Demand for credit in high-density markets in Kampala: Application of digital lending and implication for product innovation

Jimmy Ebong
SMC University, Switzerland
ebongjimmie@yahoo.co.uk
ORCID 0000-0001-8493-6700

George Babu
School of Business, Christian Brothers University,
USA
bgeorge@cbu.edu
ORCID 0000-0002-2791-828X

Abstract. This study sought to ascertain the factors that drive the demand for credit among businesses in the high-density markets in Kampala (Uganda) and its suburbs and draw implications for innovations and application of digital lending. A combination of qualitative and quantitative approaches was applied to profile end retailers and businesses in the high-density markets located in Kampala and its suburbs and to assess the demand for credit at these markets. The market for credit in the high-density market in Kampala and its suburbs can sufficiently support innovation and application of digital lending. Most business owners enthusiastically intended to grow their businesses and are looking for affordable financing opportunities. Drivers of demand for credit arise from the need for inventory management, debtor management and to pay for operating expenses. Short business cycles mean high turnover, hence opportunities for uptake of credits in small amounts and shorter repayment periods. It is recommended for fintechs to improve product features as well as shorten their delivery channels, thereby enhancing convenience in accessing credit. Further studies should explore business models and partnerships for providing affordable credit.

1. INTRODUCTION

Enhancing the access to credit for businesses and individuals is good for both development and welfare as well as for performance of financial markets (Kumar, 2013; Rom, 2014). Businesses with access to finance are resilient and more productive (George & Henthorne, 2017). From an economic perspective, growth in production and productivity leads to increases in GDP. Improving access to financial services such as savings and credit, for businesses run by women, who are generally considered excluded allows for owners of such businesses to be part of a financial system (Rosen, 2010), thereby, enhancing development of an inclusive society as well as enhances building of an inclusive financial system (Rom, 2014). There is also a reverse relationship between improvements in socioeconomic status of poor people and uptake of financial services. A study conducted in India (Kumar, 2013) on financial inclusion and its determinants found that socioeconomic set up shapes banking and uptake of financial services.

According to FinScope (2018), Uganda has witnessed an incremental growth in financial inclusion. In 2009, 70% of the local individuals were financially included. This currently stands at 78%. The number of adults who are formally included have also increased from 28% in 2009 to 58% in 2018. Comparing 2013 and 2018 data indicates that, although the percentage of adults who are financially included stayed constant at 78%, there have been other significant changes. Formal inclusion increased from 52% to 58% of the adults and dependency on informal inclusion decreased from 26% to 20% of the adults.

Financial technology (fintech) innovations in Uganda is pervasive, a replication of global fintech trends. The average annual growth rate of the fintechs in Uganda has been approximately 35% over the past two years. The most common areas of fintech application in Uganda is payments, lending, investments and savings, insurance and banking. According to a fintech study commissioned by Financial Sector Deepening Uganda (CAAF, 2018), payments (47%) constitute the largest area of fintech activity in Uganda. Transaction volume in the payments space was approximately USD 4.7 bln back in 2016. The next largest fintech sectors in Uganda are banking infrastructure (23%), investment and savings (16%), and lending (7%). In 2017, the total market volume of fintech companies in Uganda was approximately USD 16 mln. There are opportunities for increasing fintech activities in the lending space.

On the international scale, technology adoption varies drastically, both in degree and scope (George & Rogers, 2018). Organizational system maturity is another factor in technology adoption (Mensah & George, 2015). The fintech industry in Uganda is still in its infancy. However, there exists a huge potential for fintechs to have more impacts on digital financial inclusion through a number of pathways. One of such pathways is providing digital credit. Digital credit and peer-to-peer lending allows low- and middle- income populations to borrow without any hassle and the need for collateral. This, in turn, helps low- and middle-income populations to manage their lifecycle events as well as meet working capital demand arising from their businesses.

High-density markets tend to have high concentration of businesses, operating close to each other and also high concentration of potential customers. High-density markets combine properties of wet and dry markets in the sense that fresh meat, fish, produce, and other perishable goods as well as durable goods such as fabric and electronics are sold in there. In East Africa, the examples of such high-density markets include Owino, Nakawa, Kalerwe markets in Kampala and Wakulima, Kangemi, Gikomba and Toi markets in Nairobi, Kariako, Manzese, Temeke and Mbagala markets in Dar es salaam.

Although there has been a marked improvement in financial inclusion in Uganda, many individuals and businesses continue to rely on credit from friends, family and informal sources. Informal sources of financing can only provide smaller amounts of credit, which may be inadequate to finance growth. This study sought to ascertain the demand for credit in high-density markets in Kampala and suburbs along with the factors that drive demand for credit among these businesses and draw implications for innovations and

applications of digital credits. More specifically, this study has generated insights regarding high-density markets and their attributes, including market size, market sectors, business cycles, profit margins and credit products preferences.

2. LITERATURE REVIEW

2.1. Theoretical perspectives and underpinnings of the study

Ouma, Odongo and Were (2017) and Kar, Nazlıoğlu and Ağır (2011) documents theoretical link between economic growth and financial development. These studies build on from earlier studies (Hermes, 1994; Levine, 1997; Khan & Senhadji, 2003; Trew, 2006). According to Kar, Nazlıoğlu and Ağır (2011), views on relationships between economic growth and financial development falls into two categories. The first view can be traced to the work of Schumpeter (1911), which stresses the relevance of financial services in enhancing economic growth. According to Schumpeter (1911), financial institutions can proactively inspire invention and stimulate potential progress by identifying and allocating resources to finance investments which are productive. The role of financial institutions is in funding increases in aggregate production and GDP. The second view expresses a reverse relationship between financial services and economic growth. This view is traceable to the work of Robinson (1952) who viewed access to finance as a somewhat insignificant element in the process of growth. In particular, Robinson (1952) contended that the demand for financial services will increase as output increase. In this case output growth has an effect on financial development. This view that financial growth follows growth in output growth is echoed in part, in a recent study conducted in India (Kumar, 2013), on financial inclusion and its determinants. Kumar (2013) found that socio-economic set up and changes in such set up, shapes banking habit and uptake of financial services. From the theoretical perspectives reviewed, there is ample evidence to support the argument that the relationship between economic growth and access to financial services is bidirectional.

