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How did the introduction of a mobile money tax in Kenya influence the usage of mobile money?

A Difference-in-Differences approach

by

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The global spread of mobile phones provides developing countries with new opportunities to spark economic growth and to improve the quality of life of their people. One specific service that emerged in this context is mobile money. Widely recognized as the most successful example is the service M-PESA in Kenya. In 2013 Kenya introduced a 10% excise fee on all financial transaction fees, including mobile money. This tax was criticized by public media and the mobile money providers for hindering the financial inclusion of the poor. This thesis uses a Difference-in-Differences model to estimate the effect of the introduction of the mobile money tax on the usage of mobile money. The results show that the observed decline of mobile money transactions in the first quarter of 2013 are part of regional trend rather than caused by the tax. The paper cannot explain the cause for this regional phenomenon and therefore calls for further research about macroeconomic factors influencing mobile money usage. Finally, a negative effect of taxation on mobile in the case of Kenya in 2013 was not found.

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List of abbreviations

| | | |
|--|---|-----------|
| African Tax Administration Forum | = | ATAF |
| African Union Commission | = | AUC |
| Common Market for East and South Africa | = | COMESA |
| Difference-in-Differences | = | DD |
| East African Community | = | EAC |
| Financial Sector Deepening Kenya | = | FSD Kenya |
| Gross Domestic Product | = | GDP |
| Global System for Mobile Communication Association | = | GSMA |
| International Crisis Group | = | ICG |
| International Telecommunications Unions | = | ITU |
| Organisation of Economic Co-Operation and Development | = | OECD |
| Kenya Institute for Public Policy Research and Analysis | = | KIPPRA |
| Kenyan Shilling | = | Ksh |
| Multinational Organization | = | MNO |
| United Nations Educational, Scientific and Cultural Organization | = | UNESCO |
| Value-added tax | = | VAT |

1 Introduction

The spread of mobile phones worldwide provides developing countries around the globe with new opportunities to spark economic growth and to improve the quality of life of its people (Duncombe & Boateng, 2009). One specific service that emerged in this context is mobile money. Introduced in several countries in 2005 (Aker & Mbiti, 2010) it allows its users to send money from one cell phone to another (Duncombe, 2012). The money is stored on the SIM card. A bank account is not required (Ndiwalana, Morawczynski & Popov, 2010). Mobile money is used to send and receive money from friends and relatives, to pay bills and taxes and to store and save money (Jack, Suri & Townsend, 2010). Until today it is not used daily by most people (Central Bank of Kenya, 2019). Mobile money plays a vital role in including the poor in the formal financial scene (Donovan, 2012a) and reducing poverty (Morawczynski, 2009).

Widely recognized as the most successful example is the service M-PESA in Kenya (Donovan, 2012a). Started in 2007 by the Vodafone daughter Safaricom, it reached over 25 million active users in December 2018 (Communications Authority of Kenya, 2019). Through sharing of phones already in 2011, 3/4 of all Kenyan households were connected by mobile money (Jack & Suri, 2012). This meant a great improvement in terms of financial inclusion. While in 2006 only 28% of the Kenyan population were included in the formal financial scene in 2019 already 83% had access (FSD Kenya, Central Bank of Kenya & Kenya National Bureau of Statistics, 2015a; Central Bank of Kenya, FSD Kenya & Kenya National Bureau of Statistics, 2019). Jack and Suri (2016) furthermore underlined the findings when they calculated that over 194,000 households were lifted out of poverty by mobile money.

At the same time, Kenya still struggles to increase its tax revenues. Even though the total tax income increased significantly since 2000, the tax to GDP ratio also remained in 2016 at a low level of 18.1% in comparison to the OECD average of 34.3% (OECD et al., 2018). This situation is prevalent around most countries in Sub-Saharan Africa (SSA) and makes governments looking for new revenue sources (Wawire, 2017). One of the main issues is the large shadow economy which cannot be taxed (Bird, 2013). With the introduction of mobile money, parts of the informal money streams are now formalized, allowing the state to tax the former untaxed people (Duncombe, 2014). This is done since 2013, when Kenya introduced a 10% excise fee on all financial transactions fees, including mobile money (Muthiora, 2015).

The introduction of the tax, which is perceived to target the mobile money sector specifically, was criticized by public media (The Economist, 2013) and Safaricom itself (Safaricom, 2013) to block the financial inclusion of the poor. This pattern of criticism around the introduction of a mobile money tax can also be observed in 2018 in Kenya (Sunday, 2018) and Uganda (Mugisha, 2018) when the governments announced a tax increase. It is further supported by articles from the former president of the central bank of Kenya Ndung'u (2018) and the Global

System for Mobile Communication Association (hereafter GSMA¹) and Deloitte (2016). Even though all these articles are well-researched none of them scientifically investigates the effect of the introduction of a mobile money tax on the usage of mobile money. This appears to be surprising as more and more countries introduce or increasing such a charge. This thesis, therefore, closes this gap by asking the following research question:

Research Question: *How did the introduction of a mobile money tax in Kenya in 2013 influence the usage of mobile money?*

The departing point for this research is the results of Rogers and Pedros (2017) who find that after the introduction of the mobile money tax mobile money usage declined by 5%. I will control the existence of this development in my descriptive statistic. To test if this development can be related to the introduction of the tax, Kenya will be compared to East Africa as a region. From there, the following hypothesis arises:

H1: *The change in usage of mobile money in 2013 was a regional phenomenon rather than related to the introduction of the mobile money tax.*

To test this hypothesis a Difference-in-Differences model (hereafter DD) will be applied, which is common to use in both taxation (Bækgaard, 2014) and mobile money research (Aron, 2018). The control group will consist of the East African countries of Burundi, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Rwanda, Seychelles, Somalia, Sudan, Tanzania, Uganda, Zambia and Zimbabwe of which Seychelles and Sudan had not started a mobile money service in 2013 and are therefore not part of the further discussion.

The DD will show the mid-term implications of the mobile money tax in a regional comparison. To explain short term variations, I will further discuss the results by taking into consideration other national events in Kenya. This will allow the reader to get a complete picture of potential influence factors when it comes to mobile money usage.

The data used in this study comes for Kenya from the Central Bank of Kenya (2019) including information about the number of transactions, the value of transactions and the number of registered accounts and agents on a monthly base since March 2007. This dataset has not been used for academic research so far. For East Africa, the data is taken from the GSMA (2019c). The dataset contains the same variables as in the Kenyan dataset without the number of registered accounts and just for March, June, September, and December starting in December 2011. A more detailed dataset on a monthly base and split into countries is available for paying customers of the GSMA.

To address the research question chapter two will give the reader background information about the context in which mobile money developed in Kenya, usage patterns and the impact of this new service. In the end, a short introduction to taxation theory will help to understand the

¹ The GSMA represents the interests of mobile operators worldwide, uniting more than 750 operators with almost 400 companies in the broader mobile ecosystem, including handset and device makers, software companies, equipment providers and internet companies, as well as organizations in adjacent industry sectors. GSMA, 2019a

expected effects of mobile money taxation. Chapter three shows the current state of the literature around mobile and development in general and mobile money in specific. After the description of the data and method in chapter four, the results of chapter five will be discussed in section six.

2 Background

This chapter will give the reader the necessary background information to understand the analysis in the following section. I will examine the situation in Kenya and East Africa with special emphasize on circumstances that can potentially influence the usage of mobile money. Second, the concept, usage and impact of mobile money will be treated in detail to later conclude on the potential effects of the mobile money tax. Next, the later will be explained in the context of taxation theory and reality in the Kenyan context.

2.1 Country Context

2.1.1 Kenya

The new millennium brought the first growth phase for Sub-Saharan Africa since the 1970s (Rodrik, 2016). Kenya did follow this trend. Its GDP grew from US\$12 billion in 2000 to US\$79 billion in 2017 (World Bank, 2019b). The ease of doing business ranking shows the same positive development. In the ranking, Kenya jumped from rank 121 out of 190 in 2013 (World Bank, 2012) to 61 in 2019 (World Bank, 2019a). On a scale reaching from the low-point 0 to the top-score100 Kenya reached 70.31 points with 51.61 being the average in Sub-Saharan Africa. This overall positive picture is disturbed by growing public debts. From 2009 till 2013, debts increased from 918.8 billion Ksh (39% of GDP) to 1,713.1 billion Ksh (45% of GDP) (KIPPRA, 2014). In 2016 public debts reached 3,763.5 Ksh (52.6% of GDP) (KIPPRA, 2017). Nevertheless, the introduction of mobile money happened in an economically stable growth phase.

Parallel to this development, the political sphere experienced important evolutions in this time. The economic growth began in 2002 when the former one-party-system, which was in place since independence in 1969, was turned down to be replaced by a democratic system (Bertelsmann Stiftung, 2018). However, it should be noted that the new millennium brought the first growth phase since the 1970s for Sub-Saharan Africa as a whole. Also, after the regime change, crime and corruption remained high (Burns, 2015). In the aftermath of the 2007 parliament elections, 3,000 Kenyans lost their lives in violent demonstrations and clashes with security forces (International Crisis Group (ICG), 2013). Since then, there are signs that democracy in Kenya develops positively. In 2013, a new president was peacefully brought into office and was re-elected in 2017. Furthermore, in 2010, a new constitution was established in a referendum setting the starting point for decentralization of the state (Bertelsmann Stiftung, 2018). Today, the Freedom House Index describes Kenya as 'partly-free' (Freedom House, 2018).

However, on its way to a middle-income country, Kenya still needs to overcome the typical economic structure of an emerging economy. The biggest sector with a share in GDP of 28% is the agricultural sector, followed by government services (15%) and trade (14%) (Timmer, Vries & Vries, 2015). The service sector is expected to gain greater importance over time, as it already contributed by 50% to the total GDP growth in 2012 (KIPPRA, 2013). Manufacturing, on the other hand, stays at just 11%.

The population of Kenya also shows the structure of a developing country. Of the 44.9 million people living in Kenya in 2013 (World Bank, 2019d), 44% were working in the agriculture sector (Timmer, Vries & Vries, 2015). At the same time, the GINI of 0.45 is the highest in the region (Bertelsmann Stiftung, 2018). 45.2% of the population are living under the poverty line. The large share of people working in agriculture and living in poverty show that a new mobile service must consider the rural and poor population as target group if it wants to reach a large scale.

2.1.2 Kenya in 2013

To be able to understand the context of the analysis in this paper better, the upcoming section will describe the situation in Kenya in 2013 in more detail. In total, the GDP grew by 4.7% in this year, accompanied by an average increase in wages of 11.2% (KIPPRA, 2014). That the economy was able to grow is remarkable as the presidential elections in March sparked fear of new riots. Even though the economy grew in the first quarter, the Kenyan National Bureau of Statistics notes that investments were delayed until after the elections (Kenya National Bureau of Statistics, 2013). The polls also lead to a decrease in international travelers arriving in Kenya (Kenya National Bureau of Statistics, 2014). This development was underpinned by the increasing Islamic terror that peaked on 21 September 2013 when 67 people were killed in a terror attack in Nairobi (International Crisis Group (ICG), 2018). Furthermore, the insufficient rain that followed in the second half of the year led to overall decreasing agriculture output (KIPPRA, 2014). That the economy was nevertheless able to grow was due to stable exchange rates and inflation rates which declined from 9.4% in 2012 to 5.7% in 2013 (KIPPRA, 2014; East African Community, 2014). Additionally, the first quarter of the year was marked by improved weather conditions in comparison to the previous year leading to higher agricultural output (Kenya National Bureau of Statistics, 2013).

2.1.3 East Africa

The African Development Bank defines East Africa as Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Rwanda, Seychelles, Somalia, South Sudan, Sudan, Tanzania and Uganda (African Development Bank Group, 2014). All of them except Somalia are part of the *Common Market for East and South Africa* (COMESA). Burundi, Kenya, Rwanda, Tanzania and Uganda additionally form the East African Community (EAC) (East African Community, 2014). As shown in table 2.1, this study will consider Burundi, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Rwanda, Seychelles, Somalia, Sudan, Tanzania, Uganda, Zambia and Zimbabwe.

The East African countries differ greatly in their socio-economic structure and their geographical conditions (African Development Bank Group, 2014). The biggest economy in the sample is Sudan, with a GDP of US\$117 billion (World Bank, 2019b). In 2013 Kenya was the second biggest economy closely followed by Ethiopia and Tanzania but was overtaken by Ethiopia in 2015. In 2013 the region grew on average by 5.3%, with Zimbabwe growing the slowest by 2% and Ethiopia being the growth driver with 10.6% (World Bank, 2019c). This marks a decline from 6.6% in 2011 and 5.6% in 2012. According to the COMESA, the slowdown was caused by the weak economic situation in Europe in 2013, which led to declining exports in the whole region (Mugunga, Abdalla & Musengele, 2014).

The year 2013 saw human rights abuses and crackdowns on Islamic terrorist groups in several countries in the region. The Human Rights Watch report for 2013 lists political motivated tensions and unrests in the two biggest mobile money economies Kenya and Uganda for the first half of the year (Human Rights Watch, 2014). For Burundi and Rwanda, the report mentions several cases of human rights abuse. In Somalia, the government was not able to enforce its power over more than the capital. This list shows that not only Kenya faced socially unstable times that might have affected the use of mobile money.

