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Can mobile banking reduce the presence of corruption?

A minor field study in Kenya

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ABSTRACT

Corruption and lack of transparency go hand in hand in poor countries. As most corrupt countries in the world can be found on the African continent, these countries have become a main target for strategies with anti-corruption movements. Despite the widespread phenomenon of corruption in this area, the technology development is prosperous, and owning a mobile phone is more common than having a toilet. This study considers the case of Kenya, which is one of the poorest and most corrupt countries in the world. Over the last seven years the country has faced a radical shift from the traditional financial banking system towards a financial system based on an electronic platform. The platform, named M-Pesa, provides mobile phone-based payment and transfer services for everyone with a mobile phone. This technological innovation has had a tremendous success with users countrywide. As a result of this development, this paper examines how the large-scale mobile phone-based payment system is used, and attempts to empirically test if it has been a successful strategy to decrease corruption in Kenya. The relationship can be explained by public choice theory, but this study reveals that the Kenyan context of corruption may be seen as being within a collective choice framework where the cost of fighting corruption outweighs the benefits. The paper applies microeconomic data on two hundred households with the aim of developing a model, which is then linked to the adoption of M-Pesa and to its impact. The aim of this paper is to give a deeper understanding of how M-Pesa affects economic growth in terms of reducing corruption. The results of testing the relationship between M-Pesa and corruption yield some but not full supportive empirical evidence for the hypothesis in this study.

Keywords: Kenya, Mobile Banking, M-Pesa, Public and Private sector, Corruption, Anti-Corruption Efforts, Economic Growth, Technology Innovation

CONVERSIONS

100 KES = 7.42 SEK = 1.13 USD

GLOSSARY OF ABBREVIATIONS

SIDA	Swedish International Development Cooperation Agency
GCB	Global Corruption Barometer
KACC	Kenya Anti-Corruption Commission
ESCC	Ethics and Anti-corruption Commission
ICC	International Criminal Court
CAJ	The Commission on Administrative Justice
EAC	East African Community
FDI	Foreign Direct Investments
ICT	Information and Communication Technology
SSA	Sub-Saharan Africa
CCK	Communications Commission of Kenya
ISCO	International Standard Classification of Occupations
ISCED	International Standard Classification of Education
OLS	Ordinary Least squared
LPM	Linear probability model
UNESCO	United Nation's organization for education, science and culture
LR	Likelihood ratio method

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1. INTRODUCTION

This chapter contains a brief description of mobile banking and corruption along with a presentation of the relationship as well as the outline of the thesis.

If you sometime in the last year have been involved in the culture of bribery and grants, you are not the only one. In 2013 more than a quarter of the world's population paid a bribe in terms of money or gifts to the public platform.[1] In addition, more than six billion people of the world's population had access to a mobile phone compared to only four and a half billion people that had access to a toilet in 2013.[2] In Kenya around 70 per cent of the population had mobile phone subscriptions and according to the World Bank the phones were mainly used for the mobile payment system called M-Pesa rather than other applications.[3,4] The extent of M-Pesa in Kenya might have big potential to replace cash and disclose the lack of transparency, increase accountability and in turn remove opportunities for corrupt.[5]

This paper evaluates if the mobile programme, M-Pesa, has an impact on corruption in Kenya. M-Pesa is a financial system built on an electronic platform providing a mobile phone-based payment and a transfer service to everyone with a mobile phone. The services are based on e-floats allowing individuals to deposit, send and withdraw money by using their mobile phones.[6] Safaricom first implemented M-Pesa in Kenya 2007 and rapidly received over 50 000 subscribers. Today, 19.42 million of the Kenyan population use M-Pesa, and around 8.9 billion US dollars has been transferred since the beginning.[7,8,9] The amount of the transactions is equal to 43 per cent of Kenya´s GDP.[10] This explosive growth can also be observed in the extent of M-Pesa agents countrywide. In 2007 Safaricom operated about 355 agents and in 2011 more than 27 000 agents were located across Kenya.[11] The fast adoption of M-Pesa, combined with a lack of financial services in Kenya, has given rise to an effective alternative to the traditional banking system.[12]

[1]Hardoon, D. and Heinrich, F., (2013), Global Corruption Barometer 2013, Transparency International, http://issuu.com/transparencyinternational/docs/2013_globalcorruptionbarometer_en?e=2496456/3903358#search
[2] UN News Centre, (2013), Deputy UN chief calls for urgent action to tackle global sanitation crisis, United Nation News Center, http://www.un.org/apps/news/story.asp?NewsID=44452&Cr=sanitation&Cr1=#.U3nimTnwK9P
[3]The World Bank, Mobile cellular subscriptions, http://data.worldbank.org/indicator/IT.CEL.SETS.P2
[4] Candall, A., Otieno, A., Mutuku, L., Colaco, J., Grosskurth, J., and Otieno, P., (2012), Mobile Phone Usage at the Kenyan Base of the Pyramid, iHub Research and Research Solutions Africa, http://blogs.worldbank.org/ic4d/files/ic4d/mobile_phone_usage_kenyan_base_pyramid.pdf
[5]Krolikowski, A., Fu, X., and Hope, R,. (2013), Wireless Water: Improving Urban Water Provision Through Mobile Finance Innovations, ttp://oxwater.co.uk/#/mobile-water-payments/4559323117
[6]Suri, T. and Jack, W., (2011), Mobile Money: The Economics of M-PESA, NBER Working Paper No. 16721
[7]Safaricom, (2013), Safaricom Limited Annual Report,, http://www.safaricom.co.ke/images/Downloads/Resources_Downloads/Annual_Report.pdf
[8]Safaricom, Video: A Journey that Kenyans have chosen, http://nchinampesa.safaricom.co.ke/#scroll,
[9]Safaricom, Timeline, http://www.safaricom.co.ke/mpesa_timeline/timeline.html
[10]Safaricom, Nchi na Safaricom M-PESA ,http://www.safaricom.co.ke/personal/m-pesa/nchi-na-safaricom-m-pesa,
[11]Safaricom, M-PESA Customer and Agent Numbers, http://www.safaricom.co.ke/images/Downloads/Personal/M-PESA/m-pesa_statistics_-_2.pdf
[12]Michaels, L., (2011), It's Better Than Cash: Kenya Mobile Money Market Assessment, Accenture, https://communities.usaidallnet.gov/ictforag/bitcache/21ac0850dc58d2fb5cb8cb2b99332b6b8d6b2151?vid=220&disposition=attachment&op=download

This new mobile phone based banking system may reduce the use of cash in Kenya and therefor be a step towards a reduction of corruption.

Despite that corruption is only characterized by negative challenges for countries, there is no question that corruption is a widespread phenomenon existing around the world, especially across undeveloped economies. The Swedish International Development Cooperation Agency (SIDA) defines corruption as the abuse of entrusted power conducted by authorities, institutions and governments. Corruption includes for instance receiving bribes with the aim of performing a favour as well as obtaining unfair advantages or benefits for someone else. These beneficial services are in general related to individual's position, power and work duties.[13]

Kenya has been described as one of the most corrupted economies in the Sub-Saharan region since its independence from Great Britain 1963. Thus, in recent years the country has experienced a period characterized by reforms and rules of law legislated with the aim of bringing major gains in terms of controlling corruption. As the president Kibaki won the 2002 election with an anti-corruption agenda, the country faced a radical shift towards a democratic nature with different anti-corruption strategies. However, within two years after the election different corruption scandals followed each other and the credibility of the government decreased.[14] According to the Corruption perception index for 2013, Kenya was ranked 136 out of 175 corrupt countries.[15]

Corruption is seen as a social phenomenon in traditional economic theory. According to the public choice approach as well as the neo-institutional model, the lack of transparency and information is the key factor in economic crimes such as bribery and grants. However, by introducing the mobile innovations, the spatial and temporal money barriers might be eliminated depending on the behaviour of the actors. At the same time our study observes that the Kenyan context of corruption can instead be viewed in a collective choice framework. This model states that the cost of fighting corruption outweighs the benefits, which makes it hard for the mobile platform to disclose the corruption-related activities.[16,17]

[13]Sida, The Communication Departement, (2013) Corruption affects development, http://www.sida.se/English/About-us/How-we-operate/Our-Work-Against-Corruption/,
[14]Anti-Corruption Resource Center: http://www.u4.no/publications/kenya-overview-of-corruption-and-anti%20corruption/downloadasset/3114
[15]Transparancy International, Corruption Perception Index 2013, http://www.transparency.org/cpi2013/results
[16]Morawczynski, O., and Pickens, M., (2009), Poor People Using Mobile Financial Services: Observations on Custumer Usage and Impact from M-PESA, CGAP Publication, https://openknowledge.worldbank.org/bitstream/handle/10986/9492/503060BRI0Box31MPESA1Brief01PUBLIC1.pdf?sequence=1
[17]Persson, A., Rothstein, B., and Teorell, J., (2010), The failure of Anti-Corruption Policies A Theoretical Mischaracterization of the Problem, QoG Working Paper Series 2010:19, SIDA: https://www.sida.se/PageFiles/39460/Failure%20Anti_Corruption%20policy%20(2).pdf

Corruption and M-Pesa are two areas where there has been widespread research presented but the relationship between these two terms is not observed to the same extent. However, there are two studies, conducted in Afghanistan and Tanzania, showing that mobile phone payment can be an anti-corruption alternative. The former analyses the relationship by observing the change of a policeman's salary before and after the implementation of the mobile system. The latter estimates the impact of the mobile-based system in terms of payments for public provided services in order to analyse if the mobile platform can be used for decreasing corrupt-related activities.[18,19]

In this paper we will investigate the situation in Kenya and if the mobile banking system may be a successful strategy against corruption. In order to investigate this relationship we will perform regressions based on individual level data from Kenya. The aim of this research is to identify the possible patterns of change in corruption since the implementation of M-Pesa in Kenya.

The structure of this paper is as follows. In section two the aim of this paper as well as our research limit is presented. In section three we present background information on Kenya and the current situation in terms of economic growth as well as the country's role in the world. In sections four and five we separately define and generally explain the mobile banking system, M-Pesa as well as the different forms of corruption. Furthermore we also describe the situation of the mobile system and corruption in more detail for the case of Kenya. In section six we go through the theoretical framework that observes the relationship between M-Pesa and the corruption in Kenya. Section seven reviews previous literature on the impact of M-Pesa on different economic factors. The methodology and estimation strategy are presented and discussed in the following section. The database and a summary of the sample are also given. Section nine contains the results and finally section ten summarizes the findings on the impact of the use of M-Pesa on corruption.

2. RESEARCH QUESTION

This chapter covers an explanation of the question, which will be analysed along with arguments for conducting the thesis in Kenya.

In this paper we aim to answer the question "*Can mobile banking reduce the presence of corruption in Kenya?"*

[18] Maurer, B., Chipchase, J., and Lee, P., (2011), Mobile Money: Afghanistan, innovations / volume 6, number 2, http://www.mitpressjournals.org/doi/pdf/10.1162/INOV_a_00067
[19] Krolikowski, A., Fu, X., and Hope, R,. (2013), Wireless Water: Improving Urban Water Provision Through Mobile Finance Innovations, http://oxwater.co.uk/#/mobile-water-payments/4559323117

Mobile banking, that is using your mobile phone to do bank services, has been a success in Sub-Sahara Africa (SSA) in terms of the number of users and easy access to financial services. It has also been suggested that this technical development might democratize the public sector as well as the private because mobile banking limits the use of cash and therefor makes it easier to "follow the money" since it leaves a digital print. [20] This suggested development would be very interesting since Africa, and especially SSA, is one of the most corrupt parts of the world.

We have chosen to investigate the relationship between mobile banking and corruption in Kenya, since Kenya is one of the most corrupt countries in the world and M-Pesa, which is the name of the mobile banking system in Kenya, is the most successful banking system in SSA. In addition, the mobile banking system in SSA was first established in Kenya and was launched by Safaricom in March 2007. [21,22]

We have decided to limit our study to M-Pesa even though there was a new service launched in 2012 called M-Shwari. The reason for the limitation is that M-Shwari was recently introduced to the market and there is not yet sufficient information available.

3. A SNAPSHOT FROM KENYA

A short summary of the history of Kenya will be presented in this chapter along with some basic information that characterizes the country and its politics.

The official name today is Republic of Kenya and the 580 000 km^2 large country is located in Sub-Saharan Africa with Somalia, Tanzania, Ethiopia, Uganda and Sudan as bordering countries. In total there are approximately 44 million inhabitants, which is about average for African countries. 3.4 million of the country's inhabitants live in the capital Nairobi. In addition, the population is relative young and more than 40 per cent are under the age of fourteen.[23]

Figure 1: Map over Kenya

Kenya is one of the world´s poorest countries and almost 45 per cent of the Kenyan population live below the poverty line. Despite this, Kenya has had a steady economic growth with an annual increase of five to

[20]Buku, M., Meredith, M., (2013), Safaricom and M-PESA in Kenya: Financial Inclusion and Financial Integrity, Washington Journal of Law, Technology & Arts Volume 8, Issue 3, https://digital.law.washington.edu/dspacelaw/bitstream/handle/1773.1/1204/8WJLTA375.pdf?sequence=5
[21]T.S, (2013), Why does Kenya lead the world in mobile money?, The Economist, http://www.economist.com/blogs/economist-explains/2013/05/economist-explains-18,
[22]Buku, M., Meredith, M., (2013), Safaricom and M-PESA in Kenya: Financial Inclusion and Financial Integrity, Washington Journal of Law, Technology & Arts Volume 8, Issue 3, https://digital.law.washington.edu/dspacelaw/bitstream/handle/1773.1/1204/8WJLTA375.pdf?sequence=5
[23]The World Factbook, Central Intelligence Agency, https://www.cia.gov/library/publications/the-world-factbook/geos/ke.html

six per cent the last five years. As a result, the income gap has increased rapidly among the inhabitants and the richest 10 per cent of the population earn approximately 44 per cent of the national income compared to the bottom 10 per cent that only earn less than one per cent.[24]

In 1885 Kenya was under German rule but only a few years later it became a British colony and was officially named British East Africa. After an 11 year long war of independence against the British colonialism starting in 1952 with the mau-mau Rebellion, Kenya became an independent nation in 1963. The Independence Day is celebrated on 12 December.[25] Since freedom, over 40 different ethnic groups have characterized Kenya. In recent years there have been several divergences of the groups ending up in ethnic violence with numerous causalities.[26]

Education is one of the most important goals for the government in Kenya with the aim of becoming a middle-income country in 2030. In order to achieve the goal, Kenya has made primary and secondary school free for everyone. This has resulted in a rapid increase of people being educated and in 2013 almost three million more children were enrolled in primary school in comparison with 2003. This is an increase corresponding to 46 per cent. As a result of these investments, almost 90 per cent of the population, older than 15 years, are today able to read and write. However this positive process is also marked by some consequences such as pressure on the teaching force, the quality of education given as well as infrastructure.[27]

The current government has invested in infrastructure to increase the possibility of trade. However, the investments have been too low and for this reason Kenya's position as the largest economy in East Africa is vulnerable. Almost 18 million of the population are included in the Kenyan labour force but the unemployment rate is still approximately 40 per cent. Furthermore, the prevailing economic growth and development are a consequence of donations and lenders from abroad. The tourist industry is important and Kenya with its beautiful landscape and animal life is a popular safari destination. The reputation has however been threatened due to recent terror attacks in the surrounding areas.[28] Other issues Kenya is dealing with are criminality, poverty and droughts that millions of people suffer from regularly.[29,30]

[24]UNICEF, Kenya at a glance, http://www.unicef.org/kenya/overview_4616.html
[25]Swedish Government, Kenya, http://www.regeringen.se/sb/d/2574/a/75489
[26]Utrikespolitiska institutet, Landguiden Kenya, http://www.landguiden.se/Lander/Afrika/Kenya/Befolkning-Sprak
[27]US Agency for International Development, Kenya: Education, http://www.usaid.gov/kenya/education
[28] The World Factbook, Central Intelligence Agency, https://www.cia.gov/library/publications/the-world-factbook/geos/ke.html
[29] BBC News Africa, Kenya profile, http://www.bbc.com/news/world-africa-13681341
[30] The World Factbook, Central Intelligence Agency, https://www.cia.gov/library/publications/the-world-factbook/geos/ke.html

Kenya, Ivory Coast, Nigeria and Ghana are called the African KING countries since they are considered to be the frontier markets in Sub Saharan Africa.[31] In addition, Kenya and other east African countries also established a common market in 2010, called East African Community, EAC, to be more independent and not rely on aid from the rest of the world. The agreement has given possibilities to increase exports as well as foreign direct investments, FDI. The expectation is that this will stimulate the economic growth as well as development of Kenya.[32]

Kenya has a republican government form and a presidential election takes place every fifth year. Uhuru Kenyatta has been president since April 2013, as he won the election and replaced former president Mwai Kibaki. The election was peaceful compared to the post-election in 2007, which led to countrywide violence where almost 1500 were killed and 300 000 became homeless. The post-election violence ended when the new constitution was established. However, both President Kenyatta and vice-president William Ruto are currently being charged by the international Criminal Court for different crimes related to the post-election violence of 2007. The Kenyans see this prosecution as a milestone for the lack of legal action related to high civil servants. This incident, with the new constitution and a reformed judicial system have exposed several economic as well as corruption crimes and hopefully the country will face a future with a democratic system.[33]

4. MOBILE PHONE MARKET IN AFRICA

In this chapter the mobile market in Sub-Saharan Africa is introduced. It contains a preamble to the successful mobile banking platform in Kenya, and an example of how M-Pesa has disclosed the lack of transparency.

4.1 The extent of mobile money in Sub-Saharan Africa

The adoption of mobile phones has been miraculous and has occurred worldwide at the fastest rate ever observed in technology history. For the radio to obtain 50 million users it took 50 years. To reach the same number of users it took television 13 years and the Internet seven. For the mobile phone it only took three years and today the number of subscribers has reached approximately seven billion.[34]

[31] Kenne, B., (2014), Kenya, Ivory Coast, Nigeria, And Ghana: The African KINGs, http://seekingalpha.com/article/1954601-kenya-ivory-coast-nigeria-and-ghana-the-african-kings
[32] Swedish Government, Kenya, http://www.regeringen.se/sb/d/2574/a/75489
[33] Ibid
[34] Buku, M., Meredith, M., (2013), Safaricom and M-PESA in Kenya: Financial Inclusion and Financial Integrity, Washington Journal of Law, Technology & Arts Volume 8, Issue 3, https://digital.law.washington.edu/dspacelaw/bitstream/handle/1773.1/1204/8WJLTA375.pdf?sequence=5

The mobile technology has grown rapidly in SSA since the beginning of the century. In 2008 over 60 per cent of the people had mobile phone coverage, which can be compared with approximately 30 per cent in 2000. During the corresponding period of time the number of mobile phone subscribers increased from 16 million to 276 million.[35]

The growth of the mobile phone market in poor countries of SSA has exceeded all expectations. In Sub-Saharan Africa, there were 253 million subscribers in total the same year, which means there has been an annual growth of 18 per cent in five years. The subscribers are forecasted to reach 346 million by 2017, which would correspond to an annual growth of 43 per cent between 2012 and 2017. In addition, according to the World Bank data 2013, 16 per cent of the population in Sub-Saharan African used their mobile phones for financial transactions. The corresponding number in the rest of the developing world was three per cent.[36]

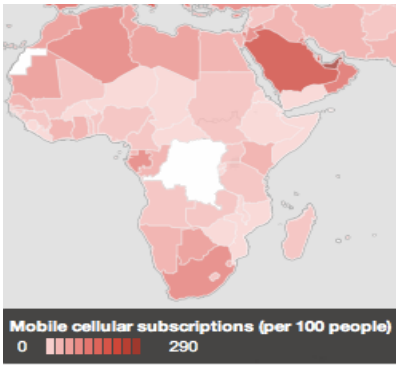


Figure 2: Mobile cellular subscriptions per 100 people

4.2 Mobile phone market – the case of Kenya

Kenya is far ahead of other African countries when it comes to technological innovations. Investments and market regulations to improve the mobile sector and develop the technology infrastructure have increased rapidly last year. In 2012 the mobile market represented more than 20 per cent of the contribution to the Kenyan Information and Communication Technology (ICT) sector.[37]

Kenya is generally seen as the global leader of mobile money. This title became concrete as the Kenyan telecom companies were established. The first publicly owned mobile phone companies in Kenya were introduced in the beginning of the 1990s but were only conventional to a small extent in the initial stage.[38] In the introduction stage the main company operating on the market was Safaricom, which today is the largest company on the Kenyan mobile market. Safaricom is currently privately owned and has strengthened its market role since the successful establishment of M-Pesa. The company has recently increased its annual market share by approximately 2 per cent points. Presently it corresponds to more than 65 per cent of the market share with 20 million subscribers. In addition, the mobile operator regulates over 90 per cent of the total amount of mobile text massages and approximately 80 per cent of the voice

[35]Hardoon, D. and Heinrich, F., (2013), Global Corruption Barometer 2013, Transparency International
[36]Asli, D. K., and Klapper, L., (2012), "Measuring financial inclusion: The global index database." World bank policy research working paper 6025, http://elibrary.worldbank.org/doi/pdf/10.1596/1813-9450-6025
[37]iHubResearch, (2012), The insider's guide to mobile Web/ marketing in Kenya http://www.ihub.co.ke/ihubresearch/uploads/2012/july/1343053407_819_604.pdf
[38] Suri, T,. and Jack, W., (2009), Mobile Money: The Economics of M-PESA, GSMA, p.4 http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2012/05/economics_MPESA.pdf

traffic in Kenya.[39] This places the mobile operator significantly ahead of its nearest competitors.[40] There are three rivals that also have launched a mobile program in terms of mobile money. The second largest mobile operator after Safaricom is Airtel with 5.5 million subscribers accounting for 18 per cent of the market share and the third largest is Essar operating under the name yuMobile, which has 2.7 million subscribers corresponding to 9 per cent of the market.[41,42] Orange is the smallest operator of the country´s four mobile operators with 7 per cent corresponding to 2.2 million subscribers.[43]

4.3 The financial sector of Kenya

It is difficult to get a correct proportion of the population formally "unbanked" in Kenya, but it was estimated to be close to 80 per cent in 2009. Kenya is traditionally observed as a cash-based economy where the estimation is that 95 per cent of the financial transactions are being handled with cash.[44] Even though a majority of the population is unbanked, there are still options for individuals that are included in the banking sector. In total there are 44 operating banks in Kenya, out of which 31 are owned locally and the remaining are foreign owned. Together the financial institutions that are locally owned comprise 27 commercial banks, three banks that have the Government of Kenya and State Corporations as shareholders and one institution for mortgage in housing finance.[45]

The situation in Kenya is typical for underdeveloped countries where the financial issues are solved in an informal way because people in this part of the world usually lack a bank account.[46] This informal way is not convenient, safe or in connection with the rest of the world. In order to reach economic vitality it is essential to provide financial services to a large part of the population.[47] Mobile banking is considered to work as a solution in order to simplify entry to the banking industry. Financial services offered through mobile phones are not different from traditional banking channels, and should rather be seen as branchless banking. [48]

[39]Wachira, C., (2014), Safaricom May Meet Regulator's Network Demand With Essar Buy (1), Bloomberg News, http://www.businessweek.com/news/2014-03-07/safaricom-may-meet-regulator-s-demands-on-network-with-essar-buy
[40]Buku, M., Meredith, M., (2013), Safaricom and M-PESA in Kenya: Financial Inclusion and Financial Integrity, Washington Journal of Law, Technology & Arts Volume 8, Issue 3, https://digital.law.washington.edu/dspacelaw/bitstream/handle/1773.1/1204/8WJLTA375.pdf?sequence=5
[41]Wachira, C., (2014), Safaricom May Meet Regulator's Network Demand With Essar Buy, Bloomberg News, http://www.bloomberg.com/news/2014-03-07/safaricom-may-meet-regulator-s-demands-on-network-with-essar-buy.html
[42]Vikas, SN., (2014), Aritel Kenya Seeks Approval TO Acquire Essar's yuMobile, http://www.medianama.com/2014/03/223-airtel-kenya-yumobile/
[43]Okutoyi, E., (2014), France Telecom reviewing Orange Kenya, Uganda operations, ItWebAfrica, http://www.itwebafrica.com/mobile/309-kenya/232557-france-telecom-reviewing-orange-kenya-uganda-operations
[44] Michaels, L., (2011), It's Better Than Cash: Kenya Mobile Money Market Assessment, Accenture, http://www.merchantpro.co/betterthancash.pdf
[45] The Central Bank of Kenya, Commercial Banks & Mortgage Finance Institutions
[46]Asli, D. K., and Klapper, L., (2012), "Measuring financial inclusion: The global index database." World bank policy research working paper 6025, http://elibrary.worldbank.org/doi/pdf/10.1596/1813-9450-6025
[47] Mutsune, T., (2014), No Kenyan left behind: The case of financial inclusion through mobile banking, Global Conference on Business and Finance Proceedings, Vol. 9,Nr. 1
[48] Ibid.