Theoretical perspectives related to behavioural economics also explains behaviours of consumers (Kozuka, & Nottage, 2009) of digital credit. Postulations of behavioural economics are found in the works of Laibson and List (2015); Bhargava & Loewenstein (2015), Lafevre and Chapman, (2017). According to Lafevre & Chapman (2017) behavioural problems of consumers are manifested when making decisions concerning consumption of financial products and hence insights from behavioural economics can be used to protect consumers, especially where consumers have to make decisions in the midst of complex circumstance. Unpredictability in patterns of how consumers make decisions may affect the way a market works. Behavioural economics postulates concepts and consumer biases relevant for financial services (de Ávila, de Oliveira, de Melo Silva Ávila, & Malaquias, 2016). Behavioural economics advances choice architecture and framing as being mechanisms to protect consumers of financial services. Choice architecture and framing (Thaler & Sunstein, 2008; Lafevre & Chapman, 2017) refers to the environment under which one decides when there is a likelihood of such a person to be influenced by many features, noticed and unnoticed.

Behavioural economics are applicable to explain fraud in digital lending (LexisNexis, 2019), default (Hertzberg, Liberman & Paravisini, 2015), credit behaviour (Carlsson, Larsson, Svensson, & Åström, 2017) and bankruptcy (Sánchez, 2018). LexisNexis (2019) posits that fraud in digital lending are financially detrimental to smaller banks and non-bank lenders more than market competitions that such landers face. Livshits (2015), advanced approaches to modelling credit markets of consumers.

According to Carlsson, Larsson, Svensson, and Åström, (2017) digitisation affects an individual's financial behaviour. The works of Carlsson, et al. (2017), relates to and can be applicable to explain young people's vulnerability to digital credits and the rising incidence of gambling using digital credit and youth

indebtedness (MSC, SPTF, Smart Campaign & AFD, 2019). According to Carlsson, et al, (2017), financial counselling can limit effects of digital credit on youth. However, counselling should be informed by awareness of levels of vulnerability of young people as consumers of digital financial services. In addition, counselling should be informed by the level of perception of financial services, including perception of a digital society. According to Sánchez (2018), technology has rapidly increased household borrowing, resulting to bankruptcy.

Theories of transaction costs economics (TCE) advanced by Coase (1937, 1998) and Williamson (1989,2008) are applicable to explain credit market imperfections (Matsuoka & Shibata, 2012), choice of rating technology and loan pricing (De Silva, Dockner, Jankowitsch, Pichler & Ritzberger, 2014; Matsuoka & Shibata, 2012), information acquisition (Banerjee, 2005), information sharing in credit markets (Pagano & Jappelii, 1993) and the relevance of technology in breaking information barriers in digital credit (Beck, Ioannidou & Schäfer, 2018; Sedunov, 2017). Transaction cost is the variance in the cost of conducting transactions for resources in a marketplace. Imperfect knowledge of the products and services and their properties drives up transaction costs in the markets for financial services. Transaction costs manifests in the form of bounded rationality, opportunism (rent seeking), maladaptation and information asymmetry. Foss and Webber (2016) expanded the transaction costs economics literature, by including in the transaction costs assumptions heuristic and cognitive biases.

A system for rating customers helps to overcome information asymmetry and improves a bank's competitiveness. According to De Silva, et al. (2014) banks can price and manager loan portfolios using rating systems, however, should invest in technology for rating hence a trade-off that banks have to make. According to Matsuoka and Shibata (2012) a good technology would help curb imperfections in the credit market, which arise from credit bubbles. They (Matsuoka & Shibata, 2012) noted that there can exist numerous points of stability in the credit market, but credit bubbles may cause slumps and low-level traps by averting the adoption of highly productive technology.

According to Banerjee (2005), technology is relevant to screen customers and help select productive borrowers, also screen out unproductive borrowers. This attribute of technology has effects on incentives to acquire customers and the nature of information available for sharing between lenders. Banerjee (2005), posits that there is a level of uncertainty concerning the quality of superior technology. This uncertainty affects incentives for information acquisition. In a study on adverse selection, Hertzberg, Lieberman and Paravicini (2015) found that adverse selection is potentially induced by longer loan maturity and that longer loan maturity period attracts less creditworthy borrowers. Pagano and Jappelii (1993) posits that lenders' motivations for information sharing, especially motivation for sharing information about borrowers are related to how borrowers can move from one lender to another, the differences in the information about borrowers, the size of the credit market, and to the attribute or robustness of information technology. The incentive to share information are dampened by the trepidation of competition posed by potential entrants to the credit or lending market. Information sharing may increase lending volumes when adverse selection is high, and borrowers abscond from the market.

Beck, Ioannidou and Schäfer (2018) investigated the relevance of contract design and credit scoring models to enable lenders steer across information asymmetry arising from physical distance between lender and borrower. Beck, et al, (2018) found that foreign banks navigate through their little knowledge of the market through a combination of tight contract design and credit records. Foreign banks tend to demand collateral as opposed to or in addition to credit scoring. Foreign banks are also more likely to base their pricing on internal credit rating. Domestic or local banks are likely to price credit according to their relationships with clients. Sedunov (2017) studied the effect that technology has on soft-information lending and unravelled that banks engage in less soft-information lending when back-office bank technology is more

productive. Banks engage in less soft-information lending when they own interactive web technology. Also, competition, lending decisions, and bank size are the primary drivers of technological development.

