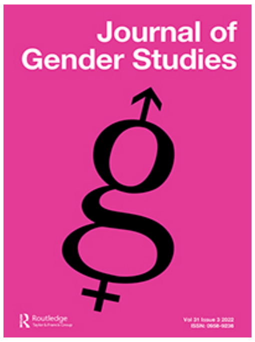

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Assessing the impact of mobile money on improving the financial inclusion of Nairobi women

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ABSTRACT

This paper assesses to what extent, and in what ways, mobile money has affected the financial inclusion of women in Nairobi. Women in Kenya have limited property rights and continue to require approval from their husbands or male family members to conduct financial activities. Besides, most women are concentrated in the informal economy, which has exacerbated their level of financial exclusion since they struggle to provide the documentation that financial institutions require, thus making them more dependent on informal finance. This paper demonstrates how mobile money has significantly decreased the proportion of women in Nairobi excluded from using financial services. Drawing upon survey work conducted by the author across eight areas of Nairobi, this research reveals how mobile money has enabled women to benefit from instant remittance and payment services, and has offered a means of storing money safely, which is an attribute particularly valued by younger women and those with lower levels of educational attainment and income. Although mobile money does not address many of the structural drivers of gendered financial inequality, it has improved levels of financial inclusion by increasing women's access to various financial channels from which they were previously excluded.

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financial inclusion; fintech; mobile money; gender; women's empowerment

1. Introduction

In societies around the world, women are often treated as inferior and constitute a vulnerable group. Because of entrenched gender roles and gender discrimination, women traditionally have less education, and they are subordinated by male family members, creating a number of restrictions in terms of their economic activities. In Kenya – the focus of this paper – women have limited property rights (Gaafar, 2014; Mueller & Mulinge, 2001; Srujana, 1996), and they face discrimination in accessing financial services compared to men (Aterido, Back, & Iacovone, 2013; Demirguc-Kunt, Klapper, & Singer, 2013; Ellis et al., 2007; Naituli, Wegulo, & Kaimenyi, 2006). For example, financial institutions do not treat them as customers in their own right, but typically expect permission from husbands or male family members to conduct financial activities. As a result, women generally face higher barriers to financial access, which reduces their decision-making power within the household and makes them more dependent on male family members (Fanta & Mutsonziwa, 2016).

One of the most important recent changes in the financial landscape in Kenya – and across sub-Saharan Africa – has been the phenomenal success of mobile money services. First introduced in Kenya in 2007, mobile money has distinctive advantages in that it is more accessible and can easily reach large populations and wider areas based on extensive agent networks and wireless communication. As

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a result, the number of mobile money subscribers was about 33 million in June 2019, accounting for 69% of the total population (about 48 million) (Communication Authority of Kenya (CA), 2019, p. 63).

A growing body of recent literature has argued that the rapid growth of mobile money has played an important role in strengthening women's financial inclusion by enabling them to access financial services independently without their husbands' or male family members' permission, to conduct financial transactions more easily and with greater autonomy (GSMA, 2015, 2017; Buvinic & Furst-Nichols, 2016; World Bank, 2018), and to enable more women to move out of subsistence agriculture into business (Suri & Jack, 2016).

This paper explores these claims and assesses the extent to which mobile money has improved levels of financial inclusion amongst women in Nairobi. This study further develops the existing body of literature on the impact of mobile money on women's financial inclusion in two ways. First, it focuses specifically on the experiences of urban women. Levels of financial exclusion are often perceived by state actors to be less severe in cities because of access to banks, but in reality urban women also face difficulties in accessing formal financial services due to institutional, economic, financial, and cultural issues (Chakrabarty, 2013, pp. 2–4). Therefore, this analysis contributes to research on the impact of mobile money on financial inclusion of women in urban areas who, despite their close proximity to formal financial services, have faced high levels of financial exclusion. Second, this research focuses on the impact of different financial functions of mobile money and disaggregates analysis according to age, income level and educational attainment. This research thus offers a more fine-grained analysis of the specific pathways through which mobile money has impacted on women's financial inclusion than is found on much of the current literature.

Focusing research on the mechanisms of financial inclusion amongst women is important because it not only offers important opportunities to increase women's financial activity and ameliorate longstanding forms of financial exclusion, but also because it has the potential to promote women's empowerment and levels of economic activity, and to reduce gender inequality in the long term. The research presented in this paper addresses three research questions to explore these issues:

(1) What are the characteristics of urban women's financial activities?
(2) How has the usage of financial channels by urban women changed after the emergence of mobile money?
(3) In what ways has mobile money affected urban women's financial activity?

In addressing these research questions, this paper tests the hypothesis that mobile money is particularly effective in addressing financial exclusion amongst women by providing financial services which are cheaper and better suited to their needs, which in turn increases their financial activity.

This rest of the paper consists of five sections and a conclusion. The first section introduces reasons for impediments to women's financial activity and the importance of financial inclusion for reducing gender inequality and poverty. The second section explores definitions of financial inclusion and how financial inclusion can be beneficial to women. The third section reviews the existing literature on the relationship between mobile money and women's financial inclusion, and situates my study in relation to this literature. The fourth and fifth sections draw upon the findings of my independent survey work conducted in Nairobi to analyse the impact of mobile money on financial inclusion amongst women. The fourth section explains my research methods, focusing on the design and implementation of my survey. The fifth section then analyses the findings of my survey work to assess the characteristics of women's financial activity and mobile money use, and the impact of mobile money on women's financial inclusion.

