2004). Bureaucratic delays and bribe-taking, *Journal of Economic Behaviour and Organization* pp. 313–320.

Bourhis, R., Turner, J. and Gagnon, A. (1997). Interdependence, social identity and discrimination, *in* R. Spears, P. Oakes, N. Ellemers and S. Haslam (eds), *The Social Psychology of Stereotyping and Group life*, Cambridge, MA: Blackwell, pp. 273–295.

Brewer, M. and Kramer, R. (1986). Choice behavior in social dilemmas: Effects of social identity, group size and decision framing, *Journal of Personality and Social Psychology* **50**: 543–549.

Brock, W. and Durlauf, S. (1999). What have we learned from a decade of empirical research on growth? growth empirics and reality, *World Bank Economic Review* **15**: 229–72.

Brown, David, S., Michael, T. and Andrew, W. (2005). Political polarization as a constraint on government: Evidence from corruption.

Brown-Kruse, J. and Hummels, D. (1993). Gender effects in laboratory public goods contribution: Do individuals put their money where their mouth is?, *Journal of Economic Behavior and Organization* **22**: 255–268.

Brunetti, A. and Weber, B. (2003). A free press is bad news for corruption, *Journal of Public Economics* **87**: 1801–1824.

Burks, S., Carpenter, J. and Verhoogen, E. (2000). Playing both roles in the trust game: The golden rule and machiavellian behavior, *mimeo* .

Burns, J. (2003). Inequality aversion and group identity, *Working Paper, University of Cape Town* .

Burns, J. (2004a). Insider-outsider distinctions in south africa: The impact of race on the behaviour of high school students, *Draft* .

Burns, J. (2004b). Race and trust in post-apartheid south africa, *CSSR Working Paper No. 78* .

Burns, J. and Visser, M. (2008). Income inequality and the provision of public goods: When the real world mimics the lab, *University of Cape Town, Working Paper* .

Byrne, D. (1969). Attitudes and attraction, *Advances in Experimental Social Psychological* **4**: 35–89.

Cadsby, C. and Maynes, E. (1998). Gender and free riding in a threshold public goods game: Experimental evidence, *Journal of Economic Behavior and Organization* **34**: 603–620.

Camerer, C. (2003). *Behavioural Game Theory*, Princeton University Press.

Cameron, L., Chaudhuri, A., Erkal, N. and Gangadharan, L. (2009). Propensities to engage in and punish corrupt behavior: Experimental evidence from australia, india, indonesia and singapore, *Journal of Public Economics* **93**: 843–851.

Cardenas, J. C. (2003). Real wealth and experimental cooperation: experiments in the field lab, *Journal of Develoment Economics* **70**: 263–289.

Carpenter, J. (2002). Measuring social capital: Adding field experimental methods to the analytical toolbox, *in* J. Isham, T. Kelly and S. Ramaswamy (eds), *Social Capital and Economic Development: Well-being in Developing Countries*, Edward Elgar Publishing Ltd, pp. 119–137.

Carpenter, S. (1998). Sustainability and common-pool resources: Alternatives to tragedy, *PHIL and TECH* **3**.

Chand, S. and Moene, K. (1999). Controlling fiscal corruption, *World Development* **27**(7): 1129–40.

Chang, E. and Golden, M. (2004). Electoral systems, district magnitude and corruption, *Annual Meeting of American Political Science Association*.

Charnes, G. and Rabin, M. (2002). Understanding social preferences with simple tests, *Quarterly Journal of Economics* **117**: 817–869.

Chieni, S. N. (1998). The harambee movement in kenya: The role played by kenyans and the government in the provision or education and other social services, *Institute of Distance Education* .

Chweya, L. (2005). The government anti-corruption programmes, *in* L. Chweya, J. Tuta and S. Akivanga (eds), *Control of Corruption in Kenya: Legal-Political Dimensions 2001-2004*, Claripress Ltd, pp. 1–51.

Coleman, J. (1990). *Foundations of Social Theory*, Cambridge: Harvard University Press.

Collier, P. (2000). Ethncity, politics and economic performance, *Economics and Politics* **12**: 225–45.

Collier, P. and Gunning, W. (1999). Explaining african economic performance, *Journal of Economic Literature* **37**: 64–111.

Collier, P. and Hoeffler, A. (1998). On the economic causes of civil war, *Oxford Economic Papers* .

Collier, P. and Hoeffler, A. (2000). Greed and grievance in civil war, *Policy Research Working Paper 2355, World Bank, Washington DC* .

Croson, R. (2008). Theories of commitment, altruism and reciprocity: Evidence from linear public good games, *Working Paper* .

Croson, R. and Gneezy, U. (2009). Gender difference in preferences, *Journal of Economic Literature* **47**(2): 448–474.

Damania, Richardson, Fredricksson and Muthukumara (2004). The persistence of corruption and regulatory complaince failures: Theory and evidence, *Public* **121**: 363–390.

Dawes, R. (1980). Social dilemmas, *Annual Review of Psychology* **31**: 169–193.

Dawes, R. and Thaler, R. (1988). Cooperation, *Journal of Economic Perspectives* **2**(3): 187–197.

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.

Diehl, M. (1989). Justice and discrimination between minimal groups: The limits of equity, *British Journal of Social Psychology* **28**: 227–238.

Diggle, P., Heagerty, P., Liang, K. and Zeger, S. (2002). *Analysis of Longitudinal Data*, 2nd edn, Oxford: Oxford University Press.