2.2 Relevance and importance of credit access and digital credit

Many studies (Abdallah, 2016; Björkegren & Grissen, 2018; Carrera, 2019; Carlsson, Larsson, Svensson & Åström, 2017; Deininger & Goyal, 2012; Gatsi & Gbettey, 2019; Van Loo, 2018) document that enhancing access to credit for individuals and businesses leads to increased financial inclusion. According to Gatsi and Gbettey (2019), increasing financial inclusion is relevant in policy discussions because increased financial inclusion leads to economic growth and development. Access to credit enhances financial inclusion especially if credit providers develop products that respond to the needs of lower-income consumers. On the other hand, digital credit is said to worsen welfare of its consumers (Carlsson, Larsson, Svensson & Åström, 2017). According to Carlsson, et al. (2017) when consumers access digital credit, their behaviours change. According to Carrera (2019) investment in digital tools by financial services providers boost customers' access to services. Carrera (2019) and Deininger and Goyal (2012), also reported that digital channels and how such channels facilitate convenience and security drive increases in accessing of credit and other financial services. Notably, digital credit enables financial services providers to extend services to reach low-income markets (Deininger & Goyal, 2012). Digital credit demonstrates potential for banking the poor (Björkegren & Grissen, 2018), especially using mobile phones as a channel for distribution.

Also, access to credit increases affordability of technology, thereby enhancing adoption of such technologies. Abdallah (2016) provided evidence to justify that credit market inefficiencies reduces adoption of technologies in agriculture especially in Africa. Abdallah (2016) acknowledges the role of microfinance in enhancing access to credit. Björkegren and Grissen (2018) discusses the role of mobile phones in helping people access digital credit. They (Björkegren & Grissen, 2018) noted that the digitization of developing economies has expanded the space of feasible designs for consumer financial products.

2.3 Drivers of demand for digital credit

There has been more and more market deployment of digital credit in the recent past (Hwang, & Tellez, 2016). Edoardo, Totolo and Gubbibs (2018) revealed that the formal lending segment in Kenya was witnessing higher growth in demand for digital credit, as opposed to the informal segment. Between 2016 and 2019, uptake of digital credit issued by MNO-facilitated banks registered the largest increase within the formal lending segment. Best, Cloyne, Ilzetzki and Kleven, (2015) found that beliefs about the future, uncertainty, risk aversion, discount factors and present bias affect demand and repayment. According to Hertzberg, Liberman & Paravisini (2015), adverse selection affects demand for credit and credit repayment. Karlan & Zinman, 2018 postulate that demand for credit is elastic, and more so over the longer run.

Digital credit attributes such as speed and convenience (Hwang, & Tellez, 2016; Chen, Greg & Rafe Mazer, 2016) and the fact that no security is required, drive its demand. A study by MSC, SPTF, Smart Campaign, and AFD (2019) postulate that low incomes of household drive and sustain demand for digital credit. On the other hand, youth demographics drive the adoption of digital channel predominantly used to access digital credit. Drivers of digital credit include some of its features such as eligibility being enabled by existing digital access, loan decisions being automated and leveraged on non-traditional digital data, loans being smaller, shorter-term, and the fact that customer relations, repayments, and collections are managed remotely (Hwang, & Tellez, 2016). According to Chen, Greg, and Mazer (2016), digital credit being instant also drives its adoption.

2.4 Digital credit, lending and financial technologies.

Digital credit attributes of speed and scale create risks (Mazer & Fiorillo, 2015). Persistent expansion in unsecured consumer lending in Japan, lead to increasing over-indebtedness (Kozuka, & Nottage, 2009). In the USA, the information technology (IT) revolution and the transformation of unsecured credit market increased households' borrowing as well as bankruptcy filings (Sanchez, 2018). Izaguirre, Kaffenberger and Rafe Mazer (2018) report late repayment and defaults. They also report usage of digital credit for discretionary consumption. In developing countries, digital credit also affects household's livelihood. Some users of digital credit reduced food purchase in order to pay loans (Mazer & Fiorillo, 2015). Risks such as over-indebtedness (Kozuka, & Nottage, 2009) and bankruptcy (Sanchez, 2018); inability to meet household needs for food (Izaguirre, et al, 2018) calls for a need to protect consumers (Mazer & Fiorillo, 2015; Izaguirre, et al, 2018) of digital credit. Financial technology is relevant to address concerns related to behaviours of consumers of credit products and services (Kozuka, & Nottage, 2009; LexisNexis, 2019; Hertzberg, Liberman & Paravisini, 2015; Livshits, 2015; Carlsson, Larsson, Svensson, & Åström, 2017) as well as concerns related to transaction economics (Coase, 1937, 1998; Williamson, 1989; Matsuoka & Shibata, 2012; De Silva, Dockner, Jankowitsch, Pichler & Ritzberger, 2014; Banerjee, 2005; Pagano & Jappelii, 1993; Beck, Ioannidou & Schäfer, 2018; Sedunov, 2017). Nonetheless, human "touch" in digital lending practices tends to reduce defaults (MSC, SPTF, Smart Campaign & AFD, 2019). This has implication on design of business model for providing digital credit services. Fintechs are distorting the credit market (Wisniewski, 2018), and are reducing market shares of banks in lending (Crosman, 2019; Peters, 2019). Many factors drive the application of financial technologies in lending. These include; digitalisation and applications of relevant infrastructures (Gießmann, 2018) that paved way for innovation (Van Loo, 2018). Financial technology is evidence in Artificial intelligence credit risk prediction (van Thiel, & van Raaij, 2019), credit rating and loan pricing (De Silva, et al., 2014 ; addressing constraints with credit market imperfection (Banerjee, 2005; Matsuoka & Shibata, 2012; Pagano & Jappelii 1993), enhancing efficiencies in credit disbursement and lending and reducing costs of service provision (Fuster, Plosser, Schnabl & Vickery, 2019; Van Loo, 2018) addressing consumer credit behaviour (Carlsson et al., 2017) risk predictions (van Thiel, & van Raaij, 2019; Brighi, Lucarelli & Venturelli, 2019; Song & Zhang, 2018; PR Newswire,2019), revival and recovery in the market for financial services (Hoffman, Gibson, Scarpati & McConchie, 2008), enhancing transparency and relationships among lending partners (Angori, Aristei, & Gallo, 2019), credit availability (Ferri, Murro, Peruzzi, & Rotondi, 2019), enhance market segmentation (Bartoli, Ferri, Murro & Rotondi,2013; Berger & Black, 2011; Dunn, Castleberry, Massey, Crider, Beuoy, & Zarzecki, 2019); enhance competition in lending (Niinimaki, 2016), and presents opportunity for trading in global markets (McDowell, 2017).