2. The gender gap with regards to financial activities in Kenya

Women in Kenya generally occupy considerably less politically powerful positions than men both within the public and private spheres. Low representation in key decision-making processes, such as in parliament and local authorities, has resulted in insufficient attention being paid to women's issues. The marginalization of women is also manifested in the spatial dynamics of cities (Kinyanjui, 2014, p. 7). The majority of women tend to live and work in peri-urban or informal settlements, the least lucrative spaces in the city, due to their limited economic activities, unemployment, lack of mobility and the constraints of low income (ibid). Gender disparity is also observed in wealth distribution, skewed in favour of men due to Kenya's patriarchal society and culture with men in control of the majority of the country's resources, especially land, as well as enjoying far greater access to wage employment, where women comprise only 37% of those in formal employment (Jayachandran, 2014; KNBS, 2014, cited in AICS, 2015, p. 15). In addition, although women play an important role as income earners in their households, they still have to do almost all the housework, as well as most social and religious duties (Kiriti-Nganga, 2015; Marinda, 2005). Consequently, women in Kenya tend to be 'time-poor' and have much less time than men for leisure, education, or training (Ellis et al., 2007). Even though they work longer hours compared with those of men, they earn less because many of these hours are not remunerated (ibid).

Furthermore, many Kenyan women in the city are concentrated in the informal sector in a wide range of survival activities, such as own-account workers or unpaid family workers that involve informal retail trade, operating stalls or small shops along streets and sidewalks to serve passing pedestrians (Kiriti-Nganga, 2015, p. 20). However, even in the informal sector, women still face several obstacles, which affect their economic activity. The most prominent constraint for women's business is finance. Although men and women in Kenya face similar difficulties in finding start-up finance and getting finance to sustain business growth, these difficulties are typically greater for women than men in Kenya (Kiriti-Nganga, 2015). The major reason for this is that women are mostly unable to meet loan conditions, in particular collateral requirements (Kiriti-Nganga, 2015; Stevenson & St-Onge, 2005). Financial institutions usually require tangible collateral from borrowers for use of credit services, mostly in the form of assets such as land (Stevenson & St-Onge, 2005, p. 30). However, cultural barriers restrict many women from owning land and property (ibid).

There are several reasons that explain the gender gap in use of financial services which can be classified as demand-side and supply-side constraints (DFID & GIZ, 2013, p. 25):

Demand-side constraints: low income, low levels of education, lack of decision-making power and self-esteem, poor access to information, poor social networks and risk aversion, loyalty to informal products and customary laws.

Supply-side constraints: documentation requirements to open a bank account and use financial services, limited bank branch outreach, typical bank opening hours that clash with women's working hours, financial product features that may not meet women's requirements, and preference for male customers.

In terms of demand-side constraints, most women face difficulties in opening and using a formal bank account as a safe place to save money, due to their lack of mobility to reach bank branches, and the limited time they have available to spend travelling and queuing to use bank services. These limitations are reflected in their low levels of access to formal financial services (Women's World Bank (WWB), 2015). Indeed, almost all the people who participated in my in-depth interviews said that they are reluctant to go to a bank because it is time-consuming. Low levels of education, technical skills and the strong cultural aspects of the male mentality in Kenya have also meant that many financial institutions lack confidence in women, seeing them as lacking management skills and making them reluctant to allow women to use their financial services (Stevenson & St-Onge, 2005). As a result, financial institutions often treat women as risky customers relative to men and prefer speaking to their husbands (Aterido et al., 2013; Ellis et al., 2007). Moreover, women's high dependency on informal finance has played an important role in stopping women from exploring formal sector alternatives (Aterido et al., 2013; DFID & GIZ, 2013, p. 25; Banthia, Greene, Kawas, Lynch, & Slama, 2011).

Regarding supply-side constraints, it is difficult for women to provide documents that banks require regarding proof of identity, address, occupation and income since most of them work in the informal sector or have part-time jobs, and they often lack proof of identity (ILO, 2015). Limited physical outreach and typical bank opening hours constrain women far more than men because they are less mobile than men. Consequently, these circumstances in the formal finance sector make women depend more on informal finance, such as usurers, group savings, and credit associations, to access lump sums of money and to borrow money.

3. Why women's financial inclusion is important

The traditional definition of financial inclusion is providing un-banked and vulnerable people with appropriate, adequate, affordable and timely financial services, such as remittances, savings, and loans through formal financial institutions; services from informal financial providers are excluded from the standard definition of financial inclusion (Ssonko, 2010; Thingalaya, Moodithaya, & Shetty, 2010). There is growing interest in financial inclusion worldwide, which is reflected in the Global Partnership for Financial Inclusion (GPFI). At the G20 Summit in Seoul, the leaders of the G20 recognized financial inclusion as one of the main pillars of the global development agenda, endorsed a concrete Financial Inclusion Action Plan and announced the creation of the GPFI. GPFI is the main action plan to advance financial inclusion globally by increasing quality access to, as well as usage of, sustainable formal financial services, thereby expanding opportunities for under-served and excluded households and enterprises (GPFI, 2017). The World Bank (2008) also underlines the importance of encouraging the growth of financial access and financial inclusion, providing additional evidence to support claims that financial access boosts economic performance. They focus particularly on women's financial inclusion, considering it as a key enabler for gender equality and women's empowerment, which is one of the Sustainable Development Goals (SDGs).