Dollar, D., Fisman, R. and Gatti, R. (2001). Are women really the "fairer" sex? corruption and women in development, *Journal of Economic Behaviour and Organization* **46**(4): 423–429.

Duflo, E. (2005). Why political reservations?, *Journal of European Economic Association* pp. 668–678.

Dufwenberg, M. and Kirchsteiger, G. (2004). A theory of sequential reciprocity, *Games and Economic Behaviour* **47**: 268–298.

Dufwenberg, M. and Muren, A. (2002). Discrimination and gender and social distance, *Stockholm University Working Paper* .

Eagly, A. and Crowley, M. (1986). Gender and helping behavior: A meta-analytic review of the social psychological literature, *Psychological Bulletin* **100**(3): 283–308.

Eagly, A. and Wood, W. (1999). The origins of sex differences in human behavior: Evolved dispositions versus social roles, *American Psychologist* **54**: 408–423.

Easterly, W. and Levine, R. (1997). Africa's growth tragedy: Policies and ethnic divisions, *The Quarterly Journal Economics* pp. 1203–1250.

Eckel, C. and Grossman, P. (2001). Chivalry and solidarity in ultimatum games, *Economic Inquiry* **39**(2): 171–188.

Eckel, C. and Grossman, P. (2002). Sex differences and statistical stereotyping in attitudes towards financial risk, *Evolution and Human Behaviour* **23**: 281–295.

Eckel, C. and Wilson, R. (2003). Conditional trust: sex, race and facial expressionsin a trust game, *Discussion Paper* .

Egger, P. and Winner, H. (2005). Evidence on corruption as an incentive for foreign direct investment, *European Journal of Political Economy* **21**: 932–952.

Esteban, J. and Ray, D. (1994). On the measurement of polarization, *Econometrica* **62**(4): 819–851.

Esteban, J. and Ray, D. (2001). Collective action and the group size paradox, *American Political Science Review* **95**: 663–672.

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.

Falk, A. and Fischbacher, U. (2006). A theory of reciprocity, *Games and Economic Behaviour* **54**: 293–315.

Fehr, E. and Gachter, S. (2000). Cooperation and punishment in public goods experiments, *American Economic Review* **114**(3): 980–994.

Fehr, E. and Leibbrandt, A. (2008). Cooperativeness and impatience in the tragedy of the commons, *University of Zurich. Working Paper* **378**.

Fershtman, C. and Gneezy, U. (2001). Discrimination in a segmented society: An experimental approach, *The Quarterly Journal of Economics* **116**(1): 351–377.

Fershtman, C., Gneezy, U. and Verboven, F. (2002). Discrimination and nepotism: the efficiency of the anonymity rule, *Working Paper* .

Fischbacher, U., Gachter, S. and Fehr, E. (2001). Are people conditionally cooperative? evidence from a public goods experiment, *Economics Letters* **71**: 397–404.

Frank, B. and Lambsdorff, J. (2008). Gender effects in laboratory corruption experiments, *Working Paper* .

Frank, B. and Schulze (2000). Does economics make citizen corrupt?, *Journal of Economic Behaviour and Organization* **43**: 101–113.

Frey, B. and Meier, S. (2004). Social comparison and pro-social behaviour: Testing conditional cooperation in a field experiment, *American Economic Review* **94**(5): 1717–1722.

Gaertner, L. and Insko, C. (2000). Intergroup discrimination in the minimal group paradigm: Categorization, reciprocity, or fear?, *Journal of Personality and Social Psychology* **79**: 77–94.

Gatti, R., Paternostro, S. and Rigolini, J. (2003). Individual attitudes toward corruption: Do social effect matter?, *World Bank Policy Research Working Paper 3122* . .

Gaube, T. (2001). Group size and free riding when private and public goods are gross substitutes, *Economic Letters* **70**: 127–132.

Gilligan, C. (1982). *In a different voice, psychological theory and women's development*, Cambridge, MA: Harvard University Press.

Gintis, H. (2000). Beyond homo economicus: Evidence from experimental economics, *Ecological Economics* **35**: 311–322.

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. and Scoutter, C. (2000). Measuring trust, *Quarterly Journal of Economics* **115**(3): 811–846.

Glaeser, E., Liabson, D., Scheinkman, J. and Soutter, B. (1999). What is social capital? the determinants of trust and trustworthiness, *NBER Working Paper No. 7216* .

Glimcher, I. and Lambert, T. (2010). Cycle of corruption, *Harvard Political Review* .

Goetz, A. (2007). Political cleaners: Women as the anti-corruption force, *World Development and Change* pp. 87–105.

Goldin, C. and Katz, L. (1997). Why the united states led in education: Lessons from secondary school expansion, 1910 t0 1940, *Working Paper* .

Goldin, C. and 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.

Gordon, H. (1954). The economic theory of a common-property resource: The fishries, *The Journal of Political Economy* **62**.

Government of Kenya (1997). Kenya development plan (1979-1983), Government Printer, Nairobi.

Guerrero, M. and Rodriguez-Oreggia (2005). About the decision s to commit corruption in mexico: The role of perception, individual and social effects, *Working Paper* .

Gurgur, T. and Shah, A. (2005). Localization and corruption, *World Bank Policy Research Working Paper 3486* .

Habyarimana, J., Humphreys, M., Posner, D. and Weinstein, J. (2007a). Why does ethnic diversity undermine public goods provision?, *The American Political Science Review* **101**(4).