Table 2.1: Different definitions of East Africa. Sources: African Development Bank, 2014; East African Community, 2014; GSMA, 2019c. Own visualization.

| African Development Bank | EAC | GSMA |
|--------------------------|----------|------------|
| Burundi | Burundi | Burundi |
| Comoros | Kenya | Ethiopia |
| Djibouti | Rwanda | Kenya |
| Eritrea | Tanzania | Madagascar |
| Ethiopia | Rwanda | Malawi |
| Kenya | | Mozambique |
| Rwanda | | Rwanda |
| Seychelles | | Seychelles |
| Somalia | | Somalia |
| South Sudan | | Sudan |
| Sudan | | Tanzania |
| Tanzania | | Uganda |
| Uganda | | Zambia |
| | | Zimbabwe |

2.2 Mobile Money

The futurist Karl-Heinz Land predicted that it would not be surprising if first all people are connected to the internet before having access to running water (Land, 2018). In 2013, already over three billion people worldwide owned a mobile phone (Buku & Meredith, 2013). In Sub-Saharan Africa (SSA) 420,000,000 people were subscribed to mobile-service in 2016, which makes up for 43% of the population (Rogers & Pedros, 2017). The number of people that have access to a phone is probably even higher when considering that for example in Kenya 1/3 of all Kenyans shared their phone with someone else (Aker & Mbiti, 2010). These numbers justify that there is growing attention to the role mobile phones can play for development.

The opportunities that arise from this new connectivity are mostly seen in the context of access to information. Farmers can get information about the current national and world prices of the product directly on their phone, giving them a stronger position to negotiate (Minges, 2012), patients can get consultation from a doctor sitting far away (Duncombe, 2014) and part-time workers can get information about available jobs in the city before taking the expensive bus

into the city (Aker & Mbiti, 2010). These small changes have a big impact on the livelihood of the poor in developing countries.

One of the most recognized technologies in this new mobile economy is the upraise of mobile money. “M-finance is an umbrella term that incorporates mobile cash transfers (m-transfers) and payments (m-payments), financial transactions undertaken using mobile devices such as a mobile phone.” (Duncombe, 2012, p.370). Ndiwalana, Morawczynski & Popov (2010) define mobile money closer as “a term used to loosely refer to money stored using the SIM (subscriber identity module) as an identifier as opposed to an account number in the conventional banking sense. [...] The corresponding cash value is physically held by the MNO [Multinational Organization], a bank or another third party depending on the business model.” (p.1). It is important to note that a simple cellphone is enough to use this service. A smartphone is not required.

Mobile money services were first launched in 2005 in a variety of developing countries (Aker & Mbiti, 2010). At the beginning of 2019, there were 298.7 million active users in 90 countries who transferred US\$1.3 billion (Pasti, 2019). The service is mostly used in Sub-Saharan Africa, which in 2017 made up for 49.1% of all mobile money users worldwide, followed by South Asia with 34%. Just 1.7% of all users live in Europe or Central Asia (GSMA, 2017). The most researched country in this context is Kenya, with its mobile money service M-PESA, which is widely seen as the most successful service worldwide (Donovan, 2012a).

2.2.1 Mobile Money in Kenya

2.2.1.1. General

In 2005 Safaricom started a first pilot phase for its new service M-PESA (Hughes & Lonie, 2007). Safaricom is operating in Kenya as part of Vodafone. (Buku & Meredith, 2013). Since its official launch in 2007 (Hove & Dubus, 2019), M-PESA managed to reach 25,570,165 active users in December 2018 (Communications Authority of Kenya, 2019). In September 2013, 76% of the Kenyan population had access to mobile money and 62% had their own account (Intermedia, 2014). The total value of mobile money transactions reached US\$3.6 billion in January 2019 (Central Bank of Kenya, 2019).

After the launch of M-PESA, five additional services were brought to market: AirtelMoney in 2009, Tangaza Pesa Mobile Money Transfer in 2011, MobilKash in 2011, Equitel in 2014 and T-Kash in 2018 (GSMA, 2019b). Even though all of them are still in the market, no competitor managed to threaten Safaricom's strong position. In 2018 M-PESA still had a market share of 80% (Communications Authority of Kenya, 2019).

Several authors discuss the reasons why mobile money has been so successful in Kenya. First, Kenya has and had a high penetration of mobile phones. In 2011, 93% of households owned a mobile phone (Demombynes & Thegeya, 2012). The Central Bank of Kenya supported this development in 2009 with the decision to suspend the extra fee on mobile handsets (Rogers & Pedros, 2017). In 2016, 59% of all Kenyans had an active mobile service subscription whereas the average in Sub-Saharan Africa was 43%. The authors find that the number of mobile internet subscriptions (56% in Kenya / 26% in SSA) also indicates a more active use than in other countries in the region.

Next to the high penetration of mobile phones, the unique social situation in Kenya is seen as a success factor. During the colonial era, urbanization was prevented. The late urbanization leads to the special status that until today, the ties between the urban centers and the rural periphery are robust (Buku & Meredith, 2013). This meant a high demand for services to send money home. The authors describe how before mobile money was introduced people had to either travel home to hand over the money in person, hand the money to a bus company to transport the cash, send it via post or ask friends for help. All alternatives were connected with high costs and risks.

The last major advantage Safaricom had over competitors in other countries was the support of the central bank. After the first successes of M-PESA, the banking sector demanded to regulate the service as strictly as traditional banking services. The central bank, however, valued the financial inclusion of the poor higher than the protection of conventional banks and denied the request (Onsongo & Schot, 2017).

2.2.1.2. Usage

Mobile money in Kenya is used mainly in four different ways. The most important use case is to send money to friends and relatives, with 60% of users stating that they use it to send and 64% to receive money (Intermedia, 2014). These transactions are often between urban workers and their rural relatives to support the ones that stayed home (Morawczynski, 2009). M-PESA specifically promoted this use case through marketing campaigns (Intermedia, 2014). For each transaction and the withdrawal of money a service fee is collected. The charges are not calculated as percentage but in fixed tariffs based on the amount transferred. In 2012 for a transaction of 10 to 49 Kenyan Shilling (Ksh) (US\$0,1 - US\$0,48) a transaction fee of 3 Ksh (US\$0,03) was required. The fee makes up for 0,2% to 20% of the transacted amount. Since 2016 up to 100 Ksh are free of charge (Safaricom, 2019). The maximum amount being allowed to transfer per transaction is 75,000 Ksh (US\$741) (Madise, 2019).

The second most used function is paying bills. In 2013 10% used M-PESA to pay school fees, hospitals, regular bills or to make donations (Intermedia, 2014; Aker & Mbiti, 2010). Also, taxes can be paid with mobile money through the new i-Tax system (Bett & Yudah, 2017).

According to the Financial Inclusion Survey, 10% of the users also use it for savings (Intermedia, 2014). Many authors have argued that the discussion about whether people are using M-PESA to save or not depends on how you define saving (Hove & Dubus, 2019). Extra services, designed explicitly for savings with interest rates, like M-Kesho and M-Shwari did not pick up since their introduction, which is partly due to their little interest rates (Demombynes & Thegeya, 2012). To which degree M-PESA is used to safely store money also remains part of the discussion. Where Morawczynski (2009) and Plyler, Haas & Nagarajan (2010) find that people use their phones to store money, Jack & Suri (2012) and Cohen & Stuart (2011) disagree with them. Ouma, Odongo & Were (2017) use data of the FinAccess survey in a regression to answer this question. Their results show a clear correlation between using M-PESA and saving money. However, they also show a strong correlation between education and income and do not test for connection between M-PESA usage and education and income. It, therefore, remains questionable what they measure. This is better done by Demombynes & Thegeya (2012) who show that among all income groups M-PESA increases saving.

Nevertheless, Hove & Dubus (2019) in a recent study find no connection between mobile money usage and saving.

The last presented use case, the use of insurance through mobile money, was just used by 0.2% of all users in 2013 (Intermedia, 2014). This is surprising as the case of the Kenyan farmer who can get easy insurance for his crops with the use of mobile money is often cited example (Duncombe, 2016). It seems like the media coverage is higher than its actual usage.

Even though mobile money spread quickly around Kenya, there is still a substantial part of the population who is not using it. The FinAccess Household Survey 2019 asked why and found that the main reason are service charges being named by 37.7% (Central Bank of Kenya, FSD Kenya & Kenya National Bureau of Statistics, 2019). At the same time, just 0.5% address the overall affordability. This gives a hint that the tariffs imposed on each transaction might still be too high from the perspective of some users.

Overall it can be said that mobile money is not used for everyday payments. Still in 2019, 89% of all daily payments are done in cash (Central Bank of Kenya, 2019). Only 12% of mobile money users use it on a daily bases (Central Bank of Kenya, FSD Kenya & Kenya National Bureau of Statistics, 2019). This might change already in 2019 when mobile money providers, in general, try to transform their business into a '*payment as a platform*'² approach with more additional services for daily usage (Pasti, 2019).

2.2.1.3. Impact

Mobile money is seen as a major contribution to include people into the financial system. In 2006, only 28% of all Kenyans were part of the formal financial system (FSD Kenya & Central Bank of Kenya, 2013). In 2019 the same survey found that 82.9% are now included (Central Bank of Kenya, FSD Kenya & Kenya National Bureau of Statistics, 2019). How big the contribution of mobile money to this success is, can be seen in the data of Financial Inclusion Survey of Intermedia in 2018 which finds that 87% of all Kenyans have a mobile money account and 88% have either a bank account or a mobile money account, leaving 1% with just a bank account (Intermedia & Bill and Melinda Gates Foundation, 2018). However, it should also be noted, that in 2006 only 39% of the population were excluded entirely while 33% had access to informal financial systems like saving circles (FSD Kenya & Central Bank of Kenya, 2013). That this is also an important topic for the Kenyan state is shown by the FinAccess survey that was published for 2006, 2009, 2013, 2016 and 2019 covering between 4000 and 6500 participants (FSD Kenya, Central Bank of Kenya & Kenya National Bureau of Statistics, 2015a, 2015b, 2015c, 2016, 2019). Additional to that InterMedia in collaboration with the Bill and Melinda Gates foundation conducts a similar survey every year since 2014 for a range of countries around the world, including Kenya, Rwanda, Tanzania and Uganda (Intermedia, 2014, 2015, 2016; Intermedia & Bill and Melinda Gates Foundation, 2017, 2018).

² This connects consumers and businesses with a range of third-party services to meet their evolving needs, from enterprise solutions for micro-, small- and medium-sized enterprises (MSMEs) to e-commerce, credit, savings and insurance. (Pasti, 2019, p.6)

Even though the fact that more people are included in the formal financial sector is often seen as positive, it can also be questioned how big the actual improvement for the people is. Cohen and Stuart (2011) find that mobile money mainly evolves along existing use structures rather than opening up a lot of new opportunities through financial institutions. Adam and Walker (2015) add that for the central bank, mobile money creates the chance that more people are affected by its policy.

Next to the macro-economic effects, there are several direct ways how mobile money impacts the life of its users. Jack & Suri (2016) find that 194,000 households were lifted out of poverty through mobile money. The service helps its users to save money as it is a cheaper alternative to send money home (Aron, 2018). For women, mobile money is a chance for more equality as they can hide money better and can receive it directly on their phone without needing their husband (Morawczynski & Pickens, 2009). It also makes households less vulnerable to external shocks as it allows victims to receive support from a more extensive network (Jack & Suri, 2012). This is an important function for mobile money users. It also means that in the event of a catastrophe the usage of mobile money might go up instead of down. However, this is not scientifically investigated yet.

One indirect effect of the invention of mobile money is the general mindset shift regarding financial inclusion. One example where this can be seen is the new health insurance in Kenya that was introduced in 2010 and raised the insurance rate from little more than 0% to 12% at the beginning of 2019 (Central Bank of Kenya, FSD Kenya & Kenya National Bureau of Statistics, 2019).

To sum it up mobile money has a positive impact on the people in Kenya as it gives them access to formal financial institutions, helps to recover from income shocks and makes it easier and cheaper to send money home. Because of this importance, Safaricom and the public media criticized the introduction of an excise fee on financial transaction in February 2013 arguing that it will hinder the improvements in financial inclusion (The Economist, 2013; Safaricom, 2013). To understand this discussion better, section 2.3. will examine the role of taxation for the state, its importance and the problems for developing countries before giving a brief overview and explanation of mobile money taxation.

2.2.2 Mobile Money in East Africa

After Kenya the second country to introduce a mobile money service was Tanzania in April 2008, followed by Uganda in January 2009. The other countries in the sample one after the other started their services in 2009 until 2011 with Malawi in February 2012 and Ethiopia in February 2013 being the late comers (GSMA, 2019b). Ever since the start of the record in December 2011 East Africa, including Kenya, made up for over 50% of transactions globally covering over 1.1 billion transactions every month in 2018 (GSMA, 2019c). The market is not dominated by one player, which would make sense in an industry that benefits from network

effects but has national players in every country with a few international brands. Interestingly, M-PESA just expanded to two other markets³ (Tanzania, Mozambique) (GSMA, 2019b).

When comparing data from the central banks from Kenya, Tanzania, Uganda and Zimbabwe the country with the most mobile money transaction in East Africa in January 2013 was Tanzania followed by Kenya, Uganda and last Zimbabwe (Bank of Tanzania, 2017; Central Bank of Kenya, 2019; Minister of Finance, Planning and Economic Development 17.07.2018; Reserve Bank of Zimbabwe, 2015). For the other countries, monthly data is not available. However, there are recent reports about Somalia that the country has overtaken in Kenya in numbers of mobile money transactions in 2018 (Owuor, 2018). This is interesting to note as it is the only country of these five that has not introduced a tax on mobile money.