One of the main impacts of financial inclusion on women is empowerment. First, through financial activities, women can become income-generating actors and financially and economically independent of their husbands or other male family members (Dobra, 2011; Littlefield, Murduch, & Hashemi, 2003). Similarly, a study in the early 1990s of three of the largest financial programmes for women in Bangladesh revealed that female clients increased their household's consumption after using banking services, and 5% of female clients escaped from poverty each year by participating in microfinance programs (Khandker, 1998). Financial inclusion programmes often give more benefits to women than men. Swamy (2014) studied the impact of women's participation in Self-Help Groups (SHGs) under microfinance in India between 2007 and 2012. This study shows that the impact of SHGs on income growth was much higher for women, 8.4%, as opposed to 3.97% for male participants.

Second, women's increased investment in social and human capital leads to increases in their material capital and social status. In Tanzania, female members of the Women Entrepreneurship Development Trust Fund (WEDTF) responded that they enjoyed more prestige and were able to emancipate themselves after creating an enterprise, regardless of the size of enterprise (Dobra, 2011, p. 138). In Rwanda 69% of female clients of Urwego Opportunity Bank (UOB) had more respect for themselves, and 38% of female users acquired heightened notions of enterprise management (ibid).

Moreover, the increased confidence and social power derived through financial activity help women to take on greater responsibility regarding family and community decisions (Holvoet, 2005; Littlefield et al., 2003; Napier, Melamed, Taylor, & Jaeggi, 2013). According to a study of the Women's Empowerment Programme in Nepal, which supported women by giving them equal access to financial opportunities, 68% of female programme members started participating in decision-making processes about family events such as children's marriages, buying and selling property, and sending their daughters to school. In the past all of these decisions were made predominantly by male family members (Littlefield et al., 2003, cited in Lakshmi & Singh, 2009, p. 249). Studies in Bolivia and Ghana also indicated that financial inclusion of women led to increased self-confidence and improved their status in the community (ibid).

Women's empowerment and greater economic power can also lead to increases in wellbeing not only for themselves, but also for their families, especially for their children. Women are more likely than men to use resources in ways that benefit their family (Kabeer, 2009; Littlefield et al., 2003; Maru & Chemjor, 2013; Mayoux, 2001; Webster & Fidler, 1996). Some studies show that children of microfinance clients are more likely to go to school, stay in school longer and have much lower incidence of child labour and student drop-out rates than other children (Littlefield et al., 2003; Noponen, 2005). Todd (1996) also found that children in Grameen Bank villages have much higher levels of schooling compared to children in non-members villages; 81% of Grameen boys went to school compared to 54% in non-Grameen households, and almost all of the girls in Grameen customer households had some schooling. In addition, financial activity enables women to have stable consumption and increased incomes which lead to better nutrition, living conditions, health practices and health outcomes. A study by USAID-AIMS found that 95% of female clients in the Foundation for Credit and Community Assistance (FOCCAS) programme in Uganda engaged in improved health and nutrition practices for their children, and 32% of clients had tried at least one AIDS-prevention practice compared 18% of non-clients (Barnes, Gaile, & Kibombo, 2001).

4. Mobile money and women's financial inclusion

There is a small body of literature that explores the role that mobile money plays in addressing the gender gap in access to and uptake of formal financial services (CBK et al., 2016, 2019; World Bank 2018; Suri & Jack, 2016). Work by Suri and Jack (2016) has been influential in emphasizing the role of mobile money in promoting financial inclusion and alleviating poverty in ways that particularly benefit women. Their research, based on household panel surveys conducted in Kenya between 2008 and 2014, claims that access to M-Pesa 'increased per capita consumption levels and lifted 194,000 households, or 2% of Kenyan households, out of poverty', with the impact of mobile money most pronounced for female-headed households. This highly cited work emphasizes the role that mobile money has played in enabling women to improve their financial resilience. They argue that mobile money has facilitated an estimated 185,000 women to graduate out of subsistence agriculture into business or retail activities and reduced their reliance upon working multiple part-time jobs.

A series of smaller-scale studies have also highlighted the positive impacts of mobile money on women's financial inclusion and empowerment. According to Ndiaye (2014), mobile money has provided women in Migori County, located on the Kenyan side of Lake Victoria, with greater capability to save money in a safe place and has enabled them to preserve their savings more successfully than when money is stored within the home. In addition, compared to the past when their husbands often used family savings to buy alcohol or other personal items and left them with no money to be able to purchase food the following day, women have been able to use mobile money accounts to securely store their money away from their husband. These changes gave women confidence in financial activity; many women now consider accessing more financial services including a bank account (ibid, p. 157).

Moreover, Wandibba, Nangendo, and Mulemi (2014) reveal that women in Machakos County, Eastern Kenya, benefitted more than men from mobile money services since mobile money transfer services have bestowed upon women the financial independence that they did not have before the adoption of mobile money. Women have become able to have personal saving accounts without seeking permission from other family members, especially husbands, by using their own mobile money account (Morawczynski & Pickens, 2009; Wandibba et al., 2014). This independent financial activity and ease in money transfer and payment suggest that mobile money has the potential to promote women's empowerment, boosting women's business enterprises, their economic activity and their management of household income, enabling them to share the role of breadwinners with men (Jack & Suri, 2011; Wandibba et al., 2014). In this regard, Kenechi and Uchenna (2014) found that mobile money has significantly affected women's ability to transfer money, their level of involvement in making household decisions, and in dealing with emergencies in rural Nigeria.

