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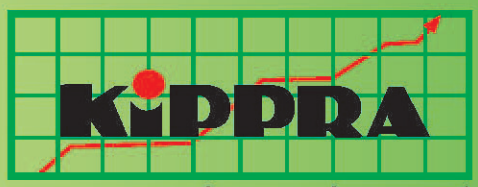

The KENYA INSTITUTE for PUBLIC POLICY RESEARCH and ANALYSIS

Gendered Effects of Government Credit Programmes on Entrepreneurship in Kenya

Rodgers Musamali
Eliud Moyi

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Kenya Institute for Public Policy
Research and Analysis

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Abstract

Addressing gender-based disparity in entrepreneurship is of policy importance globally. It does not only correct a social inequality but also enhances productivity and improves development outcomes. While appreciating that women and men face different opportunities and constraints in entrepreneurship, access to finance remains a challenge, in particular where the former tend to be adversely affected. Among other attributes, Kenya women-owned establishments tend to be less productive and have higher incidences of being necessity entrepreneurship compared to men-owned ones. In recognition of existing gender gaps in entrepreneurship and finance, the Government of Kenya has established several funds as avenues for gender mainstreaming. The mandates of these funds were tailored to respond to the Millennium Development Goals and Sustainable Development Goals, including but not limited to eliminating discrimination against women and girls, decent job creation, entrepreneurship, creativity and innovation, and encourage access to financial services. The impact of these funds in bridging gender gaps in entrepreneurship remains unexplored. The current study aims to address this literature gap by assessing the role of government funds in bridging the gender gap in entrepreneurship in Kenya. The specific objectives were to: (a) examine the role of gender in accessing government affirmative action funds; (b) determine whether government funds have any impact on entrepreneurship; and (c) determine whether gender moderates the impact of government funds on entrepreneurship. The study results indicate that access to government credit is not influenced by gender, meaning that both male- and female-owned establishments have an equal opportunity to access government credit. In addition, access to government credit fails to statistically impact on the rate of opportunity entrepreneurship but negatively impacts on the rate of necessity entrepreneurship. Access to government credit, however, strongly impacts on growth of the establishments. Male-owned establishments which access government credit have reduced chances of being necessity entrepreneurs. Contrarily, access to government credit fails to impact entrepreneurial outcomes among female-owned establishments

Abbreviations and Acronyms

ATET	Average Treatment Effect on the Treated
AASDF	Affirmative Action Social Development Fund
CWES	Constituency Women Enterprises Scheme
FOSA	Front Office Service Activity
GDP	Gross Domestic Product
ICT	Information Communication Technology
KNBS	Kenya National Bureau of Statistics
KPI	Key Performance Indicator
LPO	Local Purchasing Order
MDG	Millennium Development Goals
MSE	Micro and Small Enterprises
MSEA	Micro and Small Enterprises Authority
MSME	Micro, Small and Medium Enterprises
NGAAF	National Government Affirmative Action Fund
PFM	Public Finance Management
PSM	Propensity Score Matching
PWDs	People with Disabilities
SACCO	Savings and Credit Cooperatives Societies
SDG	Sustainable Development Goals
TIVET	Technical, Industrial, Vocational and Entrepreneurship Training
UN	United Nations
WEF	Women Enterprises Fund
YEDF	Youth Enterprises Development Fund

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1. Introduction

1.1 Background to the Study

Gender-based disparity is a global developmental challenge. The Global Gender Gap Report shows that there is a 32 per cent average gender gap that remains to be closed (World Economic Forum, 2018). According to the Report, the gender gap that remains to be closed in Kenya is 30 per cent, which is higher than the level in countries such as Rwanda (20%), Namibia (21%) and South Africa (24%). The World Economic Forum (WEF) defines *gender gap* as the difference between women and men as reflected in social, political, intellectual, cultural or economic attainments. Presumably, the United Nations General Assembly was moved by the extent of these gender gaps during adoption of the Agenda 2030 containing 17 Sustainable Development Goals (SDGs) (UN, 2016). This is perhaps why gender is captured in several SDGs, including number 5 and target 8.3. SDG number 5 seeks to achieve gender equity and empower all women and girls by eliminating discrimination against women and girls, eliminating violence and harmful practices directed at women and girls, recognizing and valuing unpaid care and domestic work. Target 8.3 envisions development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourages the formalization and growth of micro-small- and medium-sized enterprises, including through access to financial services (UN, 2016). In Kenya, most of these global and regional gender responsive policies and goals have been accommodated in the Constitution of Kenya 2010.

Advancing gender equity is smart economics (World Bank, 2019). Women participation in entrepreneurship[1] is important because it corrects a social inequality, enhances productivity and improves development outcomes. First, increasing the number of women entrepreneurs has positive implications for family welfare. Some studies estimate that women spend 90 cents of every additional dollar on the welfare of their families in form of nutrition, education and health compared to 30-40 cents by men (VanderBrug, 2013). Second, women entrepreneurship creates jobs for self and others, provides incomes, serves markets with valued products, promotes economic autonomy, reduces social exclusion and contributes to economic growth. Conversely, gaps in entrepreneurship imply lost potential output and value. Reducing the gender gap and promoting female entrepreneurship is good for economic development and poverty reduction. While acknowledging that there is no single definition for entrepreneurship, some authors such as Schumpeter and Drucker view entrepreneurs as innovators.

1 In this study, we follow Parker (2018) to define an entrepreneur as a person who perceives a business opportunity and responds by establishing a new enterprise. This concept is used interchangeably with self-employment where a person with no regular wage or salary draws an income from a business or profession. In this context, entrepreneurship can be defined as the discovery and exploitation of opportunities by creating a business enterprise.

Schumpeter (1949) defined an entrepreneur as an innovator who creates a new good or new quality; a new method of production; a new market; and a new source of supply or a new industry. Schumpeter's theory of entrepreneurship is synonymous with innovations, whereby successful entrepreneurs get rid of passive ones through a gale of 'creative destruction'. Drucker (1985) viewed innovation to be a tool used by entrepreneurs to exploit business opportunities. Entrepreneurs fall into two groups: opportunity and necessity. Opportunity entrepreneurs are people who identify available opportunities and exploit them, whereas necessity entrepreneurs are those who are pushed into self-employment either due to job loss or when they have unsatisfactory options to participate in the economy (Lucas et al., 2012). According to Pietrobelli et al. (2004), necessity entrepreneurs get into business involuntarily and as a transitory option to provide a means for survival. Necessity entrepreneurs tend to have lower aspiration levels than opportunity entrepreneurs (Reynolds et al., 2002). In addition, they are relatively less educated, lack prior managerial experience, have limited access to capital, are more likely to be informal, lack formal business networks, and are not protected by labour laws. Opportunity business owners are more likely to be male, younger, and wealthier (in terms of household income), and have a higher preference for business ownership compared to paid employment than necessity business owners (Van der Zwan et al., 2016).

In entrepreneurship and finance, women and men face different opportunities and constraints (Parker, 2018). Evidence indicates that female entrepreneurs are fewer than male entrepreneurs (Kelley et al., 2012). Women start their firms with a lower level of financing than men (Alsos et al., 2006). A relatively lower proportion of women-owned firms apply for loans (Carrington, 2006; Treichel and Scott, 2006). When they apply for loans, rejection rates are higher (Cavalluzo, Cavalluzo and Wolken, 2002). However, when their applications are successful, they receive smaller amounts compared to men-owned firms (Treichel and Scott, 2006). Again, they tend to obtain more of their capital from internal sources rather than external sources (Rob and Walken, 2002; Coleman and Robb, 2009). This discrimination in financial markets is attributed to many factors, including legal discrimination, social norms, education, skills, confidence, risk preferences, assets, networks and time constraints (Orser, Riding and Manley, 2006; World Bank, 2019).

In Kenya, there are significant differences between women- and men-owned establishments in terms of their performance, attributes, entrepreneurship and access to finance (see Appendix 1). Regarding performance, Appendix 1 shows that mean productivity and business growth for men-owned establishments are significantly higher than for women-owned establishments. The incidence of opportunity entrepreneurship is higher among men-owned establishments

compared to women-owned establishments. Women are more likely to become necessity entrepreneurs compared to men. In addition, their establishments are likely to be smaller in size and relatively younger. Thus, compared to men-owned establishments, women-owned establishments suffer a disadvantage in terms of being unable to appropriate scale economies and business experience.