Fintech holds great potential for both financial inclusion and economic development. McKinsey Global Institute (2016) highlighted that digital finance has the potential to provide access to financial services to 1.6 billion people in emerging economies by 2025, with more than half of them being women. The report also highlights that the widespread use of digital finance could boost the annual GDP of all emerging economies by USD 3.7 trillion. Technological innovations in financial services have also changed how consumers interact with and receive financial products and services. This, together with the disruptive and fast-paced nature of Fintech, presents both opportunities and challenges for regulators and policymakers.

3. METHODOLOGY

A mixed method, consisting of both qualitative and quantitative approaches was adopted to profile end retailers and businesses in high density markets located in Kampala and its suburbs and ascertain factors that drive demand for credit among these businesses.

3.1 Population and sampling

The market study estimates the average number of end retailers per market is 6,266 with the majority (72%) engaged in agri-trade as indicated in the table below.

Table 1

Average end retailers and nature of businesses

Items traded	Proportion of traders	No. of traders
Agri-Traders		
Food stuffs	42%	2,632
Fruits and vegetables	17%	1,065
Grains and pulses	4%	251
Meat products	9%	564
	72%	**4,512**
Non Agri-Traders		
Clothes	2%	125
Charcoal	3%	188
Retail	3%	188
Restaurants	1%	63
Second-hand clothes	5%	313
Others[1]	14%	877
	28%	**1,754**
Total	**100%**	**6,266**

To establish the end retailers dealing in the selected Fast Movable Consumer Goods (FMCGs), the team conducted interviews with the staff at the selected multinational companies to identify the distributors covering the territory. Subsequent interviews with the distributors enabled the team to establish the number of end retailers served within the catchment areas.

Table 2

Average end retailers and nature of businesses

Category	Number of distributors	Average number of end retailers
Unilever	5	2,489
Nile Breweries	4	476
Uganda Breweries Limited	10	650
Crown Beverages	34	200
Century/Coca cola	33	624
Total	**86**	**4,439**

---

[1] This category consists of end retailers dealing in diverse items like car spare parts,

Quantitative Interviews

The market research obtained views on demand and supply of unsecured working capital credit from end retailers operating in 18 high-density markets in Kampala and its neighbouring districts of Wakiso, Mpigi, and Mukono. The end retailers in the markets were broadly categorised into two groups as follows:

      a) Five Specific FMCGs category: These consisted of alcohol/beer; beverages; homecare and beauty products by Unilever. The alcohol/beer supply chains included in the study were Uganda Breweries Ltd and Nile Breweries whereas the beverages consisted of Century Bottling Company and Crown Beverages.

      b) The General traders: consisted of the rest of the end retailers not engaged in the 5 FMCGs above. The end retailers in this category were classified into two:

            1. Agri-traders: end retailers dealing in agricultural commodities such as fruits and vegetables, food stuff, meat, grains and pulses

            2. Non agri-traders: end retailers dealing in the rest of the merchandise traded in the high-density markets

Qualitative Interviews

The qualitative interviews included focus group discussions and key informant interviews. Up to 12 FGDs were conducted with end retailers in 12 markets. For each value chain, the team conducted one Key Informant Interview (KII) with the company and at least one core distributor to enable identification of margins along the supply chains, working capital requirements and other important metrics. In total, 36 Key Informant Interviews were conducted with; Market chairpersons/secretary /Defence, Trader associations, heads of market saving groups and distributers of the 5 FMCG.

1.3.2 Data Collection Tools

The team developed research tools to collect all the information and varying views, from the end retailers as well as key players, on demand and supply of unsecured working capital financing among MSMEs operating in the identified high-density markets. The tools included:

      i. *Structured business owners' tool*: The structured quantitative tool was developed and used to collect information from individual end retailers in the high-density markets

      ii. *Key Informant Interview Guide*: This guide was developed and used to conduct interviews and consultative meetings with market leaders in each of the identified high-density market and distributors of FMCG in the research area.

      iii. *Focus Group Discussion (FGD) Guide*: the FGDs provided a good platform for brainstorming on the demands, attitudes, and business dynamics of micro/small business traders in high-density markets.

4. EMPIRICAL RESULTS AND DISCUSSION

4.1 Descriptive Summary

The majority of the end retailers in the high-density markets are female at 59.5%. 38.5% of the end retailers are youths aged below 30 years while 73.6% of the end retailers are aged below 40 years. The educational level of the end retailers varied significantly between the general trade and FMCG retailers. The highest formal educational level attained by 51% and 15% of the general trade retailers and FMCG respectively was completion of primary school. The proportion of the FMCG retailers who had at least

completed secondary education is 62%. The educational level notwithstanding, overall 70% of the end retailers can read and write in English. The end retailers have personal financial goals that they are pursuing and as such view their businesses as a means to reaching these goals. The financial goals of the end retailers in both categories were largely similar. Many of the end retailers have formally registered their businesses with the various authorities. 94.7% (144) of the 152 FMCG businesses haven been registered while 73.3% (189) of the 258 business are registered. The average weekly sales for all the end retailers was $ 493. The average weekly sales for the FMCGs, Agri-traders and Non Agri-traders was $ 603, $ 329 and $ 493 respectively. The proportion of end retailers with weekly sales below $ 410 is 288 representing 70.3%. The proportion of agri-traders, non-agri-traders and FMCG retailers with weekly sales below $ 411 is 80.3%, 64.1% and 67.1% respectively.