2.3 Taxation

Tax revenues are important for states to fund their expenditures to guarantee a functioning environment in which businesses can function (Carnahan, 2015). What the exact role of taxes should be was already discussed by Schumpeter (1918) and Goldscheid & Lazarsfeld (1917) at the end of the first world war. This section will describe the special situation of taxation in developing countries in general and in Kenya in specific to understand the context of the introduction of the new mobile money tax. Additionally, a short introduction in taxation theory will be given to get a prediction how the mobile money tax should affect the usage from a theoretical point of view.

2.3.1 Taxation and Development

The importance of taxes for developing countries got new attention with the rise of the East Asian Tigers in after 1960. Several authors argue that high initial saving rates of the population allowed the states to invest in the industry and through that were part of the growth story (Rodrik, 1994; Weiss, 2005). This development also triggered an extensive World Bank report on taxation and development by Newbery & Stern (1987) in which they state that taxation might be a tool to force people to save (Newbery, 1987). However, until today taxation remains a problem in Africa. The tax to GDP ratio is with 18.2% in Sub-Saharan Africa significantly lower than the OECD average with 34.3% (OECD, ATAF & AUC, 2018).

One major reason for this difference are the administrative problems of developing countries. For administrations in developing countries it is more difficult to enforce and collect taxes than in the developed world (Bird, 2004). The author points out that this needs to be taken into consideration when advising emerging economies on tax policies. One problem for administrations is the big informal sector that is difficult to control and tax (Bird, 2013).

³ The expansion is not done by Safaricom, but by other Vodafone branches in the countries.

2.3.2 Taxation in Kenya

Tax revenue in Kenya increased from 186 billion Ksh in 2001 to 1,332 billion Ksh in 2016 (OECD, 2019). Despite this growth in absolute numbers, the tax to GDP ratio did not grow over 18.1% which is just under the African average of 18.2% and far below the OECD average of 34.3% (OECD et al., 2018). This is partly due to tax collection problems that were described by Bird (2013) and are also found in Kenya (Wanjiru et al., 2019; Ngotho & Kerongo, 2014). The increase in tax revenue is due to a series of tax reforms that aimed to make tax payment easier (The Institute of Certified Public Accountants of Kenya, 2016).

In 2013 the primary sources of revenue were income taxes and taxes on individual revenues accounting for 26.87% of total tax revenue. It was closely followed by taxes on other goods and services including excises fees with 25.98%. Value-added taxes (VAT) made up 22.75% of the taxes (OECD, 2019). The system is criticized for being too income inelastic, overtaxing the poor (The Institute of Certified Public Accountants of Kenya, 2016). The new financial excises fee introduced in 2013 contributed to 0.51% of total tax revenues in the fiscal year 2014 (OECD, 2019).

Despite the overall positive development of tax revenues did the Kenyan government not achieve its tax goals for the financial year 2013 (KIPPRA, 2014). This led to the introduction of the Finance Act 2013, which also included the new financial excises fee discussed in this paper (The Institute of Certified Public Accountants of Kenya, 2016). How this is designed exactly will be explained in the next section.

2.3.3 Mobile Taxation

In the context of little tax returns and big informal markets, it appears to be attractive to tax a sector that reaches the poor and is easy to regulate: The mobile phone sector (International Telecommunication Union, 2013). All African countries have some additional taxes on mobile services ranging from VATs on handsets and airtime to excise fees on buying credit. This is criticized by the GSMA as being unproportionally (GSMA & Deloitte, 2016). The most extreme example they point out is the DR of Congo where according to them the mobile sector contributes to 3% of the GDP but pays 17% of the total tax revenue (Rogers & Pedros, 2017). In Kenya, the normal VAT is 17%, which is accompanied by an extra 10% on mobile services.

One specific mobile tax is the taxation of mobile money. At the beginning of 2013, Kenya introduced a 10% excise fee on all financial services. The tax applies whenever a fee is paid in the context of financial services. These are transactions as much as withdrawals. The fees apply to mobile money as well as to traditional banking but are believed to target especially mobile money. The tax is paid by the provider or the bank and is taken from the revenue. Excise fees are usually imposed on products like alcohol or tobacco, where the state wants to prevent the people from using it (OECD, ATAF & AUC, 2018). However, in the African context, it might make sense as it is easy to administrate and will be collected from the big companies instead of the individual customer (Carnahan, 2015).

Other countries in East Africa were quick to follow the example. Uganda introduced a 10% excise fee on financial service just like Kenya in July 2013, which lies within the timeframe of my model. Tanzania did the same one year later. In between Zimbabwe introduced a tax of US\$0.05 on each mobile money transaction (GSMA & Deloitte, 2016). In the summer of 2018, the Kenyan government increased the excise fee for mobile service to 12% and traditional banking services to 20% (Omondi, 2019). Uganda at the same time increased the excise fee just for mobile money service to 15% and additionally introduced a 1% tax of the value of each mobile money transaction (Makumbi, Muhindo & Munyandi, 2018).

2.3.4 Taxation and Demand in Theory

To understand why several interest groups expect negative spill-overs by a mobile money tax, this section will be concluded with a short introduction into a simple taxation theory. The simplest version of taxation theory assumes that prices are in the optimum, which leads to an increase in prices as soon as the tax is increased. This will then lead to lower demand (Newbery & Stern, 1987). This theory is weakened when the demand is price inelastic. Another way how the theory might fail is when companies decide to absorb the tax to gain an advantage over their competitors (International Telecommunication Union, 2013).

Based on this theory, Muthiora (2015) describes two ways how a tax can affect the development of mobile money negatively. First, if the companies decide to absorb the tax, it will lower their profits and consequently the incentive to invest. Second, if the prices are passed on to the consumer, the demand will decrease. The second part will be tested in this thesis with the case of Kenya. Do companies pass on the tax to the consumer? And is the consumption of mobile money price elastic or inelastic?

3 Literature Review

The spread of mobile phones in the developing world and its importance for development is also reflected in the academic literature. Since 2009 the World Bank publishes every three years a new report about “Information and Communication for Development” (The World Bank, 2009). In the first version, Zhen-Wei Qiang, Rossotto and Kimura (2009) point out the importance of broadband internet for developed and emerging economies. Acer and Mbiti (2010) support these findings but point out that more macro-economic research is needed.

More on the microeconomic level are the studies by Duncombe (2014) who finds that mobile phones enable users to mobilize their resources better which is supported by Goyal (2010) who concludes that better access to information increases welfare. Duncombe (2016) underlines these results for the agriculture sector, where information access is crucial for more efficient work.

In the field of mobile and development is one technology that gained special attention: mobile money. Since its launch in 2005 it was studied by social scientists like Morawczynski (2009), political scientists like Townsend (Jack, Suri & Townsend, 2010), business administration researchers following Lal and Sachdev (2015), economists like Mawejjc and Lakuma (2017) and even the computer scientists Adaba and Ayoung (2017). Probably the most studied example is the case of M-PESA in Kenya. Even though there is literature about mobile money in other countries and regions for example Diniz, Cernev & Nascimento (2016) about Brazil this literature review will focus on the extensive research available for Kenya and Sub-Saharan Africa.

3.1 Field Studies – Laying the Foundation

The first published article about M-PESA was written by Hughes and Lonies (2007) in autumn 2007, just months after the launch of M-PESA. The authors, who were employees of the Vodafone daughter Safaricom, describe the development of the product M-PESA from an internal point of view and are not often cited.

The first studies from independent researchers focused on how mobile money is used by the people in Kenya. One of the most cited authors is Morawczynski who published two articles in 2009 covering her field trip to a suburb of Nairobi and a village in the rural area (Morawczynski, 2009; Morawczynski & Pickens, 2009). She found great improvements in living standards for the poor and described the special Kenyan use case of relatives living in the city sending money back home to the rural area. Her study is the base for later authors and sets the narrative about mobile money in Kenya. However, Morawczynski not only focuses on Kenya. In 2010 she co-authored another field trip to Uganda applying the same study design their again (Ndiwalana, Morawczynski & Popov, 2010).

The work of Morawczynski was followed by Plyler, Haas & Nagarajan (2010) who surveyed three districts in Kenya. They found that M-PESA helps local economic expansion; security in terms of food, finance and physical; capital accumulation and to improve the business environment by reducing transaction costs. The authors claim to have chosen the areas to represent the Kenyan population, but it seems questionable whether the urban population was not underestimated.

The third often cited study is by Jack and Suri (2012). With 3000 participants, their survey is the most extensive one of the three. By using a difference-in-differences model, they underlined the finding that mobile money helps users to overcome external shocks by receiving financial aid by friends and family from across the country. This is stressed out again in their 2016 paper where they add that mobile money helped to lift 2% of all Kenyan households out of poverty.

Next to these three important studies, smaller field trips have been done. Cohen and Stuart (2011) focused on the usage of mobile money by the poor, which was not articulated that explicitly before, but the result of most of the other studies did so too. A little cited study by Mbogo (2010) surveys 300 micro-businesses in Nairobi and how mobile money impacted their business.

3.2 Desk Work – Putting the Findings into a Theoretical Context

After 2012 the work of the field researchers in Kenya was mostly done and desk research became more common. The question of why M-PESA was successful in Kenya was addressed by a series of authors, including Donovan (2012b), Jack, Suri & Townsend (2010) and Burns (2015). Buku and Meredith (2013) explained the success with the special social situation of Kenya with late urbanization and strong dependencies between the urban centers and the rural periphery. This created a special demand structure that was already described by Morawczynski & Pickens (2009). Onsongo & Schot (2017), on the other hand, saw Safaricom's customer centricity as key to success.

Donovan (2012a), Jack, Suri & Townsend (2010) and Burns (2015) are all overwhelmingly positive about its impact. Burns, for example, points out that mobile money helped users to get credits from formal banks more easily as they can access them with their mobile money account and do not need a bank account. This view is supported by Mbiti & Weil (2014), who are influential authors in the discussion. Their studies are frequently cited by authors like Rogers & Pedros (2017) who write for the GSMA.

Even though this effect is not entirely questioned in the literature in recent years there emerged some critics. Already in 2012, Maurer wrote an article where he shows which narratives are used to frame mobile money (Maurer, 2012). His work lacks academic citation standards but stands out with Maurer's own connection into the industry. He shows that the narrative of including the poor into the financial scene might not be wrong but is also very appealing to industry leaders. Onsongo & Schot (2017) and Hove & Dubus (2019) find that mobile money structurally leaves out the very poor as they do not have access to mobile phones. They find

this to be true even though people share their phones. This contradicts the story of a financial service for everyone.

3.3 Taxation and Mobile Money

As shown before, a topic that gained relevance since 2013 is the effect of mobile money taxation. However, the literature dealing with this topic is rare. The only two articles found that deal explicitly with mobile money taxation are International Telecommunication Union (2013) and Adam & Walker (2015). The former shows on a theoretical base why it is attractive to governments to introduce such a tax and how it could affect the development of mobile money. They argue that mobile money tax is easy to collect, but an exaggerated value-added tax could have negative spill-over effects. The article is written in cooperation with the UNESCO, but the International Telecommunication Union needs to be under suspicion for conflicts of interest.

Therefore, the only independent article about the topic is written by Adam & Walker (2015) who analyze the impact of mobile money on the fiscal system. They argue that on the one hand, the inclusion of the former unbanked via mobile money leads to a higher reach of central bank policies. On the other hand, they express concerns that the mobile money system might lead to a parallel system that is entirely out of the hands of the central bank. They, in general, support the idea of a mobile money tax to widen the tax base of the state and keep control over this part of the system.

Another author raising his voice is Ndung'u (2018). The former president of the Central Bank of Kenya expresses concerns that taxation of mobile money will incentive the usage of cash which, according to him, should not be in the interest of the government. Even though he grounds his argument on numbers, his article is not an academic paper. However, his point of view is widely shared in mainstream media in Africa (Sunday, 2018) and companies (Mugisha, 2018).

Apart from this specific literature, the GSMA provides reports about the impact of taxation of mobile services in general. In 2016 they argued that mobile services in Africa are in general overtaxed and stop the industry from growing which, according to them, harms the whole industry (GSMA & Deloitte, 2016). Rogers and Pedros (2017) are even more explicit in arguing that the tax in 2013 led to a decline in mobile money growth. This is repeated in their 2019 "State of the industry report" (Pasti, 2019), where they examine the state of the mobile money industry in general and shortly talk about the new mobile money tax in Uganda. Even though their arguments seem convincing, it must be noted that it is in their interest that taxes are lowered. It appears to be concerning that also independent researchers like Aker & Mbiti (2010) have to rely completely on data by the GSMA.

The review of the literature has shown that there is extensive literature about the usage and the impact of mobile phones and mobile money in Kenya. In recent years the overwhelmingly positive reports about mobile money were accompanied by a few critical voices. What is missing in the literature so far are studies about macroeconomic influence factors on the usage of mobile money. Some articles treat taxation of mobile services and mobile money, but they are constrained and seldom independent. The purpose of this paper is to close this gap by estimating the effect of the introduction of the mobile money tax in 2013 in Kenya on its usage.

This will be done with a difference-in-differences model. The model was found to be helpful in the context of mobile money research (Aron, 2018) and taxation (St. Clair & Cook, 2015) alike.