Habyarimana, J., Humphreys, M., Posner, D. and Weistein, J. (2007b). Why are co-ethnics believed to be more trustworthy?, *Working Paper* .

Haile, D., Sadrieh, K. and Verbon, H. (2004). Trust in a segmented south african society: An experimental investigation, *Working Paper Tilbutg University* .

Hall, R. and Jones, C. (1999). Why do some countries produce so much more output per worker than others?, *Quarterly Journal of Economics* **114**: 83–116.

Hardin, G. (1968). The tragedy of the commons, *Science* pp. 1243–1248.

Harris, A., Evans, W. and Schwab, R. (2001). Education spending in an aging america, *Journal of Public Economics* **81**(3): 449–72.

Henrich, J., Boyd, R., Bowles, S., Camerer, C., Fehr, E. and Ginitis, H. (2001). In search of homo economicus: Behavioral experiments in 15 small-scale societies, *The American Economics Review* **91**(2): 73–78.

Herzfeld, T. and Weiss, C. (2003). Corruption and legal (in)effectiveness: An empirical investigations, *European Journal of Political Economy* **19**: 621–632.

Hines, J. (1995). Forbidden payment: Foreign bribery and american business after 1977, *NBER Working Paper No. 5266* .

Hofmeyr, A., Burns, J. and Visser, M. (2007). Income inequality, reciprocity and public good provision: An experimental analysis, *South African Journal of Economics* **75**(3): 508–520.

Horwitz, M. and Rabbie, J. (1982). Individuality and membership in the intergroup system, *in* H. Tajfel (ed.), *Social Identity and intergroup Relations*, Cambridge: Cambridge University Press.

Huntington, S. (1968). *Political Order in Changing Societies*, Yale University Press.

Isaac, R. and Walker, J. (1988). Group size effects in public goods provision: The voluntary contributions mechanism, *The Quarterly Journal of Economics* **103**(1): 179–199.

Jacquemet, N. (2006). Corruption and betrayal: Empirical evidence, *University of Paris Working Paper* .

Jetten, J., Spears, R. and Manstead, A. (1996). Intergroup norms and intergroup discrimination: Distinctive self-categorization and social identity effects, *Journal of Personality and Social Psychology* **71**: 1222–1233.

Karlan, D. (2002). Social capital and group banking, *mimeo, MIT* .

Kaufmann, D. (1997b). The missing pillar of a growth strategy for ukraine: Reforms for private sector development, *in* P. Cornelius and P. Lenain (eds), *Ukraine:*

Accelerating the Transition to Market, Washington: International Monetary Fund, pp. 234–74.

Kaufmann, D. and Wei, S. (2000). Does "grease money" speed up the wheels of commerce?, *IMF Working Paper* **WP/00/64**.

Kenyatta, J. (1964). *Harambee: The Prime Minister's Speeches*, Oxford University Press, Oxford.

Khwaja, A. (2000). Can good projects succeed in bad communities? collective action in the himalayas, *mimeo, Harvard University* .

Kibwana, K., Akivaga, S., Mute, L. and Odhiambo, M. (2001). *Initiatives against Corruption in Kenya: Legal and Policy interventions 1995-2001*, Claripress Ltd.

Kibwana, K., Wanjala, S. and Okech-Owiti (1996). *The Anatomy of Corruption in Kenya: Legal, Political and Socio-Economic Perspectives*, Claripress Ltd.

Kidombo, K., P. (2007). *The Architecture of Corruption in Kenya*, Sino Printers and Publishers, Nairobi.

Kimenyi, M. (2006). Ethnicity, governance and the provision of public goods, *Journal of African Economies* **15**: 62–99.

Kleiman, E. and Rubinstein, Y. (1996). Sex and the leuthold free rider experiment: Some results from an israel sample, *The Journal of Economic Education* **27**(3): 238–257.

Klitgaard, R. (1988). *Controlling Corruption*, University of California Press.

Klopp, J. (2002). Can moral ethnicity trump political tribalism? the struggle for land and nation in kenya, *African Studies* **61**(2).

Kollock, P. (1998). Social dilemmas: The anatomy of cooperation, *Annual Review of Sociology* **24**: 183–214.

Kramer, R. M. and Brewer, M. B. (1984). Effect of group identity on resource use in simulated commons dilemma, *Journal of Personality and Social Psychology* **46**(5): 1044–1057.

Krueger, A. (1974). The political economy of rent-seeking society, *American Economic Review* **64**: 291–303.

Kunicova, J. and Rose-Ackerman, S. (2005). Electoral rules and constitutional structures as constraints on corruption, *British Journal of Political Science* **35**: 573–606.

LaFerrara, E. (1998). Inequality and participation: Theory and evidence from rural tanzania, *Mimeo* .

LaFerrara, E. (2002). Self-help groups and income generation in the informal settlements of nairobi, *Journal of African Economies* **11**(1): 61–89.

Lambsdorff, G. and Frank, B. (2007). Corrupt reciprocity, *Discussion Paper of the Economics Faculty of Passau University, Number 51-07, August* .

LaPorta, R., Lopez-Silenes, S., Andrei, S. and Vishney, R. (1998). The quality of government, *Journal of Law Economics and Organization* **45**: 222–279.

Lederman, Loayza and Rodrigo, S. (2005). Accountability and corruption: Political institutions matter, *Economics and Politics* **17**: 1–35.

Ledyard, J. (1995). Public goods: A survey of experimental research, *in* J. Kagel and A. Roth (eds), *Handbook of Experimental Economics*, Princeton University Press., pp. 111–194.