When mobile banking was introduced in Kenya it was called the "first product in the world that allows unbanked, with no banking details, no registration, no bank account, no credit card, to do banking."[49] The service is considered to be the primary element to the organization of economic movement, risk management and other related issues.[50]

4.4 M-Pesa

M-Pesa was developed by Vodafone and launched by Safaricom as recently as 2007, but it has rapidly grown countrywide due to the system's convenience and effectiveness. Furthermore, the Kenyan Central Bank has licensed M-Pesa as a "non-banking financial service", which means that the mobile programme is not subject to the rules of law or regulated as other banks.[51]

By using the slogan "Send money home" Safaricom has facilitate the way of transferring money between individuals.[52] Before M-Pesa was launched, the money was delivered either by hand or through friends. Another option was to give a bus driver the money, a system which most commonly required the receiver to wait at a bus station in order to pick up the cash.[53] Instead of transferring money through unsecure ways, M-Pesa became a successful alternative for handling money. The revolutionary system enables customers to access financial services through mobile phone messaging. More specifically, the mobile programme allows transfer of money between phones through the Safaricom network in terms of SMS. The typical interactions for M-Pesa include payments, salaries, airtime and deposits or withdrawals using an M-Pesa outlet. Local M-Pesa agents and independent agents such as shop, kiosk and petrol stations provide these services.[54]

4.4.1 How to register for M-Pesa

In order to use M-Pesa one needs to be registered for a M-Pesa SIM card at authorised M-Pesa agents. The registration is free of charge and one is required to show valid identification. Important to note is that one does not have to own a mobile phone in order to become a M-Pesa user. It is enough to register for a M-Pesa SIM card since the card is not linked to a specific phone.[55,56]

[49] Mutsune, T., (2014), No Kenyan left behind: The case of financial inclusion through mobile banking, Global Conference on Business and Finance Proceedings, Vol. 9,Nr. 1
[50] Ibid
[51]Maitrot, M. and Foster, C., (2012), Use of technology in delivering social protection: The Case of M-PESA, University Press Limited (UPL) with PPRC and UNDP Bangladesh, http://infomediation.files.wordpress.com/2013/12/maitrot-and-foster-2013-use-of-technology-in-delivering-social-protection.pdf
[52] Heyer, A. and Mas, I., (2009), Seeking Fertile Grounds for Mobile Money, GSMA- Mobile Banking for the unbanked, http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2012/03/fertile_grounds_mobile_money55.pdf
[53] Suri, T. and Jack, W., (2014), Risk Sharing and Transactions Costs: Evidence from Kenya's Mobile Money Revolution, American Economic Review. Feb2014, Vol. 104 Issue 1
[54]Maitrot, M. and Foster, C., (2012), Use of technology in delivering social protection: The Case of M-PESA, University Press Limited (UPL) with PPRC and UNDP Bangladesh, http://infomediation.files.wordpress.com/2013/12/maitrot-and-foster-2013-use-of-technology-in-delivering-social-protection.pdf
[55]Safaricom, How to register for M-PESA, http://www.safaricom.co.ke/personal/m-pesa/my-m-pesa-account/how-to-register-for-m-pesa

4.4.2 M-Pesa services

As stated above, M-Pesa allows one to access financial services such as payments, transactions between individuals, airtime, cash deposits in one's M-Pesa account as well as withdrawals.[57] The maximum amount in a M-Pesa account is 100 000 Kenyan shillings corresponding to 1129 US dollars. The method of depositing cash into an M-Pesa account is easy. The process is built on registered M-Pesa users deposing money with Safaricom agents and in return the users receive an e-float, also called e-money, in an electronic M-Pesa account connected to the mobile phone number. This e-money can then be used for different transactions. One can also deposit money directly into another person's M-Pesa account at an M-Pesa agent outlet.[58,59,60]

In order to transfer money between individuals, the sender is the only one required to have an M-Pesa account; i.e., the receiver does not have to be a Safaricom subscriber. The process is built on the sender tapping the receiver's phone number and amount of money to be transferred. When the transfer is accepted by the Safaricom network system, the money is transferred. If the receiver has a M-Pesa account, he/she will obtain a message including the new balance on the M-Pesa account. If the receiver does not have a M-Pesa account, he/she will obtain a message about the transfer; he/she will then need to go to an agent in order to redeem the money.[61],[62] The maximum amount of money that may be transferred is 140 000 Kenyan shillings (1580 US dollars) daily and 70 000 Kenyan shillings (790 US dollars) per transaction.[63]

One may also withdraw money from the M-Pesa account through an ATM or a M-Pesa agent. Then the e-float will be converted to real money. In order to withdraw one needs to transfer the amount of money to the M-Pesa agent. When the transaction is verified by the Safaricom network system, the agent will receive an approval message and can provide the cash for the user. If one is not a Safaricom subscriber, one needs to show the message saying that one has received the money and when the agent verifies the transaction the cash can be obtained.[64] One can also withdraw money from an ATM assuming that one is a M-Pesa subscriber when any one of PesaPoint, Equity Bank, Diamond Trust Bank, KCB, Family Bank or NIC BANK

[56]Maitrot, M. and Foster, C., (2012), Use of technology in delivering social protection: The Case of M-PESA, University Press Limited (UPL) with PPRC and UNDP Bangladesh, http://infomediation.files.wordpress.com/2013/12/maitrot-and-foster-2013-use-of-technology-in-delivering-social-protection.pdf
[57]Safaricom, M-PESA service tariffs, http://www.safaricom.co.ke/personal/m-pesa/m-pesa-services-tariffs
[58]Safaricom, M-PESA account tariffs, http://www.safaricom.co.ke/personal/m-pesa/my-m-pesa-account/tariffs
[59]Safaricom, Deposit Cash to Your Account, http://www.safaricom.co.ke/personal/m-pesa/m-pesa-services-tariffs/m-pesa-person-to-person/deposit-cash-to-your-account
[60]Safaricom, M-PESA service tariffs, http://www.safaricom.co.ke/personal/m-pesa/m-pesa-services-tariffs
[61]Maitrot, M. and Foster, C., (2012), Use of technology in delivering social protection: The Case of M-PESA, University Press Limited (UPL) with PPRC and UNDP Bangladesh, http://infomediation.files.wordpress.com/2013/12/maitrot-and-foster-2013-use-of-technology-in-delivering-social-protection.pdf
[62]Safaricom, Send (transfer) money, http://www.safaricom.co.ke/personal/m-pesa/m-pesa-services-tariffs/m-pesa-person-to-person/send-transfer-money
[63]Safaricom, My M-PESA account-tariffs, http://www.safaricom.co.ke/personal/m-pesa/my-m-pesa-account/tariffs
[64]Maitrot, M. and Foster, C., (2012), Use of technology in delivering social protection: The Case of M-PESA, University Press Limited (UPL) with PPRC and UNDP Bangladesh, http://infomediation.files.wordpress.com/2013/12/maitrot-and-foster-2013-use-of-technology-in-delivering-social-protection.pdf

controls the ATM. In order to use the ATM withdrawal service one needs to select ¨Withdraw Cash from ATM¨ on the P-Mesa menu in the phone. After one receives a SMS from M-Pesa with a 6-digit code that is used on the ATM, one can obtain the cash.[65]

M-Pesa subscribers can also use the mobile programme to pay bills. Close to 300 companies, organizations and institutions offer a mobile platform where they give their customers the opportunity to pay their bills and premiums through the mobile payment system. One can pay bills directly from the M-Pesa menu on the phone or at a M-Pesa outlet. The companies may charge customers for paying bills through M-Pesa.[66,67]

In addition Safaricom has customer fees for some services provided through M-Pesa. These charges depend on the amount transferred as well as which function is used. The fees are presented in Kenyan shillings and are summarized below.

Transaction value		**Transaction type and fee**		
Min	Max	Transaction to M-Pesa Subscribers	Transaction to non M-Pesa subscribers	Withdraw from M-Pesa agent
10	49	3	N/A	N/A
50	100	5	N/A	10
101	500	27	66	27
501	1000	33	66	27
1001	1500	33	66	27
1501	2500	33	66	27
2501	3500	33	88	49
35001	5000	33	105	66
5001	7500	55	143	82
7501	10000	55	171	110
10001	15000	55	220	159
15001	20000	55	237	176
20001	25000	82	275	187
25001	30000	82	275	187
30001	35000	82	275	187
25001	40000	82	N/A	275
45001	50000	110	N/A	275
50001	70000	110	N/A	330

Table 1: Fees for M-Pesa

Transaction Value		**Transaction type and fee**
Min	Max	Withdraw from ATM
200	2500	33
2501	5000	66
5001	10000	110

[65]Safaricom, Withdraw Cash, http://www.safaricom.co.ke/personal/m-pesa/my-m-pesa-account/tariffs
[66]Camner, G and Sjöblom, E, (2009), "Can the success of M-PESA be repeated?", http://emil.sjoblom.com/pdf/M-Pesa_implementations_Ke_Tz.pdf
[67]Buku, M., Meredith, M., (2013), Safaricom and M-PESA in Kenya: Financial Inclusion and Financial Integrity, Washington Journal of Law, Technology & Arts Volume 8, Issue 3, https://digital.law.washington.edu/dspacelaw/bitstream/handle/1773.1/1204/8WJLTA375.pdf?sequence=5

10001	20000	193

Table 2: Fees for M-Pesa

Other Services	Fee
Deposits	Free
Registration for M-Pesa	Free
Buy Airtime	Free
M-Pesa Balance Enquiry	1

Table 3: Fees for M-Pesa

In our sample, the most used function of M-Pesa, by almost 90 per cent of the respondents, was transferring money to other people. In addition, approximately 73 per cent of the respondents were using M-Pesa for buying airtime. The third most common function was to pay bills through M-Pesa, which was used by more than half of the sample. This presented in table 4.

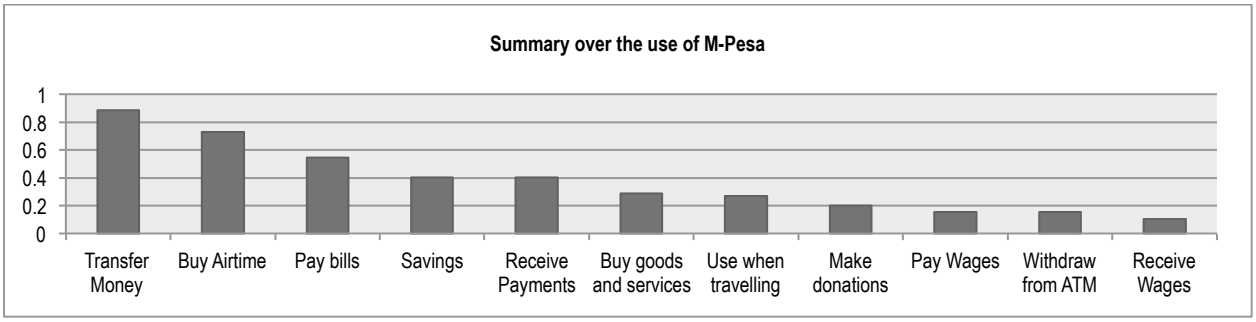


Table41: Summary over the use of M-Pesa

4.5 The success of M-Pesa

In the initial stage of M-Pesa the main promotion was towards the urban and rural people due to the transfer facilitates of sending money over a long distance. However, M-pesa has grown fast and has become an important payment and transaction instrument for the whole Kenyan population. The customers appreciate the system due to its easy access, reasonable price, credibility and flexibility in comparison to other options.[68]

Since Safaricom introduced M-Pesa to the market, the system has covered transactions to a value of 8.9 billion US dollars. In addition, the mobile service reached nearly 70 % of the Kenyan population with 17 million active users in 2013.[69,70]

Furthermore, the retail agents of M-Pesa have increased by almost the same extent as the mobile system. This is because the customer base became larger, which in turn increased the demand for agents. From a

[68] Heyer, A. and Mas, I., (2009), Seeking Fertile Grounds for Mobile Money, GSMA- Mobile Banking for the unbanked, http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2012/03/fertile_grounds_mobile_money55.pdf
[69] Safaricom, M-Pesa timeline, http://www.safaricom.co.ke/mpesa_timeline/timeline.html
[70] Asli, D. K., and Klapper, L., (2012), "Measuring financial inclusion: The global index database." World bank policy research working paper 6025, http://elibrary.worldbank.org/doi/pdf/10.1596/1813-9450-6025

base in 2007, which is presented by the picture on the left in figure 3, Safaricom operated about 355 agents. In the beginning of 2011 more than 27 000 agents were located in diverse sectors across Kenya, which can be observed in the picture on the right in figure 3.[71] The darker spots correspond to the newer agents. In addition, there were five times more M-Pesa agents than post offices in Kenya in 2013.[72,73]

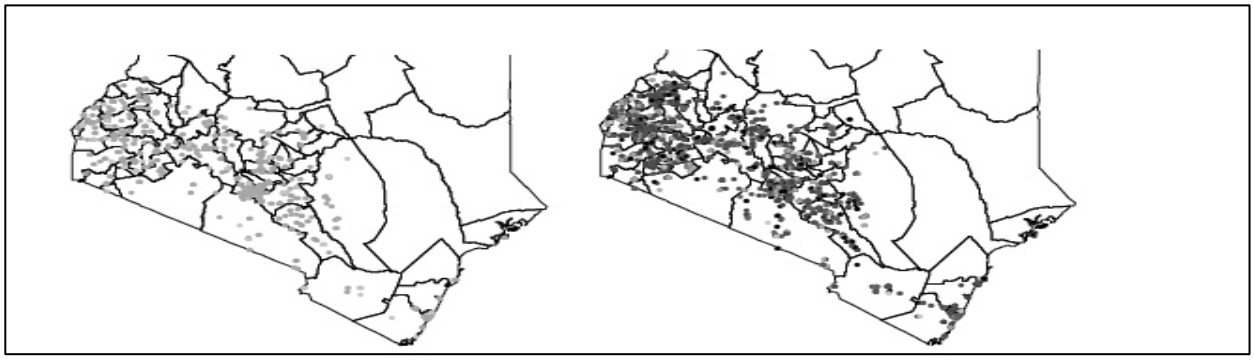


Figure 3: M-Pesa Agents across the country

As stated above, Kenya is the leader on the mobile money market, and since M-Pesa is the most widespread system in the country it has been studied in order to see what made it so successful. In general observers conclude that this can be explained by the fact that a large part of the population have limited alternatives to financial services, and at the same time many individuals migrate to bigger Kenyan cities in order to find a job and keep a financial link with their families. Furthermore the main operator on the market, Safaricom, has a large network and large market share in combination with high density of mobile phone owners in the country. Another reason for success is that the decision makers were ready to learn from what happened with the new service.[74]

4.6 The mobile market and the role of the government

The Kenyan government plays an important role for the mobile market in terms of regulations and policies. Both the Central Bank of Kenya and the government are supporting the mobile sector and encouraging fair business competition on the market. They also promote and invest in the mobile sector, which has been essential for contributing technology innovations. In addition, they have implemented favourable polices which have been essential for the success of the mobile based financial system. The main public departments, which control the mobile market, are the Communications Commission of Kenya (CCK), Kenya ICT board and the Ministry of Information and communication.

[71] Safaricom, M-PESA Customer and Agent Numbers, http://www.safaricom.co.ke/images/Downloads/Personal/M-PESA/m-pesa_statistics_-_2.pdf
[72] Buku, M., Meredith, M., (2013), Safaricom and M-PESA in Kenya: Financial Inclusion and Financial Integrity, Washington Journal of Law, Technology & Arts Volume 8, Issue 3, https://digital.law.washington.edu/dspacelaw/bitstream/handle/1773.1/1204/8WJLTA375.pdf?sequence=5
[73] Suri, T. and Jack, W., (2014), Risk Sharing and Transactions Costs: Evidence from Kenya's Mobile Money Revolution, American Economic Review. Feb2014, Vol. 104 Issue 1
[74] Michaels, L., (2011), It's Better Than Cash: Kenya Mobile Money Market Assessment, Accenture, http://www.merchantpro.co/betterthancash.pdf

There are also other organs using the service with the aim to supply citizens with information, note, however that the adoption of mobile phones for this purpose has been relatively slow despite the potential. A number of ministries use this information channel and one example of this is the Ministry of Agriculture, which collects and sends price information on agricultural products on a daily basis. Also the Kenyan health agency, KEMSA, uses mobile phones to improve its customer service through a SMS application. There is no standardized development plan for how ministries and other government bodies are supposed to develop mobile phone applications; instead they are all developing it on their own. [75]

4.7 How mobile phones transform development

The rapid growth of the mobile phone market and mobile money market has several effects on the society. More specifically, by enabling individuals to access financial services through the mobile phone, several opportunities arise. It breaks down entry barriers for entrepreneurs to enter the private sector as well as enabling a platform creating ideas, business models and communication methods.[76] Other ways of how mobile money possibly can transform development according to USAID and Citi Bank is that it can strengthen an individual's livelihood and have impact on the reduction of corruption.[77]

One example of how mobile money is reducing corruption is the people living in Isiolo, a town in Kenya, where M-Pesa is simplifying the process for financial transactions. An agreement with the Kenyan government has been set up in order to make it easier to pay bills and collect revenue. By this agreement the inhabitants in Isiolo can pay their bills by using their mobile phones instead of spending hours travelling to the county revenue office. The system is includes public transactions, for instance when buying or leasing land and livestock selling and buying. Before Isiolo implemented M-Pesa as an alternative way for these services most transactions within the mentioned sectors were marred by corruption, since absence of transparency benefits individuals that are dealing under the table and hence perform corrupt activities. Through mobile money transactions the system becomes more transparent in business activities, and when other sectors also begin using the platform it may also reduce the corruption in those sectors. [78]

[75] iHubResearch, (2012), The insider's guide to mobile Web/ marketing in Kenya, , http://www.ihub.co.ke/ihubresearch/uploads/2012/july/1343053407_819_604.pdf
[76] US Agency for International Development, Digital Finance, http://www.usaid.gov/sites/default/files/documents/15396/Digital%20Finance%20Fact%20Sheet.pdf
[77] US Agency for International Development and Citi Group, (2012), 10 Ways to Accelerate Mobile Money, http://www.citigroup.com/citi/news/data/120612a.pdf
[78] Okpamen, H., (2014), M-Pesa To Ease Bills Remittance For Kenyan Community, http://www.ventures-africa.com/2014/03/m-pesa-to-ease-bills-remittance-for-kenyan-community/

5. CORRUPTION

In this chapter a preamble of the great problems of corruption facing mainly the developing world is given, and most essentially the situation in Kenya is described. In addition the anti-efforts performed and their results in Kenya are given.

5.1 Definition of corruption

Corruption is a broad and complex term as well as a widespread phenomenon among the countries in the world, especially in the most undeveloped nations. Evidence states that corruption is one of the most harmful phenomenons for a poor country since corruption affects a country's social, political and economic factors and covers a wide range of prevalence of illegal behaviours. More specifically, corruption does not only steal resources from the population but also undermines the economic growth, justice as well as decreases trust among the public sector.[79,80,81]

According to SIDA, corruption is defined as a conflict of interest and abuse of entrusted power conducted by authorities, institutions and governments. Specifically, corruption includes among other things receiving bribes in terms of payments or gifts to perform a favour as well as obtain self-contained unfair advantages or benefits for someone else. These beneficial services are in general related to an individual's position, power and work duties.[82]

Corruption is generally classified into three different levels: petty and bureaucratic, grand and lastly political corruption. These divisions are based on partly the size of the transaction and the volume of money lost, and partly in the institution or sector where corruption takes place.[83]

5.2 Petty and bureaucratic corruption

In most of the literature covering corruption, petty and bureaucratic corruption is often described as common and regular abuse of trust related to relative small bribes.[84] This type of corruption is characterized by inefficient and distorted regulations for owners or managers of enterprises, set by the lower level of the public sector that generates incentives for bribes. Specifically, enterprises are in a sense

[79] Transparency International, FAQS on corruption, http://www.transparency.org/whoweare/organisation/faqs_on_corruption/2/
[80]Lambert-Mogiliansky, A. Majumdar, M. Radner, R. (2007) Strategic analysis of petty corruption: Entrepreneurs and bureaucrats. Journal of Development Economics 83
[81]Transparency International, Corruption Perception Index 2013, http://www.transparency.org/cpi2013/results
[82]Swedish International Development and Cooperation Agency, How we work against corruption, http://www.sida.se/English/About-us/How-we-operate/Our-Work-Against-Corruption/
[83]Transparency International, FAQS on corruption, http://www.transparency.org/whoweare/organisation/faqs_on_corruption/2/
[84]Lambert-Mogiliansky, A. Majumdar, M. Radner, R. (2007) Strategic analysis of petty corruption: Entrepreneurs and bureaucrats. Journal of Development Economics 83

required to make informal facilitation payments to regulatory and administrative officials in order to get access to public goods and services. Furthermore, these types of unofficial payments are made to receive privileges in authority processes concerning, among other things, trade licences, tax and duties payments as well as passport, registration of new firms and preferential laws concerning the rights of workers.[85,86]

The international finance cooperation (IFC) survey of 2007, provided by the Central Bank, presents qualitative and quantitative measures of corruption. This survey indicates that, in 2007, 38 per cent of the Kenyan enterprises considered corruption as a major restriction in the public sector, whereas 30 per cent of all the firms in Sub-Saharan Africa consider an informal payment to be required. Furthermore, almost 80 per cent of the firms in Kenya were expected to give unofficial payments in order to get preferential bureaucratic services, relative to 42 percent of all the firms in Sub-Saharan Africa.[87,88]

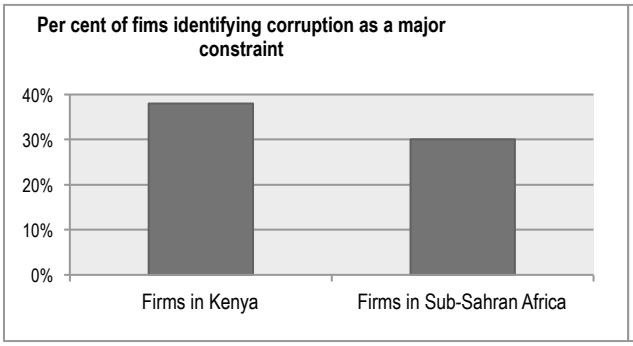


Table 5: Per cent of firms identifying corruption as a major constraint.

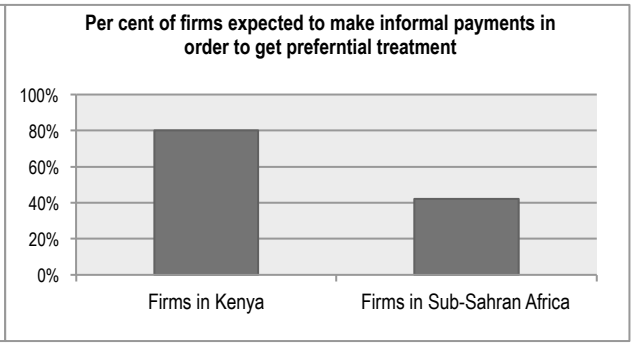


Table 6: Per cent of firms expected to make informal payments in order to get preferential treatment.