In terms of borrowing behaviour, Appendix 1 shows that women-owned establishments were more likely to apply for a loan compared to men-owned establishments. Surprisingly, loan rejections were not differentiated by gender. On average, men-owned establishments apply for almost four times of the volume of credit applied for by women-owned establishments. The same applies to the amount of credit received. Although there are differences in the amount of initial capital and additional capital between the two groups, the differences are not statistically significant.

Given the existence of gender gaps in entrepreneurship and finance, the Government of Kenya has established several funds aimed at providing financial support to vulnerable groups (women, youth and people with disabilities). These funds are also seen as avenues for gender mainstreaming. The funds include Women Enterprise Development Fund (WEF), Youth Enterprise Development Fund (YEDF), Uwezo Fund, and National Government Affirmative Action Fund (NGAAF). A review of the mandates of these funds suggests that they were tailored to respond to targets set in the Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs). Following in the footsteps of the national government, six counties have recently established affirmative action funds; namely Kiambu County Jijenge Fund (set up in 2018), Kajiado County Mbuzi Moja Afya Bora (set up in 2018), Makueni County Empowerment Fund (set up in 2016)[2], Wajir County Revolving Fund (set up in 2014), Mandera County Trade Development Fund (set up in 2014) and Garissa County Revolving Fund (set up in 2019). Whereas most of these initiatives have disbursed huge amounts of public money, there has been no research effort to estimate their impact. It would therefore be interesting to assess the efficacy of these funds in meeting the objectives for which they were established, especially by examining their potential to bridge gender gaps in entrepreneurship.

1.2 Problem Statement

This study is motivated by three gaps in the literature. First, there is ambiguity in empirical literature regarding the relationship between gender and access to

2 This fund has been locally designated as Tetheka Fund.

credit. Some empirical studies such as Mazumder et al. (2017), Wahidi (2017), Bahta et al. (2017) and Chowdhury (2019) support the gender discrimination hypothesis while others such as Hansen and Rand (2014), Damiyano and Dorasamy (2019), Bardasi et al. (2011), Aterido et al. (2013), Bruhn (2009) and Storey (2004) did not find evidence of its existence. An exception to these two strands of findings are two studies: one by Wellalage and Locke (2017) and the other by Aterido et al. (2013). Wellalage and Locke (2017) report lower credit constraints among women-owned enterprises in South Asia. Aterido et al. (2013) confirms the existence of an unconditional gender gap in Sub-Saharan Africa, but the gender gap disappears when key observable characteristics of the enterprises or individuals are accommodated. Therefore, evidence is mixed and provides rather conflicting results about the existence of gender gaps in access to credit, depending on possible individual differences among borrowing firms, country-specific characteristics and different definitions adopted to define the gender composition of the firms. Second, there is little evidence on whether gender gaps exist in accessing government-supplied credit. Finally, there has been no systematic analysis of the impact of government-supplied credit on entrepreneurship in Kenya, although there are several government-initiated schemes to supply credit to vulnerable groups (women, youth and PWDs) as a means of empowering them to get into business. Given these shortcomings in the literature, the purpose of this study is to examine the role of gender in the impact of government credit on entrepreneurship in Kenya.

1.3 Objectives of the Study

The broad objective of the study is to assess the role of government funds in bridging the gender gap in entrepreneurship in Kenya. Specifically, the objectives of the study are to:

(i) Examine the role of gender in accessing government affirmative action funds

(ii) Determine whether government funds have any impact on entrepreneurship

(iii) Determine whether gender moderates the impact of government funds on entrepreneurship

2. Review of Policies, Laws and Regulations

There are several policies, laws and regulations that guide gender and entrepreneurship interventions in Kenya. These include the Constitution of Kenya, Gender Policy, MSE Act 2012, Sessional Paper No. 9 of 2012 on National Industrialization Policy, and the Kenya Vison 2030. The Constitution of Kenya 2010 established the National Gender and Equality Commission to promote gender equality, coordinate and mainstream gender, persons with disabilities and other marginalized groups in national development. The Gender Policy of 2011 created the Department of Gender and Social Development under the Ministry of Gender, Children and Social Development whose mandate was to support women entrepreneurs obtain capital through the Women Enterprise Fund. The Women Enterprise Fund was established in August 2007 to provide accessible and affordable credit to women start-ups and existing businesses. To ensure proper utilization of the loan, the Fund builds the entrepreneurial skills of borrowers.

The Micro and Small Enterprises Act 2012 provides a legal and institutional framework for the promotion, development and regulation of micro and small enterprises through several avenues: (1) by facilitating access to business development services by micro and small enterprises; (2) by facilitating formalization and upgrading of informal micro and small enterprises; and (3) by promoting an entrepreneurial culture. The Act established MSEA to, among other mandates, promote the mainstreaming of youth, gender and persons with disabilities in all micro and small enterprises activities and programmes. A key gap in the legislation is that the MSE Act 2012 focuses on the firm (it seeks to increase the number of firms and the competitiveness of the firm) rather than focusing on the business owner who is the engine behind the firm. Another shortfall is the lack of an entrepreneurship policy. An entrepreneurship policy would shift focus to the individual as the key actor, which is bound to increase supply of opportunity entrepreneurs. Currently, we have more business owners rather than entrepreneurs in Kenya.

The Sessional Paper No. 9 of 2012 on the National Industrialization Policy 2012-2030 lays emphasis on promoting and sustaining a vibrant, globally competitive and diversified industrial sector for generation of wealth and employment through the creation of an enabling environment. More specifically, the policy seeks to enhance human resource skills through development of technical, entrepreneurial, production and managerial skills for industrial development. The main shortcoming of the policy is the failure to consider the gender aspect in industrialization, which makes the policy gender-blind. The Kenya Vision 2030 recognizes the importance of entrepreneurship and advocates for its flourishing and training for MSEs to increase capacity to be able to meet their needs. The

vision requires Technical, Industrial, Vocational and Entrepreneurship Training (TIVET) institutions to play a pivotal role in improving the human resource capacity suitable for entrepreneurship while also correcting the high disparities in access and equity in education. This is critical in matching skills to market demand and helps correct informality in the long run (most young people end up in the informal or Jua Kali sector due to skills mismatch). The Kenya Vision 2030 underscores the importance of gender equity and prescribes interventions to mainstream gender in society. The policy identifies challenges that hinder women to participate in entrepreneurship, particularly access to credit and training. Therefore, the policy response of increasing funds and providing training to women entrepreneurs saw the establishment of Women Enterprise Fund (WEF) and Youth Enterprise Development Fund. The Women Enterprise Fund was established in August 2007 to promote economic empowerment of women by providing accessible and affordable credit and other support services to facilitate establishment and expansion of businesses for wealth and employment creation. The Women Enterprise Fund was established to provide accessible and affordable credit to women start-ups and existing businesses.

The Women Enterprise Fund offers several products, which include loans (Constituency Women Enterprise Scheme- CWES, LPO financing, and Bid Bond financing), capacity building and market linkages and support. Loan products under the Constituency Women Enterprise Scheme (Tuinuke loan) are channelled through registered women groups. The loan is provided to self-help groups of 10 members or more who must be comprised of either 100 per cent women or 70 per cent women and 30 per cent men. Group leadership positions and account signatories must be women and the group must have an account in a Bank/SACCO FOSA/Post Bank/Deposit Taking Micro-finance (DTM). The account must have been in existence for at least three months. In addition, the group must be trained on business management skills by the WEF officers. Loans are interest-free but only attract an administrative fee of 5 per cent of gross disbursed amount and is repayable within 1 year with a grace period of 1-2 months subject to the amount. The minimum loan is Ksh 100,000 and the maximum loan is Ksh 750,000 which can be achieved through a graduation principle.