4.2 Drivers of demand for Working Capital Credit

4.2.1 Inventory Management

The value of inventory purchases

The majority of agri-traders (83.6%) each time purchase goods worth at most $ 274 while the weekly cumulative purchases of 79.7% was at most $548. Similarly, 76.2% of the non-agri traders each time purchased inventory of at most $ 274 while 64.6% indicated weekly purchases of at most 548. Up to 73% of the FMCG retailer each time purchase inventory worth at most $ 274 as well as a cumulative weekly purchase of at most $ 548. The aggregated weekly inventory purchases of all the end retailers is $ 282,466.

Weekly inventory turnover

The average weekly inventory turnover for all the end retailers was three. 80.4% of the agri-traders had a stock turnover of between 1 to 3 times a week and 69.3% for the non-agri-traders. 80.9% of the FMCGs end retailers had a weekly stock turnover of between 1 to 3 times. The weekly inventory turnover average of three implies the end retailers on average sell all their respective stock purchases within two days of purchase. 23.8% of the non-agri-traders had an inventory turnover of between six and seven implying that they purchased and sold out their inventory on a daily basis.

Given the competitive prices of the end retailers in the high-density markets, the high inventory turnover enhances the overall profitability of the businesses.

Inventory days

The average inventory days for all the end retailers was 3 days during the peak period when demand is highest. Even in the slow days when demand is low, all the traders still sold their respective inventories within a week with the exception of Unilever and non-agri traders who spent 10 and 11 days respectively. This inventory turnover is still fair for the business given that the pricing strategy in the high-density market requires higher turnover for the business to remain profitable.

Source of funds for purchase of inventory

Most of the end retailers used internal funds to finance inventory purchases. In addition to the internal funds, some end retailers also used loans and supplier credit to finance the purchase of inventory. 2.6% and 8.1% of FMCG and general traders respectively entirely depended on external sources of financing to purchase inventory. This mainly entailed getting supplier credit provided for three days during which the traders sell off the goods and are therefore able to pay off the suppliers using cash receipt from the sale of goods.

The leading providers of supplier credit are the agricultural commodity dealers especially during the harvest periods when their inventory levels are high. Owing to the highly perishable nature of most agricultural produce, the dealers mitigate the risk of incurring losses by disposing off their inventory to the

end retailers with whom they have a business relationship on credit. On the other hand, the distributors of the FMCG also provided credit to the retailers especially during the month end periods when they seek to meet the monthly sales targets set by the multinational companies. The provision of credit facilities also depends on the personal relationship between the distributors and end retailers.

Supplier credit was the second highest means of inventory purchases financing followed by loans in third place. The abundance of agricultural produce particularly during the harvest seasons can potentially lead to significant losses due to their highly perishable nature. To mitigate this risk, the agricultural produce dealers offer credit to the agri-traders in order to dispose of their inventory. Considering that the agri-traders account for an average of 72% of the end retailers supplier credit constitute a significant source of funds for inventory purchases and reduces the demand for loans from this market segment particularly during the harvest period. In addition, the dealers do not levy any charges to the end retailers for any supplier credit provided. However, supplier credit for the agri-traders is low during the off-seasons since there is no risk of loss given the inventory levels, which in turn drives up demand for loans.

Other reasons for preference of supplier credit include; convenience of access, the retailers do not risk any funds since the end retailer only pays the supplier once the goods are sold, which is usually after three days for most of the end retailers. However out of the 410 end retailers, only 164 (40%) are able to get stock on credit implying that the majority do not access this service.

Seventy end retailers used loans to finance inventory purchases and the amounts varied with the FMCG end retailers borrowing the highest amounts, followed by the non-agri traders and lastly agri-traders. 56.3%, 62.9% and 70.3% of the FMCG, non-agri traders and agri-traders respectively borrowed a maximum loan amount of $ 411.

The interest rates charged on the loans varied with the least being 1% per month. 29 of the 70 borrowers were charged a minimum interest rate of 5% per month as showed in the Table below.

Table 3

Number of borrowers and the Interest charged by institution category

	1% per month	2% per month	3% per month	4% per month	5% per month	More than 5% per month
	(n=7)	(n=17)	(n=10)	(n=7)	(n=20)	(n=9)
Bank	0	4	2	2	9	0
SACCO	2	5	7	1	6	6
Credit Institution	2	4	0	0	1	0
Money lenders	0	1	1	0	0	3
Family	2	0	0	0	0	0
MDI	0	2	0	2	1	0
VSLA/ROSCA	1	1	0	2	2	0
Others	0	0	0	0	1	0

The highest loan tenure was a year and shortest period two weeks. The majority of the end retailers, however, borrowed for one month. Considering that the inventory days were on average 3 days, the loan period is appropriate with the exception of the 1-12 months period.

Table 4

Number of borrowers and the Interest charged by institution category

Loan Period	> $ 139	$ 139 to $ 416	$ 416 to $ 694	$ 694 to $ 1,111	< $ 1,111	Total
2 Weeks	4	2	2	-	-	8
1 Month	13	5	4	-	1	23
2 Months	4	5	3	-	-	12
3 Months	1	2	2	1	-	6
4 Months	-	-	-	-	1	1
6 Months	-	6	3	-	3	12
8 months	-	1	-	-	-	1
1 Year	-	-	-	2	5	7

Stock out

111 (27%) end retailers reported having stock out days, which resulted in missed sales opportunities thereby affecting their profitability. 81 general traders and 30 FMCG retailers reported stock out days largely due to lack of money to finance inventory purchases.

The end retailers attribute the stock out days to various reasons that include inadequate working capital, diversion of cash due to personal challenges, delays in accessing credit and supplier delays amongst others. The stock out days have invariably affected the overall business profits due to missed sales opportunities. The end retailers believe additional working capital financing will help them address most of the causes of the stock out days.

Out of the 111 end retailers who experienced stock out, 20 (18%) eventually accessed loans to purchase inventory which resulted in an improvement in the weekly sales as illustrated in the table below.

Table 5

Change in weekly sales after stock out

Category	Borrowed after stock out	Did not borrow after stock out
	$	$
Beverages	623	341
Alcohol	1,943	418
Agri Traders	1,359	420
Non Agri Traders	834	547

Additional working capital financing from loans will certainly help the end retailers to improve their business performance in addition to further growing the business as demonstrated in the table above.