5.2.1 Grand Corruption

The form of corruption defined as grand corruption differs from other classifications of corruption in both the extent of the consequences and by the way it functions.[89] It is generally defined as the gravest form of corruption and occurs at the highest level of the institutional and political sectors that control the central functions of the state.[90] The grand corruption arises through misusing of the political system for favourable treatment by highly positioned politicians and state agents that aim to sustain law and order.[91]

[85]Transparency International, FAQS on corruption, http://www.transparency.org/whoweare/organisation/faqs_on_corruption/2/
[86]Kenya, (2007), Kenya: Country Profile 2007, http://www.enterprisesurveys.org/~/media/FPDKM/EnterpriseSurveys/Documents/Profiles/English/Kenya-2007
[87]Ibid.
[88]Anti-Corruption Resource Center: http://www.u4.no/publications/kenya-overview-of-corruption-and-anti%20corruption/downloadasset/3114
[89]Global Organization Of Parliamentarians Against Corruption (GOPAC), (2013), Prosecuting Grand Corruption as an International Crime, http://gopacnetwork.org/Docs/DiscussionPaper_ProsecutingGrandCorruption_EN.pdf
[90]Transparency International, FAQS on corruption, http://www.transparency.org/whoweare/organisation/faqs_on_corruption/2/
[91]Hechler, H., Zinkernagel, G., Koechlin, L., and Morris, D., (2011), Can UNCAC address grand corruption?, U4 Report 2011:2, http://www.cmi.no/publications/file/4226-can-uncac-address-grand-corruption.pdf

5.2.2 Political corruption

The last form of corruption is called political corruption and is defined to take place among the countries' political parties. In particular, the governments have an influence on the policymaking rules that consider the allocation of resources as well as financing. In addition the politicians abuse their position to maintain their authority, prestige and wealth. Due to absence of resources and the widespread institutional weakness, specifically in undeveloped countries, the political parties have become vulnerable to corruption.[92]

According to the Global Corruption Barometer (GCB) 2013, close to 53 per cent of the Kenyan respondents reported that the political parties were corrupt or extremely corrupt. In addition, 59 per cent of the approached citizens perceived that public officials were corrupt or extremely corrupt.[93] Furthermore, based on a corruption scale, measuring how vulnerable the institutions and authorities are to corruption provided by GCB, the Kenyan political parties scored 3.8 on a scale from one to five. One correspondent stated no existence of corruption and five stated extreme corruption among the parties.[94]

5.3 The Consequences of corruption

Corruption is a complex economic, social as well as political problem and also one of the most damaging phenomena for the poorest part of the world. This is because a country characterized by corruption faces many different challenges within the state because corruption undermines democratic authorities and the financial system in terms of preventing fair rule of law provision as well as distorting electoral processes. Additionally, this leads to a lack of legitimacy of the nation and contributes to the absence of transparency and credibility of the countries.[95]

According to presented evidence, poverty and corruption are significantly related.[96] The reason for this is that the world lowers or suspends the aid to corrupt states; the aid is given to improve the state and the living conditions for the individuals. In addition, corruption lowers foreign investment, limits the access to basic public services and increases the cost of the delivery of the services. Furthermore, this in turn may lead to a decrease in the countries growth and human development.[97,98]

[92]Anti-Corruption Resource Center: http://www.u4.no/publications/kenya-overview-of-corruption-and-anti%20corruption/downloadasset/3114
[93]Transparency International, Global Corruption barometer (GCB) 2013: http://www.transparency.org/gcb2013/country/?country=kenya
[94]Ibid
[95]Lambert-Mogiliansky, A. Majumdar, M. Radner, R. (2007) Strategic analysis of petty corruption: Entrepreneurs and bureaucrats. Journal of Development Economics 83.
[96]Sida The Communication Department, (2013) Corruption affects development, http://www.sida.se/English/About-us/How-we-operate/Our-Work-Against-Corruption/
[97]European Commission, (2008), Budget support- The effective way to finance development?, European Communities, http://ec.europa.eu/europeaid/infopoint/publications/europeaid/documents/budgetsupport08_en.pdf
[98]Transparency International, (2004), Transparency International Annual Report 2003, http://issuu.com/transparencyinternational/docs/ti_annual_report_2003?e=2496456/3168301

5.4 The case of Kenya

Kenya is a country that has been characterized by institutionally and political instability since the country gained its independence from Great Britain.[99] The country has several times faced social and political challenges where the government has been perceived as complex and dominated by principles that provide a key feature for corruption among the countries' political authorities and institutional sectors. Today Kenya is ranked 136 among the world's 175 most corrupt countries and corruption still occurs in many of Kenya´s key sector and institutions. [100,101]

Kenya has faced regular violence related to political elections since the shift from one-party rule towards the implementation of multi-party politics in the beginning of 1991. One of the most perceived political processes was the flawed Presidential election violence in 2007. Both national and international observers suspected vote rigging in the election process, where Mwai Kibaki was declared as president in 2007, and public anger spread across the country. This caused a deepening of ethnic divisions and radical post-election violence lasting into 2008 and more than a thousand people died and fled in fear.[102,103]

These drawbacks have faced the country on and off and have led to an unstable annual growth for Kenya. When the post-election violence occurred the country faced a radical economic downturn where the production and transport were disordered, resulting in among other things an increase of the basic goods. Furthermore the tourism revenue decreased by 80 per cent compared to previous years and the GDP fell from 7.0 per cent to 1.5 per cent between 2007 and 2008.[104,105] After this weakness the country finally turned the corner and increased growth from 1.5 per cent in 2008 to 4,6 per cent in the end of 2012. Compared to other Sub-Saharan African countries where the annual GDP in 2012 was 4.26, Kenya lies a little above the average. The same pattern can be observed in table 7 during the estimated period from 2000, with an exception in 2007-2008.[106]

[99] BBC News, Kenya Profile, http://www.bbc.com/news/world-africa-13682176
[100] Anti-Corruption Resource Center: http://www.u4.no/publications/kenya-overview-of-corruption-and-anti%20corruption/downloadasset/3114
[101] Transparency International, Global Corruption barometer (GCB) 2013: http://www.transparency.org/gcb2013/country/?country=kenya
[102] The BBC World Service Trust, (2008), The Kenyan 2007 elections and their aftermath:
the role of media and communication, http://downloads.bbc.co.uk/worldservice/trust/pdf/kenya_policy_briefing_08.pdf
[103] UK AID from the Department for International Development, (2009), Elections in Kenya 2007,
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/67654/elections-ke-2007.pdf
[104] Ibid.
[105] The World Bank, Country and region specific forecasts and data, http://www.worldbank.org/en/publication/global-economic-prospects/data?variable=NYGDPMKTPKDZ&region=SST
[106] Ibid.

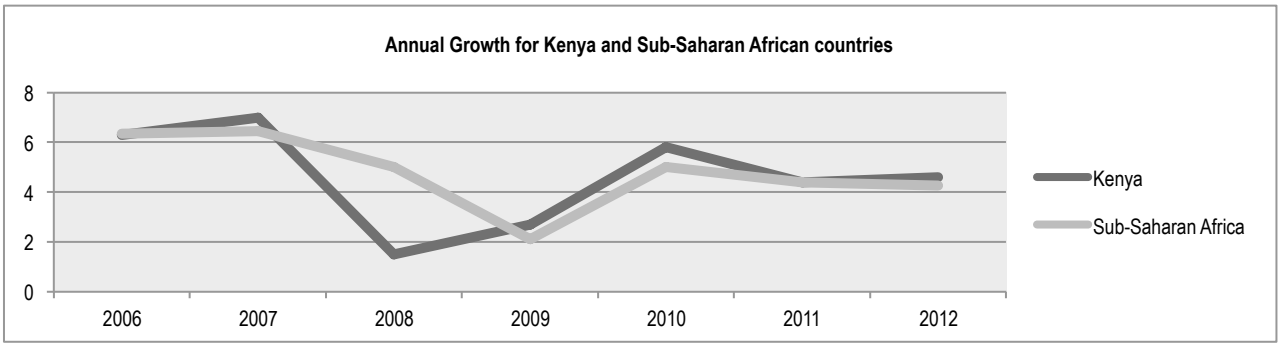


Table 7: Annual Growth for Kenya and Sub-Saharan Africa countries

5.5 The extent of corruption in the Kenyan institutions

Corruption is common in the Kenyan essential sectors, such as the police, judiciary as well as public administration and financial management. According to the Global Corruption Barometer 2013 the most corrupt authority was the police and 95 per cent of the Kenyan citizens felt that the police were corrupt or extremely corrupt. In addition, 68 per cent of the respondents' felt that the parliament was corrupt or extremely corrupt as well as 53 per cent felt that the political parties were corrupt or extremely corrupt.[107] Table 8 ranks the sectors in Kenya on a scale of 1-5 where a score of 5 is extremely corrupt and 1 is not corrupt at all.[108]

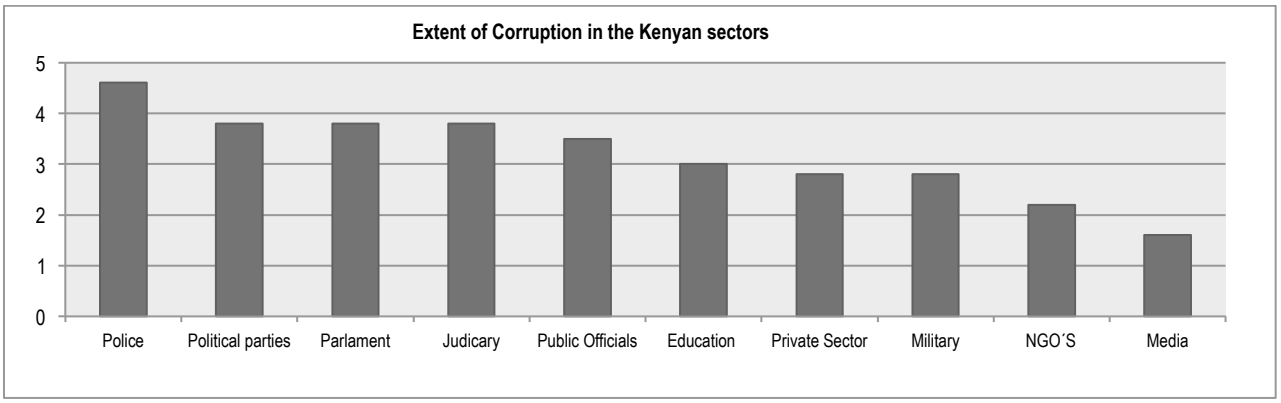


Table 8: Extent of Corruption in the Kenyan sectors

Transparency International´s East African Bribery Index 2013 data also indicates that 36 per cent of the respondents paid a bribe to speed up the service. Furthermore, 26 per cent of the respondents were involved in a bribery situation in order to access different services while a small portion of the respondents reported that they paid a bribe because it was expected as well as to avoid paying full cost for the service. These numbers are presented in table 9. This implies that the lack of transparency of transactions may be the root of bribery in the public sector.[109]

[107]Transparency International, Global Corruption Barometer 2013, http://www.transparency.org/gcb2013/country/?country=kenya
[108]Transparency International, Global Corruption Barometer 2011/2012, http://www.transparency.org/country#KEN_PublicOpinion
[109]East African Bribery Index 2013,
http://www.google.se/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CDEQFjAA&url=http%3A%2F%2Ftikenya.org%2Findex.php%2Fthe-east-african-

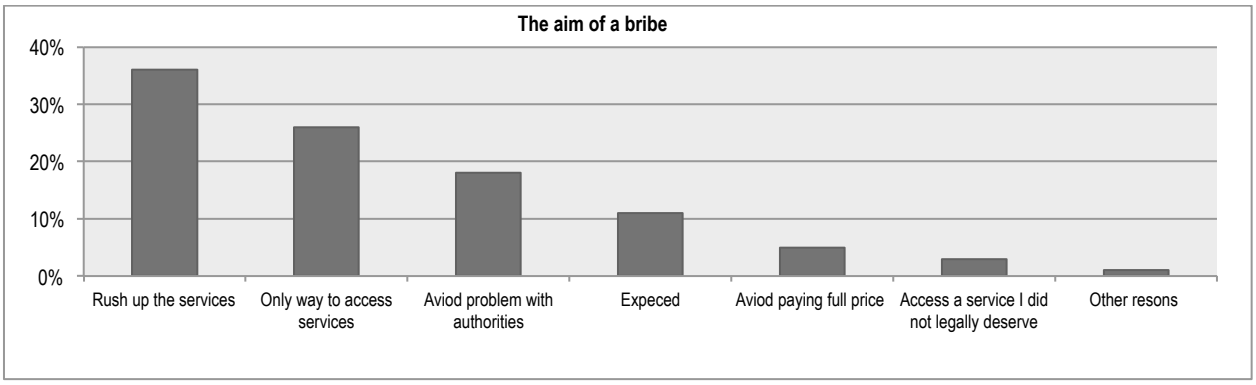


Table 9: The aim of a bribe

5.5.1 Police

The sector concerning the countries' and individuals' security in terms of the police was the most corrupt institution in Kenya 2013. According to the East African Bribery Index 2013 more than 70 per cent of the Kenyans reported that they had accessed services by paying bribes. This number is consistent with the Eastern African Bribery Index 2012 where 64 per cent of the respondents reported that they been asked for a bribe by the police force. More specially, most common is that the Kenyan traffic police demand a bribe.[110] The East African Bribery Index of 2012 states that the frequency of bribery situations related to the police force as well as the amount paid as a bribe have decreased compared to previous years.[111]

5.5.2 Judiciary

The judicial system is also one of the most essential institutions affected by bribery. According to the transparency International's GCB 2011, 43 per cent of Kenyans have been involved in a bribery situation when interacting with the judiciary.[112]

Freedom House 2013 also indicates that the Kenyan courts have for a long time been characterized by lack of capacity because the sector is affected by ineffective case management, poor infrastructure as well as underfinanced. This has in turn led to ineffective proses characterized by corruption where most of the ministers and officials that have performed corrupt allegations have been reinstated and never convicted.[113]

bribery-index%3Fdownload%3D218%3Athe-east-african-bribery-index-2013&ei=g6eFU_feKO364QSE_oGYCg&usg=AFQjCNGOJPgmPpC5cwwTEYbzsi3SVlQjgQ&sig2=v6cZLTdzGspsPA4mFCrzeA&bvm=bv.67720277,d.bGE

[110]East African Bribery Index 2013, http://www.google.se/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CDEQFjAA&url=http%3A%2F%2Ftikenya.org%2Findex.php%2Fthe-east-african-bribery-index%3Fdownload%3D218%3Athe-east-african-bribery-index-2013&ei=g6eFU_feKO364QSE_oGYCg&usg=AFQjCNGOJPgmPpC5cwwTEYbzsi3SVlQjgQ&sig2=v6cZLTdzGspsPA4mFCrzeA&bvm=bv.67720277,d.bGE

[111]Business Anti-Corruption Portal, (2014), *A Snapshot of Corruption in Ghana*, Retrieved from http://www.business-anti-corruption.com/country-profiles/sub-saharan-africa/ghana-version/snapshot.aspx

[112]Martini, M., (2012), Kenya: overview of corruption and anti-corruption, Anti-Corruption Resource Centre

[113]Freedom House, Kenya, http://www.freedomhouse.org/report/freedom-world/2013/kenya#.U3tVgTnwK9M

5.5.3 Public Administration and Financial Management

As stated above one of the most common reasons to pay a bribe was in order to access services provided by the public sector. One of the reasons is that the Kenyan institutional administration level is low and is generally characterized by lack of transparency and inefficiency. Since the implementation of the new constitution in 2010 there has been some positive progress and according to the Global Integrity Scorecard Kenya moved from 56 of 100 in 2006 to 60 in 2011 in terms of government conflict of interest.[114,115]

In the 2012 Open Budget Index, which is a measure of transparency, Kenya scored 49 of 100, which is higher, compared to the average score of 43 for all the 100 countries that were included in the survey. This indicates that some information regarding governmental and financial activity is published for the people.[116] Furthermore, financial records are missing and the decisions regarding the countries budget are not often published. One example strengthens the fact that corruption exists was when over one million dollars went missing in 2010 from the Kenyan budget in terms of the public school system. This in turn caused the US to cancel its aid for the Kenyan school system.[117,118]

5.6 The anti-corruption efforts in Kenya

During the last decade the work to fight corruption has become a project involving several international organizations. As the most corrupt countries in the world are located in Africa it is no coincidence that most of the projects and anti-corruption strategies target the African continent. Many of the countries, for example Kenya, also have national anti-corruption movements in terms of reforms and establishment of organizations, but still there is a lack of success when it comes to major gains from the efforts, as there are mainly implementation problems.[119]

5.6.1 Legal framework

As mentioned above all levels of governmental corruption still remain a serious problem and have characterized the Kenyan system in terms of authorities and sectors since the independence from Great Britain. In addition, many examples of corruption have been commonly exposed in the police sector, official bodies, nongovernmental organizations and judiciary as well as state efforts that have undermined the civil society activity.[120]

[114]Global Integrity, The Global Integrity Raport: 2011, https://www.globalintegrity.org/global/report-2011/kenya/
[115]Global Integrity, The Global Integrity Raport: 2006, https://www.globalintegrity.org/global_year/2006/
[116]International Budget Partnership, Kenya: Country Info, http://internationalbudget.org/what-we-do/open-budget-survey/country-info/?country=ke
[117]Voice of America, Missing Millions Put Kenya's Public Education System in Jeopardy, http://www.voanews.com/content/missing-millions-put-kenyas-public-education-system-in-jeopardy-86355052/159795.html
[118]Martini, M., (2012), Kenya: overview of corruption and anti-corruption, Anti-Corruption Resource Centre
[119]Persson, A., Rothstein, B., and Teorell, J., (2010), The failure of Anti-Corruption Policies A Theoretical Mischaracterization of the Problem, QoG Working Paper Series 2010:19, SIDA, https://www.sida.se/PageFiles/39460/Failure%20Anti_Corruption%20policy%20(2).pdf,
[120]Freedom House, Kenya, http://www.freedomhouse.org/report/freedom-world/2013/kenya#.U3tVgTnwK9M

In the early stage of President Kibaki's presidential mandate he promoted an anti-corruption agenda to turn the country from bribery as well as economic crimes towards a country with a more democratic system. After Kibaki won the election in 2002 he reformed and implemented some new laws to reduce corruption and strengthen the Public Finance Management system as well as the legal framework. For example in 2003, the Anti-corruption and Economic Crime Acts as well as Public Officer Ethics Act was passed. The first mentioned act does not cover the private sector but it includes rules for among other things corrupt situations such as foreign bribery, money laundering, conflict of interest as well as abuse of office and blackmailing. The Public Officer Ethics Act 2003 includes a code of regulations where for example certain political officers need to declare their financial assets and all civil servants have perform their duties efficiently and honestly and ensure that the services are provided correctly.[121] The Public Procurement and Disposal of Assets Act was implemented in 2005 to control everything related to procurement with strict penalties when the rule is broken. According to the GCB 2012, regarding this act the country has scored quite well compared to other parts of Sub-Saharan Africa.[122]

The proceeds of Crime and Money Laundering Act was also adopted in 2009 due to mostly international pressure. The main point of this act was to criminalize money laundering and adopt a rule to identify, trace as well as confiscate the proceeds of crime.[123,124]

The public organ Kenyan anti-corruption commission (KACC) that was implemented under the Anti-corruption and Economic Crime Act 2003 was also improved during President Kibaki. The goal of the organization was to investigate economic crimes as well as corrupt conduct in both the public and private sector. For example, KACC demanded that both public servants needed to report the source of income. Furthermore, KACC published information about the danger of corruption and also provided support for private people as well as institutions that reported any form of economic crime.[125]

Another hope of a democratic Kenya was observed as the old constitution was extended and the new constitution was implemented in 2012. The new constitution provides freedom of the press and speech as well as a series of legal and institutional instruments for major gains for the country in terms of reducing corruption as well as strengthening political rights and civil liberties. However, there are some cases from

[121] National Council for Law Reporting with the Authority of the Attorney General, (2009), Laws of Kenya, http://publicofficialsfinancialdisclosure.worldbank.org/sites/fdl/files/assets/law-library-files/Kenya_Public%20Officer%20Ethics%20Act_2003_revised%202009_EN.pdf
[122] Transparency International, Global Corruption Barometer 2011/2012, http://www.transparency.org/country#KEN_PublicOpinion
[123] Anti-Corruption Resource Center: http://www.u4.no/publications/kenya-overview-of-corruption-and-anti%20corruption/downloadasset/3114
[124] Mathini, A., and Muange, B., (2010), New Law to Comat Money Laundering in Kenya, ALN Insight, http://www.africalegalnetwork.com/wp-content/uploads/2012/10/New-Law-to-Combat-Money-Laundering-in-Kenya-Bernard-Muange-Anjarwalla-Khanna-ALN-Insight-April-2010.pdf
[125] The Kenya Anti-Corruption Commission, http://www.icac.org.hk/newsl/issue24eng/button1.htm

2011 when the government and civil servants tried to restrict the rights in practice that are provided by the constitution. For example there were reports that security forces as well as officials threaten journalists or media for corruption.[126]

The current president Uhuru Kenyatta and the vice-president William Ruto, elected in 2013, appeared before the International Criminal Court (ICC) in connection with the post-election violence in 2007. They were charged with crimes such as human rights abuse as well as organizing ethic clashes. This shows that the governmental work against corruption as well as improvement of the economic growth is struggling.[127,128]

5.6.2 Institutional efforts and framework

In addition to the legal framework there are also institutional efforts trying to fight corruption in Kenya. Several anti-corruption organizations are operating countrywide to decrease the extent of economic crime and corruption. One of the biggest organizations in Kenya is the Ethics and Anti-corruption Commission (EACC) that replaced the former Kenya Anti-Corruption Commission (KACC) and was adopted in 2011. ESCC is a public organ that was also formed by the Ethics and Anti-Corruption Act but also established under the new constitution. Since 2012, Mr. Mumo Matemu has been the chairman for EACC.[129,130] EACC has mostly the same assignments as KACC but also an expanded mandate where they have the right to study cases of corruption as well as economic crimes across the country through law enforcement. EACC also combats corruption by using preventive measures and education on the impact of corruption as well as promotion of ethics and anti-corruption strategies.[131,132] However, it has no prosecutorial power and all cases are transferred to the Attorney General.[133]

The Attorney General is a public organization that recommends and gives legal advice to the government as well as civil authorities and institutions. Within this framework the organization also has the overall responsibility for the legal system and has to make sure that it works effectively and that everyone both in private and public sectors are equally treated before the law. The current general is Githu Muigai and he was appointed in 2011 by the former president Kibaki.[134] However as the pattern of failure pervades the Kenyan anti-corruption effort, so does the work of the Attorney General. He has several times been

[126]Freedom House, Kenya, http://www.freedomhouse.org/report/freedom-world/2012/kenya#.U3tdMjnwK9O
[127]Doya, D., (2014), Kenyan President Struggles With Growth as He Faces ICCT Trial, Bloomberg News, http://www.bloomberg.com/news/2014-03-04/kenya-president-struggles-with-growth-as-he-faces-violence-trial.html
[128]Freedom House, Kenya, http://www.freedomhouse.org/report/freedom-world/2012/kenya#.UzGuZdxa_1o
[129]Ethics and Anti-Corruption Commission, http://www.eacc.go.ke
[130]Anti-Corruption Resource Centre: http://www.u4.no/publications/kenya-overview-of-corruption-and-anti%20corruption/downloadasset/3114
[131]Ethics and Anti-Corruption Commission, *About EACC: Commissioners,* Retrieved from http://www.eacc.go.ke/default.asp?pageid=4
[132]Anti-Corruption Resource Centre: http://www.u4.no/publications/kenya-overview-of-corruption-and-anti%20corruption/downloadasset/3114
[133] Freedom House, Kenya, http://www.freedomhouse.org/report/freedom-world/2013/kenya#.U3tVgTnwK9M
[134]State Law Office, http://www.statehousekenya.go.ke/government/attoneyG.htm

criticized due to the absence of success in convicting people, especially high positioned civil servants involved in some economic and corrupt crimes. According to Freedom House data from 2010, the former KACC as well as EACC transferred several cases of corruption but only a few of them have been prosecuted since 2003.[135]

Furthermore, the government created the Commission on Administrative Justice (CAJ) also called the office of the Kenyan ombudsman under the Commission on Administrative Justice Act that was adopted 2011.[136] The commission is an organ where private and public institutions as well as individuals can report complaints regarding public officials. In addition, CAJ also has a mandate for investigating all forms of maladministration such as public service delivery, address allegations of corruption, abuse of civil servants, discrimination as well as unethical conduct.[137]

5.6.3 The performance of the anti-corruption strategies

In spite of the corruption scandals that came to light in the beginning of 2000, failure of anti-corruption strategies as well as the charges from ICC, the national governmental trust has to some degree been improved. According to GCB 2010, 48 per cent of the respondents said that corruption has decreased since 2007 and 39 per cent said it increased. Furthermore GCB data shows that 70 per cent of the inhabitants felt that the governmental efforts against corruption were effective which can be compared to 2006 where only 39 per cent felt that the effort was effective.[138,139,140]

The anti-corruption efforts in terms of the legal framework made by Kenya are considered to be quite forceful and according to the country´s Global Integrity, Kenya scored 100 on a scale of 0 - 100 in 2011. Thus, Kenya still performs weakly when it comes to the activities against corruption related to the political framework and scored only 50 on a scale of 0 to 100.[141]

[135] Anti-Corruption Resource Center: http://www.u4.no/publications/kenya-overview-of-corruption-and-anti%20corruption/downloadasset/3114
[136] The Commission on Administrative Justice, http://www.ombudsman.go.ke
[137] Anti-Corruption Resource Centre: http://www.u4.no/publications/kenya-overview-of-corruption-and-anti%20corruption/downloadasset/3114
[138] Transparency International, Global Corruption barometer (GCB) 2013: http://www.transparency.org/gcb2013/country/?country=kenya
[139] Anti-Corruption Resource Centre: http://www.u4.no/publications/kenya-overview-of-corruption-and-anti%20corruption/downloadasset/3114
[140] Freedom House, Kenya, http://www.freedomhouse.org/report/freedom-world/2013/kenya#.U3tVgTnwK9M
[141] Transparency International, Corruption Perception Index 2013, http://www.transparency.org/cpi2013/results

6.THEORETICAL FRAMEWORK

This chapter contains the theoretical framework where some traditional economic approaches explaining the factors that influence individuals to participate in corrupt actions. Additionally, the technology base is related to these theories.