The purpose of LPO financing is to increase the capacity of women to service tenders and meet supply requirements. Individual women who own enterprises or companies are eligible. For companies to be eligible, they must be registered but and have a membership of either 100 per cent women or 70 per cent women and 30 per cent men. Applicants are required to have a valid Local Purchase Order/Local Service Order duly signed and stamped by the procuring entity, a duly signed Letter of Undertaking and acceptable collateral as per Fund's Credit Policy, customer account details and a certified copy of the letter by the supplier

(loanee) to the procuring entity requesting payment through WEF. A maximum amount of Ksh 2 million can be disbursed. A one-off administration fee of the loan amount is chargeable for a tenor of 90 days. The amount that can be financed is 60 per cent of the LPO amount. The purpose of the bid bond is to assist women to achieve requirements of the tendering process. The product is meant for individual women who own either enterprises or companies. The minimum amount is Ksh 50,000 while the maximum amount is Ksh 2,000,000.

WEF uses a volunteerism concept to provide capacity building services. Under this, volunteers are based at the constituency level; they recruit, train, and monitor projects run and loan repayments. The training curriculum includes business skills, market access and basic ICT skills. Additionally, the fund supports women entrepreneurs to access markets important for their products and services. The fund facilitates women-owned enterprises to develop linkages with established enterprises/institutions for business and mentorship and market their products in domestic, regional and international markets. The strategies used are participation in marketing events such as trade fairs, exhibitions, conventions/conferences and road shows. Linkages are established through sub-contracting, out-sourcing, sale to government, franchising, and business mentorships or business development trainings.

Uwezo Fund was established through Legal Notice No. 21 of the Public Finance Management Act, 2014. The fund was launched on 8th September 2013 and enacted through a Legal Notice No. 21 of the Public Finance Management Act, 2014, and published on 21st February 2014. The Fund is a flagship programme of the Kenya Vision 2030 to enable women, youth and persons with disability access finances with an aim of promoting businesses and enterprises at the constituency level. The Fund is a specific intervention under the youth skills development and women empowerment programmes of the Kenya Vision 2030. The objectives of the fund are to expand access to finances for the youth, women and persons with disability at the constituency level for businesses and enterprises development, generate gainful self-employment for the youth and women and model an alternative framework for funding community-driven development initiatives. The Fund operates at the constituency level through a revolving fund where collateral free loans are advanced to beneficiaries and repaid at zero interest.

The Youth Enterprise Development Fund (YEDF) was established in 2006. It was transformed into a state corporation the following year to focus on enterprise development as a strategy of integrating youth into mainstream economic activity. Through entrepreneurship, the YEDF seeks to transform the minds of the youth from being job seekers to becoming job creators. It offers loans, business

development services, market support and linkages, commercial infrastructure and Youth Employment Schemes Abroad.

Other initiatives include the National Government Affirmative Action Fund (NGAAF), which is a successor to the Affirmative Action Social Development Fund (AASDF). The Fund was inaugurated and operationalized in July 2015 through the Kenya Gazette Notice dated 19th May 2015. The Fund is governed by the Public Finance Management Act, 2012 (National Government Affirmative Action Development), Regulations 2016. The Fund is meant to: (1) enhance access to finance for women through a revolving fund for furtherance of economic empowerment initiatives such as table banking, savings and credit cooperative organizations; (2) add value to initiatives by affirmative groups, socio-cultural development and nurturing of talent for the youth, which may include promotion of art, music and sports; and (3) enhance access to services for survivors of gender-based violence, female genital mutilation and early and force marriages through provision of legal aid, rescue centres, and shelters.

3. Literature Review

3.1 Predictors of Entrepreneurship

Parker (2018) defines an entrepreneur as a person who perceives a business opportunity and responds by establishing a business venture, while a self-employed person is one with no regular wage or salary but draws an income from a business or profession. In practice, these two concepts are used interchangeably. Both theoretical and empirical studies have identified several predictors of entrepreneurship. Such predictors include gender (Simoes et al., 2016; Cueto and Rodriguez Alvarez, 2015), social capital (Backman and Karlsson, 2016), marital status (Cueto and Rodriguez Alvarez, 2015; Wu and Wu, 2015; Leoni and Falk, 2010), family background (Krasniqi, 2014; Wu and Wu, 2015), wealth (Simoes et al., 2016), human capital (Krasniqi, 2014; Shavit and Yutchman-Yaar, 2001; Krasniqi, 2014; Backman and Karlsson, 2016), life cycles (Simoes et al., 2016; Wu and Wu, 2015) and discrimination (Backman and Karlsson, 2016; Cueto and Rodriguez, 2015). The effect of gender on entrepreneurship is ambiguous. Labour market discrimination theory (Cueto and Rodriguez, 2015; Shavit and Yutchman-Yaar, 2001) suggests a positive correlation between females and self-employment. This is explained by gender-biased practices in the labour market that discriminate against women. Self-employment constitutes an escape route out of biased labour market practices. In contrast, psychological theories predict a negative correlation between being female and starting a business, which is explained by risk aversion among women; they make choices that have risk exposure compared to men (Krasniqi, 2014).

According to family business theories, there is a negative correlation between being female and self-employment. Women tend to be “time poor” because they balance between family work and running business, although they naturally spend more time than men on domestic work. Due to this, they get into business as a last resort; they do it out of necessity and become household entrepreneurs (Kelley et al., 2010). Social capital theories ascribe more social capital to men than women because of the high density of former’s job-related social networks (private, job-related and professional) compared to women (Backman and Karlson, 2016). These social networks avail useful job market and business information. Van der Zwan, et al. (2010) found that men moved faster on the entrepreneurship ladder compared to women.

Entrepreneurship outcomes can be shaped by social and human capital. Social capital consists of private networks (family and friends), work networks (colleagues, suppliers and customers) and professional networks (occupational associations, trade unions, communities of practice, and chamber of commerce)

(Backman and Karlsson, 2016). These networks serve as conduits for job markets and business information, which enhances the ability of the receiver to identify new business opportunities. Human capital is accumulated through schooling, training and job experience (Simoes et al., 2016; Krasniqi, 2014). According to Shavit and Yutchman-Yaar (2001), the effect of human capital on entrepreneurship is unclear. However, studies have established the existence of threshold effects in the relationship between human capital and entrepreneurship (Krasniqi, 2014; Backman and Karlsson, 2016). This implies that individuals who possess very high and very low human capital are less likely to enter business compared to those with intermediate levels of human capital.

Marital status and family background have been found to significantly affect entrepreneurship (Wu and Wu, 2015; Cueto and Rodriguez, 2015). In making lending decisions, lenders consider married individuals to be financially stable (Wu and Wu, 2015). Similarly, married individuals can benefit from knowledge spillovers from their spouses (Leoni and Falk, 2010). The financial and human capital resources possessed by the husband are likely to influence the choice by the spouse between wage employment and self-employment (Caputo and Dolinsky, 1998). According to Simoes et al. (2016) and Wu and Wu (2015), the offspring and spouses of the self-employed have a higher propensity to become self-employed compared to others. This is explained by several reasons. First, it occurs through the transfer of human capital (managerial skills, knowledge, values and attitudes), social capital (inheritance of business, business contacts and networks) and financial capital (access to wealth or income). Finally, children (and spouses) may be inspired by their parents (spouses) into business through role modelling.

According to lifecycle theories, age is an important determinant of entrepreneurship (Van der Zwan et al., 2010). Many studies have established a curvilinear relationship between the two variables (Krasniqi, 2014; Simoes et al., 2016; Wu and Wu, 2015). The positive relationship is explained by the fact that accumulation of human, social and financial capital increases with age. As people age, they acquire more education, experience and networks. This process continues until middle age when the relationship is reversed (Krasniqi, 2014). The negative relationship after the threshold is explained by certain attributes that accompany old age, such as lower aspiration levels, lower dynamism, higher risk aversion, less time to recover initial investment, lower physical and mental ability and failing health (Krasniqi, 2014; Simoes et al., 2016).

According to discrimination and disadvantage theories (Backman and Karlson, 2016), groups that suffer from exclusion and marginalization (immigrants, women, ethnic minorities) seek entrepreneurship for upward social mobility (Shavit and Yutchman-Yaar, 2001; Cueto and Rodriguez, 2015). Because of

cultural barriers, prejudice, labour market regulations, language barriers, lack of business and business contacts, these individuals set up survivalist (necessity) enterprises because the owners are pushed into business.