However, in recent years there has been a growing critique of the grandiose claims surrounding the role of mobile money in promoting women's financial inclusion. A number of studies (Bateman, Duvendack, & Loubere, 2019; Natile, 2020) draw attention to the fact that the research that underpins these claims has been produced by large multi-lateral institutions directly involved in funding the expansion of mobile money services, such as the World Bank, the IMF and the Bill and Melinda Gates Foundations (FSD, 2016; FSD, 2019; World Bank 2018), or consultants and researchers funded by these institutions (e.g. Jack & Suri., 2014; Suri & Jack, 2016). Natile (2020) develops a feminist critique of the 'success' of M-Pesa in Kenya through interrogating the nexus between digital financial inclusion and gender equality. She argues that the digital financial inclusion agenda is premised on 'a logic of opportunity rather than a politics of redistribution'. Women are made responsible for converting the opportunities conferred by mobile money into improved livelihoods, but in a context where the structural inequalities and power relations that create and reproduce gendered exclusion, oppression and inequality are left unchallenged.

Bateman et al. (2019) draw attention to how fintech companies have accumulated huge wealth from facilitating the financial transactions of the poor, which accrues mostly to global business elites rather than Kenya's poor. This form of 'digital mining', they argue, epitomizes another form of resource extractivism in the global south, replicating longstanding forms of exploitation. They are highly critical of the 'false narrative' emerging around fin-tech initiatives like M-Pesa that proclaim poverty alleviation and women's empowerment, while masking the role that such innovations play in enriching elites at the expense of the poor.

As debates surrounding the impact of mobile money on addressing women's financial inclusion become increasingly contested and polarized, there is a need for fine-grained empirical research that can offer more nuanced understandings into the impact of mobile money. The research I present in this paper aims to address this need in two ways. First, this research disaggregates the impact of mobile money on women's financial activities according to different financial functions (saving, borrowing, sending and receiving), and thorough analysis of how mobile money's impact varies according to age, income level and educational attainment. Second, this research combines survey data with in-depth interviews, with the latter offering greater scope to analyse the causal mechanisms that underly survey findings. While acknowledging the validity and importance of many of the recent critiques levelled against overblown policy narratives that portray mobile money as a silver bullet for women's financial inclusion, this research aims to show that mobile money has generated certain positive impacts on Nairobi women's financial activities.

5. Research methods

The literature briefly cited above shows how increasing women's financial inclusion and use of financial services can improve their economic empowerment and increase their social status and wellbeing. This paper aims to build upon these insights by assessing the extent to which mobile money has increased women's financial inclusion.

This study focuses on Nairobi, Kenya. Kenya has been a pioneer in mobile money services and has the highest mobile money usage in the world. The fact that mobile money services have been available for the past 12 years enables this study to collect detailed mobile money data and compare the reported changes in levels of women's financial inclusion and activities before and after mobile money use. Nairobi also has a wide spectrum of income levels enabling the research to assess how the impact of mobile money on women's financial inclusion intersects with levels of wealth.

This study employed two methods of data collection: a structured questionnaire survey and in-depth interviews. The questionnaire survey collected data on respondents' living standards, economic situation and the characteristics of their financial activity and usage of mobile money. It was carried out between October 2015 and February 2016 across eight different areas[1] in Nairobi, covering a total of 358 respondents.

The survey used quota sampling as an alternative to probability sampling method because it was not possible to find a proper sampling frame especially in Kibera since most of the population lives in informal settlements or their houses are unregistered. The population was firstly divided into certain strata and for each stratum the number (quota) of elements to be included in the sample is fixed. The quotas of the three income areas were set equally since the number of households in high-, middle- and low-income areas were similar, between 16,000 and 19,000.[2] The survey was conducted with 110–130 people for each stratum, and the survey areas and participants were randomly selected to minimize bias. For low-income areas, the survey was conducted in the relatively safe (or formal) areas in Kibera, south-west Makina and Olympic, for safety reasons, and the main target was people working as local vendors along main streets. In the case of middle-income areas, survey areas were randomly selected by Random Point Generator. In high-income areas, it was difficult to gain access to many estates due to the security systems these estates use. Therefore, I conducted the survey in estates where I could gain access, and with households that agreed to participate in the survey. I tried to conduct the survey with all the people/households in the selected survey areas, and if they were not available or they did not want to participate I moved to the next household.

Swahili and English are effectively lingua francas in Kenya. The questionnaire was written in English, but a research assistant was hired to provide additional explanations in Swahili about the purpose of the survey and to answer any questions respondents had when completing the survey.

Table 1 shows the demographic characteristics of questionnaire survey respondents. The ratio of male respondents to female respondents was similar, most respondents were in their 20s and 30s, and almost half of them graduated from college or university. In terms of employment status, most respondents reported that they were employed and received a monthly wage, with the second most common response being that they had their own business. In terms of the monthly income of those surveyed, responses were bunched at the lowest income option, '0–10,000', and the highest income option, 'above-100,001'.

Responses from teenage respondents were excluded from analysis since the reason for them not to use formal financial services or various financial channels before the emergence of mobile money might be because they were too young. The total number of respondents excluding teenage respondents is 194 and 147 for male and female respondents respectively. This quantitative dataset was then digitized and analysed using SPSS. In order to perform statistical analysis, McNemar's test was used to assess whether there was a significant change in the main financial channel used and the proportion of the population that were financially excluded, defined as those who used informal channels or did not use any financial channels, before and after using mobile money.

In-depth individual interviews were conducted with 43 individuals, 29 female and 14 male participants, in four different places, two low-income and two middle-income research areas. These interviews were conducted one month after the questionnaire survey in order to generate greater insight into gender inequality, gender roles and financial activity. Since the interviews were focused more on exploring women's financial inclusion, female respondents are double the number of male respondents.