6.1 Public choice theory

One of the economic theories used to define and explain a country's political system is the traditional public choice theory. The theory considers a normative theoretical framework determining what form of politics and governments that should take place in a country.[142] The decision-making situations made by the bureaucrats and public officials are generally characterized by a rent-seeking behaviour. This behaviour includes maximizing their own welfare potential and interdependent interests within the constitutional rules.[143] This performance is especially observed in the developing country where the absence of legislators in the political system is widespread and rather dominated by bribery as well as political violence, possibly defined as corruption.[144,] These rent-seeking behaviours corrupt the governmental processes because these rent-seekers will make decisions that is influenced by their own gain.[145]

Rothstein and Uslaner further explain this theory. They state that these corrupt institutions and governments are often related to poverty, and characterize mostly the developing part of the world. The way the institutions are formed and ruled leads to the fact that social trust cannot easily be established within a country. Furthermore, a general process can be observed in these countries, where corrupt governments have less money to spend on the infrastructure as well as on the income to the public officials. Most likely this will in turn lead to public employees spending more time on their own interests than on the society as well as demanding funds from the public purse.[146,147]

As stated above a corrupt government is an ineffective authority, which leads to among other things higher transaction costs. These transaction costs occur as a part of the economic interaction when creating contracts. Institutions and authorities, which are characterized by corruption, often have officials that seek gains from transactions and will thereby incur higher costs for individuals who are participating in different

[142] Mbaku, J., (2010) Rent-Seeking and Corruption, http://www.rrojasdatabank.info/borner/borner10.pdf
[143] Ostrom. V, (1975), Public Choice Theory: A New Approach to Institutional Economics. American Journal of Agriculture Economics, Vol. 57, No. 5, Proceeding Issues
[144] Mbaku, J., (2010) Rent-Seeking and Corruption, http://www.rrojasdatabank.info/borner/borner10.pdf
[145] Ibid.
[146] Butler, E., (2012), Public Choice – A Primer, London; The Institute of Economic Affairs
[147] Rothstein, B. Uslaner, E.M, (2005), All for all. Equality, Corruption and Social Trust, World Politics, nr 58

contracts. Szymanski (2007) strengthens this theory and states that one of the major risks for corruption is the lack of transparency.[148]

A new modern economic theory has further extended the public choice theory and related the rent-seeking behaviour to the worldwide technological success. The technological achievements have the possibility to reduce transaction costs and instead improve the accountability and transparency. As stated above the developing part of the world is more sensitive to a potential risk of corruption and economic crime, which makes it more necessary to make transactions and different public processes transparent.[149]

6.2 Neo-institutional economics: Principal-agent theory

In line with the public choice theory the neo-institutional economic theory states that corruption is a phenomenon of social structure and generally occurs by the decisions of individuals as well as the result of interest and information asymmetry.[150] According to the neo-institutional economic theory, corruption is considered a principal-agent problem. This theory is often related to be the most significant as well as predominant model to explain the dynamics behind a governmental and inter-organizational procurement process related to corrupt actions.[151]

Within this framework there are two types of actors, the first is an agent often represented by a bureaucrat or a civil servant and second, a principal that generally is a citizen. Furthermore, the model is based on two key assumptions. The first assumption is that there is a conflict between the principal and the agent, which is assumed to have a rent-seeking behaviour. The second assumption is built on asymmetric information between the two actors, where the agents have more information compared to the principals. This differs from a majority of models and theories in the field of economics, which assume fair information, and hence in this framework transaction costs would be less important since they would correspond to the information costs.[152] From these assumptions it is easy to observe the problem arising from the principal perspective.

This problem occurs when a principal delegates a commission to an agent. The agent may have or obtain information regarding the assignment that he/she is not willing to share for the principal, asymmetric information. In addition, another issue is to motivate the agent to perform in the best interest of the principal as the agent may have other goals defined as conflict of interest. In this situation principals are responsible

[148]Rothstein, B. (2003). Sociala fällor och tillitens problem. Stockholm: SNS förlag
[149]Neupane, A., Soar, J. and Vaidya, K. (2014) Anti-corruption capabilities of public e-procurement technologies: principal-agent theory. In: Technology development and platform enhancements for successful global e-government design. United States; IGI Publishing (IGI Global), Hershey, PA.
[150]Groenendijk, N., (1997), A principal-agent model of corruption, The Netherlands; Kluwer Academic Publishers, Crime, Law & Social Change 27: 207–229
[151]Neupane, A., Soar, J. and Vaidya, K. (2014) Anti-corruption capabilities of public e-procurement technologies: principal-agent theory. In: Technology development and platform enhancements for successful global e-government design. United States; IGI Publishing (IGI Global), Hershey, PA.
[152]Grossman. S. and Hart. O., (1983), An Analysis of the Principal-Agent Problem, The Econometrica Society, Econometrica, Vol. 51, No. 1 (Jan., 1983), pp. 7-45

for the failure costs and prevention costs, whilst agents perform and hide their activities. The conclusion of the model in short is that corrupt situations arise where there is asymmetric information as well as when the agent discloses the interest of the principal and acts in a self-winning manner.[153,154]

One example of the principal-agent problem can be observed in the relationship between tax collectors and the management of the Treasury. The tax collectors (agents) have more available information about the revenue potential of a country's tax base compared to the Treasury (principal). By means of this asymmetric information bribery and economic crime opportunities are possible. By relating this problem to the technological innovations, the asymmetric information may decrease since fees and transaction costs will be clearer which will result in less bribery in the equilibrium. A natural effect when cash decreases in society should be a less complex payment system with fewer opportunities for corrupt activities.[155]

6.3 Collective action problem

The assumptions made by the principal-agent model are that only the agent is engaged in corrupt behaviour. However, if the principal also is corrupt, the framework for principle-agent will not be able to work as an analytical tool for corruption. Therefor, instead of viewing corruption as a principal-agent problem, it is rather suggested that corruption is more likely to be a collective action problem.

According to this problem the success of anti-corruption reforms and rewards of corruption is dependent on the number of individuals that are likely to be corrupt in the society. More specifically, the theory does not assume that all actors are by definition corrupt; instead rationality is understood to be reciprocal, in other words the actors are dependent on how others choose to act. This leads to what is called a collective action problem.[156]

In addition, depending on to what degree corruption is defined, the benefits of a normal behaviour related to corruption are expected to be higher than the costs, at least in the short term. This is because, when people act corruptly, everyone has a personal gain from choosing corrupt alternatives before non-corrupt ones. As a result, when corruption is the ordinary behaviour, no one is willing to take the role of implementing anti-corruption reforms such as controlling devices and regimes that promote punishment. In addition, the theory argues that these actions are not effective due to lack of actors who have motivation to

[153] Ibid.
[154] Persson, A., Rothstein, B., and Teorell, J., (2010), The failure of Anti-Corruption Policies A Theoretical Mischaracterization of the Problem, QoG Working Paper Series 2010:19, SIDA, https://www.sida.se/PageFiles/39460/Failure%20Anti_Corruption%20policy%20(2).pdf,
[155] Persson, A., Rothstein, B., and Teorell, J., (2010), The failure of Anti-Corruption Policies A Theoretical Mischaracterization of the Problem, QoG Working Paper Series 2010:19, SIDA, https://www.sida.se/PageFiles/39460/Failure%20Anti_Corruption%20policy%20(2).pdf,
[156] Ibid

enforce them. This remains valid even though perfect information is assumed and all individuals consider the society to be better off with less corruption. [157]

In a context where corruption is not seen as an exception but instead as a prevailing rule, the establishment of reforms for fighting corruption usually arises as a "second order" collective action problem. Within this form of collective action problem the anti-corruption efforts and controlling measurements will not be effective since no one will be willing to hold the corrupt actors accountable. In the end, because the principals are corrupt and are performing in a matter that is not in the interest of the society but rather prioritize their own interest, reforms against corruption established on the grounds of principal-agent will be unsuccessful. [158,159]

6.4 Game theory

A fourth theory that is applied in this paper is game theory, which likewise is in line with previous presented decision theories and analyses decision-makers strategically independent behaviours. The aim of the game theory model is to study and explain the different interacting strategies of all actors participating in the game.[160]

According to this approach there are two or more individuals participating in the game, called players. The players have strategies and depending on which combination of strategies that is chosen by the players, the outcome will differ. These strategies weigh the cost against the benefits. [161] There are two key assumptions that underlie this theory, the first is that the players act rationally. More specifically, the player is rational as he/she makes decisions according to his/hers preferences with the aim of maximizing his/her own welfare.[162] The second assumption states that the decision-makers deliberate strategically and intelligently, where the player takes the choices of others into account when deciding.[163] The theory studies different games but mutually they all face the characteristic of dependency between them. This means that the outcome of each agent is dependent on the strategies of all other agents.[164]

[157] USAID, Uganda mobile money assessment and case study, http://solutionscenter.nethope.org/assets/collaterals/Uganda_Market_Assessment_and_Case_Studies_Final.pdf
[158] USAID, Uganda mobile money assessment and case study, http://solutionscenter.nethope.org/assets/collaterals/Uganda_Market_Assessment_and_Case_Studies_Final.pdf
[159]! Persson, A., Rothstein, B., and Teorell, J., (2010), The failure of Anti-Corruption Policies A Theoretical Mischaracterization of the Problem, QoG Working Paper Series 2010:19, SIDA, https://www.sida.se/PageFiles/39460/Failure%20Anti_Corruption%20policy%20(2).pdf
[160] Ross, D., (2010), Game Theory, http://plato.stanford.edu/entries/game-theory/
[161]Li Lianju, S. and Luyan. P, (2011), Game Theory Analysis of the Bribery Behavior, International Journal of Business and Social Science Vol. 2 No. 8
[162]Myerson, R., (1997), Game Theory: Analysis of Conflict, First Harvard University Press
[163]Osborne, M. and Rubinstein, A., (1994), A Course In Game Theory, Massachusetts Institute of Technology
[164] Dixit, A. and Nalebuff, B., Game Theory, http://www.econlib.org/library/Enc/GameTheory.html

Game theory is used as both a microeconomic and macroeconomic model when studying quantitative example and can be applied in this case to bribery behaviour where the idea is to study the strategies of the person who accepts bribes and the person who refuse the bribe. The study assumes that all individuals foster their own interests in their own lives, corresponding to the above-mentioned basic assumption of rationality. Bribery will then be the consequence when all agents are playing according their optimal strategy after observing their own as well as other agents' actions.[165] This decision-making process can be explained through a simple static game model where the general bribery pattern consists of two players, player A and player B, where the aim is to exchange their interest. This model assumes complete information and three different outcomes presented in table 10.

Case1 Bribery, Bribery: Player A is interested in some kind of benefit, which he/she can obtain from Player B by giving a bribe. This leads to the fact that player B gets additional revenue to his income which we denote by *a* but also an additional cost that is related to corrupt activities such as moral and risk which is denoted *b.* The same holds for player A where the additional revenue is denoted by *d* and the cost is denoted by *e.*

Case 2, Bribery, No Bribery: If player B refuses to accept the bribe from player A, all sorts of benefits and costs will be eliminated and the outcome will be 0 for both participating agents.

Case 3, No bribery, Bribery: Player A will choose to not participate in bribery while player B will choose to demand a bribe. This leads to a cost related to corrupt activities for player B that is denoted by *c.* Player A however will get a moral satisfaction and gain *e.*

Case 4, No bribery, No Bribery: If either player A or player B chooses to participate in corrupt activities the outcome will be 0 for both.

A/B	Bribery	No Bribery
Bribery	**a-b,** d-e	**-c**,e
No Bribery	**0**,0	**0,**0

Table 10: Game Theory

From the assumptions made above the players act in self-interest and choose the strategy that maximizes their own welfare by studying the other player's decision. Therefore, in this case a,b,d,e> 0 and in order to find the Nash equilibrium one needs to determine each player's strategy. Player A will always choose bribery despite the strategy chosen by player B since d-e>e and 0=0. Similar arguments hold for player B

[165] Lianju, S. and Luyan. P, (2011), Game Theory Analysis of the Bribery Behavior, International Journal of Business and Social Science Vol. 2 No. 8

where a-b>-c and 0=0. From this one can conclude that bribery is the dominant strategy for both player A and player B and the Nash equilibrium becomes the situation where player A chooses bribery and player B also chooses bribery.[166]

7. PREVIOUS LITERATURE

This chapter contains a literature review, including a summary of other empirical evidence as well as other perspectives of the mobile banking that has been observed.

The idea of establishing a new financial system in terms of mobile money became concrete when M-Pesa was launched 2007 in Kenya. The system has become a major part of the Kenyans' lives and has provided an effective instrument for Kenyans' to access banking services. Due to this mobile money development several countries worldwide have been trying to replicate and implement the same system. However, there has still not been a similar effect as in Kenya but there are some examples where the implementations have succeeded to some degree.[167]

7.1 The relationship between mobile banking and corruption in other countries

Afghanistan has a similar mobile banking system called M-Paisa, which was implemented in 2008 by a company named Roshan. M-Paisa has expanded countrywide but not to the same extent as M-Pesa in Kenya. In 2010 an article was published by the General Counsel and Head of Government affairs for Roshan named Samir Satchu that presented significant results showing that the mobile banking in Afghanistan can be a fundamental instrument for reducing corruption. The research, which is presented in the article, was conducted in the district of Jalrezz in Wardak Province and analysed the relationship between a policeman's salary before and after the implementation of M-Paisa. The results were that when the policemen started to receive their salary through M-Paisa the salary range increased by almost 25 % and it was also the first time they knew how much they earned and also The main conclusions from this research were that a country can benefit from the mobile banking in many different ways and this practise can be an alternative solution that discloses the corruption issues as well as the lack of transparency and accountability.[168,169]

Another study by Krolikowski, Fu and Hope (2013) examines mobile payment as a tool to facilitate public services as well as for decreasing corrupt-related activities. The study was conducted in Dar es Salaam,

[166]Lianju, S. and Luyan. P, (2011), Game Theory Analysis of the Bribery Behavior, International Journal of Business and Social Science Vol. 2 No. 8
[167] Maurer, B., Chipchase, J., and Lee, P., (2011), Mobile Money: Afghanistan, innovations / volume 6, number 2, http://www.mitpressjournals.org/doi/pdf/10.1162/INOV_a_00067
[168]Satchu, S., (2009), Rebuilding a Shattered Nation: The Impact of Wireless Communication and Mobile Banking in Afghanistan, Proparco's Magazine issue 4
[169]Rosha, Welcome to Afghanistan's first mobile money transfer service, http://www.roshan.af/roshan/m-paisa.aspx

Tanzania and investigated the methods used to pay bills for public water since the introduction of the mobile banking. They found that technological innovations such as M-Pesa could improve the public service delivery gradually because when use of cash decreased and mobile banking increased this created more transparency and therefor accountability and fewer opportunities for corrupt as well as bribery activities. In addition the authors also stated that the use of mobile payments could lead to an expansion of water provision because the mobile platform overcomes obstacles such as distributional losses and corruption related to cash payments.[170]

These two studies have shown great success regarding mobile banking in terms of replacing cash, which in turn might to some extent reduce corruption. This has opened up a new filed for research. However, the subject is still relatively new and there is only some literature available about the relationship between mobile banking and corruption. The limitation of literature is also because the transformation of the financial structure has not succeeded in other countries as well as in Kenya due to more awareness as well as regulations of government and banks that have put up obstacles for the mobile phone companies.[171] Thus, there is more literature available on different economical themes regarding the impact of mobile banking innovations that have been investigated. Most of the literature has analysed the impact of mobile banking systems on development in terms of the easy access to the mobile financial services for low-income people.[172]

7.2 M-Pesa and development in terms of the geographic spectrum

When the mobile revolution of M-Pesa reduced the barriers related to cash flows it gave the opportunity for the majority of Kenyans including the unbanked to access financial services. There is therefore a growing literature regarding this subject as the rapid adoption of M-Pesa and the phenomenal success have given the world a new technological tool for both the developed as well as the developing part of the world.[173]

One of the first ethnographic studies published about the impact of M-Pesa on households was by the World Bank and published in Brief 2009. More specifically, the article investigated the impact of the mobile phone platform on the poor people who used M-Pesa in Kenya. They found that many of the obstacles regarding cash transfers such as the lack of infrastructure and security were eliminated and M-Pesa had

[170]Krolikowski, A., Fu, X., and Hope, R,. (2013), Wireless Water: Improving Urban Water Provision Through Mobile Finance Innovations, ttp://oxwater.co.uk/#/mobile-water-payments/4559323117
[171]T.S., (2013), Why does Kenya lead the world in mobile money?, The Economist, http://www.economist.com/blogs/economist-explains/2013/05/economist-explains-18
[172]Suri, T,. and Jack, W., (2011), Mobile Money: The Economics of M-PESA, NBER Working paper series; Working Paper 16721, http://www.nber.org/papers/w16721
[173]Ngugi, B., et al,. (2010) M-Pesa: a case study of the critical early adopters' role in the rapid adoption of mobile banking in Kenya. https://www.ejisdc.org/ojs2/index.php/ejisdc/article/view/713

facilitated the transactions on all levels. This in turn led to the fact that even individuals in the rural area, where cash is difficult to access, gained from this revolution. In addition, the authors also found potential savings behaviour by the users of the M-Pesa program, which they stated could open up a whole new service for the mobile phone companies.[174]

William and Tavneet (2011) presented household as well as a monetary based research that investigated the mobile banking potential economic impact in terms of financial services on the users of M-Pesa. The authors also found that M-Pesa is a money-transfer product with great potential to reach out to every Kenyan household with different characteristics within a larger geographic range than any other technological device has been able to do before. This in turn has facilitated the informal cash transfers among both the rich and the poor as well as between the banked and unbanked individuals. In addition, they also confirmed the hypothesis of the World Bank and found that M-Pesa has impact on savings and investments as well as risk spreading on household level.[175]

Similar results have been found by Inter Media that presented a financial transaction diary in 2013 that covered the impacts of M-Pesa in Tanzania. M-Pesa is also working as an alternative financial system in Tanzania, but the extent of the money market is not in the same range as in Kenya. The findings of the survey were that the majority of the households were more engaged in different transactions by using M-Pesa rather than using cash. The result was built on the respondents feeling that M-Pesa is a more effective and safer delivery method compared to other informal as well as formal alternatives. In addition, they found that M-Pesa users were twice as likely to save money by using the mobile program related to non-users.[176]

Another study presented by Rotberg and Aker (2013) also stated that the mobile technology could reach a broader range of individuals and in turn change their economic, political as well as social environment. They found that mobile phones can uplift weak and failed states due to the reducing communication costs which facilities the access to information. This in turn decreases the extent of asymmetric information between actors and reduces opportunities for bribery and economic crime. They also stated that a majority of the people in Africa have mobile phones while only a small proportion of the individuals have a bank account. In addition, they mention M-Pesa as an example of a helping tool for the poor due to the range of

[174]Morawczynski, O., and Pickens, M., (2009), Poor People Using Mobile Financial Services: Observations on Custumer Usage and Impact from M-PESA, CGAP Publication, 2014-04-08,https://openknowledge.worldbank.org/bitstream/handle/10986/9492/503060BRI0Box31MPESA1Brief01PUBLIC1.pdf?sequence=1
[175] Suri, T,. and Jack, W., (2011), Mobile Money: The Economics of M-PESA, NBER Working paper series; Working Paper 16721, http://www.nber.org/papers/w16721
[176]Mirzoyants, A., (2013), Mobile Money in Tanzania- Use, Barriers and Opportunities, The financial inclusion tracker surveys project, http://www.intermedia.org/wp-content/uploads/FITS_Tanzania_FullReport_final.pdf

users. They stated that M-Pesa reduces the transaction costs related to transporting money since the spatial and temporal money barriers are eliminated. Furthermore, M-Pesa also helped the users to have control over their finances. Finally, the authors stated that as long as the trust factor exists for the mobile financial system, M-Pesa has great potential to create a more safe and secure society where everyone can access mobile money.[177,178]

8. FIELD METHODOLOGY

The field methodology is presented in this chapter in terms of the process of gathering data, along with the characteristics of the respondents as well as the limitations of the research.

8.1 The initial stage and preparations

In the initial stage we interviewed representatives from companies operating in Kenya, for example Fundamo. They provided valuable experience regarding mobile banking in Kenya and also made us fully aware of the scale of sensitivity in our subject regarding corruption. Because of this information we did not us e the word corruption while in Kenya. Instead we used other definitions for instance credibility and social trust.

We also made a questionnaire because we wanted to investigate the relationship between M-Pesa and corruption through a qualitative method. By using a questionnaire we wanted to examine how the citizens experience the situation of corruption and also their usage, frequency and habits of mobile banking. By using a qualitative method, corruption sensitivity is less likely to occur compared to quantitative analyses due to the objectification it poses.

8.2 Reviewing of the questionnaire

The questionnaire used in order to collect valuable information with the aim of developing a model, which is linked to the adoption of M-Pesa and to its impact on corruption based on both individual as well as society related questions. The questions are to some extent based on questions for measuring corruption in Kenya conducted by Afrobarometer as well as Transparency International. As the emphasis of this paper is on mobile banking and corruption the majority of the questions concern these factors.

[177] Aker, J. and Rotberg, R., Mobile Phones: Uplifting Weak and Failed States, http://csis.org/files/publication/TWQ_13Winter_RotbergAker.pdf
[178]Morawczynski, O., and Pickens, M., (2009), *Poor People Using Mobile Financial Services: Observations on Custumer Usage and Impact from M-PESA,* CGAP Publication, 2014-04-08,https://openknowledge.worldbank.org/bitstream/handle/10986/9492/503060BRI0Box31MPESA1Brief01PUBLIC1.pdf?sequence

The questionnaire is divided into six different themes. The first theme consists of socio-economic questions to collect the characteristics of the sample. Questions such as gender, age, and level of income as well as education are identified. This is followed by the next set of questions that regards the mobile banking in Kenya. There are questions about how the respondents use M-Pesa including how frequently one uses it as well as when one started to use the mobile banking. The concluding questions deal with corruption in the society as well as one's involvement in corrupt activities. The questions under this theme regard social trust, loyalty as well as expectations.

The answers are formed in a standardized way in order to make it simpler to collect data as well as generate good alternatives for qualitative opinions. More specifically, the questionnaire consists of multiple choice questions as well as dichotomous questions where the respondents only have two alternatives. In addition there are also answers consisting of numbers such as for age in order to define subsets of cases. The same questions were answered by all respondents except the questions under theme three related to working force, which were only answered by respondents working in the public sector. The questionnaire can be found in Appendix C.

8.3 Details of respondents

The areas selected for our study were located in different parts of Nairobi and were chosen randomly. The reason for choosing different areas across Nairobi was to capture a variation between respondents in terms of demographic as well as socio-economic factors. More specifically we handed out questionnaires in the provincial towns of Kilimani, Kibera, Westland, Gigiri, Kasarani, Maziwa and its surrounding villages as well as in the City Centre of Nairobi. The division of questionnaires and the sample's geographic distribution were 22 per cent in the City Centre, 5 per cent in Gigiri, 22 per cent in Kasarani, 8 per cent in Kibera, 13 per cent in Killimani, 9 per cent in Maziwa and 21 per cent in Westland as presented in table 11 and shown in figure 4.