3.2 Gender and Access to Financial Capital

Microeconomic theory identifies finance as one of the factors of production – suggesting that financial constraints can hinder growth of firms (Atiase et al., 2018). At the start-up stage, access to finance is critical. It is also critical in order to spur business growth and sustainability. In this regard, firms require access to commercial debt, leasing, supplier financing and equity financing. It has been documented that most small businesses face challenges in accessing bank credit because formal financial institutions avoid dealing with them due to their opacity (Moyi, 2019). Many studies have established a positive correlation between access to financial capital and entrepreneurship (Simoes et al., 2016; Khera, 2018). Paulson and Townsend (2004) found that wealthier households were more likely to start and invest in their businesses as opposed to poor households while Hessels et al. (2008) found that entrepreneurs from wealthier regions had better access to resources, knowledge and technology and may better strive for innovation and growth within their firm. Using data from 18 European countries, Rusu and Roman (2017) established a positive and statistically significant correlation between entrepreneurship and access to finance. These findings can be explained by the fact that households with more wealth can use own capital to start a business. Similarly, more wealth can be translated into more bank collateral, which enhances the credit score for the potential borrower.

Evidence suggests that access to finance among women and men is unequal (Diagne and Zeller, 2001; Elahi et al., 2017). There exists significant differences between men- and women-owned businesses regarding the use of debt capital (Coleman and Robb, 2009; Robb and Wolken, 2002; Constantinidis et al., 2006; Fairlie and Robb, 2009 and Chaudhuri et al., 2018) and credit (Carrington, 2006; Treichel and Scott, 2006). Women-owned firms have a higher loan denial rate (Cavalluzo, Cavalluzo and Wolken, 2002), a lower loan application rate (Carrington, 2006; Treichel and Scott, 2006), and if approved for a loan they receive smaller amounts than men-owned firms (Treichel and Scott, 2006) from formal sources, indicating credit market discrimination (Muravyev et al., 2009). Moreover, women-owned enterprises particularly suffer from difficulty in obtaining credit from formal sources (Berger and Udell, 2006) and they start their firms with a lower level of financing than men (Alsos et al., 2006). Women-owned businesses are less likely to raise capital from external sources (Constantinidis et al., 2006; Fairlie and Robb, 2009; Robb and Walken, 2002) even in the subsequent phases of their

businesses life cycle (Coleman and Robb, 2009). Usage of personal loans (from family and friends) is higher among women-owned businesses compared to men-owned businesses (Coleman and Robb, 2009).

The reasons for gender gaps in access to credit may stem from both the supply and demand sides of the credit market. In a pioneering work, Becker (1957) emphasized taste-based discrimination not explained by economic motivations but related instead to lenders' preferences and cultural beliefs about gender (Muravyev et al., 2009). Various studies have extended this argument to bank-level discrimination against loan applications from women-led businesses. Taste-based discrimination theory argues that bankers have their own taste and perspective regarding borrowers' gender (Aristei and Gallo, 2016; Pham and Talavera, 2018). Further, lenders might engage in statistical discrimination (Arrow, 1973) by using personal characteristics such as gender and believe that women are more likely to default. Demand-side gender biases explain the lower number of credit applications from women-led businesses due to the fear of refusal. Lower demand for credit by women-owned firms arise due to certain characteristics such as small size of business, the risk-averse attitude of women, which becomes one of the drawbacks hindering them from applying for credit (Stefani and Vacca, 2015), perceiving themselves to be less creditworthy (Watson and Robinson, 2003), perceiving financial barriers that do not exist, lack of self-confidence (Scott and Roper, 2009) and sector of activity; i.e. the retail trade and service industries (GEM, 2013; Unioncamere, 2014).

Financial discrimination is due to social structures that confer superior rights over collateralizable assets such as land to men (Mpuga, 2010). Similarly, financial discrimination theories argue that applications for loans by women are rejected on the basis that they are unable to control household income (Armendariz and Morduch, 2010). This is exemplified by gender constraints to finance in Botswana where women entrepreneurs have less access to start-up capital and formal sources of finance than their male counterparts (Brixiová and Kangoye, 2016). In addition, women start their businesses with slightly less capital than men. Impact evaluations of the gender gaps in access to finance have started to reveal positive results. For instance, evidence from India shows that financial access targeted to women led to growth in GDP by 1.6 per cent and reduced unemployment by 5 per cent (Khera, 2018).

Studies of gendered credit constraints in Sub-Saharan Africa found that female-owned firms suffer a disadvantage. For instance, Hansen and Rand (2014), Asiedu et. al. (2013) and Wellalage and Locke (2017) found that female-owned firms were relatively more credit-constrained than male-owned firms. However, the study by Hansen and Rand (2014) did not find any gender effects when formal

financial access data was used. Aterido et al. (2013) established that female-owned businesses were less likely to have formal education and use formal bank credit compared to male-owned ones. In addition, the gender gap in access to formal banking services in Kenya (11%) was higher than in Botswana (2%).

3.3 Effectiveness of Credit in Boosting Entrepreneurship

Relevant studies in this area were conducted to test the assertion that microcredit was among the most effective pro-poor interventions. Given this fact, studies on the impact of credit on entrepreneurship are not many. These studies apply econometric approaches that control for endogeneity bias arising from self-selection and reverse causality. The most common approach that has been used is propensity score matching, which estimates causal treatment effects. A study of the impact of government-supported participatory loans on the growth of entrepreneurial ventures in Spain shows that government-supported participatory loans boosted beneficiaries' employment and sales (Bertoni et al., 2019). Firms receiving participatory loans experienced significantly higher growth in employment and sales than did their matched firms. Evidence from Bangladesh indicates that microfinance reduced poverty through entrepreneurship, though it created necessity entrepreneurs, thus raising doubts on the capacity of microfinance to promote sustainable business enterprise (Dutta and Banerjee, 2018).

Evidence from Sri Lanka suggests that microfinance positively impacted savings and per capita incomes, thereby promoting household welfare status (Silva, 2012). Cintina and Love (2017) found no significant increase in household total expenditure, although microfinance increased expenditures on durable goods, home repairs, festivals and temptation goods. Evidence from Bangladesh indicates that larger loans from microfinance sources increased incomes, but there was likelihood for the increase in income to be dampened by less business innovation (Ferdousi, 2015). This was taken to mean that innovation was important for access and use of credit. In Sub-Saharan Africa, Aterido et al. (2013) established that use of mobile phones was correlated with formal banking services. Mobile phone ownership can be seen as a tool that reflects adoption of new technologies and access to bank delivery channels.

Evidence from Mali suggests that positive impacts of microfinance on poverty tend to favour women rather than men (Koloma and Alia, 2014). In addition, there are intertemporal and spatial effects because men benefit in the short-term while women benefit in the long-term. Microfinance only benefits men in the rural areas. Evidence from Indonesia shows that microfinance does not necessarily have

a positive impact on poverty (Takahashi et al., 2010). The impact of microfinance on various household incomes was statistically insignificant, except for the sales of non-farm enterprises for the non-poor and schooling expenditures for the poor. In Korea, credit guarantees increased the size of firms and their survival (Oh et al., 2009). However, credit guarantees failed to boost research and development, investment and growth in productivity.

4. Methodology

4.1 Estimation of Treatment Effects

This paper seeks to determine whether access to government credit (a treatment) has gendered effects on entrepreneurship (an outcome). Since this study uses observational rather than randomized data, this objective is approached from the viewpoint of Neyman-Rubin's counterfactual framework, which is also termed the potential outcome causal model[3]. The model links the cause (also termed the treatment, t_i) on individual *i* to the outcome, y_i. There are two states for the cause: the treatment state, t_i , and non-treatment state, $1\text{-}t_i$ (also termed the control). There are also two states for the potential outcome: the outcome resulting from the treatment, y_{1i} , and the potential outcome in the absence of the treatment, y_{oi}. This latter outcome is termed the counterfactual[4], which is unobservable. The relationship between the observed outcome, y_i , the two potential outcomes, y_{oi} and y_{1i}, and the assignment mechanism, t_i, can be expressed as a switching regression in equation 1.

$$y_i=t_i y_{1i}+(1-t_i)y_{oi} \qquad (1)$$

Intuitively, equation (1) says that to infer causality between t_i and y_i, the analyst cannot directly link y_{1i} to t_i under $t_i=1$. Instead, the outcome of y_{oi} under the condition that $t_i=0$ should be established as well. After accounting for the counterfactual, causality can be inferred by comparing y_{1i} and y_{oi}. However, the main problem with (1) is that only one of the potential outcomes is observed for each individual *i*. The counterfactual is not observed, implying that it is not possible to estimate the individual treatment effect. This can only be solved by using population average treatment effects. Since y_{oi} is not observed, the Neyman-Rubin's counterfactual framework prescribes that the counterfactual can be proxied by averaging out the outcome of the non-treated participants. Therefore, the key estimated measures in this study are average treatment effect among those that receive treatment (ATET) and the average potential outcome mean (POM). ATET is defined below (E refers to expectation);

$$ATET=E(y_{1i}-y_{oi}\,|t_i=1) \qquad (2)$$

To estimate ATET, the method of propensity score matching (PSM) will be used. A propensity score is the conditional probability of receiving treatment, given the pre-treatment characteristics of individual *i* (Rosebaum and Rubin, 1983).