6. Findings

6.1. Characteristics of women's financial activity and mobile money use

First of all questionnaire survey data was used in order to assess women's financial activity and mobile money use. About 66% of both male and female respondents reported that they had a bank account and 34% did not have a bank account. As a reason for not having a bank account, regardless of gender, the most significant reason given by respondents was that they did not have enough money to save. The joint second most important reasons women gave were high service fees and

Table 1. Demographic information on questionnaire respondents (N = 355).

Characteristic	Subcategory	N	%
Gender	Male	205	57.7
	Female	150	42.3
	Total	355	100.0
Age	10–19 years	14	3.9
	20–29 years	150	42.3
	30–39 years	104	29.3
	40–49 years	42	11.8
	50–59 years	35	9.9
	Over 60 years	10	2.8
	Total	355	100.0
Highest level of education	Less than a primary school	3	0.8
	Primary school	15	4.2
	Secondary school	105	29.6
	College/University	160	45.1
	Post graduate school	70	19.7
	Declined to answer	2	0.6
	Total	355	100.0
Employment status*	Farming	12	2.8
	Employed with monthly wage	113	25.9
	Employed with irregular or daily wage	22	5.0
	Part time job	20	4.6
	Unemployed	23	5.3
	Not working but looking for work	26	6.0
	Not working and not looking for work	2	0.5
	Plan to do own business soon	34	7.8
	Unpaid family worker	1	0.2
	Student	32	7.3
	Retired	12	2.8
	Own business	133	30.5
	Other	6	1.4
	Total	436	100.0
Monthly income(Ksh)	0–10,000	85	23.9
	10,001–20,000	53	14.9
	20,001–30,000	22	6.2
	30,001–40,000	22	6.2
	40,001–50,000	10	2.8
	50,001–60,000	10	2.8
	60,001–70,000	11	3.1
	70,001–80,000	10	2.8
	80,001–90,000	9	2.5
	90,001–100,000	19	5.4
	Above 100,001	70	19.7
	Declined to answer	34	9.6
	Total	355	100.0

Source: Author's fieldwork
*Multiple response

long waiting times. This was in contrast to men whose second most important reason was their ability to use alternative financial channels. This suggests that for women the main barriers to using formal financial institutions are time as well as cost; long queues and slow service processing are hindrances for women's financial activity since as mentioned above they tend to be 'time-poor' and have less spare time than men.

The survey data shows that before using mobile money, both men and women who accessed formal financial services mostly used commercial banks, accounting for over one-third of the total response in each group. For men, the second most used financial institution was 'post bank'. On the other hand, for women, the second highest response was to draw upon the services of friends or family/relatives and the ratio of respondents who did not use any financial channel or used informal finance accounted for one-third of all female respondents. When it comes to the purpose of mobile money use, the highest response for both groups was to transfer money, followed by to receive money for male respondents. In the case of female respondents, the second highest response was to store money safely and to pay a bill. These reasons were reiterated in the individual interviews.

In the interviews, most female interview participants said that the greatest advantage of using mobile money is that they can save money safely (none of the male interview participants said this was an advantage of using mobile money). In this regard, female participants firstly stressed that mobile money means that they do not have to carry cash all the time. One interviewee replied 'I can carry a big amount of money because it is on my phone' and another stated 'I don't need to carry cash, but I can buy anything from the supermarket'. Secondly, they emphasized that they can keep their money safely away from their family members or other people through mobile money, and even if they lost their phone, their money is still safely stored on their mobile money account.

In addition, another important advantage of using mobile money highlighted by female interview participants is that they can pay bills easily through mobile money (none of the male interview participants emphasized this as an advantage of mobile money). Women interviewees stated that before using mobile money, they had to wait for a long time at a bank in order to pay a bill every month, being unable to work for about half a day due to the travel time to reach a bank branch and long queues. As shown above, women have many responsibilities for social reproduction: they are in charge of almost all of household chores and childcare, but they also play an important role as income earners in their households (Ellis et al., 2007; Kiriti-Nganga, 2015). Therefore, the time it takes to process financial transactions at banks can be more disruptive to women. However, after using mobile money, women reported that they were able to pay a bill anytime they want through mobile money. Therefore, mobile money's safe and private money storage and easy money transfer function for bill payments became a major motivation for using mobile money especially for women. This is confirmed by the results of both the survey and interviews.

Similar to the reasons why people start using mobile money, the survey results indicate that the most significant benefit that people derived from using mobile money was that they could transfer money anytime. This suggests that mobile money's instant money transfer function, which enables people to send money anytime and anywhere, is the most distinctive strength of mobile money compared to other channels. Compared to men, many women responded that having a safe place to store money was a key benefit derived from using mobile money and it was the second highest response amongst all female respondents. This indicates that mobile money's easy and simple saving function has allowed women to store their money safely, increasing their saving capability and they also benefit from this since, as shown above, women prefer to use saving services.

As the main reason for storing money in mobile money accounts, regardless of gender and region, about half of respondents stated that this enabled them to respond to an emergency. For men, the second highest response was to withdraw in cash when they need it and for women, it was to save for no particular reason. Based on these responses, we can deduce that people who use their mobile money account to save money are not doing so for long-term saving or for making lump-sum payments with a particular purpose, rather it is mostly to keep their money safely.

Interview participants were also asked questions about gender discrimination in financial activity. Amongst the interviewees, about 18% of female participants and only one male participant responded that women are discriminated against in financial activity. Others said there was discrimination against women's financial activity in the past since women needed permission from their husband or male family members to open a bank account or conduct financial activity, but now they do not need such permission and can easily open a bank account. Some also responded that people are discriminated against according to occupation rather than gender when they apply for bank loans.