3.4 Hypothesis

The research question addressed in this thesis is:

Research question: *How did the introduction of a mobile money tax in Kenya in 2013 influence the usage of mobile money?*

The hypothesis arising from this situation is the following:

H1: *The change in usage of mobile money in 2013 was a regional phenomenon rather than related to the introduction of the mobile money tax.*

4 Data and Method

In my research question, I am asking for the influence of a mobile money tax in Kenya on the usage of mobile money. I stated that I will test this with a Difference-in-Differences model. Section 4.1 will present the underlying dataset and basic trends that can be observed. In the second part of the section, the exact application of the DD will be reasoned. It will be shown how the standard model is adapted to the needs of this study. In the end, the models will be presented.

4.1 Data

4.1.1 Data Source

The dataset used for this DD is constructed out of two sources. For Kenya, the data comes from the Central Bank of Kenya (Central Bank of Kenya, 2019). It provides information on the number of agents, accounts, transactions and the total value of transactions on a monthly base since March 2007. It does not differentiate between providers and does not show how many of the registered accounts were active. The Central Bank of Kenya is an independent source which is not under suspicion for manipulating the data. Data is available consistently for every variable and every point in time since the start of the dataset. It covers all providers in Kenya and is therefore representing reliably the whole mobile money scene in Kenya. As the data is collected automatically by mobile network providers, there are no data collection problems. The only weak point in the chain is the transfer from the providers to the Central Bank. However, due to the low number of providers, the Central Bank can easily track them closely. The dataset is a secondary source that has not been used in detail for academic research so far.

For the control group *East Africa*, data is taken from the GSMAs *Global Mobile Money Dataset* which publicly provides researchers with data on the number and value of transactions since December 2011 for every March, June, September and December worldwide (GSMA, 2019c). It comes with additional information on the agent network for every December and June and quarterly information about the number of active accounts. The dataset is divided into regions and for Sub-Saharan Africa into sub-regions including East Africa. The sample of East Africa contains Burundi, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Rwanda, Seychelles, Somalia, Sudan, Tanzania, Uganda, Zambia and Zimbabwe of which Seychelles and Sudan had not started a mobile money service in 2013 and are therefore not part of the further discussion. To exclude Kenya from the control group, a new dataset was created by subtracting the values of Kenya from the East African summary. The data is provided by the telecommunication companies that are part of the GSMA. As the dataset does not show information for single countries and contains failing states like Somalia, there is the danger of missing values within

the construction of the data. The dataset is a secondary source that has been used by other researchers. How much it has been used cannot be said as the reports are not publicly available. The GSMA also has a non-public version of the dataset that contains monthly data for every country with a mobile service. This is probably the most detailed dataset available about the development of mobile money.

The combination of the two datasets does not bring difficulties. Both datasets are constructed based on information of the same telecommunication providers. Furthermore, are the units the same (number of transactions/month). For further insides into regional trends, a dataset of the Bank of Uganda (2019) will be used.

4.1.2 Data description

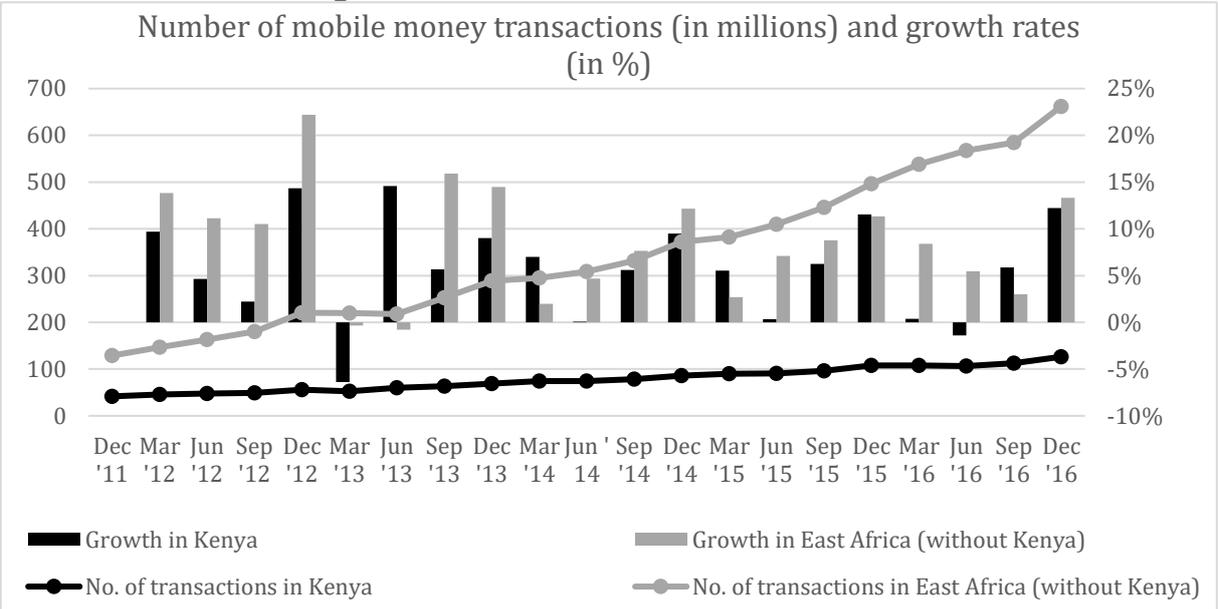


Figure 4.1: Number of money transactions (line graph measured in millions) and growth rates (bar graph measured in %). Data source: GSMA, 2019. Central Bank of Kenya, 2019. Own visualization

Figure 4.1 shows the development of mobile money transactions from December 2011 till December 2016 in Kenya and East Africa. Both Kenya and East Africa experienced a constant increase in mobile money transactions. From the growth rates, it can be seen that Kenya and East Africa both had just two months with declining transaction numbers. Kenya had negative growth rates in March 2013 and June 2016 and East Africa in March and June 2013.

In figure 4.2, the monthly growth rates for mobile money transactions in Kenya from 2010 until 2016 are displayed. The graph shows seasonal trends that do appear every year. The first and most prominent growth peak is every year in March, followed by smaller peaks in May, July, October and December. For the March peak, there is only one exception: 2013, which is then

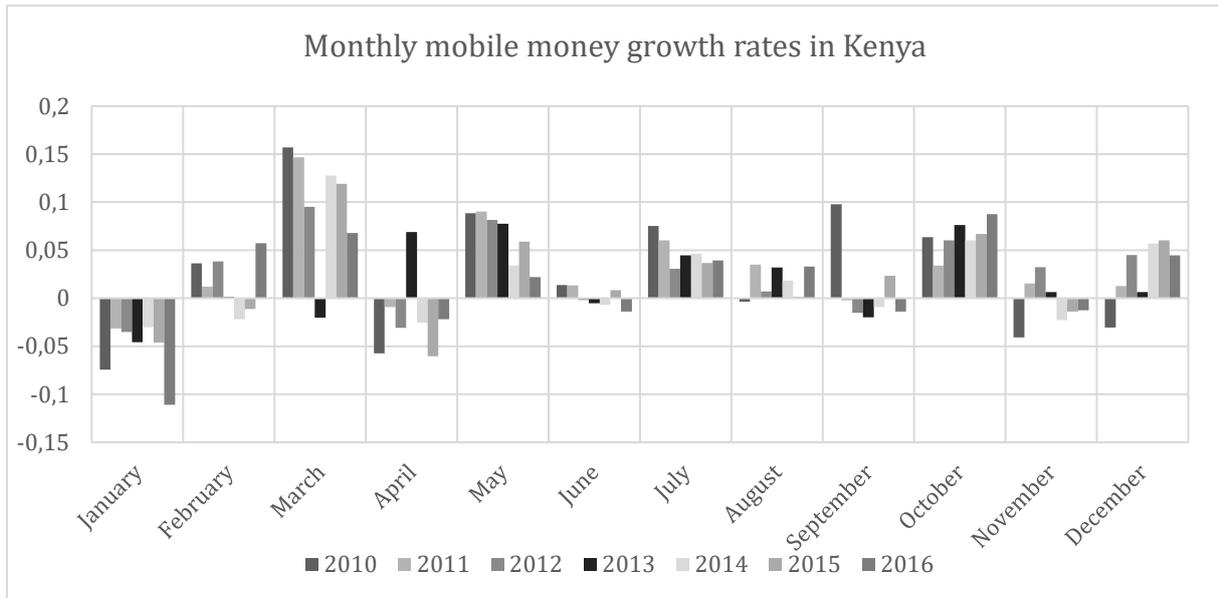


Figure 4.2: Monthly mobile money growth rates in Kenya from 2010 till 2016. Source: Central Bank of Kenya, 2019. Own visualization

followed by an unusual growth in April 2013. Through conversations with a Safaricom employee, the peaks in December and March can be explained. The increase in transactions in December is caused by the holiday season with Christmas and New Year. After that, the financial capability of households decreases in January. February is always a short month, which leads to a further decrease. In March the household economy has recovered from the holiday season so that growth rates can pick up again.

The overall trend contradicts the findings of figure 4.1, where a general upwards trend can be found in December. This can be explained by the way of the calculation. Where Figure 4.1 shows the growth rates from the last month of each quarter to the last month of the next quarter, figure 4.2 measures the growth from consecutive months. As figure 4.2 shows, June and September are usually weak months, which makes the following month appear stronger. On the other hand, December is normally a growth month, which leads to March being less prominent in comparison than in a monthly calculation. That the Kenyan trend might well be a regional phenomenon is shown by figure 4.3, which compares average monthly growth rates in Kenya and Uganda from 2010 until 2016. Uganda shows the same peaks as Kenya with a weaker downwards trend in April and an additional boost in October.

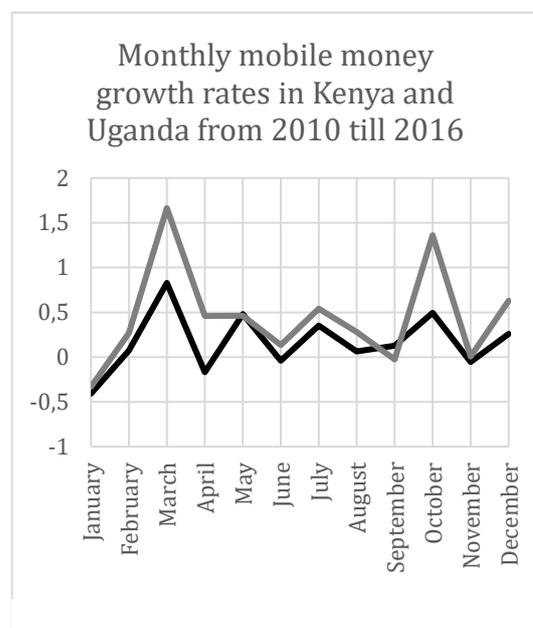


Figure 4.3: Average monthly mobile money growth rates in Kenya and Uganda from 2010 till 2016. Source: Central Bank of Kenya, 2019; Bank of Uganda, 2019. Own visualization

4.2 Method

A popular method in both tax policy research and mobile money research is the Difference-in-Differences approach (Bækgaard, 2014; Aron, 2018). DD is used for situations where an experiment is not feasible. The basic idea is that two groups are similar at the beginning of the observation after which one receives treatment and the other does not. The difference in the development of the two groups is the observed treatment effect (Angrist & Pischke, 2015). This method will be used to examine the impact of the introduction of a 10% excise fee on financial services in Kenya in 2013.

The DD approach has several advantages over simple regressions that makes it interesting for taxation research. When well-designed, both groups are affected by the same external shocks. As just the difference in the development between the groups is under observation, external shocks do not confound the result. This characteristic is valuable when the confounding variables are unknown or cannot be measured (Wing, Simon & Bello-Gomez, 2018). The same accounts for the maturation process of products or services. In the case of mobile money, a general increase in its usage over time is to be expected. However, the tax might slow down this process. By comparing Kenya to a control group, it is possible to estimate how the growth would have been without the tax (St. Clair & Cook, 2015).

4.2.1 The control group

To achieve valid results with the DD approach, the two groups under observation should be as similar as possible in the advent of the event to be studied (St. Clair & Cook, 2015). In an ideal scenario, in some parts of Kenya the tax would be introduced and in others not. As this is not the case, Kenya needs to be compared to another country or region. Intuitively, a neighbor country with a similar socio-economic structure that does not introduce a new mobile money tax and where data is available would be a good choice. However, the problem is that the usage of mobile money differs a lot from month to month, as shown in figure 4.2. and 4.3. Even though repeating seasonal changes can be observed, there is still high volatility. Furthermore, when comparing two countries to each other one need to control for national events in both.

One adjusts for these problems by using the region East Africa as a control group. While national changes can still occur, they will be balanced by other countries. Also, Kenya is part of this region, making it exposed to the same overall trends as the control groups. These external shocks can be changing weather or security conditions or large economic shocks.

What limits the interpretation of the results occurring from this comparison is the missing literature that explains the impact of macroeconomic effects on mobile money usage. Furthermore, it cannot be ruled out that the seemingly regional trend is indeed caused by a series of national events appear to happen at the same time. To control for this, it would be helpful to get access to national datasets to track down national factors. Finally, it is also possible that the external shock just hit parts of the group but not Kenya and still shows a

significant effect on the overall performance. In particular, this is true for the control group as the countries differ strongly in their demographics and geography.

At the same time, diversity is also the strength of this dataset. If the observations show a strong, unusual trend at some point, this indicates a major shift in the whole region. As figure 4.2 shows, this is the case in March and June 2013, when transaction numbers in East Africa decreased the only time in the whole series. Because information about what affects mobile money usage is limited, the broad dataset helps to cover a variety of possible influence factors.