3 This is consistent with previous studies evaluating the impact of microfinance, including Imai and Arun (2008), Setboonsarng and Partiev (2008), Aroca and Hewings (2009), Islam (2011), De Silva (2012), Koloma and Alia (2014), Cintina and Love (2017).

4 A counterfactual is a potential outcome or the state of affairs in the absence of the cause (Guo and Fraser, 2014).

Equation (2) can also be written as:

$$ATET = E(y_{1i} \mid t_i=1) - E(y_{oi} \mid t_i=1) \quad (3)$$

The first potential mean in equation (3) can be observed. However, the second potential mean in the same equation cannot be observed. This is because one person cannot be both treated and untreated at the same time. It is not possible to observe how those who took treatment would have looked in the counterfactual state. Since the counterfactual mean of those being treated, $E(y_o \mid t=1)$, is unobservable, a substitute can be used to estimate ATET. Using $E(y_o \mid t=0)$ to substitute for $E(y_o \mid t=1)$ in non-experimental studies is a bad idea because of selection bias, which is introduced via potential correlations between the treatment decision and the outcome variable of interest. According to Angrist and Pischke (2008), the amount of selection bias (SB)[5]is given by:

$$SB = E(y_{oi} \mid t_i = 1) - E(y_{oi} \mid t_i=0) \quad (4)$$

To deal with selection bias in non-experimental studies, equation (3) should satisfy two conditions: 1) Conditional independence (CI) assumption[6]; and 2) Common support (CS) condition[7]. The CI assumption can be expressed as:

$$(y_o, y_1)\, t \mid X \quad (5)$$

The CI assumption states that given observable characteristics *X*, the assignment of the study participants to treatment ($t_i=1$ if treated, 0 otherwise) is independent of the outcome of non-treatment (y_o) and the outcome of treatment (y_1).Therefore, if covariates are held constant, assignment to treatment is independent of potential outcomes. Accounting for the propensity score, the CI assumption can be re-stated as;

$$y_o, y_1 t \mid p\ (X) \quad (6)$$

The CS assumption can be expressed as:

$$0 < pr(t_i = 1 \mid X) < 1 \quad (7)$$

The CS condition ensures that for each value of *X*, there are both treated and

5 Given the type of data used by our study, which is not randomized, the study is exposed to potential SB occasioned by (1) self-selection of beneficiaries; (2) self-selection by the lender of participants; (3) self-selection of locality of operation.

6 This assumption is also called the ignorable treatment assignment assumption, unconfoundness, selection on observables and exogeneity (Guo and Fraser, 2014).

7 This is also called overlap or matching condition.

untreated individuals. Conversely, every participant can be matched to a non-participant with similar *X*. Once the CI and CS conditions are satisfied, the propensity score matching estimator for the ATET can be written as:

$$ATET \hat{} PSM = E[y_{1i} \mid p_i(X), t_i = 1] - E[y_{oi} \mid p_i(X), t_i = 0] \quad (8)$$

Equation (8) says that the average treatment effect on the treated using the PSM estimator is given by the difference between mean values over the common support, weighted by respective propensity scores. At the operational level, *y_0* and *y_1* are the potential outcomes (entrepreneurship) for the two states (access and no access to government credit).The impact of microcredit on entrepreneurship is the expected difference in the choice of entrepreneurship for the i^th individual, given the distribution of the probability to receive credit, and for the same beneficiary without access to credit given the same distribution. Propensity scores are derived as follows:

$$p(X)\ Pr(t = 1 \mid X) = E(t|X) \quad (9)$$

In estimating the propensity scores, choice for the model is made with considerations on any discrete choice models in principle. Preference for logit or probit models (compared to linear probability models) is drawn from the shortcomings of the linear probability model (LPM), such as the unlikeliness of the functional form when the response variable is highly skewed and predictions that are outside the *[0, 1]* bounds of probabilities (Caliendo and Kopeinig, 2005). In situations where the choice is a binary treatment case, and where probabilities of participation vs non-participation are required, logit and probit models regularly yield similar results. The choice between the two may not be too critical. Our study prefers the probit model.

4.2 Measurement of Variables

To determine the impact of government credit on entrepreneurship, the main outcome variables in this study are opportunity entrepreneurship and necessity entrepreneurship. To ascertain robustness of our results, we also use other proxies for entrepreneurship, including sales revenue, employment growth and productivity as documented in other existing literature on the same. The variable entrepreneurship was constructed by using responses to the question “What were the reason(s) for starting a business?”. This question had ten options but elicited a single response. One is considered an opportunity entrepreneur if the reason for starting a business was any of the six factors: (1) high demand/ready market;

(2) influenced by advertisements; (3) whether there exists high demand/ready market for the good/service in consideration; (4) better income; and (5) one prefers self-employment (Caliendo and Kritikos, 2009; Giacomin et al., 2011). The variable is captured as a dummy with 1 if owner is an opportunity entrepreneur, 0 if otherwise. One is considered a necessity entrepreneur if the reason for starting a business was any of the three factors: (1) family has worked in this activity; (2) there is availability of capital; and (3) one has no other alternative (Caliendo and Kritikos, 2009; Giacomin et al., 2011). The variable is also captured as a dummy with 1 if owner is a necessity entrepreneur, 0 if otherwise.

The variable sales revenue describes the total sales of goods and services for the previous month which includes sales on credit (Brixiová, and Kangoye (2016); Bertoni et al., 2019). Employment growth denotes the growth the firm in terms of the increase in the number of employees from inception to 2016. Following Evans (1987) growth was computed as follows:

$$(LogE_c\text{-}logE_s)/age \qquad (13)$$

Where E_c is the current number of employees, E_s is the number of employees at birth. Age is the number of years from birth (inception) to the year 2016. We follow Bokpin (2017) to define productivity as.

((Total sales of goods and services for the previous month))/(Number of employees) *(14)*

Intuitively, these variables are considered to indicate if significant changes have been recorded in the sales revenue, employment numbers or productivity of the establishment following (attributed to) benefitting from government credit. Access to government credit is considered our outcome variable in the analysis. Several studies establish significant correlation between access to credit and the rate of entrepreneurship (Dutta and Banerjee, 2018; Bertoni et al., 2019). The variable access to public credit was constructed by combining responses from three questions that asked respondents to indicate their source of initial capital, additional capital and credit. Access to public credit was coded 1 if the respondent had obtained either initial capital, additional capital and credit from government agencies (public financing agencies, public enterprise funds, government loan, postal savings).

Our independent variables in the probit regression include entrepreneur and firm characteristics such as gender, education, firm age, firm size, ownership structure, formality status, account ownership, innovation and usage of mobile phone. Gender is a strong predictor of access to finance (Wellalage and Locke,

2017; Indunil De Silva, 2012). Gender is coded 1 if the owner(s) are male and 0 if otherwise. Education is recorded as 1 if the business owner/co-owner/manager has some education and 0 if otherwise. Age of the firm is the number of years from birth (inception) of the establishment to the year 2016 (Evans, 1987; Brixiová and Kangoye, 2016). Age is log-transformed to test the existence of quadratic effects in the relationship between access to credit and age. Ownership structure of the establishment is coded 1 if the establishment was a family business, group business, partnership, co-operative or company and 0 if otherwise. Asiedu et al. (2013) found that ownership influences access to finance. Formality status of the establishment was coded 1 if the establishment was registered by the registrar of companies, 0 if otherwise. Size of the establishment receded as 1 if the firm was micro (1 to 10 employees) and 0 if otherwise. The inclusion size is consistent with Brixiová and Kangoye (2016) and Asiedu et al. (2013). Since loans are usually channelled through financial institutions, ownership of an account has been found to be an important determinant of access to finance (Dutta and Banerjee, 2018). We capture account ownership as a dummy, where 1 indicates that the establishment owns a bank account while 0 denotes otherwise.