A significant number of both female and male interviewees believed that there have been considerable changes in men's attitudes to women's economic and financial activities in Kenya. Compared to previous generations, for whom women were regarded as housewives only, many men in this generation understand the importance of women's economic and financial activity, they believe that women can perform as men do, and they have an open mind and encourage women's economic and financial activity. As a reason for the change, education was cited by interviewees as playing an important role, followed by increased women's financial access. As a result, some female interviewees felt that compared to before, women have become more independent and can conduct financial activity more freely and they have become better able to manage their money.

All male and female participants said women's financial activity is very important. For women, the primary stated reason for this is because through financial activity they can be independent of men and invest more money in themselves, planning for the future. All female interviewees reflected that mobile money is a great help to their financial activity and it has made financial services easier and more accessible. In contrast, most male participants' responses were focused more on traditional women's roles rather than women's growth or financial independence. For example, as a reason for the importance of women's financial activity, most men said it was beneficial because women's financial activity can enable them to support their husband and family and it would be helpful to raise children more easily.

To sum up, the interviews suggest that women in Nairobi have become able to access financial services much more easily than in the past due to mobile money and men's increased support for women's economic and financial activities. However, most of the male participants encouraged women's financial activity because they believed it would be beneficial for men and the household, rather than for women's growth or empowerment in its own right. This is one of the most interesting points raised in the interviews: compared to previous generations, men in this generation demonstrate greater support for women's economic and financial activities. However, changes in male attitudes continue to operate within pre-existing conceptions of gender roles and power relations within the household. On the other hand, most of the women interviewed think that women's financial activity is essential since through financial activity they can be independent of their husband, investing more in their education and business, and can plan for future financial activity, which will increase their economic empowerment in the long term.

6.2. Has mobile money helped increase of women's financial activity? (Survey results)

Tables 2 provides information about the changes in the most commonly used financial channel for four financial services – saving, sending, receiving and borrowing money – by gender, before and after using mobile money. Overall, with regard to the four financial services, almost half of respondents did not use any financial channels before using mobile money and the rest of respondents mostly used banks. Male respondents show a higher proportion of bank use than female respondents, and women used Savings and Credit Co-operative Societies (SACCO)[3] twice or more than twice as much as men.

After using mobile money, the proportion of the financially excluded population has greatly decreased for each service. For women the sharpest decrease in levels of financial exclusion was in relation to saving, from 56.9% to 7.9%, and over 60% of women used mobile money as the main financial channel for saving. Compared to sending and receiving money, for which over 80% of people used mobile money as their main channel, fewer people used mobile money as their main channel for saving. 47.6% of men used mobile money for saving and about 40% still used bank as the main channel for saving. This indicates that, as shown above, mobile money tends to be used to keep money temporarily, whereas banks are preferred to mobile money when it comes to long-term saving.

In order to assess whether the changes in the proportion of those who used informal channels or did not use any financial channel were statistically significant after using mobile money, McNemar's test was computed. The test results showed that mobile money significantly decreased the proportion of the population that was financially excluded over all four financial services (Table 2, all $p < .001$).

Table 2. Changes in use of financial institutions (McNemar's test).

Service	Gender		Formal finance			MM	Excluded	Other	Total
			Bank	MF	SACCO				
Saving	Female	Before	35.2%	1.4%	6.5%		56.9%	0.0%	100.0%
						N/A			
		After	25.7% 100.0%	0.7%	1.4%		60.7%	7.9%	0.0%
				X^2 (1, N = 138) = 59.671, p < .001					
	Male	Before	42.6%	0.5%	3.8%		52.8%	0.0%	100.0%
						N/A %			
		After	38.4% 100.0%	0.0%	3.8%		47.6%	10.2%	0.0%
				X^2 (1, N = 183) = 76.013, p < .001					
Sending	Female	Before	36.5%	2.2%	11.6%		49.6%	0.0%	100.0%
						N/A			
		After	7.1% 100.0%	0.0%	1.4%		87.2%	4.3%	0.0%
				X^2 (1, N = 137) = 58.141, p < .001					
	Male	Before	48.9%	1.1%	6.1%		42.9%	1.1%	100.0%
						N/A			
		After	15.8% 100.0%	0.0%	1.0%		79.2%	3.8%	0.0%
				X^2 (1, N = 178) = 65.127, p < .001					
Receiving	Female	Before	39.3%	3.7%	14.9%		42.2%	0.0%	100.0%
						N/A			
		After	12.8% 100.0%	0.0%	1.4%		83.7%	2.1%	0.0%
				X^2 (1, N = 135) = 52.019, p < .001					
	Male	Before	53.3%	1.1%	5.0%	N/A	38.2%	2.2%	100.0%
		After	19.5%	0.0%	1.1%	77.2%	2.2%	0.0%	100.0%
		X^2 (1, N = 177) = 59.138, p < .001							
Loans	Female	Before	24.8%	4.4%	10.9%		59.8%	0.0%	100.0%
						N/A			
		After	14.4% 100.0%	2.2%	4.3%		50.4%	28.7%	0.0%
				X^2 (1, N = 135) = 27.113, p < .001					
	Male	Before	39.0%	2.7%	9.9%		48.2%	0.0%	100.0%
						N/A			
		After	26.5% 100.0%	2.2%	6.5%		42.2%	22.6%	0.0%
				X^2 (1, N = 182) = 31.582, p < .001					

Source: Author's fieldwork
Bank = commercial bank, post bank and mortgage company; MF = microfinance institutions;
SACCO = SACCO, Cooperative and credit union; MM = mobile money;
Excluded = keep money at home, saving by keeping goods, friend or family and did/don't use the service

Female respondents, especially relatively young women (in their 20s), with low educational attainment, and low income have been more affected by mobile money's saving function compared to other groups. This can be seen in the way that these women all gave saving related answers to the questions regarding the purpose of mobile money, the most used mobile money services, and the most important benefits derived from mobile money use.