4.2.2 Assumptions

Problems with the Difference-in-Differences design occur when the parallel trends assumption is not fulfilled. The parallel trends assumption is a key pre-requisites for a DD model (St. Clair & Cook, 2015). This means that in the advent of the event, the treatment group and the control group should show the same overall trends. This refers to the dependent variable under observations but also major economic figures. To prove that this assumption holds, the development of the number of mobile money transactions in Kenya and East Africa from December 2011 till December 2012 and the development of GDP in the region will be compared.

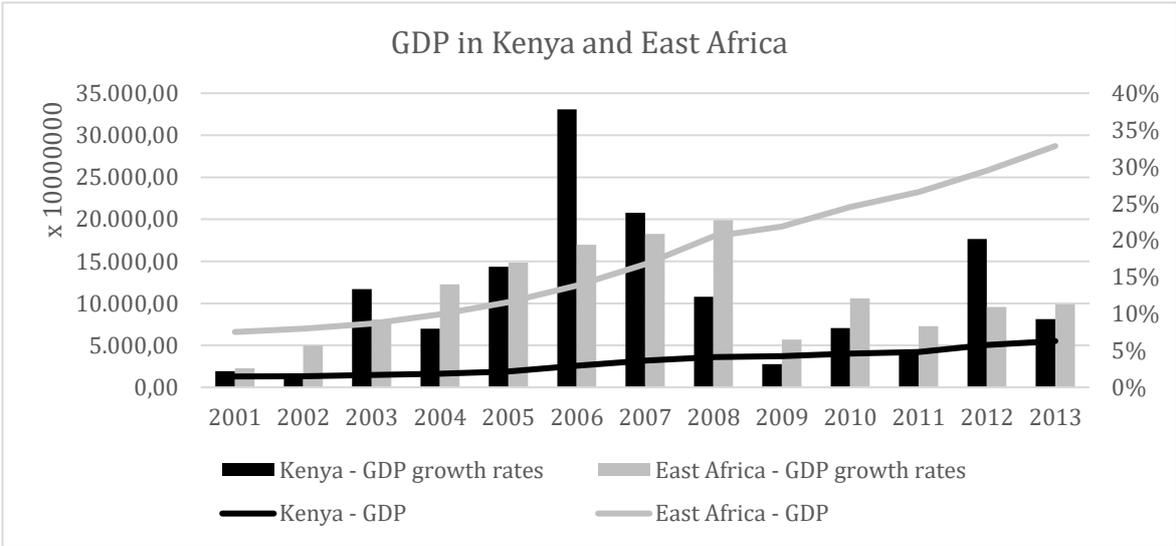


Figure 4.4: GDP and GDP Growth in Kenya and East Africa (Current Prices in US\$). Source: World Bank, 2019. Own visualization

In figure 4.4, the development of the GDP in the sample countries and Kenya can be seen. The first thing to observe is that the total GDP in East Africa is bigger than in Kenya. That is not surprising as the East Africa sample contains thirteen countries. Nevertheless, it should be noted as it shows that the groups are very different in size. The overall trend for this indicator is similar. For 2013 it can be seen that East Africa grew 2% more than Kenya. However, the basic trend in the year of interest is similar.

Figure 4.1 shows that, like the GDP, the number of mobile money transactions in East Africa is higher than in Kenya. Additionally, the growth in the East African region has been significantly higher than in Kenya. Therefore, the total number of transactions differ stronger over time and do not develop in a parallel way. However, what can be observed as well is that prior to the introduction of the mobile money tax the growth rates developed similarly. Whenever growth rates decreased in Kenya, the rates in East Africa did the same. This shows that in general, the overall trend in growth rates was similar.

From the described observations, it must be concluded that the parallel trends assumption is not fulfilled. Especially for the total number of transactions, the assumption has to be rejected. To account for the limitations, the Difference-in-Differences model will be run with growth rates instead of absolute numbers. This allows to have at least similar trends and takes into account that East Africa tends to grow faster in mobile money transactions than Kenya.

4.2.3 The event of interest

The event to be studied is the introduction of a 10% excise fee on financial services in Kenya at the beginning of 2013 (Muthiora, 2015). There has been confusion about when exactly the tax has been put in place and enforced. The new Finance Act became effective on February 1st, 2013, but media reports suggest that due to lawsuits, it was not enforced until June 18th (Nyabiage, 2013). This view is supported by the findings of the Institute of Certified Public Accountants of Kenya (2016), which finds that in the second half of 2013 the revenue through excise fees increased significantly. Also, the tax revenue of Kenya shows tax revenue from the excise fee on financial services since the fiscal year 2014, which starts in July 2013 (OECD, 2019).

When the tax was enforced cannot be found with certainty. As it is imposed on the companies and not on the consumers, it does not affect the Kenyan people directly but just through price increases by the providers. The model, therefore, uses the 10% price increase by Safaricom that was put in place for February 8th, 2013 as the event to observe (Herbling, 2013). Even though Safaricom was not the only provider back then with a market share of over 80%, it is valid to assume that a price increase by this provider had a major effect on most consumers. In my model the price increase is the treatment applied to Kenya.

4.2.4 The model

To assess the research question, the last point before the price change in Kenya in February 2013 and the first point after it will be used. This makes the short period range from December 2012 to March 2013 with no data points in between. This allows to estimate the immediate effect of the price change introduced by Safaricom. To cover possible mid-term effects, that occur after adapting to the new situation, a second and third model will be applied ranging from December 2012 to June 2013 and from December 2012 to September 2013. The basic model looks like the following, where Y is the number of mobile money transactions.

$$\delta_{DD} = (Y_{Kenya,Mar13} - Y_{EA,Mar13}) - (Y_{Kenya,Dec12} - Y_{EA,Dec12})$$

However, as discussed in section 4.2.2. the calculation will not be run with absolute numbers but with growth rates. The growth rates will always be calculated in relation to the last available month. To calculate the growth for December 2012, the following formula will be used:

$$\Delta Y_{Kenya,Dec12} = \frac{Y_{Kenya,Dec12}}{Y_{Kenya,Sep12}} - 1$$

Filling this into the standard formula the following new model comes into place:

$$\delta_{DD}^{New} = \left(\frac{Y_{Kenya,Mar13}}{Y_{Kenya,Dec12}} - 1 - \frac{Y_{EA,Mar13}}{Y_{EA,Dec12}} - 1 \right) - \left(\frac{Y_{Kenya,Dec12}}{Y_{Kenya,Sep12}} - 1 - \frac{Y_{EA,Dec12}}{Y_{EA,Sep12}} - 1 \right)$$

Simplifying the model by cutting out the -1 leads to the three new adjusted models.

$$(1) \delta_{DD}^{New} = \left(\frac{Y_{Kenya,Mar13}}{Y_{Kenya,Dec12}} - \frac{Y_{EA,Mar13}}{Y_{EA,Dec12}} \right) - \left(\frac{Y_{Kenya,Dec12}}{Y_{Kenya,Sep12}} - \frac{Y_{EA,Dec12}}{Y_{EA,Sep12}} \right)$$

$$(2) \delta_{DD}^{New} = \left(\frac{Y_{Kenya,Jun13}}{Y_{Kenya,Mar13}} - \frac{Y_{EA,Jun13}}{Y_{EA,Mar13}} \right) - \left(\frac{Y_{Kenya,Dec12}}{Y_{Kenya,Sep12}} - \frac{Y_{EA,Dec12}}{Y_{EA,Sep12}} \right)$$

$$(3) \delta_{DD}^{New} = \left(\frac{Y_{Kenya,Sep13}}{Y_{Kenya,Jun13}} - \frac{Y_{EA,Sep13}}{Y_{EA,Jun13}} \right) - \left(\frac{Y_{Kenya,Dec12}}{Y_{Kenya,Sep12}} - \frac{Y_{EA,Dec12}}{Y_{EA,Sep12}} \right)$$

Based on my hypothesis, I expect that Kenya and East Africa will develop parallel in the observed timeframe. To reject my hypothesis, the data would need to show a clear downward trend for Kenya. The next section will describe the outcome.

5 Empirical Analysis

The next chapter will analyze the results of the difference-in-differences model. It will explain the presented numbers in the context of the framework. Furthermore, the data will be placed in a long-term perspective.

5.1 Description of Results

Table 5.1: Results of Difference-in-Differences calculation

| Model | Time | 1. | 2. | 3. | 4. |
|-------|----------------|---------|---------|---------|---------|
| | December 2012 | 0.1434 | 0.2221 | 0.0787 | 0.0000 |
| (1) | March 2013 | -0.0637 | -0.0035 | 0.0602 | 0.0185 |
| (2) | June 2013 | 0.1457 | -0.0079 | -0.1537 | 0.2323 |
| (3) | September 2013 | 0.0566 | 0.1592 | 0.1026 | -0.0239 |

Columns for Table 5.1.

1. *Mobile money growth rates in Kenya*
2. *Mobile money growth rates in East Africa (Without Kenya)*
3. *Difference between the mobile money growth rates in Kenya and East Africa*
4. *Difference to the base in December 2012*

Table 5.1 shows the results of the adjusted Difference-in-Differences model (1) – (3). Column 3 and 4 contain the growth rates of mobile money transactions based on the month displayed before. Column 5 indicates the difference between the growth rates for every month and column 6 shows the results of the DD calculation.

What can be seen in the table is that Kenya and East Africa both experienced a decline in mobile money transactions in March 2013. With 6.4% Kenya lost more than East Africa with 0.4%. However, whereas East Africa continued shrinking in June, Kenya managed to grow strongly in June again. In September both groups grew substantially with East Africa growing 10% faster than Kenya.

Looking at the results of the models in column 6, the values reveal a substantially different picture. The number of 0.0185 in March 2013 indicates that the growth rates in Kenya are by 1.85% higher compared to the general trend in East Africa. This means that even though Kenya is shrinking faster than East Africa, the gap in growth rates has declined. This continuous drastically in June, where Kenya's growth rates would have been 23.23% lower if it would have followed the major trend. In September, the overall trend is in favor of East Africa again.

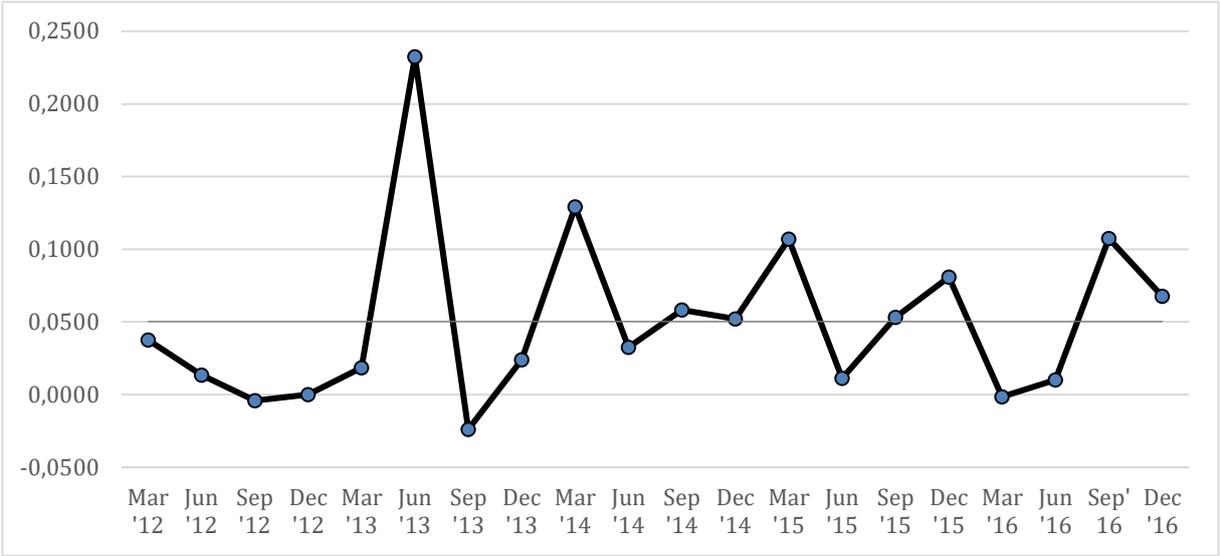


Figure 5.1: Difference-in-Differences results for March 2012 until December 2016 based on models (1) - (3)

As the parallel trend assumption does not hold the values of table 5.1 need to be set in context. Figure 5.1 shows the variance of the results of the Difference-in-Differences model over time. To calculate the values after September 2013, the used DD model was extended. The base year always remains December 2012. The value 0.0240 in December 2013, for example, means that the difference between the growth rate of Kenya and East Africa was 2.4% smaller than in December 2012. The grey line represents the average located at 0.0508. The graph helps to evaluate how the results of the models (1) – (3) must be seen over time.

It can be concluded that in June and September 2013, the difference between Kenya and East Africa were exceptionally big, whereas the result of March 2013 is within the normal deviation from the average. It can also be seen that a part of September 2013 and March 2016 Kenya's growth rates were always closer to East Africa than in December 2012. As several countries introduced a mobile money tax in the presented time frame, the graph is not suited to estimate the long-term effect of mobile money taxes as the control group is also treated. Figure 5.2 only helps to see that the 1.85% in March 2013 are within a range that appears several times.

5.2 Discussion

To answer my research question, I will first look at the growth rates for Kenya from December 2012 to March 2013 to address the statement, that the number of transactions declined in the first quarter of 2013. After that, I will use the results of my DD analysis to interpret these findings and test my hypothesis. Finally, I will propose a national explanation of the findings.