Leff, Nathaniel, H. (1964). Economic development through bureaucratic corruption, *The American Behaviour Scientist* **8**(2): 8–14.

Leigh, A. (2006). Trust, inequality and ethnic heterogeneity, *The Economic Record* **82**: 268–280.

Leite, C. and Weidmann, J. (1999). Does mother nature corrupt?: Natural resources, corruption and economic growth, *IMF Working Paper WP/66/85* .

Levitt, S. and List, J. (2007). What do laboratory experiments measuring social preferences tell us about the real world?, *Journal of Economic Perspectives* **21**(2): 153–174.

Lindley, D. and Smith, A. (1972). Bayes estimates for the linear model, *Journal of the Royal Statistical Society, Series B* **34**: 1–41.

Lipford, J. (1995). Group size and the free-rider hypothesis: an examination of new evidence from churches, *Public Choice* **83**: 291–303.

List, J. (2006). Field experiments: A bridge between lab and naturally occuring data, *Advances in Economic Analysis and Policy* **6**(2).

Locksley, A., Ortiz, V. and Hepburn, C. (1980). Social categorization and discrimination behavior: Extinguishing the minimal intergroup discrimination effect, *Journal of Personality and Social Psychology* **39**: 773–783.

Loomis, G. and Sugden, R. (1982). Regret theory: An alternative theory of rational choice under uncertainty, *Economic Journal* **92**: 805–824.

Loughran, G. (2010). *The Birth of a Nation: The story of a Newspaper in Kenya*, I. B. Tauris, 6 Salem Road, London W2 4BU.

Lui, F. (1985). An equilibrium queuing model of bribery, *Journal of Political Economy* **93**(4): 760–781.

Marwell, G. and Ames, R. (1981). Economists free ride, does anyone else?, *Journal of Public Economics* **15**: 295–310.

Mauro, P. (1995). Corruption and growth, *The Quarterly Journal Economics* pp. 681–712.

McDermott, J. (1999). International: Women police ride in on a ticket of honesty, *The Daily Telegraph*.

Meon, P. and Sekkat, K. (2005). Does corruption grease or sand the wheels of growth?, *Public Choice* **122**(1): 69–97.

Miguel, E. (2000). Ethnic diversity and school funding in kenya, *mimeo, University of Colifornia at Berkeley* .

Miguel, E. and Gugerty, M. (2004). Ethnic diversity, social sanctions, and public good in kenya, *Working Paper* .

Montalvo and Reynal-Querol (2002). Ethncity, political systems and civil wars, *Journal of Conflict Resolution* **46**(1): 29–54.

Moore, M. (1999). Mexico city's stop sign to bribery; to halt corruption, women traffic cops replace men, *The Washington Post*.

Mukherjee and Png (1995). Corruption law enforcers: How should they be compensated?, *The Economic Journal* **105**: 145–159.

Mukherjee, R. and Gokcekus (2004). Gender and corruption in public sector, *Global Corruption Report 2004*, Hodes, R.

Ndegwa, S. (1997). Citizenship and ethnicity: An examination of two transition moments in kenyan politics, *American Political Science Review* **91**(3): 599–616.

Ng, S. (1981). Equity theory and the allocation of rewards between groups, *European Journal of Social Psychology* **11**: 439–444.

Ngau, P, M. (1987). Tensions in empowerment: The experience of the harambee (self-help) movement in kenya, *Economic Development and Cultural Change* pp. 523–538.

Ng'ethe, J. (1979). *Harambee and Development Participation in Kenya: The problems of peasants and elites' interaction with particular reference to harambee projects in Kiambu District.*, PhD thesis, Carleton University . Ottawa.

Nowell, C. and Tinkler, S. (1994). The influence of gender on the provision of a public good, *Journal of Economic Behavior and Organization* **25**: 501–518.

Odhiambo-Mbai, C. (2003). Accountability and governanace in kenya since independence, *African Journal of Political Science* **8**(1).

Ostrom, E., Walker, J. and Gardner, R. (1992). Covenants with and without a sword: Self-governance is possible, *American Political Science Review* **86**(2): 404–417.

Park, H. (2003). Determinants of corruption: A cross-national analysis, *The Multinational Business Review* **11**: 29–48.

Person, Torsten, Guido, T. and Francesco, T. (2003). Electoral rules and corruption, *Journal of European Economic Association* **1**: 958–989.

Phillips, A. (1991). *Engendering Democracy*, Cambridge: Polity Press.

Posner, D., N. (2004). Measuring ethnic fractionalization in africa, *American Journal of Political Science* **48**(4): 849–863.

Poteete, A. and Ostrom, E. (2004). Heterogeneity, group size and collective action: The role of institutions in forest management, *Development and Change* **35**: 435–461.

Poterba, J. (1997). Demographic structure and political economy of public education, *Journal of Policy Analysis and Management* **16**(1): 48–66.

Rabbie, J. and Horwitz, M. (1969). Arousal of ingroup-outgroup bias by a chance win or loss, *Journal of Personality and Social Psychology* **13**: 269–277.

Rabbie, J. and Lodewijkx, H. (1994). Conflict and aggression: An individual-group continum, *Advances in Group Processes* **2**: 139–174.

Rabbie, J., Schot, J. and Viser, L. (1989). Social identity theory: A conceptual and empirical critique from the perspectives of a behavioral interaction model, *European Journal of Social Psychology* **19**: 171–202.