In order to assess how possession of a bank account varied according to age, level of educational attainment and income, Pearson's chi-square test was used (Table 3). This test shows that having a formal bank account is significantly related to age ($p < .016$), educational attainment ($p < .002$) and income level ($p < .001$); as age, education and income levels increased, the ratio of female respondents that have a bank account increased. This is shown clearly through the following comparisons: the proportion of women in their 20s, with less than secondary school education, and with low

Table 3. Possession of a bank account by female respondents' background (age, education level and wealth index).

Characteristic	Subcategory	Currently have a bank account N	% of characteristic
Age	20s	37	55.2
	30s	36	69.2
	40s	11	84.6
	Over 50s	13	92.9
	Total	97	100.0
	X^2 (3, N = 146) = 10.269, p < .016		
Highest level of education	Less than secondary school	20	48.8
	College/university	53	68.8
	Graduate school	24	88.9
	Total	97	100.0
	X^2 (2, N = 145) = 12.103, p < .002		
Living standard	Low income	21	45.7
	Lower middle income	24	63.2
	Upper middle income	25	75.8
	High income	27	93.1
	Total	97	100.0
	X^2 (3, N = 146) = 19.630, p < .001		

Source: Author's fieldwork

income that had a bank account was, respectively, 55.2%, 48.8% and 45.7%. In contrast, the proportion of women over 50, with graduate school education, and with high income that had a bank account stood at 92.9%, 88.9%, 93.1% respectively.

The survey also revealed how responses to the impact of mobile money correlated closely with certain characteristics captured in the survey. One group of women – those in their 20s, with low income, and with low formal educational attainment – all responded in the same way when explaining their main reasons for starting to use mobile money, which mobile money service they used the most, and the greatest benefit derived from using mobile money. These responses differed markedly from the group of women outside of these characteristics.

For the former group, the main purpose for starting to use mobile money was to store and protect money safely, whereas for the latter group the highest response was to transfer money, and also to pay a bill. Similar results were also found in the responses given regarding the mobile money service people used the most. The former group mostly saved money through mobile money. This contrasted with the latter group, who used mobile money primarily as a tool to use incidental services, such as money transfer and bill payment. Moreover, regarding the greatest benefit derived from using mobile money, the former group (except for those with less than secondary school education) emphasized the increasing ability to save money or having a safe place to store money. On the other hand, for the latter group (including for those with less than secondary school education), the ability to transfer money anytime was the most important benefit.

Table 4 shows the main financial instruments that female respondents used for saving money before and after using mobile money. Before using mobile money, most female respondents in their 20s, with less than secondary school, and low income showed very low formal finance usage and high ratio of financial exclusion. In contrast, most women in their 50s, with university education, and high income saved money through banks. Their primary saving mechanism was to keep money at home (48.5%, 37.8% and 48.8% respectively for women in their 20s, with less than secondary school education, and with low-income group). The next highest response for women in these categories was that they never saved money (16.7%, 31.1% and 29.3% respectively). However, after using mobile money, there was a dramatic change in the ratio of the financially excluded population

Table 4. Changes in use of financial institutions for saving by female respondents' background (age, education level and wealth index) before and after using mobile money.

			Formal finance					
Characteristic	Subcategory		Bank	MF	SACCO	MM	Excluded	Total
Age	20s	Before	24.2%	1.5%	3.0%	N/A	71.3%	100.0%
		After	13.6	1.5%	3.0%	74.2%	7.5%	100.0%
	30s	Before	34.8%	2.2%	8.7%	N/A	63.0%	100.0%
		After	27.6%	0.0%	6.4%	55.3%	10.6%	100.0%
	40s	Before	46.2%	0.0%	15.4%	N/A	53.9%	100.0%
		After	53.8%	0.0%	7.7%	38.5%	0.0%	100.0%
	Over 50s	Before	78.6%	0.0%	7.1%	N/A	21.4%	100.0%
		After	50.0%	0.0%	0.0%	35.7%	7.1%	100.0%
	Before: Total N(147) = Valid N(139, 94.6%)+missing(8, 5.4%)/ After: Total N(147) = Valid N(140, 95.2%) +missing(7, 4.8%)							
Education	Less than secondary school	Before	12.2%	2.4%	2.4%	N/A	83.0%	100.0%
		After	4.8%	0.0%	4.8%	78.6%	11.9%	100.0%
	College/university	Before	37.3%	1.3%	9.3%	N/A	52.0%	100.0%
		After	24.0%	1.3%	6.6%	60.0%	7.9%	100.0%
	Graduate school	Before	72.7%	0.0%	4.5%	N/A	22.6%	100.0%
		After	72.7%	0.0%	0.0%	27.3%	0.0%	100.0%
	Before: Total N(147) = Valid N(138, 93.9%)+missing(9, 6.1%)/ After: Total N(147) = Valid N(139, 94.6%) +missing(8, 5.4%)							
Living standard	Low	Before	17.8%	2.2%	4.4%	N/A	80.0%	100.0%
		After	6.6%	0.0%	4.4%	80.0%	8.8%	100.0%
	Lower middle	Before	21.0%	0.0%	13.2%	N/A	79.1%	100.0%
		After	7.9%	0.0%	7.9%	73.7%	10.5%	100.0%
	Upper middle	Before	35.7%	3.6%	3.6%	N/A	60.8%	100.0%
		After	31.0%	3.4%	3.4%	58.6%	3.4%	100.0%
	High	Before	82.1%	0.0%	3.6%	N/A	17.8%	100.0%
		After	75.0%	0.0%	3.6%	14.3%	7.2%	100.0%
	Before: Total N(147) = Valid N(139, 94.6%)+missing(8, 5.4%)/ After: Total N(147) = Valid N(140, 95.2%) +missing(7, 4.8%)							