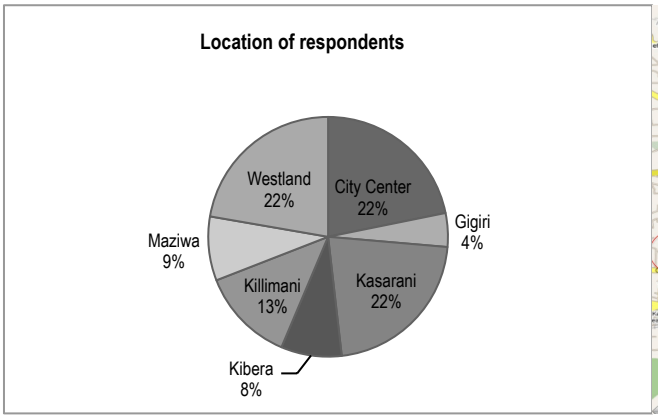


Table 11: Location of respondents

Figure 4: Location of respondents

In order to investigate the possible relationship between M-Pesa and corruption, the sample of respondents consists of a variety of individuals using the services. In addition the sample was selected at random. To gather our sample, we visited crowded places and mainly areas where shopping malls were established due to a variation of people in these places.

8.4 Limitations of our research

The qualitative method is believed to be suitable in order to investigate the relationship between M-Pesa and corruption. However there are some limitations when using questionnaires and also limitations that we have faced related to our topic, which we need to be aware of when analysing and drawing conclusions from the data collected.

The most important, and perhaps most challenging limitation in our case, is to what degree our selected respondents have been honest when answering the questions. As mentioned above, some of our questions are of a more sensitive kind, which may cause some respondents to consider it safer to answer dishonestly the questions regarding loyalty and social trust. One way to prevent this from having impact on our result was to clearly state in the questionnaire that all information is confidential. We have also been clear with all respondents that if there are any questions they consider to be inappropriate they do not have to fill in any of the alternatives. In those few cases we have not been able to use any information filled by the respondents, but on the other hand by giving this instruction to the respondents we have also made sure that all sensitive questions are answered with honesty.

One limitation when using questionnaires is that the questions can also be understood differently based on individuals' preferences. In addition, the questions can be general and broadly defined which could lead to different interpretations that are not covered by the questions and answers. In order to avoid respondents' confusion we have always been present in order to be able to answer questions that arise when a respondent read through the questionnaire.[179]

Another limitation of our study is the fact that M-Pesa is relatively new and hence it might not have had impact on the society as of yet. In some aspects it truly has but in terms of corruption it might take a longer time to show any impact. Another consequence of M-Pesa's recent introduction is that there is limited access to research within the area. We however find the quality of existing research to be of good quality and hence we have had good access to basic material.

[179]Gaiha, R. Thapa, G. (2006), A methodology for assessment of the impact of microfinance on empowerment and vulnerability, International Fund for Agricultural Development (IFAD), http://www.ifad.org/operations/projects/regions/pi/paper/2.pdf

In addition, the sample consists of 204 observations, which is rather small and is only conducted in limited areas across the big city of Nairobi. The law of large number states that the probability of obtaining a sample mean, which is close to the population mean, increases when the results are built on a large enough sample. Therefore, the size of the data might not be a correct representative sample for all individuals in Kenya. However according to Scheyvens and Storey (2003) the sample is large enough for reliable estimations.[180]

Finally, the questions were conducted in English and some of the respondents did not have sufficient language skills in order to answer the questions. In addition we also faced a limitation where the language differences between the English spoken in Kenya and the English we speak. To avoid this having any impact on our study we have, as mentioned above with other limitations, always made sure to be present and explain if any questions arose. We do not consider that the language differences have had any impact on our result.

9. OVERVIEW OF DATA

This chapter contains a summary of the data collected. We will present the data and the variables as well as how we will use them to analyse a possible relationship between M-Pesa and Corruption.

9.1 Structure of data

To evaluate the effect of M-Pesa on corruption, the regressions performed are based on individual level data. We have used a cross-sectional methodology where different specifications are estimated to observe a possible relationship between M-Pesa and corruption. In the analysis categorical measures where socio-economic variables such as gender, income and age are included as well as continuous factors that handle the individual use of M-Pesa and the extent of corruption in Kenya. The information collected regarding M-Pesa and corruption was the used to construct three new variables. These are reported and explained further down.

The data analysed in this paper includes 204 individuals and 73 different variables. This individual based framework for considering the determinants of M-Pesa and corruption provides some guidance on suitable variables to include in the empirical models. A summery of the data is presented in table 1 in Appendix A.

[180]Scheyvens, R. Storey, D., (2003), *Development Fieldwork: A practical Guide,* SAGE Publications

In addition, table 2 in Appendix A displays the main features of the entire raw data in terms of the information that has been collected. The variables used in order to investigate the relationship between M-Pesa and corruptions are described. Specifically, this table shows the overall performance of the respondents as well as the distribution of the variables.

9.2 Measuring corruption

Even though corruption is one of the most common problems in the developing part of the world it is still extremely difficult to quantify the phenomenon with exactness due to its shadowy and secretive nature. However, there are some general measurements to estimate the extent of corruption in countries. One of the most used measurements with high reliability in international policy is the corruption perception index (CPI) presented by Transparency International.[181] The index for 2013 covered 177 countries with data where the extent of corruption in each country´s public sector is scored from 0 (highly corrupt) to 100 (very clean). Important to notice is that no country scores 0 and almost 60 per cent score less than 50, which indicates a serious problem of corruption among the world's countries.[182] The CPI influences our corruption measurement instruments. The index is built on perceptions where the respondents answer questions divided into three themes. The first theme, which is most essential for our study, concerns the spread of different kinds of corruption such as grants and bribes. The following section concerns the extent of corruption in the public sector in terms of contribution to health and education. The third theme regards the individuals' views when it comes to the governmental anti-corruption movements.[183]

Transparency International also provides a worldwide opinion survey regarding corruption named The Global Corruption Barometer (GCB).[184] The barometer is built on interviews conducted around the world with the aim of charting individuals' general experience of corrupt action as well as their thoughts about public and governmental corruption. The measurement also shows how willing a person is to participate in anti-corruption research.[185] The barometer states that since 2010 the number of people willing to participate in anti-corruption efforts has decreased. In 2010 77 per cent were willing to report a corrupt activity whereas the corresponding number in 2013 was 69 per cent. This strengthens our thoughts about observing corruption as a collective action problem where the phenomenon is so common that it is hard to make a change. The biggest problem is the lack of confidence in the existing laws and enforcement. Many of the respondents also reported that they were afraid of reprisals due to the fact that there does not exist

[181]Transparency International, Measuring Corruption, http://www.transparency.org.uk/corruption/measuring-corruption
[182]Transparency International, *Corruption Perception Index 2013*http://www.transparency.org/cpi2013/results
[183]Thompson, T. and Shah, A., (2005), Transparency International's Corruption Perceptions Index: Whose Perceptions Are They Anyway?, http://siteresources.worldbank.org/INTWBIGOVANTCOR/Resources/TransparencyInternationalCorruptionIndex.pdf
[184]Transparency International, Measuring Corruption, http://www.transparency.org.uk/corruption/measuring-corruption
[185]Transparency International, In detail: Global Corruption Barometer 2013, http://www.transparency.org/gcb2013/in_detail

any effective or safe mechanism that empowers and facilitates the reporting of an inconvenient situation.[186]

9.3 Dependent variables

Three new variables are generated, where two of them refer to our dependent variables. These variables are the extent of corruption in society and individual participation in corrupt activities as well as M-Pesa. These variables are proxies of corruption. The reason for using two different measures for corruption is that it hopefully will present a more correct picture of the extent of corruption in Kenya since both the respondents' individual perspective of how widespread corruption is in the society as well as how many participate in corrupt activities are estimated.

9.3.1 The extent of corruption in society

The first variable relates to overall corruption where the extent of corruption in the society is measured. The variable includes the questions under theme 4 in the questionnaire regarding social trust as well as the question under theme 6, which handles expectations in the society. Depending on the respondent's thoughts of the extent of corruption in Kenya each respondent gets an average number. More specifically, the multiple-choice questions are graded on a scale where a high number corresponds to corruption in Kenya and a low number states that no corruption exists. The lowest number possible is 6 and the highest possible is 28. The average number for the whole sample is 19.84.

In order to control for the linear relationship among the variables the correlation is presented in table 12. Despite the fact that certain variables have low correlation they are all significantly different from zero at a 5 per cent confidence level that indicates that we can conclude a positive correlation.

	Trusted	Gain1	Gain2	Dishonest	Give bribe	Demand bribe
Trusted	1					
Gain1	0.14**	1				
Gain 2	0.19***	0.63***	1			
Dishonest	0.31***	0.31***	0.35***	1		
Give bribe	0.35***	0.39***	0.50***	0.40***	1	
Demand bribe	0.26***	0.31***	0.43***	0.44***	0.66***	1

Table 12: Correlation between variables included in corruption society. Note: Coefficient significantly different from zero with 10%(*), 5% (**), 1% (***) confidence level.

9.3.2 Individual participation in corrupt activities

The second dependent variable generated is a corruption measurement related to the respondents' individual participation in corrupt situations. The variable is built on theme 5, loyalty, that is related to individual corrupt activities such as if the respondents demand or will accept an offered bribe. Similar to the

[186]Hardoon, D. and Heinrich, F. (2013), Global Corruption Barometer 2013, Transparency International, http://issuu.com/transparencyinternational/docs/2013_globalcorruptionbarometer_en?e=2496456/3903358#search

measurement related to the extent of corruption in the society, the answers are graded on a scale where a high number corresponds to participation in corrupt situations and a low number corresponds to a non-corruption approach. The lowest number possible is 3 and the highest number is 12. The average number for the whole sample is 5.01. Also for this measurement the linear relationship is controlled and the correlation between the variables is presented in table 13. The correlation coefficients are significantly different from zero and indicate a strong positive relationship.

Variable	Offered	Accept	Demand
Offered	1		
Accept	0.65***	1	
Demand	0.40***	0.62***	1

Table 13: Correlation between variables included in corruption individual. Note: Coefficient significantly different from zero with 10%(*), 5% (**), 1% (***) confidence level.

9.3.3 Cronbach's Alpha

Internal consistency in terms of reliability and validity are two important basics when evaluating a measurement, especially for an instrument generated from field questionnaires. Reliability indicates the ability of the variable to estimate consistently and is related to the validity. In order to control for these elements one needs to test the dimensional distribution of the variable in terms of whether rightly or wrongly discarded. This test is called the Cronbach's Alpha test and takes the values between 0 and 1. If there exist any problem related to the ordinal scale in the measurement the test will give a low Alpha, which normally can be classified as a number lower than 0.5, hence showing that measurement is not reliable. In order to accept the reliability of the variable the value of Alpha needs to exceed 0.70 but should not be above 0.90 because if it is to high the variables might be unnecessary.[187]

First, a Cronbach's Alpha test is performed for the measurement related to the extent of corruption in the society. We expect to find a high value of Alpha due to the positive correlation between the variables. The Alpha for a corrupt society is 0.78, which indicates high reliability and therefore acceptable and can be observed in table 14.

Item	Obs	Item-test correlation	Item-rest correlation	Average inter-item covariance	Alpha
Trusted	204	0.54	0.33	0.43	0.80
Gain1	204	0.69	0.51	0.37	0.75
Gain2	204	0.76	0.61	0.33	0.73
Dishonest	204	0.66	0.50	0.40	0.76
Give Bribe	204	0.78	0.67	0.35	0.72
Demand Bribe	204	0.74	0.59	0.35	0.73
Test Scale				0.37	**0.78**

Table 14: Cronbach's Alpha for corruption society

[187]Tavakol, M. and Dennick, R., (2011), *Making sense of Cronbach's alpha*, International Journal of Medical Education. 2011; 2:53-55

Second, in the same way a Cronbach's Alpha test is performed for the measurement instrument indicating the individual participation in corrupt activities. The Alpha value for this index is 0.79, which indicates that the measurement has high validity and accuracy and is accepted in this study. This can be displayed in table 15.

Item	Obs	Item-test correlation	Item-rest correlation	Average inter-item covariance	Alpha
Offered	204	0.82	0.60	0.44	0.76
Accept	204	0.91	0.76	0.25	0.57
Demand	204	0.78	0.57	0.51	0.79
Test Scale				0.40	**0.79**

Table 15: Cronbach's Alpha for corruption individual

9.3.4 Biases and problem

It is important to notice that the two generated varibles for corruption may not be free from biases and problems. Generating measurment instruments based on field questionnaries has a high probability of underestimating the subject of interest. More specifically, the measurment is built on questions which are self-reported by people living in Nairobi. Some of the respondents who may been involved in corrupt situations in the past or currently may tend to excuse their behavior or may be afraid of telling the truth. If this is the case their answers are not reliable and the two measurement instruments may be distorted.[188]

9.4 Independent variables

The data set consists of 71 different independent variables related to both socio-economic factors of the respondents as well as factors defining the relationship between corruption and M-Pesa. The independent variables are divided into three groups depending on their different characteristics, binary, nominal as well as ordinary. The variables are ranged on an interval scale level, where each variable for every category has a number. However some categories will be biased when converting them to measurable scales since the variables will have different scale effects. More specifically, the distance between 1 and 2 may not be the same distance as between 3 and 4 for the same category. In order to correct for this we have generated dummy variables sorted by their feature. These variables only have two possible values, 1 and 0 where value 1 indicates the feature of the variables that is of interest for this study and 0 otherwise. From this the variables can be ranged on an interval scale when estimating.

Binary Variables	Nominal Variables	Ordinary Variables
Gender	Age	Social Trust
Mobile Phone	Age squared	Position of Power
M-Pesa	Young	Dishonesty
Use of Mobile Banking	Middle	Give Bribe
ISCO variables	Older	Demand bribe Public
Other occupation	Education	Offered Bribe

[188]Torgler, B. and Valev, N., (2004), *Corruption and age,* Crema Working Paper No. 2004 – 24, http://ww.crema-research.ch/papers/2004-24.pdf

ISCED variables	Income	Accept Bribe
Other education	Income 1-4	Demand Bribe Private
No education	Occupation	Corruption society
Measurement of M-Pesa	Frequency of using M-Pesa	Corruption individual
	Transaction 1 and transaction 2	

Table 16; Binary, nominal and ordinary variables

9.4.1 Binary variables

The first group of independent binary variables consist of variables defining gender, mobile phone use, ISCO and ISCED[189] classifications as well as variables for M-Pesa. In addition, one binary variable is generated, in terms of measurement instruments for M-Pesa.

9.4.2 M-Pesa

This index represents the respondents' use of M-Pesa, which corresponds to the questions in theme 4 in our questionnaire. The index is based on the questions related to frequency of use, which year the respondents started to use the mobile service, which functions the individuals' use and also what amount the individual transferred in the last two transactions. The variable takes the values between 4 and 22. As can be seen below in table 17 some of the variables' correlation is fairly low but they are still significant as at least a 10 per cent confidence level exists, and hence we can use the measurement. Only one of the correlation measurements is non-significant at all significance levels.

	Purpose	Usage	Start	Transaction1	Transaction2
Purpose	1				
Usage	0.31***	1			
Start	0.12*	0.12*	1		
Transaction1	0.26***	0.14**	0.20***	1	
Transaction2	0.26***	0.18***	0.08	0.62***	1

Table 17: Correlation between variables included in Mpesasoc Note: Coefficient significantly different from zero with 10%(*), 5% (**), 1% (***) confidence level.

In order to control for internal consistency a Cronbach´s Alpha test is performed for the M-Pesa variable in the same way as for the measurement instruments related to corruption. The estimated Alpha parameter takes the value of 0.58, which is quite low and indicates that the measurement might underestimate the mean of M-Pesa among the respondents. The low value might be due to the measurement instrument being heterogeneously generated in terms of too few questions included or poor interrelatedness between the variables. Additionally, this underestimation can be strengthened by the low correlation between the variables, as presented above. However, according to George and Mallory (2003), values close to 0.60 are good.[190,191] We therefor consider the value high enough in this case to use for this study's estimations.

[189] Note: ISCO is explained under the section for nominal and ordinal variables
[190]Cortina, J., (1993), *What Is Coefficient Alpha? An Examination of Theory and Applications*, Journal of Applied Psychology 1993, Vol. 78, No.1, 98-104

Item	Obs	Sign	Item-test correlation	Item-rest correlation	Average inter-item covariance	Alpha
Purpose	204		0.66	0.33	0.69	0.54
Usage	204		0.42	0.29	1.04	0.57
Start	204		0.50	0.18	0.96	0.61
Transaction1	204		0.75	0.51	0.49	0.41
Transaction2	204		0.70	0.47	0.59	0.45
Test Scale					0.75	**0.58**

Table 18: Cronbach's Alpha for M-Pesa

9.4.3 Gender

The second independent variable used in this study is gender, which is included in the regressions as a dummy. This variable indicates the demographic characteristics for the sample in terms of if the respondent is a male or a female. The data set consists of 91 women and 113 men, which corresponds to 45 per cent women and 55 per cent men.

According to some research, gender is expected to have a different impact on corruption, and they state that women are less corrupt than men. Other evidence has also been found, showing that there is a connection between higher presence of women in governmental sectors and less corruption. In addition, a study by the World Bank strengthens this relationship and concludes that men are less trustworthy than women and are more prone to corruption.[192] This economic theory is consistent with our data sample where men have a higher average value for both the view of the extent of the corruption in the society as well as individual participation in corrupt activities.

	Individual participation in corruption	The view of corruption in society
Male	5.33	19.96
Female	4.63	19.69

Table 19: Average measurement for corruption in sample (gender)

The adoption and development of technology and research is also related to gender. More specially, different reports state that there is a gender gap in adoption of new technology in that men adopt technology innovation earlier compared to women. One example is the launch of the first smart phone where the majority of the users in the initial stage were men. In addition, for the case of M-Pesa there is also a difference in usage between men and women; the statistics state that men use M-Pesa 35 per cent more frequently compared to women.[193,194] However, this theory cannot be observed in our data set. Instead it shows the opposite pattern where the women among the respondents start using M-Pesa earlier as well as use it more frequently compared to the men represented in the sample.

[191]Glien, J. and Glien, R., (2003), *Calculating, Interpreting, and Reporting Cronbach's Alpha Reliability Coefficient for Likert-Type Scales*, Midwest Research to Practice Conference in Adult, Continuing, and Community Education
[192]Nawaz, F., Gender and Corruption, http://corruptionresearchnetwork.org/resources/frontpage-articles/gender-and-corruption
[193]Digital, Z., (2011), Why are women slower to adopt technology?, The IT Donut, http://www.itdonut.co.uk/blog/2011/10/why-are-women-slower-adopt-technology
[194]. Mbiti, I. and Weil, D., (2011), Mobile Banking: The impact of M-Pesa in Kenya, National Bureau Of Economic Research Working Paper 17129, http://www.econ.brown.edu/faculty/David_Weil/Mbiti%20Weil%20NBER%20working%20paper%2017129.pdf

	Started using M-Pesa	Frequency of use
Male	6.11	2.92
Female	5.75	2.84

Table 20: Average measurement for M-Pesa in sample (gender)

9.5 Nominal and ordinal variables

The nominal variables in the model include the demographic characteristics such as age, education as well as an economic variable, income. In addition nominal and ordinal variables include active variables such as the respondents' occupation, the private as well as public trust in the society and frequency of using M-Pesa.

9.5.1 Age

A study by Torgler, B. and Valev, N. (2004) states that age has an impact on corruption. More specifically, the result indicates that the higher the age the greater impact of the justifiability of corruption compared to people in lower age.[195] However, in this study the economic pattern cannot be observed; instead the younger respondents are more prone to corruption compared to older when it comes to individual participation in corrupt activities. For the view of corruption in the society the average measurement instrument varies between the ages and the highest level can be observed for respondents over 57 years old, which to some extent is consistent with the theory.

	Individual participation in corruption	The view of corruption in society
18-25	5.40	20.10
26-33	4.99	19.52
34-41	4.81	19.66
42-48	3.55	20.27
49-56	3.67	19.00
57-	4.50	24.00

Table 21: Average measurement for corruption in sample (age)

On the same basis, some papers show that there exists a generation gap when it comes to technology adoption. More specifically, the younger people seem to adopt technology faster than older people and the gap is even thought to increase with time.[196] Regarding the statistical feature in our data set regarding age and corruption, one can observe the same pattern of the generation gap as stated in the theory. More specifically, according to our sample, young respondents started to use M-Pesa earlier and used the financial mobile banking, M-Pesa, more often compared to the older respondents.

	Started using M-Pesa	Frequency of use
18-25	5.23	2.79
26-33	6.33	2.97
34-41	6.38	2.91

[195] Torgler, B. and Valev, N., (2004), Corruption and age, Crema Working Paper No. 2004 – 24, http://ww.crema-research.ch/papers/2004-24.pdf
[196] Koschei, J., (2013), Blog post: The Growing Technological Generation Gap, The Industry, http://theindustry.cc/2013/02/12/the-growing-technological-generation-gap/

42-48	6.09	3.00
49-56	8.00	3.33
57-	8.00	1.50

Table 22: Average measurement for M-Pesa in sample (age)

9.5.2 Education

Education is also included in the model as an independent variable since certain reports state that education may be seen as one of the most effective mechanisms against corruption. The relationship between education and corruption is based on the fact that education is seen as a factor that strengthens an individual's integrity and also, most important, shapes the community in terms of rule of law and democratic authorities.[197] In addition, one study, which was conducted in six different countries located in Latin America, found that students with higher education are less tolerant of corrupt activities. Another study also found that people with education are less likely to participate in activities, which violate the law.[198] However, this pattern cannot be observed in our data where both measurement instruments for corruption increase on average between the education levels indicating that the tolerance for corruption decreases when the respondents are older.

	Individual participation in corruption	The view of corruption in society
No education	4.00	18.50
Primary	4.75	19.25
Secondary	5.55	20.24
Tertiary	5.08	20.16
Post-Graduate	4.66	19.13
Other	5.10	21.20

Table 32: Average measurement for corruption in sample (education)

An individual's education level also has significance when it comes to how fast technology is adopted. One study has investigated and followed the adoption of computers during 1970 and 1990 in OECD countries. The study found that educational level is an important determinant of the level of investment in computers. The positive connection strengthens the argument that a high level of education results in a high level of skills and also that more investments result in a more advanced capital goods sector.[199] Another study concerning technology in general rather than specific computers concludes that education is significant both in order to simplify the purchase and also when handling new information which could be seen as evidence that individuals with higher education adopt new technology faster.[200] The relationship between education and technology stated by the theory can only partly be identified among our respondents. Both the technology in terms of when the respondents started using M-Pesa as well as the frequency of using

[197] Transparency International, Education, http://www.transparency.org/topic/detail/education
[198] Inter-American Development Bank, *Education as a tool against corruption,* http://www.iadb.org/en/topics/transparency/support-for-countries/education-as-a-tool-against-corruption,6752.html
[199] Hall, B. And Khan, B., (2002), Adoption of New Technology, http://eml.berkeley.edu/~bhhall/papers/HallKhan03%20diffusion.pdf
[200] . Foster, A. and Rosenzweig, M., (2010), Microeconomics of technology adoption, Center Discussion Papers Yale University, http://www.econ.yale.edu/growth_pdf/cdp984.pdf

the mobile program vary between the education levels where the highest value for both variables can be observed for respondents with primary education.