4.2.2 Debtor management

The customers of the end retailers are mainly individuals/ households that buy goods for domestic consumption, hotels/ restaurants and schools that buy mainly agricultural produce. The end retailers sell their inventories in an average of 3 days and then replenish their inventory from their respective suppliers.

The majority of the end retailers sell their merchandise on a cash basis; however, some end retailers also offer credit to some of the customers to boost sales and enhance their overall profitability. The credit customers are mainly institutional customers like hotels/ restaurants, schools and a few selected individuals. The end retailers indicate the credit sales decision depends on the length of their trading relationship as well as past payment behaviours.

Credit Sales (Value)

The average total credit sales by the general traders is $ 133.47 with 72.9% indicating credit sales of less than $55. The small credit value is attributable to the need to minimize default as well as liquidity challenges especially since some traders faced stock out days as well as the need for more working capital to grow their businesses. The credit sales for the FMCG end retailers is higher at $ 166.71 due to the higher working capital. From the working capital management perspective, the low levels of credit sales enable the businesses to maintain adequate liquidity levels thereby easily procuring more inventory for sale as and when needed.

The credit sales for both the FMCG and General traders represented 23% of their respective total weekly sales.

Credit days

The average debtor days is 3 days with 55.6% and 60% of the FMCGs and general traders respectively offering at most 3 days. The average 3 days credit period is adequate especially when viewed against the average inventory days. The implications is therefore the debtors settle their obligations in time for the end retailers to replenish their inventory levels.

Effects of selling on credit

Whereas some traders have indicated credit sales have increased their overall sales volumes, there has been some undesirable effects. These include delays in repurchasing stock, which reduces the sales turnover levels and overall business profitability. Only 15% and 7% of the general traders and FMCGs respectively indicated credit sales never had any effect on their businesses. It's worthwhile pointing out that all these challenges can be addressed with an additional working capital injection.

4.2.3 Operating Expense

For the businesses to continue in operational existence requires settling operating expenses in a timely manner. The end retailers in the high-density markets pay operating expenses on a cash basis, which strains the liquidity situation of the businesses thereby requiring significant investment in working capital.

Weekly operating expenses

The average weekly operating expenses for end retailers range from $ 45 for the Unilever products retailers to $ 80 for the alcohol retailers. Table 10 below presents the average operating expenses category of business/products.

Table 6

Average weekly operating expenses

Item	Alcohol	Beverages	Unilever	Agri Traders	Non-Agri Traders
	$	$	$	$	$
Rent	25	22	20	7	15
Salary	38	24	12	9	20
Transport	6	5	4	5	6
Lunch	7	6	6	6	6
Market Dues	2	2	2	1	2
Security	1	1	1	1	1
Total	**80**	**60**	**45**	**29**	**50**

Past borrowing for operating expenses

Only 13.6% and 9.8% of the general trade and 5 FMCGs end retailers respectively borrowed to pay for operating expenses. The rest of the retailers use profits generated from their business operations to meet

their operating expense needs. Considering that the business cycle is three days, this is a prudent decision. Notably, 57.1% and 53.4% general traders and FMCG traders respectively borrowed a maximum of $ 164.38 to meet their operating expenses requirements as shown in the figure below.

Business Cycle

The business cycle is the period it takes the retailers to purchase goods, sell the goods and receive cash from the sales. The average business cycle for all the end retailers is 2 days for the peak periods when demand is high. The business cycle consists of 2.8 average creditor days, 3 average inventory days and 1.8 debtor days.

Business cycle = (Inventory days- Creditor days) + Debtor days
$$= (3-2.8) +1.8$$
$$= 2 \text{ days}$$

The low business cycle days implies that the retailers will be able to purchase and sell inventory multiple times thereby maximising their business profits within the loan tenure

Profit Margins

Profit margins are computed based on the average inventory purchases for the retailers. The highest margins is earned on sale of beverages (sodas) and the lowest on alcohols. The beverages are the most profitable products and have the shortest inventory days of only 2. Unilever products attract lowest margin of 10% and has longer inventory days of 3 during the peak period and 5 during the slow periods.

Table 7

Gross profit margin for each inventory purchase

Item	Gross sales	Inventory Cost	Gross profit	Profit margin
	$	$	$	%
Alcohol	535	483	52	10%
Beverages	211	159	52	25%
Unilever	331	282	48	15%
Agri Traders	257	212	45	17%
Non-Agri Traders	549	429	120	22%

Preferred features of credit products

The main financial goal of the end retailers is growing their businesses, which requires additional working capital financing. In addition, the end retailers have also suffered stock out days and subsequently missed sales due to inadequate working capital. Out of the 410 end retailers interviewed, 253 (61.7%) expressed willingness to access working capital loans using mobile phone. The average loan amount for all the end retailers was $ 348. The FMCGs retailers needed the highest average loan amount at $ 428 followed by the non-agri traders at $ 338 and lastly the agri-traders at $ 248.

Of those that were willing to access loans, most (91.7%) preferred an interest rate of between 1% and 3% per day with 39.9% preferring 1% per day. The study reveals that majority 53.7% preferred loans below $ 274 indicating that the target market needs small loans. Figure 30 presents the product features preferred by end retailers in high-density markets.

The average working capital loan amount needed by the retailers willing to borrow varied depending on the trade categories. The highest average loan was $ 410 for the FMCG retailers and the lowest was $ 274 for the agri-traders. Considering the average number of retailers in the 18 markets was 6,266, the projected total loan amount for the general traders consisting of the agri-traders and non-agri-traders is $1,260.

Table 8

Projected demand for working capital finance

	Desired average loan amount	Proportion willing to borrow	Number of end retailers in the market	Projected retailers willing to borrow	Projected total loan amounts demanded
Agri Traders	$ 284	68.0%	4,512	3,068	$ 871,993
Non Agri Traders	$ 338	65.4%	1,754	1,147	$ 388,226
FMCG	$ 428	53.3%	4,439	2,352	$ 1,006,639
Total	**$ 1,059**		**10,705**	**6,567**	**$ 2,266,859**

The average loan term for the loan projects in the table above is 2.8 months (11 weeks). The end retailers envisage the business will generate sufficient revenues to cover their loan service obligations without adversely affecting business operations. A shorter loan period may result in using the existing working capital to service the loan obligations.