Rogers and Pedros (2017) wrote that in the first three months of 2013, the usage of mobile money declined by 5%. Also, Ndung'u (2018) expressed concerns that the introduction of a mobile money tax would lead to a permanently lower utilization of the service. He argued that the growth rates after 2013 were lower than before. These statements can be partly confirmed with my data. Table 5.1 shows that in March 2013, Kenyans used mobile money 6.37% fewer than in December 2012. However, as seen in figure 4.2, the growth rates picked up already again in April. The statement of Ndung'u that growth rates were harmed in general in the first half of 2013 can therefore not be confirmed.

However, my DD analysis shows that it should be questioned whether the relationship that Rogers and Pedros draw exists. In March 2013 Kenya managed to close the gap in growth rates to the rest of East Africa by 1.85%. As figure 5.1 shows, this number is within a variation that appears regularly. It, therefore, should not be concluded that the tax improved Kenya's situation in comparison to the rest of the continent. What can be concluded is that the observed decline in transactions in quarter one of 2013 was a regional phenomenon. Looking at the results of model 2 and 3 in June and September, a structural disadvantage for Kenya due to the mobile money tax cannot be observed.

The results open two questions: First, why did the introduction of the mobile money tax not influence the usage of mobile money? Second, what caused the regional downwards trend in mobile money usage in spring 2013?

According to the simple tax theory by Newberry (1987), a tax increase should lead to higher prices and lower demand. As expected, Safaricom raised the prices, but the demand stayed constant. My explanation concerns the usage pattern of mobile money. As explained before it is not used for daily transactions but rather four times per month on average (Mbiti & Weil, 2014). Taking into consideration as well the alternatives to send money to relatives, it appears that a 10% price increase is not enough to make it unattractive for users. It, therefore, seems that the perception of state officials, as cited by Ndung'u (2018), is correct, that the demand for mobile money is price inelastic⁴.

The other question that needs to be addressed is what caused the regional downwards trend in spring 2013. Unfortunately, there have been no studies so far that analyze how macroeconomic

⁴ The point of view of the state officials, that Ndung'u refers to, does not reflect Ndung'u's position.

developments influence the usage of mobile money. At this point, I can, therefore, just speculate about the reasons for this development.

What makes the assessment even more difficult is the fact that several studies found that mobile money is used to compensate income shocks (Jack & Suri, 2012). Following this mobile money numbers might show countercyclical behavior. A natural disaster, associated with an overall decline of economic output, might lead to more mobile money transactions. Also, a temporary economic crisis could make people support their families more than before. It remains therefore unclear what to look for.

Two regional trends that have been described earlier are a decline in trade with Europe and unstable political situations. As shown the region continued to grow in 2013 but struggled with declining export rates. Whether this was the reason for the observed trend seems questionable. A weak performance in one part of the economy should usually lead to a higher need for financial support for the affected population. The other trend that was described was the increase of terrorist activities and social unrest in the region in 2013. How this would affect the usage of mobile money also remains unclear. However, the case of Kenya allows me to propose one explanation for this relationship. It should be nevertheless noted that this is not a regional explanation but rather a series of national events that happen at the same time.

As stated in the introduction, the last part of my explanation for the observed trend focuses on national factors. This is now also used as an example of how the combination of national security-related events might have led to an overall decline in mobile money usage. As explained before a major event happening in March 2013 was the presidential election that caused fear of new riots and led to delayed investments. At the same time, improved weather conditions brought higher agricultural output than in the year before. Morawczynski & Pickens (2009) have shown that mobile money is mostly flowing from urban centers to the rural periphery. However, they also found that during the violent clashes after the 2007 elections, the stream turned around to support urban citizens who were more affected by the demonstrations. This leads to the conjecture that in March 2013 people living in the cities hold back their transactions to their families in expectation of new clashes. This was possible as their rural relatives had a good agriculture outcome by this time. When the elections remained peaceful the money was transferred one month later in April. This is supported by the data in figure 4.2, where April 2013 shows a unique increase in transactions. If this theory is true cannot be finally validated in this paper. It should be underlined that this probably just explains parts of the observed effect as a regional trend is found as well.

To sum it up, my discussion does not provide a final explanation for what caused the decline in mobile money usage in March 2013. It can be due to an undefined regional trend or connected to the presidential elections. However, the analysis has shown that neither a short term nor a long-term effect by the introduction of a mobile money tax seems to exist. The regional comparison underlines that mobile money in Kenya grew just like it did before the tax. The regional comparison has shown that it is not enough to simply look at national numbers to investigate the effect of a mobile money tax.

5.3 External Validity

The purpose of this paper was presented in the context of countries in East Africa, introducing mobile money taxes. The final section of this discussion will contribute to this by elaborating on the external validity of this study. I will consider its validity for other forms of mobile money taxation and regarding long-term effects, different initial user behaviors, and response from mobile money providers.

At first, the type and the amount of the introduced tax are likely to have a big influence on its effect of mobile money. For the first round of taxes introduced Tanzania, Uganda, Zimbabwe in 2013 and 2014 the structure was similar in all cases. However, the introduction of a 1% tax on the value of all mobile money transactions in July 2018 in Uganda marks a new dimension of taxes. The results of this paper do not apply to this case.

Second, the results of this study just show the short- and mid-term effect of the tax. As other countries introduced a mobile money tax as well, the control group is treated, too. Ndung'u (2018) points out that a tax might lead to long-term shifts in usage patterns and prevents more frequent usage. This is especially relevant today as providers plan to turn their business into 'payment-as-a-platform' to reach a higher daily usage. It will be interesting to follow how this will develop in the upcoming year.

A glimpse of how mobile money can develop can be seen in Somalia, where the state does not regulate the market and mobile money transfers are for free. There, mobile money is already the most important mean of payment (Owuor, 2018). The example of Somalia is not researched well enough to connect the high number of transactions for sure to the missing regulations, but it shows that a higher frequency is possible and might have been prevented in Kenya.

Next, to evaluate the transferability of the study onto another market, the usage of mobile money should be examined. As discussed before the price inelasticity of demand for mobile money in Kenya is likely to be linked to the low frequency of mobile money transfers. If the initial usage patterns are different, the results will most likely differ, too.

The last point that will affect the way a tax influences the usage of mobile money is the response of mobile money providers. They can either chose to absorb the tax or pass it on to its users. So far, all companies have decided to pass on the full tax to its users, but it should always be checked if this is still the case in the future when using the results of this study.

6 Conclusion

The introduction of mobile money enabled a big part of the Kenyan society to access formal financial institutions. At the same time, the formalization of transactions allowed the state to tax the previously untaxed. The introduction of a mobile money tax sparked the fear that the positive development of mobile money might be undermined.

6.1 Research Aims and Objectives

This study aimed to close the gap in the literature regarding mobile money taxation. In contrast to earlier studies, this thesis did not just use data for Kenya but compared them to East Africa. The design targeted the question how the introduction of a 10% excise fee on financial services in 2013 influenced the usage of mobile money. The departure for the research was the statement of Rogers and Pedros, who concluded that the introduction of the mobile money tax led to a decline of 5% in the usage of mobile money in the first quarter in 2013. The observation could be verified, but the causality was questioned.

The corresponding hypothesis expected the observed decline in mobile money transactions to be caused by regional trends. The paper managed to find a corresponding trend between Kenya and East Africa but could not explain the causation. It was pointed out that further research is needed to find evidence on how macroeconomic events influence mobile money usage.

The final objective of the paper was to propose a national explanation for the change. It was explained how the expected riots around the presidential elections and improved weather conditions might have led to a delay of remittances from March to April 2013. This was presented as an example of how national trends apart of taxes can influence mobile money.

The goal to explain how taxation influences the usage of mobile money was partly achieved. It was shown that in the mid-term, no disadvantage for Kenya in comparison to East Africa occurred. This contradicts the expectation of the simple tax theory, presented in 2.3.4., which predicted a decline in demand after a tax increase. The points towards a price inelasticity of mobile money demand. Instead of the tax being responsible for the decline of usage in Kenya in March 2013, the regional downwards trend in March and June 2013 are found to be the cause. However, this cannot ultimately be verified.

6.2 Limitations

The results are limited by the unclear relationship between the control and treatment group. As discussed in chapter 4, the Difference-in-Differences model allows the researcher to estimate a result without knowing all confounding variables as they affect both the treatment and the control group. However, this is not clear for the case of Kenya and East Africa. Even though the results for March and June 2013 show a significantly different behavior than for the rest of the timeframe, it cannot be concluded with certainty that the cause for this change also affected Kenya. This problem is further caused by missing literature on the relationship between macroeconomic effects and mobile money usage.

6.3 Practical Implications and Future Research

Following the results of the discussion, a moderate tax on mobile money does not harm the usage of mobile money. This is due to the price inelasticity of demand caused by a low frequency of usage. At the same time, the tax generates additional revenue for the state. With the further growth of the mobile money sector, this revenue will become more important for the state. However, it should be noted that it is possible that the tax hinders the development towards daily usage.

The results of this study are very country specific to Kenya. This study, therefore, lays the foundation for other researchers to verify my findings for other cases. Researchers should put special emphasis on the influence of different user behaviors on the use of mobile money. With more and more countries introducing a mobile money tax, the application of Difference-in-Differences design will become more difficult as untreated control groups are missing.

A case that has not been studied a lot so far is Somalia. The country achieved higher mobile money penetration than any other country in the region and has no regulation on the market. This country should be further investigated in future research. At the same time, the findings will be even more difficult to transfer as Somalia as a failed state has a special socio-economic situation.

Another strand of literature should evaluate more on taxation theory and its implication for mobile money taxation. This paper has shown on a superficial level that mobile money demand is price inelastic. This should be further investigated with other methods and cases.

Finally, the ambition of mobile money providers to transform their service into platform businesses for daily usage and the different approaches regarding mobile money taxation in Kenya and Uganda since summer 2018 allows researchers to investigate the effect of varying taxation models on the spread of daily mobile money usage.

Overall the topic of mobile money taxation is highly relevant for the people in Kenya as it directly affects their ability to take part in the financial system. The main achievement of this

study has not been to ultimately answer the question how mobile money taxes influence user behavior. The contribution of this thesis to the literature is to point out the difficulties in researching in mobile money taxation and breaking the purely negative narrative of mobile money taxes hindering financial inclusion. Future research should focus on using more detailed datasets and establishing a connection between macroeconomic trends and mobile money usage.

References

Adaba, G. B.; Ayoung, D. A. (2017). The development of a mobile money service: An exploratory actor-network study, *Information Technology for Development*, vol. 23, no. 4, pp.668–686

Adam, C. S.; Walker, S. E. J. (2015). Mobile Money and Monetary Policy in East African Countries. University of Oxford. Oxford. Available online: https://editorialexpress.com/cgi-bin/conference/download.cgi?db_name=CSAE2016&paper_id=277 [Accessed 07.01.2019]

African Development Bank Group (2014). The African Development Bank: A partner of Choice for the Eastern Africa we want. Nairobi. Available online: https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/AfDB_Partner_of_Choice_for_East_Africa_-_EARC_Report_2014.pdf [Accessed 18.05.2019]

Aker, J. C.; Mbiti, I. M. (2010). Mobile Phones and Economic Development in Africa, *Journal of Economic Perspectives*, vol. 24, no. 3, pp.207–232

Aron, J. (2018). Mobile Money and the Economy: A Review of the Evidence, *World Bank Res Obs*, vol. 33, no. 2, pp.135–188

Bækgaard, H. (2014). The Differences-in-Differences Approach with overlapping differences: Experimental Verification of Estimation Bias. Danish Rational Economic Agents Model. København (DREAM Working Paper 2014:3). Available online: www.dreammodel.dk/pdf/W2014_03.pdf [Accessed 03.05.2019]

Bank of Tanzania (2017). Mobile Transactions. Available online: <https://www.bot.go.tz/PaymentSystem/MOBILE%20TRANSACTIONS.xlsx> [Accessed 25.05.2019]

Bank of Uganda (2019). Mobile Money Data. Unpublished raw data

Bertelsmann Stiftung (2018). BTI 2018 Country Report: Kenya. Bertelsmann Stiftung. Gütersloh. Available online: https://www.bti-project.org/fileadmin/files/BTI/Downloads/Reports/2018/pdf/BTI_2018_Kenya.pdf [Accessed 25.04.2019]

Bett, B. K.; Yudah, O. A. (2017). Contribution of i-Tax System as a Strategy for Revenue Collection at Kenya Revenue Authority, Rift Valley Region, Kenya, *International Journal of Scientific and Research Publications*, vol. 7, no. 9, 389-396. Available online: <http://www.ijsrp.org/research-paper-0917/ijsrp-p6948.pdf> [Accessed 02.12.2018]

Bird, R. M. (2004). Administrative Dimensions of Tax Reform, *Asia-Pacific Tax Bulletin*, no. 10, pp.134–150. Available online: <http://unpan1.un.org/intradoc/groups/public/documents/UNPAN/UNPAN015761.pdf> [Accessed 17.04.2019]

Bird, R. M. (2013). Taxation and Development: What Have We Learned from Fifty Years of Research?, *IDS Working Papers*, vol. 2013, no. 427, pp.1–19

Buku, M. W.; Meredith, M. W. (2013). Safaricom and M-PESA in Kenya: Financial Inclusion and Financial Integrity, *Washington Journal of Law, Technology & Arts*, vol. 8, no. 3, pp.377–400. Available online: <https://digital.lib.washington.edu:443/dspace-law/bitstream/1773.1/1204/5/8WJLTA375.pdf>