Innovation is also considered an important attribute of entrepreneurship according to Ferdousi (2015). The variable Innovation combines responses to three questions on product, process and marketing innovation. It is denoted as 1 if establishment had exhibited product, process and marketing innovation and 0 if otherwise. Product innovation was coded 1 if the respondents indicated that they had either introduced a new product or significantly improved the product between 2013 and 2015, and 0 if otherwise. Process innovation was coded as 1 if the respondents indicated that they had either introduced a new process or significantly improved the process between 2013 and 2015, and 0 if otherwise. Marketing innovation was coded as 1 if the respondent indicated that they had either introduced a new marketing technique or significantly improved the technique between 2013 and 2015 and 0 if otherwise. Regarding ownership of mobile phones, the variable is captured as a dummy, with 1 indicating that the establishment had a dedicated mobile telephone for business during the year 2015 and 0 if otherwise.

4.3 Data Sources

The study used the MSME 2016 survey data whose scope was national and contains information on the characteristics, operations, dynamics and evolving nature of MSMEs in Kenya. The survey used stratified random sampling design to obtain samples of licensed establishments and stratified multi-stage cluster sampling design to obtain samples of unlicensed establishments. Structured questionnaires were administered to both licenced and unlicensed businesses. The

unit of observation was the establishment rather than the enterprise. For survey purposes, an establishment was defined as an economic unit that produces and/or sells products and operates from a single physical location (KNBS, 2016). If a business, enterprise or firm has several such locations, each is termed a separate establishment.

Two sampling frames were used to obtain samples of licensed establishments (establishment-based sampling frame) and unlicensed establishments (household-based sampling frame). Establishment level used stratified random sampling along the following steps: (i) A list of enterprises was obtained from county government registers; (ii) Merger of data from 47 counties, large firms removed; (iii) Merged data was classified using International Standard Industrial Classification - ISIC codes; (iv) The square root allocation method was used to allocate the sample to the 47 counties and the ISIC categories; (v) 13,093 establishments were successfully interviewed. The National Sample Survey and Evaluation Programme V (NASSEP V) sampling frame was used to obtain households by applying a stratified multi-stage cluster sampling approach along the following steps: (i) The country was divided into 47 counties; (ii) each county divided into rural and urban strata except Nairobi and Mombasa; (iii) Strata were divided into clusters. This process produced 600 clusters (354 urban, 246 rural); (iv) Systematic sampling was used to obtain 24 households for each cluster; (v) 11,071 households were successfully interviewed.

5. Results and Discussions

5.1 Descriptive Statistics

Appendix 1 presents the descriptive statistics of the variables. The results show that employee growth was 14 per cent, on average. The incidence of opportunity entrepreneurship was 58 per cent while necessity entrepreneurship was 23 per cent, which suggests that the proportion of growth-oriented establishments was relatively higher than the proportion of survivalist establishments. This is good for private sector growth because it is opportunity entrepreneurs who possess the attribute of discovering, assessing and exploiting opportunities. As such, opportunity entrepreneurs are associated with the Schumpeterian dynamism that is fuelled by innovation, productivity growth and structural transformations. The mean sales revenue was Ksh 217,804 while the mean level of productivity was Ksh 17,007 per employee. The results show that penetration of affirmative government funds is still shallow, with only 2 per cent of the establishments having benefitted from these funds. Of the establishments that accessed government credit, 80.6 per cent were opportunity entrepreneurs while 19.4 per cent were necessity entrepreneurs. Most establishments (92%) were small-sized, with women being more inclined towards micro activities. This implies that most firms in the sector do not benefit from economies of scale. The prevalence of registered firms was 23 per cent, with male-owned establishments being more likely to be registered (27%) compared to women-owned establishments. Such high level of informality among MSMEs denies them access to credit, technology and government institutions and services. In addition, this implies that these establishments are insulated from government regulation and they evade taxes. About 49 per cent of the establishments owned a bank account, which is good for financial inclusion. Gender discrimination in entrepreneurship is reflected by the fact that 65 per cent of the establishments were male-owned, which is not good for equity. About 12 per cent of the establishments were involved in innovation of some sort (product, market or process), 47 per cent of the establishments owned a dedicated mobile phone for use in the business, and 94 per cent of the firms have owners/managers/co-owners with some education (primary, vocational, secondary or university/college). Given very high standard deviations reported in Appendix 2, we can deduce that establishments in Kenya are very heterogenous.

5.2 Correlation Matrix

Appendix 2 shows that most of the correlation coefficients reported in Appendix 3 are below 0.5. High correlations are between log age and log age squared (r=0.96), which is expected because the latter variable is derived from the former. Given

these low correlations, we can conclude that multi-collinearity is not likely to bias the regression results.

5.3 Results and Discussions

This section presents the probit estimates of the probability that the respondent accessed public funds. It reports results from impact assessment using propensity score matching and Nearest-Neighbor Matching, Kernel Based Matching, and Stratification matching. This allows us to determine whether our results are robust across different approaches.

5.3.1 Probability of accessing public funds

Estimates of the probit regression equation are presented in Table 1. Wald Chi square statistic and its associated p-value show that the model is statistically significant at 1 per cent level. What this means is that we reject the null hypothesis that all coefficients associated with independent variables are jointly equal to zero.

Table 1: Probit estimates of the probability of accessing public funds

Variables	**Regression dydx(*)**
Age of the establishment	0.00 (0.004)
(Age of the establishment)^2	-0.00 (0.001)
Ownership structure	0.00 (0.003)
Formality status	-0.00 (0.002)
Size of the establishment	-0.01 (0.005)
Account ownership	0.01*** (0.002)
Innovation	0.01*** (0.004)
Mobile phone	0.002** (0.002)
Education of the owner	0.01*** (0.003)
Gender of the owner	0.00 (0.002)

Observations	16,209
Wald Chi^2	214
p-value	0.01
Pseudo R^2	0.102

Robust standard errors are in parentheses. ***, ** and * indicate statistical significance at 1%, 5% and 10%, respectively.

The results presented in Table 1 show that the estimated marginal effect of gender is close to zero, positive but statistically insignificant at conventional levels. This means that female- and male-owned establishments have equal access to government affirmative funds. We therefore fail to detect any significant gaps between the two groups of establishments and conclude that access to government credit is not influenced by gender. This finding seems to agree with the study by Hansen and Rand (2014), which established that there were no gender differences when finance was accessed from formal sources. This result may reveal government commitment to its own gender policy, which prescribes gender equality. We also establish that ownership of an account, innovation and mobile phone ownership are significant determinants of access to government-supplied credit. Establishments with bank accounts have a 1 per cent higher likelihood of borrowing from government than those lacking a bank account. This could be attributed to the requirement by government institutions that loan applicants must have bank accounts for ease of channelling loan cash. This finding is similar to Dutta and Banerjee (2018), who found that ownership of an account was significantly correlated with financial inclusion.

Establishments that had undertaken some form of innovation (whether product, market or process) were 1 per cent more likely to get government credit than non-innovators. This is an indicator that establishments that innovate require more resources to facilitate them in achieving their entrepreneurial outcomes and would proactively look out for this support, including from government sources. These results are consistent with the findings by Ferdousi (2015). Ownership of mobile phones compared to non-ownership was found to increase the chances of borrowing from government by 0.2 per cent. This finding entrenches the role of embracing technology (in this case a mobile phone) as a communication and facilitative aid to accessing credit. This result corroborates results of Aterido et al. (2013). The coefficient on education is 0.01 and statistically significant. This implies that establishments whose owners are educated rather than non-educated have a 1 per cent higher chance of borrowing from the government. This result can be explained by the fact that educated persons are more likely to be financially literate and tend to possess better management skills.