	Started using M-Pesa	Frequency of use
No education	5.50	3.50
Primary	7.00	3.25
Secondary	6.12	2.62
Tertiary	5.70	2.88
Post-Graduate	6.13	3.03
Other	5.60	2.80

Table 24: Average measurement for M-Pesa in sample (education)

The education system, structure and its content vary across the world's countries and the choices of education have increased rapidly. Therefore the United Nation's organization for education, science and culture (UNESCO) has implemented a universal system for education classification named International Standard Classification of Education, ISCED. More specifically, the aim of classifying educational programmes is to simplify when constructing statistics regarding education, both from a country perspective and also internationally. The classification is based on a multi-dimensional classification framework and consists of a seven-level hierarchical system where all included education levels are divided and administered with a code number from 0 to 6.[201,202]

Code	Level of education
0	Pre-primary
1	Primary education or first stage of basic education
2	Lower secondary education or second stage of basic education
3	Upper secondary education
4	Post-secondary education non-tertiary education
5	First stage of tertiary education
6	Second stage of tertiary education

Table 25: ISCED classification

9.5.3 Income

The income variable in our data set provides information of the respondent's monthly income. There are reports stating a positive and significant relationship between income and corruption in terms of a distributive conflict over corruption. More specifically, statistics show that the extent of corruption is more limited among lower income individuals due to limited money when participating in possible corrupt situations. This relationship can also be shown by the public choice theory where the high-income population have greater possibility to behave corruptly in terms of rent seeking due to the cost of diverting public resources to private gain and hence benefit from corrupt activities.[203,204] From this study's data one

[201] United Nations Educational, Scientific and Cultural Organization, (2006), International Standard Classification of Education ISCED 1997, http://www.uis.unesco.org/Library/Documents/isced97-en.pdf
[202] United Nations Educational, Scientific and Cultural Organization, ISCED: International Standard Classification of Education, http://www.uis.unesco.org/Education/Pages/international-standard-classification-of-education.aspx
[203] Castillo, A. and Cousinou, G., (2011), Distributive Effects and Justification of Corruption, http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=0CDIQFjAB&url=http%3A%2F%2Fwww.aecpa.es%2Fuploads%2Ffiles%2Fmodules%2Fcongress%2F10%2Fpapers%2F510.doc&ei=FL9OU9aPPIeW0QXNzoDYBg&usg=AFQjCNGAlHIu55zihIcTZuEu_09XhMdLzw
[204] Mbaku, J., (2010) Rent-Seeking and Corruption, http://www.rrojasdatabank.info/borner/borner10.pdf

can to some extent observe this economic pattern among the income levels where respondents who have a higher monthly income are more prone to corruption. In addition, it can also be observed that respondents with a higher income state that corruption is a widespread phenomenon whereas the low-income respondents report the opposite. However this can be due to the lower income respondents not having the possibility to participate, which makes the corrupt situations invisible for these people.

	Individual participation in corruption	The view of corruption in society
0-3000	5.13	20.90
3001-6000	6.27	19.64
6001-9000	5.27	21.47
9001-12000	5.53	21.06
12001-15000	5.78	19.52
15001-18000	4.65	19.82
18001-	4.43	18.84

Table 26: Average measurement for corruption in sample (income)

When it comes to the relationship between income and technology it is proven that high income is profitable when adopting new technology. This is also a reason why poor countries have complications in catching up with technology and that households face limitations in terms of social status.[205] However, on a country-level one can easily conclude that Kenya is an exception due to its leading role in financial mobile banking. Hence, from our sample it seems that this theory cannot be applied on an individual-level either where low income people started using M-Pesa earlier or are more frequent users. More specifically, the higher the income the later the respondents started using M-Pesa. Also, low-income respondents use it more frequently compared to high-income respondents, and thus the difference is small and not stable as it varies among the income levels.

	Started using M-Pesa	Frequency of use
0-3000	5.40	2.85
3001-6000	5.00	2.82
6001-9000	4.33	3.07
9001-12000	5.59	2.65
12001-15000	6.78	2.93
15001-18000	6.29	2.94
18001-	6.40	2.91

Table 26: Average measurement for M-Pesa in sample (income)

[205] Foster, A. and Rosenzweig, M., (2010), Microeconomics of technology adoption, Center Discussion Papers Yale University, http://www.econ.yale.edu/growth_pdf/cdp984.pdf

9.5.4 Public and Private occupations

The active variable in terms of occupation is important in the role of our model because it not only distinguishes between different types of occupation but also between respondents working in the private or public sector. Transparency International stated in 2013 that corruption is a large problem in the public sector of the world's countries. Figure 5 covers 177 countries that have been ranked according to CPI. The colours indicate the level of perceived corruption where the darker colour indicates a higher level of corruption and the lighter colour little or no corruption. From this map one can sate that corruption is a widespread phenomenon in SSA. In the developing part of the world, corrupt politicians and government officials receive bribes believed to total between twenty and forty billion US dollars every year.[206] This corresponds to 20-40 per cent of official development aid.[207]

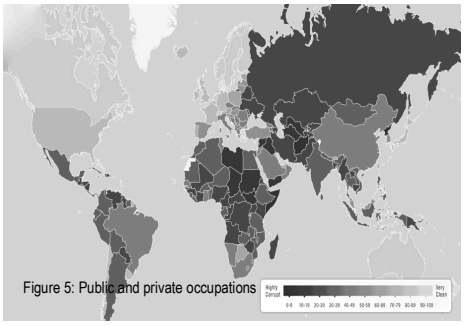


Figure 5: Public and private occupations

Private corruption does not exist to the same extent as public and government corruption. However it is still a worldwide problem and according to Transparency International more than 283 private international cartels were disclosed in a 15 years period. There is evidence that they have harmed the consumers in terms of direct economic losses to a value of 300 billion US dollars.[208] In addition, the total cost of corruption taking place in the developing countries is calculated to be 500 million US dollars. This corresponds to 3.7 times the amount of global aid.[209] According to our sample, the respondents in the public sector are more prone to corruption in terms of participating in corrupt activities. However, the respondents in the public sector state that there is less corruption in the society compared to the respondents in the private sector.

	Individual participation in corruption	The view of corruption in society
Private sector	4.96	20.12
Public sector	5.43	17.61

Table 28: Average measurement for corruption in sample (occupation)

The data information collected about occupation is divided by a system defined as International Standard Classification of Occupations (ISCO). This classification is a ten-level hierarchical system with detailed level occupational subgroups where the majority of the world's jobs are divided into over 400 unit groups. The classifications are based on the skill level and skill specialization essential for each job and were established by the United Nations to organize data concerning the work force. This international

[206] Transparency International, Global Corruption Report 2009: Corruption and The Private Sector, New York; Cambridge University Press, http://www.transparency.org/whatwedo/pub/global_corruption_report_2009
[207] Transparency International, *Corruption Perception Index 2013,* http://www.transparency.org/cpi2013/results
[208] Transparency International, Global Corruption Report 2009: Corruption and The Private Sector, New York; Cambridge University Press, http://www.transparency.org/whatwedo/pub/global_corruption_report_2009
[209] Magpile, J. and Hameed, S., (2014), Removing the Corruption Tax on the Private Sector, Center for Strategic and International Studies, http://csis.org/publication/removing-corruption-tax-private-sector

classification makes it easier to compare statistics regarding occupations among countries. Each of the occupation groups is defined by a title and a code number and the respective codes and corresponding occupation for our sample can be seen in the table 29.[210,211]

Code	Occupation
1	Managers
2	Professionals
3	Technicians Associate Professional
4	Clerical Support Workers
5	Service and sales workers
6	Skilled Agriculture, Forestry and Fishery Workers
7	Craft and Related Trade Workers
8	Plant and machine Operators and Assemblers
9	Elementary Occupations
0	Armed Forces Occupations

Table 29: ISCO classification

10. ANALYSES AND RESULTS

This chapter presents the models used along with their main features and problems. Furthermore, estimations where the variables are tested are given and we present their significance as well as the results.

10.1 Model specification

In order to analyse the relationship between M-Pesa and corruption several model specifications are developed which are linked in different ways to adoption of M-Pesa and to mobile banking impact. The statistical inference is a two-sided hypothesis where the null hypothesis (H_0) is defined as if M-Pesa has no effect on the extent of corruption, whether corruption is defined as an individual or society. The null hypothesis is tested against the alternative hypothesis (H_1), which states that M-Pesa has an effect on corruption. The results related to the impact of M-Pesa on corruption generated by the models are captured by the estimated coefficient β_1. If the coefficient obtains a positive and significant value, one can conclude that the null hypothesis can be rejected and the Kenyan financial mobile system, M-Pesa, has a positive impact on corruption, in terms of reduction.

Hypothesis
H_0: M-Pesa has no effect on corruption
H_1: M-Pesa has a effect on corruption

Table 30: Hypothesis

The two variables for corruption are the dependent variables in this study and are estimated separately. Each model is estimated through six different regressions. More specifically, the models are first estimated

[210] International Labour Organization, (2012), *International Standard Classification of Occupations,* ILO Cataloguing in Publication Data
[211] Ibid.

in their most basic form where only variables for corruption and M-Pesa are included. Additional variables are then gradually added to the model to control for different effects in order to generate more precise estimates of the causal effect from M-Pesa.

The models are analysed by using two different regression models, ordered probit estimation and multiple linear probability model (LPM). The LPM model is ran according to the ordinary least square method (OLS) and the order probit model is estimated by the method of likelihood ratio (LR). The ordered probit model is used for ordinal dependent variables, which is the case in our study. The model estimates the effects of the impact from the independent variables by indicating that more than two values are indistinguishable from LR estimates when observing the same relationship. This model is therefore appropriate for the types of variables included and presents results where the underlying variables are reliably represented.

The ordered probit model is written as:

$$Y = \phi(\beta' x + \varepsilon_i)$$

Y is the dependent variable, ϕ is the standard normal distribution function when performing a Chi-squared test. β is a vector of estimated parameters which represents the effect of a change in the independent variables on the underlying scale, i.e. dependent variable. In addition, x is the vector of explanatory variables and ε_i is the error term.[212]

Hence, this model can only be used when the scale of the dependent variable is limited. Despite the fact that the ordered probit estimation is most appropriate in this case, this strategy can only be estimated for models where we have the measurement for individual corruption as our dependent variable. The reason is that the dependent variable related to the extent of corruption in the society is constructed in the sense where the measurement has a too broad scale. This might lead to biased results when using the ordered probit model and therefore LPM is constructed and used to estimate the models concerning the extent of corruption in the society.[213]

The LPM is commonly used when the dependent variable is binary and takes the value zero or one but can also be used when the dependent variable takes more than two values. Hence, LPM requires an interval level measurement of the dependent variable and might not therefore be the best estimation strategy in this case, as our dependent variables are formed through an ordinal scale. The model also differs from the

[212]Duncan, C., Khattak, A. and Council, F., *Applying the Ordered Probit Model to Injury Severity in Truck- Passanger Car Rear-End Collision,* Transportation Research Record 1635 Paper No. 98-1237

[213]Angrist, J., (2009) Mostly harmless econometrics an empiricist's companion. http://sfxeu05.hosted.exlibrisgroup.com/46LUB?url_ver=Z39.88-2004&ctx_ver=Z39.88-2004&ctx_enc=info:ofi/enc:UTF-8&rfr_id=info:sid/sfxit.com:opac_856&url_ctx_fmt=info:ofi/fmt:kev:mtx:ctx&sfx.ignore_date_threshold=1&rft.object_id=2550000000005641&svc_val_fmt=info:ofi/fmt:kev:mtx:sch_svc&

order probit model in terms of the interpretation of the estimated parameters. More specifically, the probabilities increase linearly with the independent variables while the opposite is assumed for the order probit model. In other words, the relationship between the dependent and independent variables are linear where the conditional expectations of the dependent variable given the independent variables are interpreted as the conditional probability that a relationship exists when the dependent variables take different values. The estimated parameters are interpreted as a change in the probability that the dependent variables take a specific value as the independent variable changes by one unit. Despite the lack of success with the LPM in this case, the model is correct and acceptable for use and enough assumptions are taken to fulfil our criteria of estimation.

We define LMP by the following:

$$Y=\beta_0+\beta_1 x_{1i}+\beta_2 x_{2i}+\beta_3 x_{3i}+\ldots+\beta_k x_{ki}+\varepsilon_i$$

Y is the dependent variable and x_i the independent variables. The parameter β is the estimated effect of the variables and ε_i is the error term which is normally distributed and also the variance of the error terms is constant, i.e. homoscedasticity is assumed.[214]

10.2 Limitations of the models

The OLS and LR methods usually estimate similar marginal-effects, hence both methods struggle with a sort of misclassification of the dependent variable if the data is presented according to an ordinal scale. In this case the dependent variables are presented on an ordinal scale and can only take specific values, which are determined and calculated. Thus, by using the OLS or LR estimation the value of the dependent variable can lie outside this scale and take a lower or higher value than given. This misclassification of the dependent variable yields inconsistent coefficient estimates. This problem can be controlled for, and thus it is easier to eliminate the bias of estimated variables when using LR compared to OLS. However, an attempt to control for this misclassification is presented by performing a sensitivity analysis for both methods further below. [215]

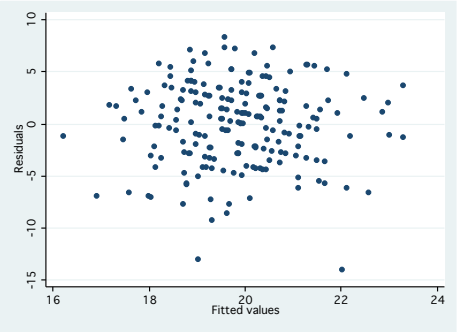
A majority of the LPM models are estimated by the OLS method due to its basic form and simplicity in interpreting the estimated coefficients. However the use of the LPM model is limited and is not used to the same extent as the order probit model, since it commonly yields biased and inconsistent estimates. One problem, which generates this biased inference, is related to outliers. As the data consists of observations with very high or small values, which distinguishes from the abnormal value, the OLS method does not

[214]Schaffer, M., (2012), Probit better than LPM?, Mostly Harmless Econometrics, http://www.mostlyharmlesseconometrics.com/2012/07/probit-better-than-lpm/
[215]Hausman, J.A., Abrevaya, J. and Scott-Morton, F.M., (1998)

work properly. The reason is that these values will have disproportionally large effects on the coefficients. Hence, this is controlled for and further explained under the section on sensitivity analysis.[216]

Another problem related to the LPM model, especially in this case where cross-sectional data is used, is that the assumption of homoscedastic disturbance is not valid. Instead it is assumed heteroskedasticity in the error terms indicating that the variance is not constant. In the LMP model the variance of the standard error is rather determined based on the value of variables that are independent.[217,218] Hence, this problem might bias the inference of interest by under- or overestimating the coefficient estimates, which indicates unreliable results. The problem is difficult to control for but in order to eliminate as much bias as possible a robustness control variable is added.

The left figure displays the squared residuals for the extent of corruption in the society. The residuals are graphed as a diagnostic tool and cannot be a one hundred per cent reliable measurement. However it is easy to observe that there is no discernible systematic pattern between the residuals and fitted values, which are the independent variables indicating that there is perhaps no heteroskedasticity in the data. On the other hand the figure on the right represents the squared residuals for the measurement instrument related to individual participation in corrupt activities. Here a systematic relationship between the independent variables and the squared residuals can be observed. There are certain kinds of negative linear relationship indicating possible heteroskedasticity presented in the data. Using the order probit model, which controls for heteroskedasticity, solves this problem.[219]



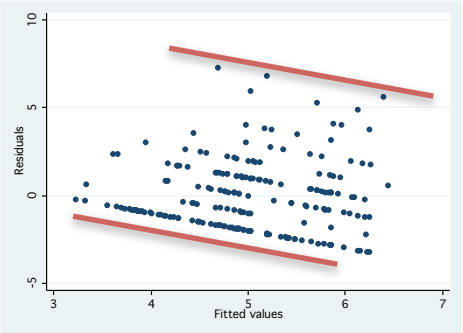


Figure 6: Plot over the squared residuals for the extent of corruption in the society Figure 7: Plot over the squared residuals for the individual participation in corrupt activities

[216]Angrist, J., (2009) Mostly harmless econometrics an empiricist's companion. http://sfxeu05.hosted.exlibrisgroup.com/46LUB?url_ver=Z39.88-2004&ctx_ver=Z39.88-2004&ctx_enc=info:ofi/enc:UTF-8&rfr_id=info:sid/sfxit.com:opac_856&url_ctx_fmt=info:ofi/fmt:kev:mtx:ctx&sfx.ignore_date_threshold=1&rft.object_id=2550000000005641&svc_val_fmt=info:ofi/fmt:kev:mtx:sch_svc&
[217]Pedace, R., 3 Main Linear Probability Model (LPM) Problems, Econometrics For Dummies, http://www.dummies.com/how-to/content/3-main-linear-probability-model-lpm-problems.html,
[218]Gujarati, D., (2006) Essentials of Econometrics, third edition New York: McGraw-Hill. p, 202
[219]Gujarati, D., (2006) Essentials of Econometrics, third edition New York: McGraw-Hill. p, 289

As stated above, the conditional probability changes linearly with the independent variables, which leads to the fact that the increasing effect of the independent variables remains constant throughout. More specifically, if the estimated parameters show an increase, the probability of the dependent variable increases linearly despite the value of the increase in the independent variable. In reality this assumption does not hold and instead an assumption of non-linearity is taken.[220]

The order probit model is commonly preferred as an estimation strategy due to its credibility in estimating coefficients. However, there are some problems with the method and there also exists some biased inference when the sample is limited. But this does not dramatically change the results because the model is consistent.

Finally, the inference might become biased as the model consists of endogenous dummy variables, in other words variables are correlated and dependent on other variables. This might occur since some of the answers of the respondents might be correlated due to clustering problems commonly referred to as the Moulton problem. This implies that the respondents' answers are correlated because the respondents are subject to some of the same background characteristics in terms of exposing the same environmental influences such as the extent of corruption. Although this problem might bias the results, the collected data is fairly small and in such cases the clusters rarely lead to any bias changes in inference. However, in order to adjust for this and make the results more credible, this problem is to some extent defined by controlling for heterogeneity.

10.3 Predictions

In this study the hypothesis stated is that M-Pesa reduces the extent of corruption, i.e. that the coefficients estimated have a negative slope for the M-Pesa. The prediction is that individuals using more functions of M-Pesa and using it more frequently should be less involved in corruption and have a more non-tolerant view concerning the overall corruption situation in the country as a whole. Also, we expect individuals who started to use mobile banking early to be less prone to corruption and have a more positive view of corruption in the society than those who are later adopters. These arguments are built on the fact that as an individual uses the financial mobile banking the transactions will be registered and the cash flow will decrease, resulting in less possibility for corrupt activities.

Another prediction is that employees in the public sector in comparison with the private sector are more corrupt. This hypothesis is built on the theory that corruption is more common in the public sector. More

[220]Gujarati, D., (2006) Essentials of Econometrics, third edition New York: McGraw-Hill. p, 202

specifically, there is a higher possibility for corrupt activities between private and public individuals in terms of paying a bribe to get a benefit from the state or get out of an inconvenient situation rather than a similar situation between two private individuals. This in turn might be due to the fact that individuals in the public sector have a higher degree of power due to their working position.

10.4 Regression Analysis

In the following analysis the impact of M-Pesa on corruption is investigated and it is therefor useful to see the linkage between the different stages in the analysis. The first part is based on a model for each variable including the whole sample. The second part present three different sensitivity analyses where the estimations are performed for different subgroups.

Important to note is that the dependent variables are formed on an ordinal scale. Therefore the computed R^2 index is by secondary importance and not much value is put in its interpretation. In addition, the intercept values here have no viable practical meaning and hence is not interpreted. For the OLS estimation, a measurement named Root MSE standing for rot mean squared errors is also presented in the ANOVA tables. This index implicates that the more accurate the model is, the less error and therefor a low MSE value. However this index is not standardized and therefor not interpreted in our results rather only presented for interest.[221]

Additionally, the variation in certain control variables appears to be less important for explaining the impact of M-Pesa, as observed when estimating. Therefore, the coefficients on the control variable are reported in Appendix B and are only distributed briefly here.

10.4.1 The whole sample

In this part the regressions are performed for the whole sample covering 204 observations. The basic data behind this identification strategy can be illustrated by using a two-by-two table. Table 31 displays the probit as well as OLS results that illustrate the identification strategy and a test of an implication of the assumptions made above.

Our baseline specification for the LR estimates shown in first column, includes only the measurement instrument for individual participation in corruption and the M-Pesa index. As mentioned above, several control variables are then added with the aim to test how the result changes or holds as another variable is added or eliminated. According to the estimates M-Pesa decrease corruption in the three first model

[221] Reading and using STATA output, http://web.mit.edu/course/17/17.846/OldFiles/www/Readout.html

specifications, thus M-Pesa does not have statistically significant impact on corruption, although its estimated coefficients are in line with the theoretical approach. Note, however, that the standard error for the last four regressions are lower compared too the standard error in the two first model specifications. Despite the insignificance the control variables added have substantial explanatory power for the dependent variable. By including more control variables to the model the residual variance decreases which in turn lowers the standard error of the regression estimates.

In order to explore variables that supply to other effects that might reduce corruption, two of the control variables in the order probit model for corruption can be further interpreted. A factor incorporated as control variable is gender. The estimated coefficients for gender are statically negative on the 5 per cent level. This gender difference in the effect of M-Pesa used on corruption may help to explain the theory where women are less corrupt than men. Another factor that is used for interpretation of the results are income. The variables for high-income have a positive value indicating that high-income respondents tend to be less significantly prone to corruption compered to low-income respondents.

The last six columns in table 31 display the OLS coefficients for the dependent variable measuring the extent of corruption in the society. M-Pesa's impact on corruption is statistically insignificant at a 10 per cent confidential level in 3 of 6 model specifications. More specifically, the panel sample for the OLS estimates that the average effect of M-Pesa across the significant values decreases corruption.

The relationship between M-Pesa and corruption become insignificance when variables are added for additional control. As the significance drops from the variable of interest (M-Pesa) one can conclude a sign of problem. However, the standard errors for the M-Pesa variable is high enough which indicates that we cannot draw any substantive conclusion from this estimate and that this model is effectively unidentified. This can also be strengthened by the P-value for the regression as whole where half of the models are not significant indicating some problem with correlation among the variables. This might lead to the fact the independent variables are explaining the same part of the variation in the dependent variable, M-Pesa. This in turn might lead to that the explanatory power of the independent variables being divided up among them.[222]

	Dependent variable: Individual participation in corrupt activities						**Dependent variable: The extent of corruption in the society**					
	Probit						**OLS**					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Mpesasoc	-0.01	-0.02	-0.01	0.00	0.01	0.01	-0.15*	-0.15*	-0.17*	-0.13	-0.12	-0.14
	(0.21)	(0.22)	(0.02)	(0.02)	(0.02)	(0.02)	(0.08)	(0.08)	(0.09)	(0.09)	(0.09)	(0.10)

[222]Reading and using STATA output, http://web.mit.edu/course/17/17.846/OldFiles/www/Readout.html

Gender		-0.37**	-0.36**	-0.46***	-0.43***	-0.44***		-0.38	-0.38	-0.59	-0.56	-0.54
		(0.15)	(0.15)	(0.16)	(0.16)	(0.16)		(0.58)	(0.58)	(0.57)	(0.62)	(0.61)
Young			0.74*	0.90**	0.96**	0.92**			-1.65	-1.12	-1.08	-0.91
			(0.45)	(0.41)	(0.41)	(0.43)			(1.78)	(1.90)	-194	(1.94)
Middle			0.43	0.68	0.71	0.67			-1.39	-0.55	-0.57	-0.53
			(0.46)	(0.43)	(0.43)	(0.45)			(1.83)	(1.96)	(2.01)	(2.00)
Income1				0.57	0.52	0.57				1.74	1.63	1.65
				(0.22)	(0.22)	(0.25)				(0.77)	(0.78)	(0.86)
Incom2				0.66***	0.62***	0.67***				2.37***	2.39***	2.29***
				(0.22)	(0.24)	(0.24)				(0.83)	(0.83)	(0.81)
Income3				0.59***	0.53**	0.53**				0.93**	0.97**	1.10*
				(0.21)	(0.22)	(0.22)				(0.76)	(0.78)	(0.79)
ISCED2					0.32	0.30					0.91	1.04
					(0.37)	(0.36)					(1.24)	(1.13)
ISCED5					0.23	0.22					1.22	1.26
					(0.35)	(0.35)					(1.16)	(1.01)
ISCED7					0.09	0.07					0.77	0.88
					(0.35)	(0.35)					(1.23)	(1.08)
Other education					0.40	0.34					2.23	2.41*
					(0.51)	(0.50)					(1.56)	(1.43)
ISCO2						-0.42						-2.02
						(0.48)						(1.93)
ISCO3						-0.42						1.68
						(0.48)						(1.95)
ISCO5						-0.22						0.43
						(0.39)						(1.77)
Other occupation						0.31						0.51
						(0.44)						(-1.89)
Sample	Core	Core	Core	Core	Core	Full	Core	Core	Core	Core	Core	Full
N	204	204	204	204	204	204	204	204	204	204	204	204
R2	0.0004	0.0082	0.0139	0.0322	0.0344	0.0361	0.0166	0.0186	0.0227	0.0668	0.0748	0.0920
Pseudo R2	0.0004	0.0082	0.0139	0.0322	0.0344	0.0361	0.0166	0.0186	0.0227	0.0668	0.0748	0.0920
Root MSE							4.1147	4.1207	4.1327	4.0692	4.0937	4.0984

Table 31: The whole sample. Note: Coefficient significantly different from zero with 10%(*), 5% (**), 1% (***) confidence level. Robust standard error in parentheses.