Rapoport, A. and Chammah, A. (1965). Sex differences in factors contributing to the level of cooperation in the prisoner's dilemma game, *Journal of Personality and Social Psychology* **2**: 831–838.

Rauch, J. and Evans, P. (2000). Bureaucratic structure and bureaucratic performance in less developed countries, *Journal of Public Economics* pp. 49–62.

Raudenbush, S. and Bryk, A. (1986). A hierarchical model for studying school effects, *Sociology of Education* **59**: 1–17.

Ringera, A. (2005). Roadmap to a corruption free environment in kenya: Keynote address, *Technical report*, Kenay Anti-Corruption Commission.

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.

Rose-Ackerman, S. (1975). The economics of corruption, *Journal of Public Economics* **4**(February).

Rose-Ackerman, S. (1978). *The Political Economy of Corruption*, New York: Academic Press.

Roth, A. (1988). Laboratory experimentation in economics: A methodological overview, *The Economic Journal* **98**: 974–1031.

Ruppert, D., Wand, M. and Caroll, R. (2003). *Semiparametric Regression*, Cambridge: Cambridge University Press.

Schulze, G. and Frank, B. (2003). Deterrence versus intrinsic motivation: Experimental evidence on the determinants of corruptibility, *Economics of Governance* **4**: 143–160.

Seguino, S. and Lutz, M. (1996). Gender and cooperative behavior: Economic man rides alone, *Feminist Economics* **2**: 1–21.

Seldadyo, H. and Haan, J. (2006). The determinants of corruption: A literature survey and new evidence, *EPCS Conference* .

Sell, J. and Wilson, R. (1991). Levels of information and contributions to public goods, *Social Forces* **70**: 107–124.

Sell, J. and Yeongi, S. (1997). Comparing public goods with common pool resources: Three experiments, *Social Psychology Quarterly* **60**: 118–137.

Serra, D. (2006). Empirical determinants of corruption: A sensitivity analysis, *Public Choice* **126**(1): 225–256.

Shang, J. and Croson, R. (2008). Field experiments in charitable contributions: The impact of social influence on the volutary provision of public goods, *Working Paper* .

Sherif, M., Harvey, O., White, B., Hood, W. and Sherif, C. (1961). *Intergroup Conflict and Cooperation: The Robbers Cave Experiment*, Norman: Institute of Group Relations, University of Oklahoma.

Shleifer, A. and Vishny, R. (1993). Corruption, *The Quarterly Journal of Economics* **108**: 599–617.

Shleifer, A. and Vishny, R. (1994). Politicians and firms, *Quarterly Journal of Economics* **109**.

Singer, J. (1998). Using sas proc mixed to fit multilevel models, hierarchical models and individual growth models, *Journal of Educational and Behavioural Statistics* **24**(4): 323–355.

Sosa, L. A. (2004). Wages and other determinants of corruption, *Review of Development Economics* **8**(4): 597–605.

Sung, H. E. (2003). Fairer sex or fairer system? gender and corruptio revisited, *Social Forces* **82**: 703–723.

Swamy, A., Knack, S., Lee, Y. and Azfar, O. (2001). Gender and corruption, *Journal of Development Economics* pp. 25–55.

Tajfel, H. (1982). Social psychology of intergroup relations, *Annual Review of Psychology* **33**: 1–39.

Tajfel, H. and Billig, M. (1974). Familiarity and categorization in intergroup behavior, *Journal of Experimental Social Psychology* **10**: 159–170.

Tajfel, H., Billig, M., Bundy, P. and Flament, C. (1971). Social categorization and intergroup behavior, *European Journal of Social Psychology* **1**: 149–178.

Tajfel, H. and Turner, J. (1979). An integrative theory of intergroup conflict, *in* W. Austin and S. Worchel (eds), *The social psychology of intergroup relations*, Monterey, CA: Brooks/Cole, pp. 33–47.

Tanzi, V. (1998). Corruption around the world- cause, consequences, scope and cures, *IMF Staff Papers* pp. 559–594.

Tavares, J. (2003). Does foreign aid corrupt?:, *Economic Letters* **79**: 99–106.

Taylor, M. and Ward, H. (1982). Chickens, whales and lumpy goods: Alternative models of public goods provision, *Political Studies* pp. 350–70.

Transparency International (2003). Harambee: The spirit of giving or reaping?, *Technical report*, Transparency International Kenya.

Transparency International (2009a). *Corruption Perception Index 2009*, Transparency International.

Transparency International (2009b). *Kenya Bribery Index 2008*, Transparency International.

Treisman, D. (2000). The causes of corruption: A cross-national study, *Journal of Public Economics* pp. 399–457.

Turner, J., Brown, R. and Tajfel, H. (1979). Social comparison and group interest in ingroup favouritism, *European Journal of Social Psychology* **9**: 187–204.

Turner, J., Hogg, M., Oakes, P., Reicher, S. and Wetherell, M. (1987). *Rediscovering the social group: A self-categorization theory*, Oxford: Blackwell.

van der Merwe,W and Burns,J. (2008). What's in a name? racial identity and altruism in post-apartheid south africa, *South Africa Journal of Economics* **76**(2).

VanRijkeghem, C. and Weder, B. (1997). Corruption and the rate of temptation: Do low wages in the civil service cause corruption?, *IMF Working Paper WP/97/73* .

VanRijkeghem, C. and Weder, B. (2001). Bureaucratic corruption and the rate of temptation: Do wages in the civil service affect corruption, and by how much?, *Journal of Development Economics* **65**: 307–331.