Burns, S. (2015). Mobile Money and Financial Development: The Case of M-PESA in Kenya. SSRN

Carnahan, M. (2015). Taxation Challenges in Developing Countries, *Asia & the Pacific Policy Studies*, vol. 2, no. 1, pp.169–182. Available online: <https://onlinelibrary.wiley.com/doi/pdf/10.1002/app5.70>

CCK (2012). First Quarter of the Financial Year 2012/13: July-September 2012. Communications Commission of Kenya (Quarterly Sector Statistics Report). Available online: <https://ca.go.ke/wp-content/uploads/2018/02/Sector-Statistics-Report-Q1-2012-13.pdf> [Accessed 13.05.2019]

Central Bank of Kenya (2019). Statistic on Mobile Payments. Available online: <https://www.centralbank.go.ke/national-payments-system/mobile-payments/#> [Accessed 22.05.2019]

Central Bank of Kenya; FSD Kenya; Kenya National Bureau of Statistics (2019). 2019 FinAccess Household Survey,

Cohen, M.; Stuart, G. (2011). Cash In, Cash Out Kenya: The Role of M-PESA in the Lives of Low-Income People. Financial Services Assessment. Available online:

http://www.fsassessment.umd.edu/publications/pdfs/cash_in_cash_out_kenya.pdf [Accessed 14.04.2019]

Communications Authority of Kenya (2019). Second Quarter Statistics Report for the financial year 2018/2019: October - December 2018. Available online: <https://ca.go.ke/wp-content/uploads/2019/03/Sector-Statistics-Report-Q2-2018-19.pdf> [Accessed 01.05.2019]

Demombynes, G.; Thegeya, A. (2012). Kenya's mobile revolution and the promise of mobile savings. The World Bank (World Bank Policy Research Working Paper, 5988)

Diniz, E. H.; Cernev, A. K.; Nascimento, E. (2016). Mobile social money: An exploratory study of the views of managers of community banks, *Revista de Administração*, vol. 51, no. 3, pp.299–309

Donovan, K. P. (2012a). Mobile Money for Financial Inclusion, in T. Kelly, N. Friederici, M. Minges & M. Yamamichi (eds.), *Information and communications for development 2012. Maximizing mobile*. Washington, D.C: World Bank, pp.61–73

Donovan, K. P. (2012b). Mobile Money, More Freedom?: The Impact of M-PESA's Network Power on Development as Freedom, *International Journal of Communication*, no. 6, pp.2647–2669. Available online: <https://ijoc.org/index.php/ijoc/article/view/1575> [Accessed 07.01.2019]

Duncombe, R. (2012). An evidence-based framework for assessing the potential of mobile finance in sub-Saharan Africa, *J. Mod. Afr. Stud.*, vol. 50, no. 3, pp.369–395

Duncombe, R. (2014). Understanding the Impact of Mobile Phones on Livelihoods in Developing Countries, *Development Policy Review*, vol. 32, no. 5, pp.567–588

Duncombe, R. (2016). Mobile Phones for Agricultural and Rural Development: A Literature Review and Suggestions for Future Research, *The European Journal of Development Research*, vol. 28, no. 2, pp.213–235

Duncombe, R.; Boateng, R. (2009). Mobile Phones and Financial Services in Developing Countries: A review of concepts, methods, issues, evidence and future research directions, *Third World Quarterly*, vol. 30, no. 7, pp.1237–1258

East African Community (2014). East African Community Trade Report 2013. Arusha

Freedom House (2018). Freedom in the World 2018: Kenya. Available online: <https://www.refworld.org/cgi->

bin/texis/vtx/rwmain?page=publisher&docid=5b2cb8664&skip=0&publisher=FREEHOU&querysi=kenya&searchin=fulltext&sort=date [Accessed 25.04.2019]

FSD Kenya; Central Bank of Kenya (2013). FinAcces National Survey 2013: Profiling developments in financial access and usage in Kenya. Available online: https://s3-eu-central-1.amazonaws.com/fsd-circle/wp-content/uploads/2015/08/30095841/13-10-31_FinAccess_2013_Report.pdf [Accessed 28.04.2018]

FSD Kenya; Central Bank of Kenya; Kenya National Bureau of Statistics (2015a). FinAccess Household Survey 2006 (Harvard Dataverse). Available online: <https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi%3A10.7910%2FDVN%2F39QR9E> [Accessed 24.04.2019]

FSD Kenya; Central Bank of Kenya; Kenya National Bureau of Statistics (2015b). FinAccess Household Survey 2009 (Harvard Dataverse). Available online: <https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi%3A10.7910%2FDVN%2FVWLG4> [Accessed 24.04.2019]

FSD Kenya; Central Bank of Kenya; Kenya National Bureau of Statistics (2015c). FinAccess Household Survey 2013 (Harvard Dataverse). Available online: <https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi%3A10.7910%2FDVN%2FJSPE9W> [Accessed 24.04.2019]

FSD Kenya; Central Bank of Kenya; Kenya National Bureau of Statistics (2016). 2016 FinAccess Household Survey. Nairobi. Available online: <https://s3-eu-central-1.amazonaws.com/fsd-circle/wp-content/uploads/2016/02/30093031/The-2016-FinAccess-household-survey-report4.pdf> [Accessed 24.04.2019]

FSD Kenya; Central Bank of Kenya; Kenya National Bureau of Statistics (2019). 2019 FinAcces Household Survey. Nairobi. Available online: <https://www.knbs.or.ke/download/2019-finaccess-household-survey/> [Accessed 24.04.2019]

Goldscheid, R.; Lazarsfeld, R. (1917). Staatssozialismus oder Staatskapitalismus?: Ein finanzsoziologischer Beitrag zur Lösung des Staatsschulden-Problems, *Archiv für Rechts- und Wirtschaftsphilosophie*, vol. 11, no. 2, pp.255–259

Goyal, A. (2010). Information, Direct Access to Farmers, and Rural Market Performance in Central India, *American Economic Journal: Applied Economics*, vol. 2, no. 3, pp.22–45

GSMA (2017). 2017 state of the Industry Report on Mobile Money. London

GSMA (2019a). About Us. Available online: <https://www.gsma.com/aboutus/> [Accessed 13.04.2019]

GSMA (2019b). Mobile Money Deployment Tracker. Available online: <https://www.gsma.com/mobilemoneymetrics/#deployment-tracker> [Accessed 25.05.2019]

GSMA (2019c). Global Mobile Money Dataset. Available online: <https://www.gsma.com/mobilemoneymetrics/#global?y=2011?v=overview?g=global> [Accessed 10.05.2019]

GSMA; Deloitte (2016). Digital inclusion and mobile sector taxation 2016: The impacts of sector-specific taxes and fees on the affordability of mobile services. Available online: The impacts of sector-specific taxes and fees [Accessed 13.04.2019]

Herbling, D. (2013). Mobile money transfers defy tax charge, rise to Sh1.2 trillion. Business Daily. Available online: <https://www.businessdailyafrica.com/Mobile-money-transfers-shoot-up-despite-tax-/-/539552/2043490/-/e8k3siz/-/index.html>

Hove, L.; Dubus, A. (2019). M-PESA and Financial Inclusion in Kenya: Of Paying Comes Saving?, *Sustainability*, vol. 11, no. 3, pp.568

Hughes, N.; Lonie, S. (2007). M-PESA: Mobile Money for the “Unbanked” Turning Cellphones into 24-Hour Tellers in Kenya, *Innovations: Technology, Governance, Globalization*, vol. 2, no. 1-2, pp.63–81

Human Rights Watch (2014). World report 2014: Events of 2013. New York: Human Rights Watch (World report / Human Rights Watch, 2014). Available online: http://www.hrw.org/sites/default/files/reports/wr2014_web_0.pdf [Accessed 25.05.2019]

Intermedia (2014). Digital Pathways to Financial Inclusion: Findings from the First FII Tracker Survey in Kenya

Intermedia (2015). Kenya - Digital pathways to financial inclusion: 2014 Survey Report (Financial Inclusion Insights)

Intermedia (2016). Kenya - Wave 3 Report FII Tracker Survey: Conducted September 2015 (Financial Inclusion Insights)

Intermedia; Bill and Melinda Gates Foundation (2017). Kenya - Wave 4 Report FII Tracker Survey: Conducted August 2016 (Financial Inclusion Insights)

Intermedia; Bill and Melinda Gates Foundation (2018). Kenya - Wave 5 report fifth annual FII tracker survey: Conducted June-July 2017 (Financial Inclusion Insights). Available online: http://finclusion.org/uploads/file/kenya-wave-5-report_final.pdf [Accessed 24.04.2019]

International Crisis Group (ICG) (2013). Kenya's 2013 Elections (Africa Report, 197). Available online: <https://www.refworld.org/cgi-bin/texis/vtx/rwmain?page=search&docid=50f952872&skip=0&query=2013&coi=KEN&searchin=title&sort=relevance> [Accessed 25.04.2019]

International Crisis Group (ICG) (2018). Al-Shabaab Five Years after Westgate: Still a Menace in East Africa. Brussels (Africa Report, 265)

International Telecommunication Union (2013). Taxing telecommunication/ ICT services: An overview. Geneva (Regulatory and Market Environment). Available online: <https://www.itu.int/en/ITU-D/Regulatory-Market/Documents/Publications/Taxation2%20E-BAT3.pdf> [Accessed 13.04.2019]

Jack, W.; Suri, T. (2016). The long-run poverty and gender impacts of mobile money, *Science (New York, N.Y.)*, vol. 354, no. 6317, pp.1288–1292

Jack, W.; Suri, T.; Townsend, R. (2010). Monetary Theory and Electronic Money: Reflections on the Kenyan Experience, *Economic Quarterly*, vol. 96, no. 1, pp.83–122. Available online: <http://resolver.ebscohost.com/openurl?sid=google&auinit=W&aualast=Jack&atitle=Monetary+theory+and+electronic+money%3a+Reflections+on+the+kenyan+experience&title=Economic+Quarterly+-+Federal+Reserve+Bank+of+Richmond&volume=96&issue=1&date=2010&spage=83&site=ftf-live> [Accessed 18.04.2019]

Jack, W. J.; Suri, T. (2012). Risk Sharing and Transactions Costs: Evidence from Kenya's Mobile Money Revolution. Available online: <https://pdfs.semanticscholar.org/931c/14aa39222a426dce1b6e6d8e058e2b2b6fcc.pdf> [Accessed 12.04.2019]

Kenya National Bureau of Statistics (2013). First Quarter 2013 GDP Release (Quarterly GDP Reports). Available online: <https://www.knbs.or.ke/download/1st-quarter-gdp-2013/> [Accessed 16.05.2019]

Kenya National Bureau of Statistics (2014). Leading Economic Indicators: December 2013 (Leading Economic Indicators)

- KIPPRA (2013). Kenya Economic Report 2013: Creating an Enabling Environment for Stimulating Investment for Competitive and Sustainable Counties. Kenya Institute for Public Policy Research and Analysis. Nairobi
- KIPPRA (2014). Kenya Economic Report 2014: Navigating Global Challenges While Exploiting Opportunities for Sustainable Growth. Kenya Institute for Public Policy Research and Analysis. Nairobi. Available online: <http://kippra.or.ke/kippra-publications-2/#7-kenya-economic-report> [Accessed 16.05.2019]
- KIPPRA (2017). Kenya Economic Report 2017: Sustaining Kenya's Economic Development by Deepening and Expanding Economic Integration in the Region. Kenya Institute for Public Policy Research and Analysis. Nairobi. Available online: <http://kippra.or.ke/kippra-publications-2/#7-kenya-economic-report> [Accessed 16.05.2019]
- Lal, R.; Sachdev, I. (2015). Mobile Money Services: Design and Development for financial inclusion. Harvard Business School (Working Paper, 15-083)
- Land, K.-H. (2018). Erde 5.0 - die Zukunft provozieren. Köln: FutureVisionPress e.K
- Madise, S. (2019). The Regulation of Mobile Money: Law and Practice in Sub-Saharan Africa. Cham: Palgrave Macmillan (Palgrave Macmillan Studies in Banking and Financial Institutions). Available online: <https://doi.org/10.1007/978-3-030-13831-8> [Accessed 22.05.2019]
- Makumbi, M.; Muhindo, L.; Munyandi, K. (2018). Uganda - Corporate Taxation. IBFD. Amsterdam. Available online: https://research.ibfd.org/#/doc?url=/linkresolver/static/gtha_ug_s_9.5.#gtha_ug_s_9.5, zuletzt aktualisiert am 31.08.2018 [Accessed 13.04.2019]
- Maurer, B. (2012). Mobile Money: Communication, Consumption and Change in the Payments Space, *Journal of Development Studies*, vol. 48, no. 5, pp.589–604
- Mawejje, J.; Lakuma, E. C. P. (2017). Macroeconomic Effects of Mobile Money in Uganda. Economic Policy Research Centre (EPRC) (Research Series, 135)
- Mbiti, I.; Weil, D. (2014). Mobile Banking: The Impact of M-Pesa in Kenya. Cambridge, MA (NBER Working Paper, 17129)
- Mbogo, M. (2010). The Impact of Mobile Payments on the Success and Growth of Micro-Business: The Case of M-Pesa in Kenya, *Journal of Language, Technology & Entrepreneurship*

in *Africa*, vol. 2, no. 1, pp.182–203. Available online: <https://www.ajol.info/index.php/jolte/article/download/51998/40633>