10.5 Sensitivity Analysis

Quantitative methods that are controlled for systematic error and biases in the study baseline results are proved to be less statistically successful compared to methods which assume random errors. However, it is of importance to define various sources of errors in order to motivate possible uncertainties of the results. Therefore a sensitivity analysis is motivated and can be defined as an extension of the method characterized by discussions of different results. In order to correct for possible robustness such as unobserved heterogeneity in the above-presented results, a sensitivity analysis is performed in terms of correction of data as well as estimations of complementary approaches. In this analysis assumptions, which are related to the dependent variables, are violated. Any errors and unidentified causal effect can then hopefully be estimated and corrected, as the analysis is re-estimated.[223,224] There are three different types of sensitive analysis completed.

[223]Greenland, S., (1996), *Basic Methods for Sensitivity Analysis of Biases*, International Journal of Epidemiology Vol. 25, No.6
[224]Leone, A., Minutti-Meza, M. and Wasley, C., (2013), Influential Observations and Inference in Accounting Research, https://business.uoregon.edu/sites/business1.uoregon.edu/files/media/andrew-leone-accounting-research-wkshop-2013-11.pdf

10.5.1 Sensitivity analysis with outliers: Subgroups

The first sensitivity analysis performed is made by dividing the sample into two different groups, public and private employed. More specifically, one group consists of respondents that worked in the public sector and one group consists of respondents belonging to the private sector. The first group for public officials covers 23 respondents and the second subgroup covers 181 individuals. The results for each group is then compared to the results estimated for the baseline sample.

Table 32 reports the estimations for the dependent variable measuring the individual participation in corrupt activities. The coefficient estimated for M-Pesa for both subgroups are similar to those found in the baseline sample. Thus, none of those were statistically significant.

Explanatory Variable	**Dependent variable: Individual participation in corrupt activities**						**Dependent variable: Individual participation in corrupt activities**					
	Public						**Private**					
	1	2	3	4	5	6	1	2	3	4	5	6
Mpesasoc	-0.06	-0.08	-0.04	0.06	0.10	0.08	-0.01	-0.02	-0.01	-0.01	0.00	0.01
	(0.10)	(0.09)	(0.10)	(0.12)	(0.13)	(0.13)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Sample	Core	Core	Core	Core	Core	Full	Core	Core	Core	Core	Core	Full
N	23	23	23	23	23	23	181	181	181	181	181	181

Table 32: Subgroups- corruption individual. Note: Coefficient significantly different from zero with 10%(*), 5% (**), 1% (***) confidence level. Robust standard error in parentheses.

Table 33 provides a rough comparison of the overall magnitudes of the six estimates of M-Pesa impact on the extent of corruption in the society for both subgroups. As we compare public and private employees it shows that M-Pesa reduces corruption more in the public sector, even if this is an insignificant relationship. However, as can be observed the effects shown in last model specification regarding public servants takes the highest value and is also significant at the 10 per cent confidence level.

Explanatory Variable	**Dependent variable: The extent of corruption in the society**						**Dependent variable: The extent of corruption in the society**					
	Public						**Private**					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Mpesasoc	-0.56	-0.49	-0.54	-0.43	-0.53	-0.62*	-0.09	-0.10	-0.12	-0.08	-0.08	-0.10
	(0.39)	(0.37)	(0.40)	(0.37)	(0.35)	(0.30)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.10)
Sample	Core	Core	Core	Core	Core	Full	Core	Core	Core	Core	Core	Full
N	23	23	23	23	23	23	181	181	181	181	181	181

Table 33: Subgroups- corruption society. Note: Coefficient significantly different from zero with 10%(*), 5% (**), 1% (***) confidence level. Robust standard error in parentheses.

10.5.2 Sensitivity analysis with outliers: Reduce the scale

Another sensitive analysis, which is performed in order to attempt to determine the underlying impact on the baseline results, is made by reducing the scales of the answering choices. As explained above, both dependent variables for corruption are based on questions that have multiple-choice alternatives. Instead of using a four-scale answer choice, the index related to the individual participation in corrupt activities is

transformed and instead only consists of three-scale answering choices. In this case the answering alternatives ¨very often¨ are assigned the value 0. The initial scale for the index runs between 3-12 and consequently in this case the measurement takes the value between 3-9, where the value 3 indicates no corruption and 9 indicates corruption. In the same way, the scale is transformed for the index regarding the extent of corruption in the society where the question under theme 4 with five-scale answering alternatives is decreased to a three-scale. For theme 6 related to inconvenient situations, the four-scale answering alternatives are reduced to a three-scale answering choice. Previously the measurement ran between 6-28 and in this analysis it takes the value between 8-18. Therefore, the number of observations has decreased from 204 to 195 in this case.

In this analysis the panel sample presented in table 34 estimates imply that the average effect of M-Pesa across the six model specifications for the probit model decrease corruption. According to the coefficients M-Pesa decrease corruption by 0.03 percentage points on average, note however, M-Pesa does not have a statistically significant impact, although its estimated coefficients are as expected negative. In the second model, the OLS estimates indicates the same pattern, thus 3 of 6 model specifications are significant.

In addition, based on the OLS sample, at a low level of education the impact of M-Pesa increases corruption, which is according to the abovementioned theory. As 30 per cent of the sample is low educated one can conclude that the public policy in Kenya to enhance the populations' education, as mentioned in section 3, is very important in order to reduce the extent of corruption in the country.

Explanatory Variable	**Dependent variable: Individual participation in corrupt activities**						**Dependent variable: The extent of corruption in the society**					
	Probit						**OLS**					
	1	2	3	4	5	6	1	2	3	4	5	6
Mpesasoc	-0.03	-0.04	-0.03	-0.03	-0.02	-0.02	-0.11	-0.12	-0.14*	-0.11	-0.12*	-0.11*
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.08)	(0.08)	(0.08)	(0.08)	(0.07)	(0.07)
ISCED2					0.21	0.18					2.20***	1.91**
					(0.37)	(0.28)					(0.82)	(0.79)
Sample	Core	Core	Core	Core	Core	Full	Core	Core	Core	Core	Core	Full
N	196	196	196	196	196	196	75	75	75	75	75	75

Table 34: Reduce the scale. Note: Coefficient significantly different from zero with 10%(*), 5% (**), 1% (***) confidence level. Robust standard error in parentheses.

10.5.3 Sensitivity analysis without outliers: Controlling for outliers

In this part of the sensitivity analysis well-known observations, which may influence the results of the study, are eliminated. In order to perform this sensitivity analysis an alternative index for the two dependent variables are generated again. This process is based on controlling for observations for the dependent variable that lie an abnormal distance from other observations in the sample and are defined as outliers. More specifically the observations that are remarkably large or small compared to other observations are

eliminated. Graphing the data for the two corruption measurements presented in figure 8 and 9, one can observe the behaviour of the data and eliminate the outliers. Note, however, that graphing the outliers is only a simple diagnostic tool used to generate a clear picture about the outliers in this data set. Thus, even if outliers generally are biased observations, it is important to emphasize and carefully control for these observations because they can contain valuable information about the relationship investigated.[225] Therefore, in order to strengthen which observations are outliers, a common model is used where observations showing two standard deviations from the mean of the dependent variables are excluded.[226]

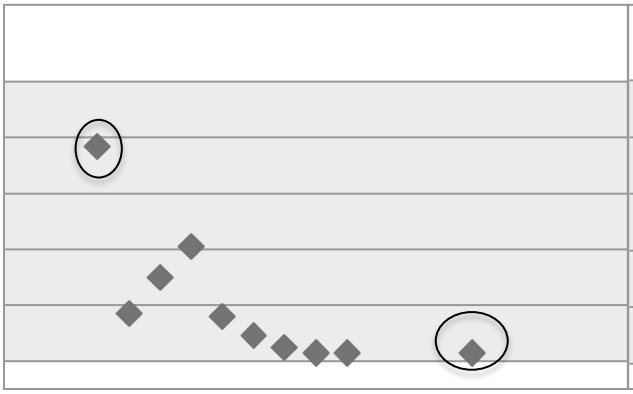


Figure 8: Outliers for individual participation in corrupt activities

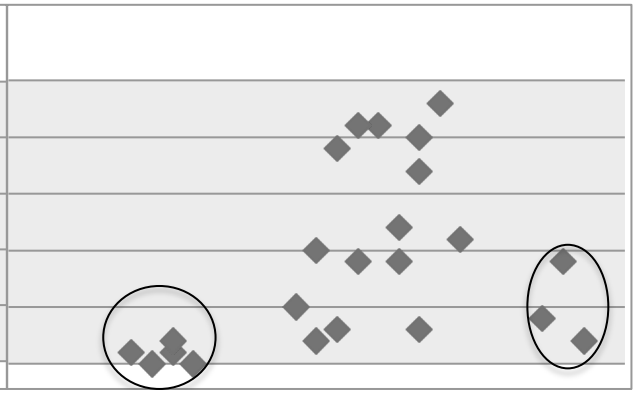


Figure 9: Outliers for the extent of corruption in the society

The ordinary scale for the measurement related to individual participation in corruption was 3-12, and after elimination of the outliers the new scale is calculated to run between 4 and11. The same calculations are made for the measurement regarding the extent of corruption in society where the initial scale ran between 6 and 28 and in this analysis it takes the values between 15 and 25. Hence, both dependent variables are built in the same way and consist of the same variables as presented previously.

In both cohorts presented in table 35, in average the impact of M-Pesa decreases corruption. However, even if the M-Pesa index used in this model is operated to target more precise measurements regarding the impact of M-Pesa on corruption there is no significant relationship.

Explanatory Variable	**Dependent variable: Individual participation in corrupt activities**						**Dependent variable: The extent of corruption in the society**					
	Probit						**OLS**					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Mpesasoc	-0.03	-0.03	-0.02	-0.02	-0.01	-0.00	-0.10	-0.10	-0.10	-0.10	-0.09	-0.10
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.07)	(0.07)	(0.07)	(0.07)	(0.08)
Sample	Core	Core	Core	Core	Core	Full	Core	Core	Core	Core	Core	Full
N	124	124	124	124	124	124	172	172	172	172	172	172

Table 35: Controlling for outliers. Note: Coefficient significantly different from zero with 10%(*), 5% (**), 1% (***) confidence level. Robust standard error in parentheses.

[225]Angrist, J., (2009) Mostly harmless econometrics an empiricist's companion. http://sfxeu05.hosted.exlibrisgroup.com/46LUB?url_ver=Z39.88-2004&ctx_ver=Z39.88-2004&ctx_enc=info:ofi/enc:UTF-8&rfr_id=info:sid/sfxit.com:opac_856&url_ctx_fmt=info:ofi/fmt:kev:mtx:ctx&sfx.ignore_date_threshold=1&rft.object_id=2550000000005641&svc_val_fmt=info:ofi/fmt:kev:mtx:sch_svc&

[226]Field, A, (2005). *"Discovering Statistics Using SPSS",* Second edition, London: Sage Publications, London

11. CONCLUDING REMARKS AND SOME THEORY CONCLUSIONS

This final chapter presents a conclusion of our topic, discussion of our results and lastly a suggestion for future studies within the field.

In this paper we have studied if M-Pesa has any effect on corruption in Kenya by performing several estimations. We have collected the data for these estimations by handing out questioners to people living in Nairobi.

In the two first regressions, which covered the whole sample, no stable relationship between M-Pesa and corruption could be observed with the exemption from the first three model specifications regarding the extent of corruption in the Kenyan society. When the models are controlled for omitted effect of different characteristics, the estimations shrink to result in a pattern of negative correlation between observed levels of output for M-Pesa and supposed corruption. In addition, these results show that M-Pesa to some extent work as an anti-corruption tool. However, one should note that most of these negative coefficient estimations are not signification despite the fact the model specifications include control variables.

The resulting complex of insignificant independent variables is difficult to analyse with conventional methods of a qualitative study, as it is prone to include effects that are not covered. More specifically, a number of hard catch theoretical and practical reasons related to the data set might account for the difficulty in identifying a significant relationship between M-Pesa and corruption. One example, which might be a keystone for the bias result, can be explained by the mischaracterization of the problem of corruption. The estimations are based on self-reported questionnaires, which might have led to the variables included being strongly dependent on each other. More ordinary problems of the generated measurements are also likely to have contributed to mediocre empirical results in this area due to the fact that the measurement instrument represents a complex phenomenon. Sensitivity analyses are therefore presented with the aim of challenging such difficulties. Note that the sensitivity analyses have produced less vigorous and more ambiguous results where M-Pesa decreases both indexes for corruption. Although the relationship between the observed factors concurs with the economic theory and our expectations, the results are still insignificant and indicate that one needs to be careful when drawing substantive conclusions from the estimates. In addition, one can to some extent conclude that the sensitive analyses have not succeeded in taking different effects into account, which makes the models unidentified.

The extensive literature regarding the economic theories in terms of the decision-making models helps to explain why M-Pesa has largely failed to work as an anti-corruption tool. More specifically, our estimations reveal that the Kenyan context of corruption can be observed within a collective choice framework instead of a principle-agent problem. As a matter of accounting, the major source of the failure of M-Pesa according to the theory is that the costs of fighting corruption outweigh the benefits. In addition, this collective-action theory states that in a context where corruption is not seen as an exception, but instead as a prevailing rule, the establishment of reforms for fighting corruption is usually hard. Even if the Kenyan population morally disapprove of corruption and are fully aware of the consequences, the anti-corruption efforts and controlling measurements will not be effective, since no one is willing to take responsibility or fight corruption. This leads to the breakdown of the anti-corruption strategy of M-Pesa.

To continue, there is limited access to previous studies in this area, which makes it difficult to determine which variables should be identified as key drivers for both M-Pesa and corruption. Despite the fact that there is no clear evidence of a direct effect of M-Pesa on measured corruption, there are studies that have looked separately at the effects of M-Pesa on economic factors. These have shown more promising results, for example that M-Pesa increases economic growth.

Finally, a recurring theme in both the theoretical discussion of corruption and related empirical studies shows a close relationship between corruption and the governmental sector. The reason is that many of the opportunities for corrupt activates are created in these sectors due to the lack of institutional rules and transparency in accounting.[227] In order to check if this pattern can be observed in our thesis, estimations have been made where the data set was divided into two different subgroups. More specifically, regressions were made separately for respondents in the public and private sectors. However, these estimations have also fallen short of identifying with precision the relationship between M-Pesa and the extent of corruption in Kenya. Note, however, that the relationship was still negative but not significant except for the regressions in section 10.6.1 regarding public employees. This result shows that respondents from the public sector using M-Pesa have a negative impact on the corruption index in terms of reducing corruption. This implies a signal that improving governance structure in Kenya leads to less corruption.

Our understanding of the relationship between M-Pesa and corruption remains limited as one can conclude that the negative correlation is insignificant and one cannot rely on a clear demonstration of a strong link

[227] OECD (2010), Issues paper on corruption and economic growth, http://www.oecd.org/g20/topics/anti-corruption/Issue-Paper-Corruption-and-Economic-Growth.pdf

between M-Pesa performances and reducing corruption. Further support for a strong anti-corruption policy in terms of M-Pesa is however desired in order to create evidence that financial mobile banking reduces the damaging effect in terms of corruption. This relationship can be revolutionary due to the importance for a sustainable and justifiable development. In order to generate variables that make the output more reliable, we believe that the relationship should be studied for a longer period of time. Additionally, in order to study changes in corruption and how the phenomenon changes over time, a better option would perhaps be to study a sample of individuals regularly.

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13. APPENDIX A

Table 1:

Variable	Definition	Expected Relationship
Identification number	Each respondents gets a number, 1-204	
Occupation	1= Student, 2=Business, 3=Education, 4=Security, 5=Service, 6=Hospital, 7=Financial, 8=Retail, 9= Other	+/-
ISCO2	International Standard Classification of Occupation where class 2 responds to professionals If class 2 it yields 1 otherwise 0	
ISCO3	International Standard Classification of Occupation where class 3 responds to Technicians and associate professionals. If class 3 it yields 1 otherwise 0.	
ISCO4	International Standard Classification of Occupation where class 4 responds to clerical support workers. If class 4 it yields 1 otherwise 0	
ISCO5	International Standard Classification of Occupation where class 5 responds to service and sales workers. If class 5 it yields 1 otherwise 0	
Other occupation	Respondents that have other occupation. If other occupation it yields 1 otherwise 0	
Gender	1 if Male or 0 if Female	+/-
Age	1=18-25, 2=26-33, 3=34-41, 4=42-48. 5=49-56, 6=57-	+
Age squared	All variables for age are squared	
Young	Dummy: Respondents between age 0-33. If age 0-33 it yields 1 otherwise 0.	
Middle	Dummy: Respondents between age 34-48. If age 34-48 it yields 1 otherwise 0.	
Older	Dummy: Respondents age 49 or older. If age 49 or older it yields 1 otherwise 0.	
Income	Monthly income: 1=0-3000, 2=3001-6000, 3=6001-9000, 4=9001-12000, 5=12001-15000, 6=15001-18000, 7=18000-	+
Income 1	Dummy: Monthly income between 0-6000. If income between 0-6000 it yields 1 otherwise 0,	
Income2	Dummy: Monthly income between 6001-12000. If income between 60001-12000 it yields 1 otherwise 0.	
Inomce3	Dummy: Monthly income between 12001-18000. If income between 12001-18000 it yields 1 otherwise 0.	
Income4	Dummy: Monthly income over 18000. If income is over 18000 it yields 1 otherwise 0.	
Education	1= No education, 2=Primary, 3=Secondary, 4=Tertiary, 5=Post-Graduate, 6=Other	-
ISCED1	Dummy: International Standard Classification of Education where class 1 responds to primary. If class 1 it yields 1 otherwise 0.	
ISCED2	Dummy: International Standard Classification of Education where class 2 includes (in our data) class 3 and 4 and responds to lower and upper as well as post secondary education. If class 2 it yields 1 otherwise 0	
ISCED5	Dummy: International Standard Classification of Education where class 5 includes (in our data) class 6 and responds to first and second stage tertiary education If class 5 it yields 1 otherwise 0.	
ISCED7	Dummy: International Standard Classification of Education where class7 responds to Post-Graduate. If class 7 it yields 1 otherwise 0	
Other education	Dummy: Education that is not capture in ISCED classification for our sample If other education it yields 1 otherwise 0	
No education	Dummy: Respondents that have no education. If no education it yields 1 otherwise 0	
Mobile phone	If Yes it yields 1 otherwise 0	-
M-Pesa	If Yes it yields 1 otherwise 0	-
Purpose 1	Transfer money to other people	-
Purpose 2	Savings	-
Purpose 3	Receive Wages	-
Purpose 4	Pay Wages	-
Purpose 5	Buy Airtime	-
Purpose 6	Use when traveling	-
Purpose 7	Pay bills	-
Purpose 8	Buy goods and services	-
Purpose 9	Withdraw from ATM	-
Purpose 10	Receive Payments	-
Purpose 11	Make donations	-
Measurement of purpose	Sum of al purpose for each individual	
Usage	Frequency of use: 1=Every day, 2=2-4times/week, 3=less than 3 times/week, 4=less than 1 time/month	-
Start	Start using M-Pesa: 1=2007, 2=2008, 3=2009, 4=2010, 5=2011, 6=2012, 7=2013, 8=2014	-
Measurement of M-Pesa	Including purpose 1-11, usage and start Takes value between 4-22: 4 is less frequent user and 22 is more frequent user	-
Measurement of M-Pesa	Each variable for measurement of M-Pesa is squared	

squared		
Transaction 1	Value of the respondents last transaction	
Transaction 2	Value of the respondents second last transaction	
Public sector	1 if the respondent works in public sector, 0 otherwise	+
Keep work	Ordinal: 1= Sure, 2=Quite sure, 3=Quite Unsure, 4=Unsure	
Friends public sector	If the respondents have friends in the public sector it yields 1, otherwise 0.	
Same position	1 if the respondent have the same position as he/she, 0 otherwise	
Trusted	If people in general can be trusted: 1= Strongly Agree 2=disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly disagree	
Use Position 1	Possibility for public officer to use his/her position of power for private gain 1=Very difficult 2=Difficult, 3=Possible, 4=Easy, 5=Very easy	
Use position 2	Possibility for public officer at a higher level to use his/her position of power for private gain. 1=Very difficult 2=Difficult, 3=Possible, 4=Easy, 5=Very easy	
Dishonesty	Public officers are in general dishonest: 1=Never, 2=No, 3=To some extent, 4=Yes, 5=Very Much	
Give Bribe	Possibility for one to give a bribe in order to get out of a inconvenient situation: 1=Unlikely, 2=Sometime, 3=Likely, 4=Very likely	
Demand Bribe	Possibility that public officer demand bribe: 1=Unlikely, 2=Sometime, 3=Likely, 4=Very likely	
Corruption society	Measurement for corruption in the society. Takes value between 6-28 A value of 6 indicates no corruption and 28 indicates high corruption	
Offered a bribe	How often the respondent has been offered a bribe: 1=Never, 2=Sometime, 3=Often, 4=Very Often	
Accept bribe	How often the respondent would accept a offered bribe: 1=Never, 2=Sometime, 3=Often, 4=Very Often	
Demand bribe	How often the respondent would demand a bribe: 1=Never, 2=Sometime, 3=Often, 4=Very Often	
Corruption individual	Measurement for individual participation in corrupt activities. Takes value between 3-12 A value of 3 indicates no corrupt activity and 28 indicates high participation in corrupt activities	

Table 2

Variable	Obs	Mean	Std. Dev.	Min	Max
Identification number	204	102.5	59.03	1	204
Occupation	204	5.81	2.96	1	9
ISCO2	204	0.83	0.28	0	1
ISCO3	204	0.11	0.32	0	1
ISCO4	204	0.03	0.17	0	1
ISCO5	204	0.44	0.50	0	1
Other occupation	204	0.34	0.47	0	1
Gender	204	1.45	0.50	1	2
Age	204	2.97	1.02	2	7
Age squared	204	9.86	7.54	4	49
Young	204	0.76	0.43	0	1
Middle	204	0.21	0.41	0	1
Older	204	0.02	0.16	0	1
Income	204	4.66	2.35	1	7
Income1	204	0.25	0.43	0	1
Income 2	204	0.16	0.36	0	1
Income 3	204	0.21	0.41	0	1
Income 4	204	0.38	0.49	0	1
Education	204	4.17	0.94	1	6
ISCED 1	204	0.20	0.14	0	1
ISCED 2	204	0.21	0.41	0	1
ISCED 5	204	0.37	0.48	0	1
ISCED 7	204	0.34	0.48	0	1
Other education	204	0.05	0.22	0	1
No education	204	0.01	0.99	0	1
Mobile phone	204	1	0	1	1
M-Pesa	204	1	0	1	1
Transfer money	181	1	0	1	1
Savings	82	1	0	1	1
Receive Wages	21	1	0	1	1
Pay Wages	31	1	0	1	1
Buy Airtime	149	1	0	1	1
Use when travelling	55	1	0	1	1
Pay bills	111	1	0	1	1
Buy goods and services	59	1	0	1	1

Withdraw from ATM	31	1	0	1	1
Receive Payments	82	1	0	1	1
Make Donations	41	1	0	1	1
Measurement for purpose	204	4.13	2.30	1	11
Usage	204	2.12	0.81	1	4
Start	204	3.05	1.95	1	8
Measurement for M-Pesa	204	12.97	3.51	4	22
Measurement of M-Pesa squared	204	180.53	5.65	16	484
Transaction 1	204	3.19	2.06	1	8
Transaction 2	204	2.68	1.86	0	7
Public sector	204	1.89	0.32	1	2
Keep work	25	2.92	1.00	1	4
Friends public sector	25	1.04	0.20	1	2
Sane position	25	1.60	0.50	1	2
Trusted	204	3.26	1.04	1	5
Use position 1	204	3.50	1.07	1	5
Use position 2	204	3.75	1.09	1	5
Dishonesty	204	3.33	0.89	1	5
Give Bribe	204	3.06	0.91	1	4
Demand bribe	204	2.93	0.99	1	4
Corruption Society	**204**	**19.84**	**4.14**	**6**	**28**
Offered a bribe	204	1.80	0.84	1	4
Accept bribe	204	1.80	0.93	1	4
Demand bribe	204	1.41	0.76	1	4
Corruption Individual	**204**	**5.01**	**2.13**	**0**	**12**

Table 8: Descriptive statistic for the whole sample

APPENDIX B

Dependent variable: Individual participation in corrupt activities. Public respondents						
Explanatory variables	(1)	(2)	(3)	(4)	(5)	(6)
Mpesasoc	-0.06	-0.08	-0.04	0.06	0.10	0.08
	(0.10)	(0.09)	(0.10)	(0.12)	(0.13)	(0.13)
Gender		-0.68	-0.79*	-1.03**	-1.45***	-3.54***
		(0.45)	(0.44)	(0.52)	(0.55)	(0.93)
Young			0.67	1.42*	2.45***	2.62***
			(0.43)	(0.84)	(0.79)	(0.85)
Middle			-0.08	1.40*	3.50***	3.16***
			(0.41)	(0.75)	(1.12)	(1.20)
Income1				2.51**	2.96***	4.45***
				(1.05)	(0.92)	(1.20)
Incom2				1.34**	1.71**	1.81*
				(0.60)	(0.88)	(1.13)
Income3				1.58**	1.95***	2.82***
				(0.68)	(0.60)	(0.64)
ISCED2					N/A	N/A
					-	-
ISCED5					0.08	0.02
					(0.68)	(0.82)
ISCED7					-1.53**	-2.43***
					(0.63)	(0.79)
Othereducation					N/A	N/A
					-	-
ISCO2						-0.21
						(0.51)
ISCO3						-3.79***
						(1.28)
ISCO5						-2.37***
						(0.92)
Otheroccupation						-2.58***
						(0.78)
Sample	Core	Core	Core	Core	Core	Full
N	23	23	23	23	23	23
Prob>chi2	0.5623	0.2483	0.0815	0.0046	0.000	0.000
Pseudo R2	0.0041	0.0296	0.0524	0.1552	0.2212	0.3193
Constant						
Cut1	-1.46	-2.95	-2.04	0.64	1.26	-4.45
	(1.60)	(1.77)	(1.86)	(2.30)	(2.34)	(3.10)
Cut2	-1.10	-2.57	-1.65	1.14	1.86	-3.64
	(1.57)	(1.75)	(1.85)	(2.33)	(2.32)	(3.03)
Cut3	-0.65	-2.09	-1.13	1.86	2.64	-2.55
	1.53	(1.70)	(1.81)	(2.32)	(2.31)	(2.84)
Cut4	-0.16	-1.57	-0.56	4.56	3.41	-1.37
	(1.51)	(1.66)	(1.80)	(2.35)	(2.39)	(2.87)
Cut5	0.34	-1.03	0.00	3.17	4.05	-0.62
	(1.52)	(1.63)	(1.79)	(2.36)	(2.42)	(2.81)
Cut6	0.59	-0.77	0.27	3.49	4.41	-0.31
	(1.47)	(1.58)	(1.75)	(2.35)	(2.27)	(2.68)
Cut7	0.95	-0.43	0.62	3.92	4.94	0.13
	(1.53)	(1.57)	(1.80)	(2.46)	(2.28)	(2.70)

Note: Coefficient significantly different from zero with 10%(*), 5% (**), 1% (***) confidence level. Robust standard error in parentheses.