5.3.2 Impact of government credit on entrepreneurship

Table 2: Impact of government credit on entrepreneurship

Matching Algorithm	Outcome variables	Treated (N)	Control (N)	ATET	t-values
Nearest Neighbour Matching (NNM)	Opportunity entrepreneurship	450	13,727	0.05	1.64
	Necessity entrepreneurship	450	13,727	-0.02	-1.06
	Growth	450	7,454	0.07	4.60
	Sales revenue	450	13,173	-993,000	-7.49
	Productivity	450	13,173	-60,800	-4.95
Kernel-Based Matching (KBM)	Opportunity entrepreneurship	450	23,714	0.03	1.70
	Necessity entrepreneurship	450	23,714	-0.06	-2.63
	Growth	450	23,714	0.07	3.22
	Sales revenue	450	23,714	-38,700	-1.01
	Productivity	450	23,714	-2,696	-1.01
Stratification Matching	Opportunity entrepreneurship	292	15,917	0.03	0.64
	Necessity entrepreneurship	292	15,917	-0.04	-3.71
	Growth	292	15,917	0.06	4.62
	Sales revenue	292	15,917	-262,000	-2.55
	Productivity	292	15,917	-6,554	-2.76

Table 2 presents results of the impact of government credit using different measures of entrepreneurship and different matching algorithms. Generally, evidence shows that government credit does not necessarily increase the rate of entrepreneurship. The results indicate that access to government credit does not significantly affect the rate of opportunity entrepreneurship using three different algorithms. Interestingly, government credit significantly reduced the rate of necessity entrepreneurship using kernel-based matching and stratification matching. In this case, access to government credit reduced the chances of the owners being necessity entrepreneurs by 4 per cent to 6 per cent. However, using the Nearest Neighbour Matching (NNM), we fail to detect any impact of government credit on necessity entrepreneurship. These findings may be taken to indicate that government credit has been used to discourage necessity entrepreneurship but has failed to spur opportunity entrepreneurship. The failure of government credit to impact opportunity entrepreneurship may be attributed to the low

penetration of such credit. Out of the sample of 24,164 establishments, only 2 per cent had accessed government credit. The negative impact of government credit on necessity entrepreneurship is not surprising. Access to govern credit requires applicants to have an account at a financial institution and to be registered. Since necessity entrepreneurs are more likely to be informal, they are less likely to hold a business account and less likely to be registered. These two factors may lower their chances of accessing government credit.

Generally, using proxies of entrepreneurship (employment growth, sales revenue and productivity) yields inconsistent results. Whereas government credit spurs growth of establishments, it is also associated with reduced sales revenues and lower productivity. Establishments that have accessed government credit have 6 per cent to 7 per cent higher chances of growing (Nearest Neighbour Matching, Kernel-Based Matching and Stratification Matching). This indicates that access to government credit is good for growth outcomes of establishments. These findings on employment growth are consistent with Bertoni et al. (2019). However, the use of government credit is associated with Ksh 993,000 to Ksh 262,000 lower sales revenue and Ksh 60,000 to Ksh 6,554 decline in productivity. This can be taken to mean that usage of government credit acts as a revenue and productivity disincentive. This may be attributed to the perception among borrowers that government money is some sort of "free lunch", since the repayment terms are lax compared to commercial loans. Therefore, they do not work harder to service the loans, which shows up in lower productivity and sales.

5.3.3 Impact of government credit on male- and female-owned entrepreneurship

Table 3 reports impact of government credit on entrepreneurship when gender of the manager/owner of the establishment is male.

Table 3: Impact of government credit on male entrepreneurship

Matching Algorithm	Outcome variables	Treated (N)	Control (N)	ATET	t-values
Nearest Neighbour Matching (NNM)	Opportunity entrepreneurship	203	5,688	0.04	1.02
	Necessity entrepreneurship	203	5,688	-0.04	-1.74
	Growth	203	3,200	0.08	3.61
	Sales revenue	203	5,491	35,915	0.44
	Productivity	203	5,491	-2,977	-1.03
Kernel-Based Matching (KBM)	Opportunity entrepreneurship	203	11,729	0.04	1.06
	Necessity entrepreneurship	203	11,729	-0.08	-2.47
	Growth	203	11,729	0.08	3.98
	Sales revenue	203	11,729	-49,300	-1.36
	Productivity	203	11,729	-4,317	-2.05
Stratification Matching	Opportunity entrepreneurship	194	10,128	0.03	0.85
	Necessity entrepreneurship	194	10,128	-0.06	-2.38
	Growth	194	10,128	0.08	3.80
	Sales revenue	194	10,128	-339,000	-2.31
	Productivity	194	10,128	-7,531	-2.39

The results in Table 3 indicate that the main impact of government credit was to reduce the incidence of necessity entrepreneurship but failed to spur opportunity entrepreneurship. Establishments that used government credit had between 4 per cent to 8 per cent lower chances of the owners/managers being necessity entrepreneurs. This implies that male-owned establishments that access government credit are significantly less likely to be necessity entrepreneurs, meaning they are more likely to be pull entrepreneurs. Applying proxies of entrepreneurship (employment growth, sales revenue and productivity) again yields inconsistent results. Government credit among male-owned establishments leads to increase in employment growth by 8 per cent but to decrease in sales revenue and productivity. In this case, sales revenues fall by Ksh 339,000 and productivity by between Ksh 4,317 to Ksh 7,531 per employee.

Table 4: Impact of government credit on female entrepreneurship

Matching Algorithm	Outcome variables	Treated (N)	Control (N)	ATET	t-values
Nearest Neighbour Matching (NNM)	Opportunity entrepreneurship	99	2,648	0.04	0.60
	Necessity entrepreneurship	99	2,648	0.02	0.74
	Growth	99	1,139	0.04	1.10
	Sales revenue	99	2,537	-3,040,000	-15.69
	Productivity	99	2,537	- 176,000	-16.41
Kernel-Based Matching (KBM)	Opportunity entrepreneurship	99	6,410	0.00	0.06
	Necessity entrepreneurship	99	6,410	-0.02	-0.28
	Growth	99	6,410	0.04	1.86
	Sales revenue	99	6,410	-28,700	-1.10
	Productivity	99	6,410	-11,100	-0.04
Stratification Matching	Opportunity entrepreneurship	98	5,789	0.00	0.03
	Necessity entrepreneurship	98	5,789	0.01	0.21
	Growth	98	5,789	0.04	1.16
	Sales revenue	98	5,789	- 80,400	-2.11
	Productivity	98	5,789	- 4,248	-1.36

Table 4 presents the results of impact of government credit on entrepreneurial outcomes when gender is female. The findings indicate that access to government credit failed to spur both opportunity and necessity entrepreneurship. However, government credit leads to employment growth of 4 per cent but to declines in both productivity and sales revenue. Productivity declines by Ksh 176,000 per employee while sales revenue declines by between Ksh 80,400 and Ksh 3,040,000. In general, this finding indicates that access to government credit yields the desired outcomes for female-owned establishments. While this may be surprising to policy makers and is against the expectations of government interventions, the results are consistent to Takahashi et al. (2010) who established that micro-finance did not impact positively on poverty.