4.3 Discussions of findings

Theories of economic growth and financial market development (Ouma, Odongo & Were, 2017; Hermes, 1994; Levine, 1997; Khan & Senhadji, 2003; Trew, 2006) posits a relationship between economic growth and financial development. This theory links financial inclusion to improvement of welfare of those who are included. On the other hand, theories related to behavioural economics (Best, Cloyne, Ilzetzki, & Kleven, 2015; Hwang, & Tellez, 2016; Chen, et al., 2016) points to the dangers of digital credit to worsen welfare of its youthful customers. Studies from Tanzania show that some users of digital credit reduced food purchase in order to repay loans (Kozuka & Nottage, 2009). This study found that overall, the age of most traders in the high-density market ranges from 18 to 40 years. In addition, about 60% of retailers are women. Therefore, there is a huge potential to create an impact on youth and women who are predominantly owners of businesses in the high-density markets by enhancing their access to credit. Postulations of studies on digital credit (Best, Cloyne, Ilzetzki, & Kleven, 2015; Hwang, & Tellez, 2016; Chen, et al., 2016) show that digital credit can worsen welfare of its youthful customers. This calls for the relevance of protecting consumers and responsible lending. This study adds voice to the call for responsible lending.

TCE theories (Coase, 1937, 1998; Williamson, 1979,1989,1992) and related studies (Crook. et al, 2013; Foss & Webber, 2016; Hertzberg, et al., 2015; Matsuoka & Shibata, 2012) advanced credit market imperfections and the relevance of technology in dealing with such imperfections, respectively. This study found that retailers are optimistic to grow the businesses and are enthusiastically looking for affordable sources of finance. This finding of the study serves to amplify the need for a lender to be cautious of information asymmetry that may be driven by the dire desire of the borrower to access credit. This study also highlights potential application of technology to enhance risk prediction (van Thiel & van Raaij, 2019) and application of technology in loan pricing (De Silva, et al., 2014).

This study revealed insights of the features of the high-density markets which forms the basis for enhancing customer experience. The study revealed preferred product features and income levels of potential borrowers. Potential borrowers prefer convenience in accessing loans and a willingness to access credit on mobile phones. Potential borrowers prefer interest rates of 1% to 4% per day. Also, the target market needs small loans of about $ 274 per business cycle averaging 2-3 days. These findings present opportunities for enhancing transaction-based lending and using credit scoring, built on trails of mobile

money transactions. These findings also present opportunities for enhancing customer experience through making credits conveniently accessible through their phones.

5. CONCLUSION

Estimated demand for working capital in the 18 high density markets totals to over $ 2 million. Potential market is constituted by more than 10,000 retailers. Of these, over 6,000 traders are willing to borrow. Most business owners are enthusiastic and would like to grow their businesses. In fact, such business owners are looking for opportunities to access financing for business growth. Drivers of credit demand arise from the need for inventory management, debtor management as well as the need to pay for operating expense.

In the case of inventory management, businesses surveyed have shorter inventory turnover periods varying from once to thrice a week hence such businesses need continuous financing in order to keep adequate amount of inventory. Inventory days averages 3 days when demand is highest to about a week. Most retailers used internal funds to finance purchase of inventory. Supplier credit was the second highest means of financing purchase of inventory because it is convenient. Most common length of supplier credit is a week. Also, a third of retailers experienced stock out days, resulting in missed sales, thereby affecting their profitability. Debtor management is not the main driver of demand for credit as most end retailers sell their inventories within 3 days. Majority sell their merchandise on a cash basis, a few offer credits to their customers to boost sales and increase profitability. Limited credit sale is driven by the need to minimize default and the need to manage liquidity challenges. Operating expenses such as rent, staff salary, transport, meals, market dues and security are paid on a cash basis, hence requiring the trader to maintain high liquidity. Most traders use profits generated by the business to pay for operating expenses.

Businesses have short cycles. The period it takes a trader to purchase and sell goods and receive cash from the sale of merchandise is 2 days, implying an opportunity for the businessperson to purchase and sell multiple times hence maximising their profitability. Short business cycles present opportunities for quick turnover for small sized credit. Profit margin range from 10% in the case of alcohol to 25% for beverages. This implies that businesses in the high-density markets have strong capacities to repay loans, thus presenting an opportunity for such businesses to form a formidable market for credit. Preferred products should be conveniently disbursed through channels that make it quick to access. Loan amount should be small, averaging $ 300 attracting an interest rate of 1% to 3% per day. Preferred loan tenure varies from 1 to 3 months. End-retailers were more sensitive to convenience, interest rates, collateral and good loan repayment terms.

It is recommended for Fintechs to improve product features to take care of preferred product features, hence driving adoption and harnessing commercial benefits of providing digital credit. In addition, awareness regarding digital credit is still low. Sensitization of distributors of FMCG, end retailers and stockists are recommended. Further studies should explore business models and partnerships for providing affordable credit. Such studies should explore partnerships which are effective in enhancing consumer protection while also driving down the cost of credit, hence making digital credit affordable.