Minges, M. (2012). Overview, in T. Kelly, N. Friederici, M. Minges & M. Yamamichi (eds.), *Information and communications for development 2012. Maximizing mobile*. Washington, D.C: World Bank, pp.11–30

Minister of Finance, Planning and Economic Development (17.07.2018). The Excise Duty (Amendment) (No. 2) Act, 2018, *Uganda Gazette*, vol. 36, no. 6. Available online: <https://minbane.wordpress.com/2018/10/02/https-wp-me-p1xtjg-7vp/> [Accessed 07.01.2019]

Morawczynski, O. (2009). Exploring the usage and impact of “transformational” mobile financial services: The case of M-PESA in Kenya, *Journal of Eastern African Studies*, vol. 3, no. 3, pp.509–525

Morawczynski, O.; Pickens, M. (2009). Poor People Using Mobile Financial Services: Observations on Customer Usage and Impact from M-PESA. The World Bank. Washington, D.C. Available online: <https://openknowledge.worldbank.org/bitstream/10986/9492/1/503060BRI0Box31MPESA1Brief01PUBLIC1.pdf> [Accessed 22.04.2019]

Mugisha, D. (2018). What 1% new tax on mobile money transactions means. PwC. Available online: <https://www.pwc.com/ug/en/press-room/what-new-tax-on-mobile-money-transactions-means.html> [Accessed 24.04.2019]

Mugunga, A.; Abdalla, Y. A.; Musengele, B. (2014). Annual Report 2014: "Inclusive and Sustainable Industrialization". Hg. v. A. Mugunga. Common Market for Easter and Southern Africa

Muthiora, B. (2015). Enabling Mobile Money Policies in Kenya: Fostering a Digital Financial Revolution. GSMA. Available online: <http://t1.daumcdn.net/brunch/service/user/P5W/file/mxAyGPsEeNdS1FAkt9vWxBJVHSg.pdf> [Accessed 21.01.2019]

Ndiwalana, A.; Morawczynski, O.; Popov, O. (2010). Mobile Money Use in Uganda: A Preliminary Study, *M4D*, vol. 2010 [Accessed 15.04.2019]

Ndung'u, N. (2018). Could taxation of mobile banking in Africa stall financial inclusion?, in Coulibaly B. S. (eds.), *Foresight Africa. Top Priorities for the Continent in 2019*. Washington, D.C: Brookings, pp.36–39

- Newbery, D. (1987). Taxation and Development, in D. Newbery & N. Stern (eds.), *The theory of taxation for developing countries*. Washington, D.C: Oxford University Press, pp.163–204
- Newbery, D.; Stern, N.(eds.) (1987). The theory of taxation for developing countries. The World Bank. Washington, D.C: Oxford University Press. Available online: <http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP//> [Accessed 18.04.2019]
- Ngotho, J.; Kerongo, F. (2014). Determinants of Revenue Collection in Developing Countries: Kenya's Tax Collection Perspective, *Journal of Management and Business Administration*, vol. 1, no. 1
- Nyabiage, J. (2013). Confusion hits banking sector as tax on fees is implemented, *Standard Digital*, 01.08.2013. Available online: <https://www.standardmedia.co.ke/article/2000089778/confusion-hits-banking-sector-as-tax-on-fees-is-implemented> [Accessed 10.05.2019]
- OECD (2019). Details of Public Revenues - Kenya (OECD.Stat). Available online: <https://stats.oecd.org/index.aspx?DataSetCode=REV#> [Accessed 16.05.2019]
- OECD; African Union; African Tax Administration Forum; Development Center (2018). Revenue Statistics in Africa 2018: Kenya. Available online: <http://www.oecd.org/tax/tax-policy/revenue-statistics-africa-kenya.pdf> [Accessed 16.05.2019]
- OECD; ATAF, AUC (2018). Revenue statistics in africa: 1990-2016. Paris: OECD Publishing. Available online: <http://dx.doi.org/10.1787/9789264305885-en-fr> [Accessed 25.04.2019]
- Omondi, F. (2019). Kenya - Corporate Taxation. IBFD. Amsterdam. Available online: https://research.ibfd.org/#/doc?url=/linkresolver/static/gtha_ke_auth#gtha_ke_auth, zuletzt aktualisiert am 01.02.2019 [Accessed 13.04.2019]
- Onsongo, E. K.; Schot, J. (2017). Inclusive Innovation and Rapid Sociotechnical Transitions: The Case of Mobile Money in Kenya, *SSRN Journal*,
- Ouma, S. A.; Odongo, T. M.; Were, M. (2017). Mobile financial services and financial inclusion: Is it a boon for savings mobilization?, *Review of Development Finance*, vol. 7, no. 1, pp.29–35
- Owuor, V. O. (2018). Somalia are overtaking Kenya, but there are significant risks. Quartz Africa. Available online: <https://qz.com/africa/1422018/somalia-mobile-money-beats-kenya-mpsea/> [Accessed 25.05.2019]

Pasti, F. (2019). State of the Industry Report on Mobile Money: 2018. GSMA. London. Available online: <https://www.gsma.com/r/wp-content/uploads/2019/02/2018-State-of-the-Industry-Report-on-Mobile-Money.pdf> [Accessed 16.04.2019]

Plyler, M. G.; Haas, S.; Nagarajan, G. (2010). Community-level economic effects of M-PESA in Kenya, *Financial services assessment*, pp.1–8

Reserve Bank of Zimbabwe (2015). Monthly Economic Review: December 2014. Available online: https://www.rbz.co.zw/documents/monthly_review/2014/December2014.pdf [Accessed 25.05.2019]

Rodrik, D. (1994). Getting Interventions Right: How South Korea and Taiwan Grew Rich. National Bureau of Economic Research. Cambridge, MA (NBER Working Paper, 4964)

Rodrik, D. (2016). An African Growth Miracle?, *Journal of African Economies*, vol. 5, no. 4, pp.1–18

Rogers, M.; Pedros, X. (2017). Taxing mobile connectivity in Sub-Saharan Africa: A review of mobile sector taxation and its impact on digital inclusion. GSMA. London. Available online: <https://www.gsmaintelligence.com/research/?file=675c81dc5bf71f7de080394efeedf219&download> [Accessed 11.01.2019]

Safaricom (2013). New Government tax to hit 16 million M-PESA Users. Available online: <https://www.safaricom.co.ke/about/media-center/publications/press-release/release/31> [Accessed 22.05.2019]

Safaricom (2019). M-PESA Tariff Evolution. Unpublished raw data

Schumpeter, J. (1918). Die Krise des Steuerstaates: Zeitfragen aus dem Gebiet der Soziologie

St. Clair, Travis; Cook, Thomas D. (2015). Difference-in-Differences Methods in Public Finance, *National Tax Journal*, vol. 68, no. 2, pp.319–338. Available online: http://resolver.ebscohost.com/openurl?ctx_ver=Z39.88-

[2004&ctx_enc=info%3aofi%2fenc%3aUTF-](http://resolver.ebscohost.com/openurl?ctx_ver=Z39.88-2004&ctx_enc=info%3aofi%2fenc%3aUTF-)

[8&rft_id=info%3asid%2fProQ%3aibss&rft_val_fmt=info%3aofi%2ffmt%3akev%3amtx%3ajournal&rft.genre=article&rft.jtitle=National+Tax+Journal&rft.atitle=DIFFERENCE-IN-DIFFERENCES+METHODS+IN+PUBLIC+FINANCE&rft.au=Clair%2c+Travis+St%3bCook%2c+Thomas+D&rft.aulast=Clair&rft.aufirst=Travis&rft.date=2015-06-](http://resolver.ebscohost.com/openurl?ctx_ver=Z39.88-2004&ctx_enc=info%3aofi%2fenc%3aUTF-8&rft_id=info%3asid%2fProQ%3aibss&rft_val_fmt=info%3aofi%2ffmt%3akev%3amtx%3ajournal&rft.genre=article&rft.jtitle=National+Tax+Journal&rft.atitle=DIFFERENCE-IN-DIFFERENCES+METHODS+IN+PUBLIC+FINANCE&rft.au=Clair%2c+Travis+St%3bCook%2c+Thomas+D&rft.aulast=Clair&rft.aufirst=Travis&rft.date=2015-06-01&rft.volume=68&rft.issue=2&rft.spage=319&rft.isbn=&rft.btitle=&rft.title=National+Tax+Journal&rft.issn=00280283&rft_id=info%3adoi%2f&site=ftf-live)

[01&rft.volume=68&rft.issue=2&rft.spage=319&rft.isbn=&rft.btitle=&rft.title=National+Tax+Journal&rft.issn=00280283&rft_id=info%3adoi%2f&site=ftf-live](http://resolver.ebscohost.com/openurl?ctx_ver=Z39.88-2004&ctx_enc=info%3aofi%2fenc%3aUTF-8&rft_id=info%3asid%2fProQ%3aibss&rft_val_fmt=info%3aofi%2ffmt%3akev%3amtx%3ajournal&rft.genre=article&rft.jtitle=National+Tax+Journal&rft.atitle=DIFFERENCE-IN-DIFFERENCES+METHODS+IN+PUBLIC+FINANCE&rft.au=Clair%2c+Travis+St%3bCook%2c+Thomas+D&rft.aulast=Clair&rft.aufirst=Travis&rft.date=2015-06-01&rft.volume=68&rft.issue=2&rft.spage=319&rft.isbn=&rft.btitle=&rft.title=National+Tax+Journal&rft.issn=00280283&rft_id=info%3adoi%2f&site=ftf-live)

[01&rft.volume=68&rft.issue=2&rft.spage=319&rft.isbn=&rft.btitle=&rft.title=National+Tax+Journal&rft.issn=00280283&rft_id=info%3adoi%2f&site=ftf-live](http://resolver.ebscohost.com/openurl?ctx_ver=Z39.88-2004&ctx_enc=info%3aofi%2fenc%3aUTF-8&rft_id=info%3asid%2fProQ%3aibss&rft_val_fmt=info%3aofi%2ffmt%3akev%3amtx%3ajournal&rft.genre=article&rft.jtitle=National+Tax+Journal&rft.atitle=DIFFERENCE-IN-DIFFERENCES+METHODS+IN+PUBLIC+FINANCE&rft.au=Clair%2c+Travis+St%3bCook%2c+Thomas+D&rft.aulast=Clair&rft.aufirst=Travis&rft.date=2015-06-01&rft.volume=68&rft.issue=2&rft.spage=319&rft.isbn=&rft.btitle=&rft.title=National+Tax+Journal&rft.issn=00280283&rft_id=info%3adoi%2f&site=ftf-live) [Accessed 18.04.2019]

Sunday, F. (2018). Mobile money transactions fall on new taxes, *Standard Media*, 15.11.2018. Available online: <https://www.standardmedia.co.ke/article/2001302702/mobile-money-transactions-fall-on-new-taxes> [Accessed 24.04.2019]

The Economist (2013). Charging the mobile: East African governments are targeting telecoms firms. Nairobi (Finance and economics). Available online: <https://www.economist.com/finance-and-economics/2013/06/22/charging-the-mobile> [Accessed 22.05.2019]

The Institute of Certified Public Accountants of Kenya (2016). Kenya's Revenue Analysis 2010-2015: A Historical Perspective to Revenue Performance in Kenya. Nairobi

The World Bank (2009). 2009 Information and Communications for Development: Extending Reach and Increasing Impact: World Bank. Available online: <https://openknowledge.worldbank.org/bitstream/10986/2636/1/487910PUB0EPI1101Official0Use0Only1.pdf>

Timmer, M. P.; Vries, G. J. de; Vries, K. de (2015). Patterns of Structural Change in Developing Countries, in J. Weiss & Tribe M. (eds.), *Routledge Handbook of Industry and Development*: Routledge, pp.65–83

Wanjiru, R.; Maina, A. W.; Onsomu E.; Stewart-Wilson, G. (2019). Local Government Property Tax Administration and Collaboration with Central Government: Case Studies of Kiambu, Laikipia and Machakos Counties, Kenya. Institute of Development Studies (ICTD Working Paper, 95). Available online: https://opendocs.ids.ac.uk/opendocs/bitstream/handle/123456789/14448/ICTD_WP95.pdf?sequence=3&isAllowed=y [Accessed 20.04.2019]

Wawire, N. H. W. (2017). Determinants of value added tax revenue in Kenya, *Journal of Economics Library*, vol. 4, no. 3, pp.322–344

Weiss, J. (2005). Export Growth and Industrial Policy: Lessons from the East Asian Miracle Experience (ADB Institute Discussion Paper, 26). Available online: <https://www.adb.org/sites/default/files/publication/156779/adbi-dp26.pdf> [Accessed 16.11.2018]

World Bank (2012). Doing Business 2013. Washington DC: The World Bank

World Bank (2019a). Doing Business 2019: Economy Profile Kenya (A World Bank Group Flagship Report). Available online:

<http://www.doingbusiness.org/content/dam/doingBusiness/country/k/kenya/KEN.pdf>

[Accessed 25.04.2019]

World Bank (2019b). GDP (current US\$) (World Development Indicators). Available online:

<https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=KE-UG> [Accessed

29.04.2019]

World Bank (2019c). GDP growth (annual %) (World Development Indicators). Available

online: <https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=KE-UG>

[Accessed 19.05.2019]

Zhen-Wei Qiang, C.; Rossotto, C. M.; Kimura, K. (2009). Economic Impacts of Broadband, in, *2009 Information and Communications for Development*. Extending Reach and Increasing Impact: World Bank, pp.35–50