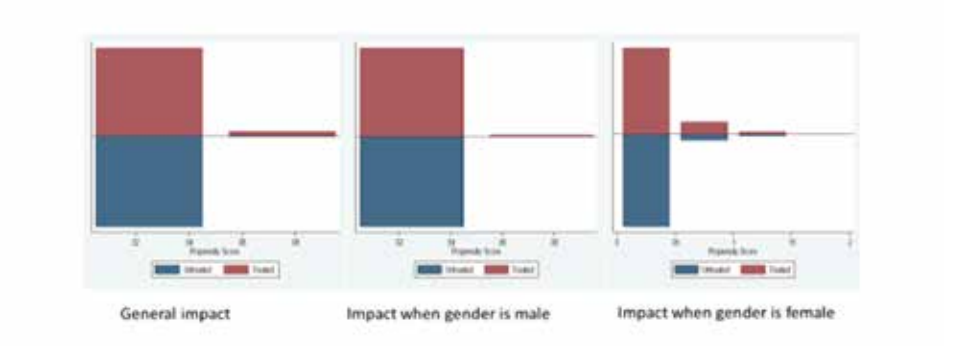
By comparing the results in Tables 3 and 4, it can be concluded that government credit leads to gendered outcomes. The only exception is the common finding regarding the impact of government credit on opportunity entrepreneurship. Whereas government credit is associated with positive employment growth

outcomes, the impact is much stronger for male-owned compared to female-owned establishments. This can be explained by many factors. First, male entrepreneurs not only apply for more amount of credit compared to female entrepreneurs, but they also receive more amount of credit (Appendix 1). Secondly, male-owned establishments are more productive, are much older and larger in size relative to female-owned establishments. These factors imply that male-owned establishments can better use the funds borrowed because they have the experience, they are more efficient and benefit from scale economies. Third, female-owned establishments are more likely to be informal. Informality confers to these establishments several disadvantages, including working in less safer areas, less access to credit, less access to public and private services, less access to technology and markets. The effects of government credit on necessity entrepreneurship in male-and female-owned establishments are also asymmetric. Whereas government credit is associated with negative impacts on male necessity entrepreneurship, such effect on female necessity entrepreneurship is absent. Similarly, we find the negative impact of government credit on both sales revenue and productivity more stronger among female-owned establishments compared to male-owned establishments.

5.3.4 Balancing test

Figure 1 shows balancing test for general impact and impact(s) when gender is male and female.

Figure 1: Balancing test



In all the scenarios, the test for balancing indicates that majority of treated and untreated units have low propensity scores between 0 and 0.04. It is therefore easy to find matches between treated and untreated units with low propensity scores.

Additionally, treated and untreated units when gender is female have slightly diverse propensity scores ranging from 0 to 0.15. From the graphs, treated and the untreated units were largely within the region of common support, indicating that all treated individuals have corresponding untreated individuals.

6. Conclusions and Recommendations

6.1 Conclusions

The purpose of this study was to investigate the gendered effects of government supplied credit on entrepreneurship in Kenya. Specifically, it sought to answer the following questions: (1) To what extent does gender influence access to government affirmative action funds?; (2) To what extent does government-supplied credit impact the rate of entrepreneurship? and (3) To what extent does gender influence the impact of government supplied credit on entrepreneurship. The study used cross-sectional data collected by the Kenya National Bureau of Statistics in 2016. It applied probit regressions to address question 1 and propensity score analysis to answer questions 2 and 3. In response to the first question, the study established that access to government credit was not gendered, implying that both male- and female-owned establishments had an equal opportunity to access government credit. In response to the second question, the study confirmed that government-supplied credit had no impact on opportunity entrepreneurship but government credit negatively impacted necessity entrepreneurship. Access to government credit, however, strongly impacted employment growth of the establishments. Finally, a gender analysis of the impact of government credit on entrepreneurship revealed that male-owned establishments that had access to government credit exhibited reduced chances of being necessity entrepreneurs, meaning that they tended towards opportunity entrepreneurship. In addition, male-owned establishments that had access to government credit experienced growth in employment while access to government credit failed to impact entrepreneurial outcomes amongst female-owned establishments.

6.2 Policy Recommendations

This study established gender parity in access to government-supplied credit. This finding can be contrasted against previous evidence, which shows that women-owned establishments suffer a disadvantage in private credit markets. The current study shows that government-supplied credit could be one of the effective channels that governments can use to achieve gender equity. Some of the approaches that have been used to supply government funds include targeting special interest groups, exploiting group dynamics, offering capacity building and market linkages, facilitating commercial infrastructure, and many others. Therefore, banks can be encouraged to adopt some of these approaches to enhance financial inclusion and address financial discrimination among women. Since access to government-supplied credit is enhanced by factors such as ownership of a bank account, innovation, mobile phone ownership and education, there

is need to review the requirements for opening an account, provide incentives to innovating firms and deepening digitalization by lowering taxes, especially for micro and small establishments. Lending institutions can be encouraged to provide financial literacy services to their potential clients, especially women and small businesses. This enhances their level of awareness regarding the scope of financial products, their terms, application requirements and so on.

This study has established that access to government credit does not necessarily increase the rate of entrepreneurship. In fact, the impact of government credit on entrepreneurship varies by type of entrepreneurship (opportunity vs necessity), by gender of owner, by the algorithm used and by the measure of entrepreneurship applied. These sets of mixed results imply that affirmative government credit is not delivering the desired outcomes on entrepreneurship as initially envisaged. There is need to rethink the conceptualization, design and implementation of these programmes with more focus on desired outcomes. Evaluation of these programmes should shift from simple output-based measures such as number of borrowers, and loan repayments towards more outcome and impact-oriented measures such as rate of entrepreneurship, employment growth, productivity, efficiency, and many others. In addition, robust impact evaluation approaches should be used to assess the policy impact of these affirmative interventions.

6.3 Areas for Future Research

Further research should delve into robust impact evaluation of government affirmative credit by undertaking randomized control trials. This can be extended to other sources of credit including banks, microfinance institutions, cooperatives, non-bank financial institutions (NBFIs), Non-Governmental Organizations (NGOs) and informal lenders. A comparison of the impact of the diverse sources of credit would help the government to understand whether the provision of social credit is cost effective, efficient and effective relative to other lenders.

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Appendices

Appendix 1: Mean differences between men-owned and women-owned establishments

	All	Male	Female	Difference
Opportunity entrepreneur (%)	58	59	57	2** α
Necessity entrepreneur (%)	23	22	24	2*** α
Productivity	17,007	19,631	12,185	7,446*** β
Business growth	0.59	0.63	0.51	0.12*** β
Formality status (%)	23	27	17	10*** α
Age of business	7.9	8.3	7.3	1*** β
Micro-enterprise	92	90	96	6*** α
% received loan from public agency	1.6	1.7	1.5	0.2 α
% applied for loan within the last 3 years	27	25	31	73.59***α
% loan application rejected during the last 12 months	47	47	48	1α
% credit application rejected	8	8	7	1α
Amount of loan applied for within the last 3 years (Ksh)	1,068,936	1,519,518	414,287	1,105,231**β
Amount of loan received within the last 3 years (Ksh)	985,851	1,394,824	392,099	1,002,725**β
Amount of initial capital (Ksh)	634,564	778,387	370,914	407,473β
Amount of additional capital (Ksh)	271,365	297,075	227,022	70,053β

****significant at the 10% level; **significant at the 5% level; *significant at the 10% level. A subscript α indicates that the Chi² test was applied to test mean differences while β indicates that the t-test was applied.*

Source: Authors' computations using KNBS (2016) data

Appendix 2: Descriptive statistics

	Mean	Standard Deviation
Sales revenue	217,805	4,145,922
Employment growth	0.14	0.26
Opportunity entrepreneurship	0.58	0.50
Necessity entrepreneurship	0.23	0.41
Productivity	17,007	313,612
Age	7.9	8.03
Ownership structure	0.38	0.48
Formality status	0.23	0.44
Size of the firm	0.92	0.31
Account ownership	0.49	0.50
Gender	0.65	0.48
Access to government credit	0.02	0.14
Innovation	0.12	0.32
Mobile phone ownership	0.47	0.50
Education of owner/manager	0.94	0.23

Source: Authors' computations

Appendix 3: Correlation matrix

	1	2	3	4	5	6	7	8	9	10	11
1. Age	1										
2. Age squared	0.96	1									
3. Ownership structure	0.05	0.04	1								
4. Formality status	0.05	0.05	0.20	1							
5. Size of the firm	-0.11	-0.11	-0.23	-0.27	1						
6. Account ownership	0.03	0.03	0.12	0.21	-0.18	1					
7. Gender	0.06	0.06	0.09	0.11	-0.10	0.06	1				
8. Access to government credit	0.00	0.00	0.02	0.01	-0.03	0.06	0.01	1			
9. Innovation	0.01	0.02	0.05	0.08	-0.09	0.11	0.01	0.04	1		
10. Mobile phone ownership	0.01	0.00	0.07	0.11	-0.08	0.21	0.04	0.03	0.10	1	
11. Education of owner/ manager	-0.06	-0.07	-0.03	0.02	0.05	0.10	0.02	0.02	0.08	-0.01	1

Source: Authors' computations

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