Velez, M., Murphy, J. and Stranlund, J. (2006). Within and between group variation of individual strategies in common pool resources: Evidence from field experiments, *University of Massachusetts-Amherst, Working Paper* .

Vigdor, J. (2004). Community composition and collective action: Analyzing initial mail response to the 2000 census., *Review of Economics and Statistics* **86**(1): 303–12.

Wahome, G. (2007). *Kenya State of Corruption Report*, Claripress Ltd.

Waiguru, A. (2002). Corruption and patronage politics: The case of harambee in kenya.

Waithima, A. K. (2007). Corruption and economic growth in kenya, *Perspectives* **1**: 69–83.

Wei, S.-J. (2000a). How taxing is corruption on international investors, *Review of Economics and Statistics* **82**: 1–11.

Wei, S.-J. (2000b). Bribery in the economies: Grease or sand?, *World Bank Working Paper* .

Wilson, L. (1992). The harambee movement and efficient public good provision in kenya, *Journal of Public Economics* **48**: 1–19.

World Bank (2000). *Helping Countries Combat Corruption: Progress at the World Bank since 1997*, World bank.

World Bank (2001). *Engendering development through equality in rights, resources and Voice*, World Bank.

Wrong, M. (2009). *It's our turn to eat: The story of a Kenyan whisleblower*, Fourth Estate Ltd (Harpercollins Publishers). UK.

Yamagishi, T., Jin, N. and Kiyonari, T. (1999). Bounded generalized reciprocity: Ingroup boasting and ingroup favoritism, *Advances in Group Processes* **16**: 161–197.

Yamagishi, T. and Kiyonari, T. (2000). The group as the container of generalized reciprocity, *Social Psychological Quarterly* **63**(2): 116–132.

Appendix A

Appendix for chapter three

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 1and 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 A.1 gives a summary of payoffs for the various players in different scenario.

Table A.1: Payoffs in different scenario

Scenario	**Payoffs for the three players**		
	Player One (Manager)	Player Two (PO)	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, player2 accepts and 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.

A.1.1 Instructions to individual players

The panels on tables A.2, A.3 and A.4 show the communication to each of the three players in the game

Table A.2: Panel for player one in the gender game

<table>
<tr><td colspan="3">This is a 3 persons interactive game in which final payoff is dependent
on a player's move and those of the other players. You are player number 1.
Your initial endowment is .....tokens.
The other two players and their gender are :</td></tr>
<tr><td colspan="2">Player number 2
Player number 3</td><td>Gender .....
Gender.....</td></tr>
<tr><td colspan="3">You have a chance to enhance your payoff by transferring some of
your tokens to player 2. The transfer cost is 20 tokens.</td></tr>
<tr><td colspan="3">If player 2 accepts your transfer, your payoff will increase by 2 times
the transfer amount while player 2 will benefit by 2.5 times.
Player Three's payoff will decrease by the transfer amount.</td></tr>
<tr><td colspan="3">At his or her own cost, player 3 may choose to punish both of you.
If player 3 chooses to punish by P amount, your payoff will decrease
by 3P while that of player 2 will decrease by 4P</td></tr>
<tr><td colspan="3">If you choose not to transfer, each of you will end up with you .
initial endowments as the final payoffs</td></tr>
<tr><td>Do you wish to transfer?</td><td>() Yes

() No</td><td>The transfer amount should be
between 50 and 80 tokens
Transfer amount .....</td></tr>
<tr><td colspan="3">You will be able to know your final payoff once you answer the following
questions. We pledge strict confidentiality.</td></tr>
</table>

Table A.3: Panel for player two in the gender game

This is a 3 persons interactive game in which final payoff is dependent on a your move and those of the other players. You are player number 2. Your initial endowment is .....tokens. The other two players and their gender are :	
Player number 1 Player number 3	Gender..... Gender.....
Player 1 has transferred .....tokens to you. If you accept the transfer, your payoff will go up by 2.5 times while player 1 will benefit by 2 times the amount. Player three's payoff will decrease by the transfer amount.	
Player 3 can at his/her cost choose to punish both of you. If player three choose to punish by P amount, your payoff will decrease by 4P while that of player 1 will go down by 3P.	
Do you wish to accept the transfer from player 1?	() Yes () No () Player one did not transfer
You will be able to know your final payoff once you answer the following questions. We pledge strict confidentiality.	

Table A.4: Panel for player three in the gender game

This is a 3 persons interactive game in which final your final payoff is dependent on your move and those of the other players. You are player number 3. Your initial endowment is .....tokens. The other two players and their gender are :		
Player number 1 Player number 2		Gender ..... Gender.....
Player 1 has transferred .....tokens to player 2.		
Player 2 has accepted the transfer. Player 1 benefits by 2 times the transfer amount while player 2 benefits by 2.5 times the transfer amount. As a result, your payoff will decline by the transfer amount.		
At your own cost, you can choose to punish both player 1 and 2. If you choose to punish by P amount, player one's payoff will decrease by 3P while that of player 2 will decrease by 4P. Your own payoff will decrease by the punishment amount.		
Do you wish to punish player 1 and 2?	() Yes () No () Player one did not transfer or player 2 did not accepted the transfer	The punishment amount should be between 40 and 65 tokens Punishment amount .....
You will be able to know your final payoff once you answer the following questions. We pledge strict confidentiality.		