Source: Author's fieldwork
Bank = commercial bank, post bank and mortgage company; MF = microfinance institutions;
SACCO = SACCO, Cooperative and credit union; MM = mobile money;
Excluded = keep money at home, saving by keeping goods, friend or family and did/don't use the service

amongst women in these categories in relation to saving, and most of them mainly used mobile money to save money.

Therefore, based on the findings, we can say that even for those women who had previously experienced the greatest levels of financial exclusion, mobile money has enabled them to access financial services, especially through providing them with the capability to save and store money safely.

7. Discussion

In order to assess in what ways mobile money has helped increase women's financial inclusion, this study has analysed characteristics of women's financial activity and mobile money use, changes in financial usage after using mobile money, and the financial effects that women have experienced from using mobile money, based on a case study of Nairobi women.

This research reveals a number of important findings for those seeking to address financial exclusion. The research firstly explored changes in gender discrimination against women in financial activity after using mobile money, based on the findings from in-depth interviews. Women in Nairobi have become able to access financial services much more freely than in the past due to mobile money and this has partly contributed to their financial empowerment. In this sense, these research findings corroborate a number of the claims made in the existing literature on the role that mobile money can play in addressing the gender gap in access to financial services (Jack & Suri, 2011; Wandibba et al., 2014). Moreover, my research highlights that there have been changes in men's attitudes to women's economic and financial activities in Kenya. As a reason for this, most interviewees said education and increased women's financial access played the most important role.

Secondly, in order to assess the changes in women's financial activity and financial inclusion after using mobile money, this study has compared the main financial channel that women used before and after using mobile money for four financial services. Mobile money has significantly decreased the level of financial exclusion amongst female respondents ($p < .001$). There are two mechanisms underpinning this shift. First, women tend to be more time-constrained than men. Hence, long queues and slow service processing for financial transactions were the main reasons that made women reluctant to use formal financial institutions. Mobile money's instant money transfer service has increased their usage of financial services and channel for financial transaction, decreasing the population who do not use any financial channel. Indeed, over 80% of respondents mainly used mobile money for sending and receiving money. This clearly demonstrates that fast and convenient money transfer is the greatest advantage of mobile money.

Second, women had a higher need for a safe place to store their money compared to men. According to the survey and interview results, saving/safe money storage was the main reason why women started using mobile money, the greatest advantage of using mobile money, and the most important function of mobile money. Indeed, saving showed the biggest decrease in the proportion of financial exclusion after use of mobile money and over 60% of women used mobile money as the main financial channel for saving. This reinforces the findings in earlier studies that have also emphasized the particular importance women attribute to using mobile money as a place to store money safely and to save (Suri & Jack, 2016, p. 1292; Ndiaye, 2014). One of the most important findings revealed by this research – and not addressed in previous literature – is that mobile money has been particularly effective at enabling those women in Nairobi who were younger, with lower levels of education attainment, and lower income to access saving services. Therefore this research shows that mobile money has the potential to not only improve levels of financial inclusion but to do so in a way that provides services even for those women who had previously experienced the greatest levels of exclusion.

8. Conclusion

Of course, mobile money remains an imperfect channel, and its capacity to overcome structural drivers of gender inequality and deep-seated attitudes towards gender roles must not be overstated. It still has several technical shortcomings such as network failures and remittance error. Moreover, it does not solve serious social issues such as gender inequality and discrimination against women. Efforts to address gender inequality and empowerment will require a wider set of interventions, such as policies and programmes that promote gender equity in employment and investment in education, health and welfare services. However, this research has demonstrated the importance of financial inclusion as a way of addressing some of the inequalities women face and shows that mobile money can play a role in facilitating women's financial empowerment. Mobile money has improved women's financial inclusion by addressing some of the most pernicious barriers women face in accessing financial services and by doing so in a way that is able to reach even young women with lower levels of education and on low incomes.

This paper has shown how after using banking services and increasing levels of financial activity, women experience a greater degree of financial and economic independence from their husbands, enabling them to manage their money and invest in themselves. This reinforces the findings of previous studies that have shown how mobile money has facilitated changes in women's financial behaviour, increased financial independence, and provides a form of economic empowerment (Jack & Suri, 2011; Morawczynski & Pickens, 2009; Wandibba et al., 2014).

This research therefore emphasizes the importance of recognizing mobile money as a credible long-term financial channel, rather than viewing mobile money merely as a temporary channel outside of financial institutions. This provides a set of important policy implications, especially the need for mobile money operators to provide a greater variety of flexible saving products connected to commercial banks or other professional financial institutions.

Notes

1. Low income: Olympic and Makina (each in Kibera), middle income: Kimathi/Bahati and Donholm, and high income: Karen, Lavington, Muthaiga and Madaraka
2. The number of households of two high-income areas were estimated using the population of the ward they were located in due to the lack of precise demographic information on those areas.
3. SACCOs are a type of cooperative which are community membership-based legal financial institutions regulated and supervised by SASRA (the SACCO Societies Regulatory Authority) in Kenya.

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