Dependent variable: Individual participation in corrupt activities. Private respondents						
Explanatory variables	(1)	(2)	(3)	(4)	(5)	(6)
Mpesasoc	-0.01	-0.02	-0.01	-0.01	0.00	0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Gender		-0.35**	-0.34**	-0.44***	-0.41**	-0.42**
		(0.16)	(0.16)	(0.17)	(0.17)	(0.17)
Young			0.93	1.07*	1.15**	1.18**
			(0.63)	(0.58)	(0.58)	(0.58)
Middle			0.66	0.84	0.86	0.88
			(0.65)	(0.60)	(0.59)	(0.60)
Income1				0.48	0.44	0.45
				(0.23)	(0.23)	(0.26)
Incom2				0.63***	0.60**	0.62**
				(0.24)	(0.25)	(0.26)
Income3				0.51**	0.45*	0.38*
				(0.23)	(0.24)	(0.24)
ISCED2					0.27	0.26
					(0l37)	(0.36)
ISCED5					0.14	0.12
					(0.35)	(0.34)
ISCED7					0.31	0.03
					(0.36)	(0.35)
Othereducation					0.37	0.40
					(0.49)	(0.50)
ISCO2						0.42
						(0.74)
ISCO3						0.37
						(0.72)
ISCO5						0.70
						(0.66)
Otheroccupation						0.62
						(0.70)
Sample	Core	Core	Core	Core	Core	Full
N	181	181	181	181	181	181
Prob>chi2	0.5808	0.0845	0.0626	0.0042	0.0304	0.0812
Pseudo R2	0.0005	0.0079	0.0135	0.0285	0.0307	0.0342
Constant						
Cut1	-0.44	-1.02	-0.07	0.35	0.65	1.37
	(0.31)	(0.42)	(0.79)	(0.77)	(0.86)	(1.14)
Cut2	-0.24	-0.82	0.14	0.56	0.86	1.59
	(0.31)	(0.42)	(0.79)	(0.77)	(0.86)	(1.14)
Cut3	0.12	-0.44	0.51	0.94	1.25	1.97
	(0.31)	(0.42)	(0.80)	(0.77)	(0.86)	(1.14)
Cut4	0.74	0.18	1.13	1.58	1.89	2.62
	(0.30)	(0.41)	(0.78)	(0.76)	(0.85)	(1.13)
Cut5	1.06	0.50	1.47	1.92	2.23	2.97
	(0.31)	(0.42)	(0.79)	(0.77)	(0.85)	(1.13)
Cut6	1.34	0.80	1.76	2.22	2.53	3.27
	(0.31)	(0.42)	(0.80)	(0.77)	(0.86)	(1.14)
Cut7	1.60	1.06	2.03	2.50	2.82	3.55
	(0.29)	(0.41)	(0.78)	(0.75)	(0.85)	(1.13)
Cut8	1.75	1.21	2.19	2.66	2.98	3.71
	(0.30	(0.40)	(0.78)	(0.75)	(0.85)	(1.13)
Cut9	2.12	1.59	2.57	3.04	3.36	4.10
	(0.35)	(0.46)	(0.81)	(0.80)	(0.88)	(1.16)

Note: Coefficient significantly different from zero with 10%(*), 5% (**), 1% (***) confidence level. Robust standard error in parentheses.

Dependent variable: The extent of corruption in society public						
Explanatory variables	(1)	(2)	(3)	(4)	(5)	(6)
Mpesasoc	-0.56	-0.49	-0.54	-0.43	-0.53	-0.62*
	(0.39)	(0.37)	(0.40)	(0.37)	(0.35)	(0.30)
Gender		1.93	2.05	3.54*	4.80**	4.04*
		(1.69)	(1.89)	(1.67)	(1.61)	(1.82)

Young			-1.02	-0.85	-4.30*	-0.85
			(2.11)	(2.21)	(2.20)	(1.05)
Middle			-0.43	1.85	-2.97	1.51
			(1.72)	(.2.72)	(2.32)	((2.17)
Income1				0.16	0.61	3.90*
				(2.50)	(2.58)	(1.81)
Incom2				9.02***	7.06***	8.92***
				(1.77)	(1.82)	(1.70)
Income3				3.24	2.66	3.73***
				(2.17)	(1.59)	(1.15)
ISCED2					N/A	N/A
					-	-
ISCED5					-5.52**	-2.96***
					(2.08)	(0.83)
ISCED7					1.86	0.54
					(1.88)	(1.08)
Othereducation					N/A	N/A
					-	-
ISCO2						3.32
						(2.10)
ISCO3						4.04
						(2.74)
ISCO5						0.91
						(1.77)
Otheroccupation						-2.58
						(1.77)
Sample	Core	Core	Core	Core	Core	Full
N	23	23	23	23	23	23
Prob>F	0.1603	0.0899	N/A	N/A	N/A	N/A
R-squared	0.1242	0.1845	0.1898	0.5557	0.6878	0.8673
Root MSE	3.7959	3.7533	3.9434	3.1989	2.8804	2.2572
Constant	25.77***	21.73***	23.08***	16.51*	23.06***	17.67**
	(5.29)	(6.69)	(7.42)	(7.80)	(7.17)	(.6.78)

Note: Coefficient significantly different from zero with 10%(*), 5% (**), 1% (***) confidence level. Robust standard error in parentheses.

Dependent variable: The extent of corruption in society						
Explanatory variables	(1)	(2)	(3)	(4)	(5)	(6)
Mpesasoc	-0.09	-0.10	-0.12	-0.08	-0.08	-0.10
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.10)
Gender		-0.59	-0.63	-0.86	-0.82	-0.76
		(0.62)	(0.61)	(0.60)	(0.66)	(0.67)
Young			-2.59	-2.06	-2.17	-2.27
			(1.72)	(1.87)	(1.93)	(1.68)
Middle			-2.09	-1.34	-1.47	-1.70
			(1.78)	(1.94)	(2.00)	(1.75)
Income1				1.74	1.63	1.35
				(0.76)	(1.75)	(0.84)
Incom2				1.95**	2.04**	1.74*
				(0.88)	(0.87)	(0.89)

Income3				0.64	0.81	1.04
				(0.86)	(0.88)	(0.89)
ISCED2					1.03	1.12
					(1.18)	(1.07)
ISCED5					1.69	1.73*
					(1.08)	(0.93)
ISCED7					1.13	1.10
					(1.22)	(1.05)
Othereducation					2.31	2.51*
					(1.49)	(1.37)
ISCO2						0.65
						(1.97)
ISCO3						1.01
						(1.86)
ISCO5						-0.82
						(1.61)
Otheroccupation						-0.17
						(1.75)
Sample	Core	Core	Core	Core	Core	Full
N	181	181	181	181	181	181
Prob>F	0.2911	0.3816	0.3309	0.0960	0.1422	0.1292
R-squared	0.0066	0.0116	0.0218	0.0601	0.0711	0.012
Root MSE	4.0826	4.0837	4.0856	4.0393	4.063	4.0672
Constant	21.31***	22.26***	24.98***	23.37***	21.96***	22.67***
	(1.16)	(1.58)	(2.31)	(2.47)	(2.80)	(3.28)

Note: Coefficient significantly different from zero with 10%(*), 5% (**), 1% (***) confidence level. Robust standard error in parentheses.

Dependent variable: Individual participation in corrupt activities						
Explanatory variables	(1)	(2)	(3)	(4)	(5)	(6)
Mpesasoc	-0.03	-0.04	-0.03	-0.03	-0.02	-0.02
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)
Gender		-0.33**	-0.33**	-0.42**	-0.39**	-0.40**
		(0.16)	(0.16)	(0.16)	(0.17)	(0.17)
Young			0.58	0.75*	0.79**	0.69
			(0.45)	(0.40)	(0.40)	(0.43)
Middle			0.43	0.66	0.67	0.58
			(0.46)	(0.42)	(0.43)	(0.46)
Income1				0.40*	0.34	0.39
				(0.22)	(0.23)	(0.25)
Incom2				0.61***	0.59**	0.63**
				(0.23)	(0.25)	(0.26)
Income3				0.53**	0.50**	0.48**
				(0.22)	(0.23)	(0.24)
ISCED2					0.21	0.18
					(0.37)	(0.28)
ISCED5					0.27	0,24
					(0.35)	(0.36)
ISCED7					0.03	-0.02
					(0.35)	(0.36)
Othereducation					0.46	0.37
					(0.51)	(0.52)

ISCO2						-0.41
						(0.48)
ISCO3						-0.72
						(0.45)
ISCO5						-0.32
						(0.38)
Otheroccupation						-0.40
						(0.43)
Sample	Core	Core	Core	Core	Core	Full
N	195	195	195	195	195	195
Prob>chi2	0.1580	0.0571	0.0816	0.0027	0.113	235
Pseudo R2	0.0034	0.0104	0.0130	0.0284	0.0321	0.0364
Constant						
Cut1	-0.69	-1.23	-0.63	-0.21	0.10	-0.39
	(0.32)	(0.43)	(0.64)	(0.63)	(0.74)	(0.91)
Cut2	-0.46	-1.01	-0.41	0.03	0.34	-0.15
	(0.32)	(0.43)	(0.64)	(0.63)	(0.74)	(0.90)
Cut3	-0.07	-0.61	-0.00	0.44	0.76	0.27
	(0.31)	(0.42)	(0.63)	(0.63)	(0.74)	(0.90)
Cut4	0.61	0.08	0.68	1.14	1.47	0.99
	(0.32)	(0.42)	(0.63)	(0.63)	(0.74)	(0.90)
Cut5	1.06	0.53	1.14	1.61	1.94	1.46
	(0.34)	(0.44)	(0.64)	(0.65)	(0.75)	(0.91)
Cut6	1.55	1.04	1.65	2.12	2.45	1.97
	(0.36)	(0.47)	(0.67)	(0.68)	(0.78)	(0.94)

Note: Coefficient significantly different from zero with 10%(*), 5% (**), 1% (***) confidence level. Robust standard error in parentheses.

Dependent variable: The extent of corruption in society						
Explanatory variables	(1)	(2)	(3)	(4)	(5)	(6)
Mpesasoc	-0.11	-0.12	-0.14*	-0.11	-0.12*	-0.11
	(0.08)	(0.08)	(0.08)	(0.08)	(0.07)	(0.07)
Gender		-0.37	-0.38	-0.64	-0.34	-0.39
		(0.56)	(0.55)	(0.59)	(0.59)	(0.60)
Young			-2.06*	-1.26	-1.00	-1.12
			(1.05)	(0.99)	(1.31)	(1.36)
Middle			-1.73	-0.86	-0.40	-0.59
			(1.10)	(1.00)	(1.42)	(1.43)
Income1				0.91	0.95	1.06
				(0.82)	(0.78)	(0.98)
Incom2				1.60**	1.95**	1.81**
				(0.65)	(0.84)	(0.89)
Income3				1.07	1.23	1.25
				(0.71)	(0.95)	(0.98)
ISCED2					2.20***	1.91**
					(0.82)	(0.79)
ISCED5					0.29	0.10
					(0.87)	(0.84)
ISCED7					1.53	-1.52
					(1.06)	(1.01)
Othereducation					0.39	-0.45
					(1.70)	(1.71)

ISCO2						-3.69
						(3.29)
ISCO3						0.03
						(2.07)
ISCO5						0.52
						(1.92)
Otheroccupation						0.44
						(2.05)
Sample	Core	Core	Core	Core	Core	Full
N	75	75	75	75	75	75
Prob>F	0.1592	0.1928	0.2039	0.1522	0.0243	0.0393
R-squared	0.0305	0.0364	0.0566	0.1092	0.2110	0.2909
Root MSE	2.3766	2.3858	2.394	2.3778	2.3079	2.2608
Constant	17.15***	17.73***	19.96***	18.48***	18.94***	18.62***
	(1.07)	(1.12)	(1.70)	(1.57)	(1.94)	(2.83)

Note: Coefficient significantly different from zero with 10%(*), 5% (**), 1% (***) confidence level. Robust standard error in parentheses.

Dependent variable: Individual participation in corrupt activities						
Explanatory variables	(1)	(2)	(3)	(4)	(5)	(6)
Mpesasoc	-0.03	-0.03	-0.02	-0.02	-0.01	-0.00
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Gender		-0.30	-0.28	-0.35*	-0.31	-0.32
		(0.19)	(0.20)	(0.20)	(0.20)	(0.20)
Young			0.44	0.60**	0.68***	0.57**
			(0.28)	(0.29)	(0.22)	(0.26)
Middle			0.17	0.34	0.38	0.25
			(0.33)	(0.34)	(0.29)	(0.35)
Income1				0.22	0.23	0.14
				(0.26)	(0.26)	(0.30)
Incom2				0.35	0.30	0.23
				(0.26)	(0.27)	(0.28)
Income3				0.32	0.21	0.17
				(0.26)	(0.27)	(0.27)
ISCED2					0.82	0.78
					(0.53)	(0.52)
ISCED5					0.38	0.29
					(0.52)	(0.51)
ISCED7					0.40	0.30
					(0.52)	(0.52)
Othereducation					0.92	0.90
					(0.59)	(0.61)
ISCO2						0.14
						(0.47)
ISCO3						-0.41
						(0.52)
ISCO5						-0.09
						(0.38)
Otheroccupation						0.05
						(0.46)
Sample	Core	Core	Core	Core	Core	Full
N	124	124	124	124	124	124

Prob>chi2	0.2955	0.2049	0.1855	0.2101	0.1225	0.1708
Pseudo R2	0.0023	0.0079	0.0114	0.0162	0.0272	0.0311
Constant						
Cut1	-1.45	-1.91	-1.50	-1.16	-0.41	-0.62
	(0.37)	(0.49)	(0.52)	(0.58)	(0.77)	(0.94
Cut2	-0.66	-1.12	-0.65	-0.35	0.40	0.20
	(0.35)	(0.47)	(0.51)	(0.57)	(0.77)	(0.94)
Cut3	0.21	-0.24	0.22	0.53	1.30	1.10
	(0.34)	(0.47)	(0.51)	(0.57)	(0.76)	(0.95)
Cut4	0.65	0.20	0.67	0.98	1.77	1.57
	(0.35)	(0.47)	(0.51)	(0.58)	(0.77)	(0.95)
Cut5	1.01	0.57	1.04	1.36	2.17	1.97
	(0.34)	(0.48)	(0.52)	(0.58)	(0.78)	(0.96)
Cut6	1.32	0.89	1.36	1.69	2.50	2.31
	(0.32)	(0.45)	(0.49)	(0.54)	(0.77)	(0.93)
Cut7	1.63	1.20	1.68	2.01	2.83	2.65
	(0.35)	(0.45)	(0.50)	(0.55)	(0.77)	(0.94)

Note: Coefficient significantly different from zero with 10%(*), 5% (**), 1% (***) confidence level. Robust standard error in parentheses.

Dependent variable: The extent of corruption in society						
Explanatory variables	(1)	(2)	(3)	(4)	(5)	(6)
Mpesasoc	-0.10	-0.10	-0.10	-0.10	-0.09	-0.10
	(0.06)	(0.07)	(0.07)	(0.07)	(0.07)	(0.08)
Gender		-0.35	-0.36	-0.37	-0.43	-0.43
		(0.44)	(0.45)	(0.45)	(0.49)	(0.49)
Young			0.35	-0.47	0.48	0.33
			(1.29)	(1.33)	(1.38)	(.140)
Middle			0.51	0.66	0.67	0.39
			(1.36)	(1.40)	(.148)	(1.50)
Income1				0.18	0.22	0.45
				(0.59)	(0.60)	(0.66)
Incom2				0.45	0.54	0.58
				(0.69)	(0.68)	(0.65)
Income3				-0.24	-0.11	-0.01
				(0.59)	(0.60)	(0.63)
ISCED2					1.08	1.28
					(0.94)	(0.94)
ISCED5					0.91	0.92
					(0.88)	(0.88)
ISCED7					1.14	1.20
					(0.92)	(0.92)
Othereducation					2.34**	2.58**
					(1.18)	(1.23)
ISCO2						2.24
						(1.55)
ISCO3						0.50
						(1.66)
ISCO5						0.61
						(1.51)
Otheroccupation						0.32
						(1.60)

Sample	Core	Core	Core	Core	Core	Full
N	172	172	172	172	172	172
Prob>F	0.1278	0.2551	0.5859	0.8046	0.6610	0.2987
R-squared	0.0147	0.0183	0.0192	0.0249	0.0394	0.0697
Root MSE	2.8904	2.8936	2.9096	2.9275	2.9417	2.9319
Constant	21.33***	21.89***	21.55***	21.25***	20.13***	19.63***
	(0.87)	(1.19)	(1.80)	(1.91)	(2.21)	(2.77)

Table XX: Correlation between variables included in corruption individual. Note: Coefficient significantly different from zero with 10%(*), 5% (**), 1% (***) confidence level. Robust standard error in parentheses.

APPENDIX C

LUND UNIVERSITY
School of Economics and Management

Questionnaire - *Your opinions count!*

We are two master's students from Lund University in Sweden currently writing our master's thesis on Mobile Banking in Kenya. This questioner will help us get a better understanding of whether Mobile Banking has an impact on the society in Kenya.

Please mark one of the following boxes on each line that indicates how much you agree or disagree with each of the following statements and questions.

Important! This survey is confidential and your identity will remain anonymous

Theme 1 – Personal questions

1. Gender

Male ◯ Female ◯

2. Age

◯ 0-17 ◯ 18-25 ◯ 26-33 ◯ 34-41 ◯ 42-48 ◯ 49-56 ◯ 57-

3. Income (per month in KSh)

◯ 0-3000 ◯ 3001-6000 ◯ 6001-9000 ◯ 9001-12000 ◯ 12001-15000 ◯ 15001-18000 ◯ 18001 or more

4. Level of education

◯ No education ◯ Primary ◯ Secondary ◯ Tertiary ◯ Post-Graduate ◯ Other

Theme 2 – Mobile banking

1. Do you have a mobile phone?

Yes ◯ No ◯

2. Are you a M-pesa user?

Yes ◯ No ◯

3. Do you have a bank account?

Yes ◯ No ◯

4. What is your the main purpose of your M-pesa: *You are allowed marking one or more answers*

☐ Transfer money to other people
☐ Savings
☐ Receive Wages
☐ Pay Wages
☐ Buy Airtime
☐ Use when travelling
☐ Pay bills
☐ Buy goods and service
☐ Withdraw from ATM
☐ Receive Payments
☐ Make donations
☐ Other_____

5. How big was your last transaction (KSh)?

◯ 0-3000 ◯ 3001-6000 ◯ 6001-9000 ◯ 9001-12000 ◯ 12001-15000 ◯ 15001-18000 ◯ 18001 or more

6. How big was your second last transaction (KSh)?

◯ 0-3000 ◯ 3001-6000 ◯ 6001-9000 ◯ 9001-12000 ◯ 12001-15000 ◯ 15001-18000 ◯ 18001 or more

7. How often do you use M-pesa?

◯ Every day ◯ 2-4 times/week ◯ Less than 3 times/month ◯ Less than 1 time/month

8. When did you start using M-pesa?

◯ 2007 ◯ 2008 ◯ 2009 ◯ 2010 ◯ 2011 ◯ 2012 ◯ 2013 ◯ 2014

9. Why don't you use M-pesa?

◯ Don't know how to use m-pesa ◯ Its not secure ◯ Mobile phones are stolen personally ◯ I want to meet the person cash ◯ it is expensive ◯ I want to deal with ◯ Its not private ◯ Other

Theme 3 – Working Force

1. What is your primary occupation?_____

2.Do you work in the public sector?

Yes ◯ No ◯

***If yes**; please answer the questions below. If no; please continue to the questions under theme 4.*

4. Which sector do you work in? _____

5. How sure are you that you will be able to keep your position/work in the future?

◯ Sure ◯ Quite sure ◯ Quite unsure ◯ Unsure

6. Do you have friends in the public sector?

Yes ◯ No ◯

7. Do most of your friends have the same position as you have?

Yes ◯ No ◯

8. Do you have friends in other sectors?

Yes ◯ No ◯

A. If yes: Which sector?

◯ Media ◯ Business ◯ Juridical ◯ Financial ◯ Other

Theme 4 – Social Trust

1. Do you agree that people in general can be trusted?

◯ Strongly agree ◯ Agree nor disagree ◯ Neither agree ◯ Disagree ◯ Strongly Disagree

2. Is it possible for public employees to use their position of power for private gain without anyone noticing it?

Very easy | Easy | Possible | Difficult | Very Difficult

3.Is it easy for public employees at a *higher level* of position to use their power for private gain?

Very easy | Easy | Possible | Difficult | Very Difficult

4. Do you find that public employees in general are dishonest or self-serving?

Very Much | Yes | To some extent | No | Never

Theme 5 - Loyalty

1.How often do you get offered payment, gifts or favors to perform a certain task within your work duties?

Very often | Often | Sometime | Never

2. How often would you accept it?

Very often | Often | Sometimes | Never

3. How often would you demand it?

Very Often | Often | Sometimes | Never

Theme 6 - Expectations

1. Is it likely that one can manage to get out of an inconvenient situation and avoid being fined or sentenced by offering a bribe?

Very likely | Likely | Sometime | Unlikely

2. Is it likely that public employees demand a bribe as an opportunity for you to get out of a situation?

◯	◯	◯	◯
Very likely	Likely	Sometime	Unlikely