Appendix B

Appendix for chapter four

B.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 1and 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 B.1 gives a summary of payoffs for the various players in different scenario.

Table B.1: Payoffs in different scenario

Scenario	**Payoffs for the three players**		
	Player One (Manager)	Player Two (PO)	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, player2 accepts and 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.

Instructions to individual players

The panels on tables B.2, B.3 and B.4 show the communication to each of the three players in the game

Table B.2: Panel for player one in the ethnicity game

<table>
<tr><td colspan="3">This is a 3 persons interactive game in which final payoff is dependent on a player's move and those of the other players. You are player number 1
Your initial endowment is .....tokens.
The surnames of the other two players are :</td></tr>
<tr><td colspan="2">Player number 2
Player number 3</td><td>Surname .....
Surname.....</td></tr>
<tr><td colspan="3">You have a chance to enhance your payoff by transferring some of your tokens to player 2. The transfer cost is 20 tokens.</td></tr>
<tr><td colspan="3">If player 2 accepts your transfer, your payoff will increase by 2 times the transfer amount while player 2 will benefit by 2.5 times.
Player Three's payoff will decrease by the transfer amount.</td></tr>
<tr><td colspan="3">At his or her own cost, player 3 may choose to punish both of you.
If player 3 chooses to punish by P amount, your payoff will decrease by 3P while that of player 2 will decrease by 4P</td></tr>
<tr><td colspan="3">If you choose not to transfer, each of you will end up with you .
initial endowments as the final payoffs</td></tr>
<tr><td>Do you wish to transfer?</td><td>() Yes

() No</td><td>The transfer amount should be between 50 and 80 tokens
Transfer amount .....</td></tr>
<tr><td colspan="3">You will be able to know your final payoff once you answer the fill the questionnaire. We pledge strict confidentiality.</td></tr>
</table>

Table B.3: Panel for player two in the ethnicity game

This is a 3 persons interactive game in which final payoff is dependent on your move and those of the other players. You are player number 2. Your initial endowment is .....tokens. The surnames of the other two players are:	
Player Number 1 Player Number 3	Surname..... Surname.....
Player 1 has transferred .....tokens to you. If you accept the transfer, your payoff will go up by 2.5 times while player 1 will benefit by 2 times the amount. Player three's payoff will decrease by the transfer amount.	
Player 3 can at his/her cost choose to punish both of you. If player three choose to punish by P amount, your payoff will decrease by 4P while that of player 1 will go down by 3P.	
Do you wish to accept the transfer from player 1?	() Yes () No () Player one did not transfer
You will be able to know your final payoff once you answer the following questions. We pledge strict confidentiality.	

Table B.4: Panel for player three in the ethnicity game

This is a 3 persons interactive game in which your final payoff is dependent on your move and those of the other players. You are player number 3. Your initial endowment is .....tokens. The surnames of the other two players are:		
Player number 1 Player number 2		Surname ..... Surname.....
Player 1 has transferred .....tokens to player 2.		
Player 2 has accepted the transfer. Player 1 benefits by 2 times the transfer amount while player 2 benefits by 2.5 times the transfer amount. As a result, your payoff will decline by the transfer amount.		
At your own cost, you can choose to punish both player 1 and 2. If you choose to punish by P amount, player one's payoff will decrease by 3P while that of player 2 will decrease by 4P. Your own payoff will decrease by the punishment amount.		
Do you wish to punish?	() Yes () No () Player one did not transfer or player 2 did not accepted the transfer	The punishment amount should be between 40 and 65 tokens Punishment amount .....
You will be able to know your final payoff once you answer the following questions. We pledge strict confidentiality.		

Appendix C

Appendix for chapter five

C.1 Notes to subjects

C.1.1 Harambee and Common Pool Resource Game

- This game is played by a group of 10 people.
- The game consist of 2 sub-games (a public good (PG)and a common pool resource (CPR) game), the sub-games follow each other.
- Participants will randomly be assigned to groups and will be given time to interact and lay a strategy for the game.
- A member in any of the groups is not bound by the group strategy since the group's objective may be at variance with individual objective.

Public Good game

- In the public good game each member will be given an initial endowment of 100 tokens from he makes a decision on how much to contribute to a common kitty.
- Each person's contribution is only known to himself.
- When every member has had a chance to contribute to the kitty, the experimenter will multiply the amount by 5.

- At the end of the game, the kitty is shared out equally among the group members regardless of individual members contributions.
- A member benefits from his contribution and that of other members.
- At the end of this game a player gets:

$$P_{ij} = W - X_i + \frac{h(\sum_{i=1}^{n} X_{ij})}{n} \tag{C.1}$$

Common Pool Resource (CPR) game

- In the common pool resource game (CPR), we start off with 1000 tokens kitty available for the group.
- Each member will have a chance to anonymously extract an amount from the kitty.
- The amount that an individual extracts will only be known to the individual
- After everyone has had a chance to extract from the kitty, the experimenter will multiply the amount left by 5.
- At the end of the game, the kitty is shared out equally among the members regardless of what an individual member extracted from the common kitty.
- At the end of the game, a player gets:

$$F_{ij} = R_i + \frac{g(\sum_{i=1}^{n}(G - R_i))}{n} \tag{C.2}$$

- Where Ri is what individual i extracts from the kitty, g is the factor by which the kitty grows, G is kitty available to the group, and n is number of people in the group.
- From the 2 games, the i^{th} player in group j final payoff is:

$$PF_{ij} = P_{ij} + F_{ij} \tag{C.3}$$

- Each player will be required to fill in a questionnaire before they get to know their final payoff.
- Read each question carefully and provide an honest answer.
- Note that each question must be answered before submission.

Table C.1 shows the interactive panel of the game.

Table C.1: The Interactive PG and CPR games panel

This game consists of 2 sub-games; harambee and common pool resource	
Indicate your gender	( ) Male ( ) Female
Indicate your ethnic identity	( ) Kikuyu ( ) Luhya ( ) Luo ( ) Kalenjin ( ) Kisii ( ) Kamba ( ) Others
Harambee sub-game	
Each member of your group has an initial endowment of **100 tokens** from which each one will be asked to individually and independently make a contribution to contribute to a common kitty. Each one's contribution can . range between **0 and 100 tokens**	
The experimenter will multiply the total sum of what your group contribute by **5** and then share the product equally among the group members regardless of individual member's contribution.	
Indicate the amount you would like to contribute	.....tokens
Common Pool Resource sub-game	
Your group has **1000 tokens** and each of you will be given a chance to independently and anonymously draw any amount from the pool. Anyone is free to draw any amount between **0 and 1000 tokens**.	
The experimenter will multiply whatever remains in the pool after each of you has drawn by **5** and then share the product equally among the members of the group regardless of the amount that an individual member drew out.	
Indicate the amount you would like to draw out from the common pool for yourself	.....tokens
You will get to know your final payoff once every member of your group has had a chance to play the game. Kindly proceed to the questionnaire. Note that all the questions must be answered. We pledge strict confidentiality.	

Table C.2: Mean contributions and withdrawals by ethnic groups

Ethnic group	Mean contribution to PG	Mean withdrawal from CPR
Kikuyu	63.96	191.5
Luo	61.31	243.88
Luhya	54.49	246.96
Kalenjin	62.87	264.5
Kisii	59.3	259.6
Kamba	55.9	220
Others	63.8	192.12

Table C.3: Mean contributions and extractions by centres

University	No. of subjects	Mean PG contribution	Mean CPR extraction
Kimathi	59	67.8	54.1
KEMU	78	52.8	57.7
Lower Kabete	47	71.4	455.4
Eldoret Polytechnic	69	52.2	305.9
Daystar Nairobi	57	53.2	126.3
Masinde Muliro	53	48.5	295.3
Daystar Athi River	37	79.9	286.5
Maseno	58	31	283.6
Mombasa Polytechnic	65	48.9	129.1
Garisa Institute	72	58.7	253
Egerton	73	91.2	300.6
Moi	93	64.9	336.5
MKU	94	72.5	156.2
Kabarak	86	62	167.4

C.2 Basic concept behind Hierarchical Linear Model (HLM)

The within-group model specifies the relationship among subject-level characteristics and the variable of interest such as PG contribution. For each group, the estimated PG contribution model is as follows:

$$\begin{aligned} pgcont_{ij} &= \alpha_{j0} + \alpha_{j1}X_{ij1} + \alpha_{j2}X_{ij2} + ... \\ &\quad +\alpha_{jk-1}X_{ijk-1} + \eta_{ij} \end{aligned} \tag{C.4}$$

for $i = 1.....n$ subjects in group j; $j = 1....J$ groups; and $k = 0....K-1$ independent variables. $pgcont_{ij}$ is the PG contribution for subject i in group j, X_{ijk} are the values on the subject-level characteristics for subject i in group j, η_{ij} is the random error term and α_{jk} are the regression coefficients that characterize the structural relationship of the subjects within group j. The regression coefficients $\alpha_{jk}$are allowed to vary across groups.

The variability in the regression parameters are a function of the decisions that were reached in individual groups given that each group was given time to interact and lay common strategies. Allowing this variability yields a between-group model. For each of the K regression coefficients in equation C.4, it is assumed that:

$$\alpha_{jk} = \varphi_{0k} + \varphi_{1k}Z_{1j} + \varphi_{2k}Z_{2j} + ... + \varphi_{p-1k}Z_{p-1j} + \nu_{jk} \tag{C.5}$$

for $p = 0.....P-1$ independent variables in the between-group model, where the φ_{pk} are regression coefficients that capture the effects group-level variables on the within-group structural relationships (α_{jk}), ν_{jk} is the random error in this group-level equation and the Z_{pj} are values on the group-level variables for group j.

Substituting equation C.5 into C.4 yields:

$$
\begin{aligned}
pgcont_{ij} &= \varphi_{00} + \sum_{k=1} \varphi_{0k} X_{ijk} + \sum_{p=1} \varphi_{pk} Z_{pj} + \sum_{k=1} \sum_{p=1} \varphi_{pk X_{ijk} Z_{pj}} \\
&\quad + v_{j0} + \sum_{k=1} \nu_{jk} + \eta_{ij} \qquad \text{(C.6)}
\end{aligned}
$$

Equation C.6 is the HLM where the last term ($v_{j0}+\sum_{k=1} \nu_{jk}+\eta_{ij}$) represent the error term. When there are no random effects in the between-group model ($v_{jk} = 0$ for all j, k), the HLM becomes equivalent to an OLS model that includes subject-level variables X_{ijk}, group-level variables Z_{pj} and their interaction terms $X_{ijk}Z_{pj}$. When the random effects remain (when one or more of the v_{jk} are not equal to zero), the application of OLS to equation C.6 is inefficient and the estimated standard errors are too small. In our analysis, we report both OLS and HLM regression results.