REFERENCES

Abdallah, A.-H. (2016). Does credit market inefficiency affect technology adoption? Evidence from Sub-Saharan Africa. *Agricultural Finance Review*, *76*(4), 494–511. https://doi.org/10.1108/AFR-05-2016-0052

Angori, G., Aristei, D., & Gallo, M. (2019). Lending technologies, banking relationships, and firms' access to credit in Italy: the role of firm size. *Applied Economics*, *51*(58), 6139–6170. https://doi.org/10.1080/00036846.2019.1613503

Banerjee, P. (2005). Information Acquisition Under Uncertainty in Credit Markets. *Review of Financial Studies*, *18*(3), 1075–1104. https://doi.org/10.1093/rfs/hhi024

Bartoli, F., Ferri, G., Murro, P., & Rotondi, Z. (2013). SME financing and the choice of lending technology in Italy: Complementarity or substitutability? *Journal of Banking & Finance*, *37*(12), 5476–5485. https://doi.org/10.1016/j.jbankfin.2013.08.007

Beck, T., Ioannidou, V., & Schäfer, L. (2018). Foreigners vs. Natives: Bank Lending Technologies and Loan Pricing. *Management Science*, *64*(8), 3792–3820. https://doi.org/10.1287/mnsc.2016.2706

Berger, A. N., & Black, L. K. (2011). Bank size, lending technologies, and small business finance. *Journal of Banking & Finance*, *35*(3), 724–735. https://doi.org/10.1016/j.jbankfin.2010.09.004

Best, M., Cloyne, J., Ilzetzki, E., & Kleven, H. J. (2015). Interest rates, debt and intertemporal allocation: evidence from notched mortgage contracts in the United Kingdom.

Bhargava, S., & Loewenstein, G. (2015). Behavioral Economics and Public Policy 102: Beyond Nudging†. *American Economic Review*, *105*(5), 396-401. doi:10.1257/aer.p20151049

Björkegren, D., & Grissen, D. (2018). The Potential of Digital Credit to Bank the Poor. *AEA Papers & Proceedings*, *108*, 68–71. https://doi.org/10.1257/pandp.20181032

Brighi, P., Lucarelli, C., & Venturelli, V. (2019). Predictive Strength of Lending Technologies in Funding SMEs. *Journal of Small Business Management*, *57*(4), 1350–1377. https://doi.org/10.1111/jsbm.12444

CAAF (2018). *FinTech in Uganda: Implications for Regulation*. Retrieved from https://fsduganda.or.ug/wp-content/uploads/2018/11/FSD-Uganda-Report-on-state-of-FinTechs-in-Uganda.pdf - Accessed on 19/11/2019

Carlsson, H., Larsson, S., Svensson, L., & Åström, F. (2017). Consumer Credit Behavior in the Digital Context: A Bibliometric Analysis and Literature Review. *Journal of Financial Counseling & Planning*, *28*(1), 76–94. https://doi.org/10.1891/1052-3073.28.1.76

Carrera, k. (2019). More important than cost-savings: credit unions invest in digital to boost member service and growth. *Credit Union Management*, *42*(9), 24. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=bsh&AN=138244173&site=ehost-live

Chen, Greg, and Mazer. R (2016). "Instant, Automated, Remote: The Key Attributes of Digital Credit." CGAP Blog. Washington, D.C.: CGAP, 8 February. http://www.cgap.org/blog/instant-automated-remote-key-attributes-digital-credit . Accesses on 20/11/2019.

Coase, R. (1998). The new institutional economics. *The American Economic Review*, *88*(2), 72-74.

Coase, R. H. (1937). The nature of the firm. *economica*, *4*(16), 386-405.

Crosman, P. (2019). Once dismissive of fintechs, traditional lenders now feeling their bite. *Cujournal.Com*, N.PAG. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=bsh&AN=136645243&site=ehost-live

de Ávila, L. C., de Oliveira, A. S., de Melo Silva Ávila, J. R., & Malaquias, R. F. (2016). Behavioral Biases In Investors' Decision: Studies Review From 2006-2015. *Revista De Gestão, Finanças E Contabilidade*, *6*(2), 112-131. doi:10.18028/2238-5320/rgfc.v6n2p112-131

De Silva, H., Dockner, E. J., Jankowitsch, R., Pichler, S., & Ritzberger, K. (2014). Choice of rating technology and loan pricing in imperfect credit markets. *Journal of Risk*, *17*(1), 29–62. https://doi.org/10.21314/JOR.2014.275

Deininger, K., & Goyal, A. (2012). Going digital: Credit effects of land registry computerization in India. *Journal of Development Economics*, *99*(2), 236–243. https://doi.org/10.1016/j.jdeveco.2012.02.007

Dunn, J., Castleberry, C., Massey, S., Crider, P., Beuoy, A., & Zarzecki, L. (2019). Technology and Small Business Lending: A Case Study. *Journal of Accounting & Finance (2158-3625)*, *19*(3), 47–56. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=bsh&AN=137673152&site=ehost-live

Edoardo, Totolo and Gubbibs. P. (2018). Digital credit in Kenya: Evidenc from demand side surveys. https://s3-eu-central-1.amazonaws.com/fsd-circle/wp-content/uploads/2018/10/18162055/Digital-Credit-in-Kenya.pdf. Accesses on 20/11/2019.

Ferri, G., Murro, P., Peruzzi, V., & Rotondi, Z. (2019). Bank lending technologies and credit availability in Europe: What can we learn from the crisis? *Journal of International Money & Finance*, *95*, 128–148. https://doi.org/10.1016/j.jimonfin.2019.04.003

Finscope. (2018). FinScope Uganda: Top line findings report. Retrieved from https://fsduganda.or.ug/finscope-2018-survey-report/ on 19/11/2019.

Foss, N. J., & Weber, L. (2016). Moving opportunism to the back seat: Bounded rationality, costly conflict, and hierarchical forms. *Academy of Management Review*, *41*(1), 61-79.

Fuster, A., Plosser, M., Schnabl, P., & Vickery, J. (2019). The Role of Technology in Mortgage Lending. *Review of Financial Studies*, *32*(5), 1854–1899. https://doi.org/10.1093/rfs/hhz018

Gatsi, J. G., & Gbettey, C. (2019). Soundness of Banks, Ease of Access to Credit and Affordability of Financial Services in Africa. *Journal of Accounting & Management (2284-9459)*, *9*(2), 45–55. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=bsh&AN=140822648&site=ehost-live

George, B. P., & Henthorne, T. L. (2007). Tourism and the general agreement on trade in services. *International Journal of Social Economics*, 27(1), 18-26.

George, B., & Rogers, J. (Eds.). (2018). *The Changing Landscape of Global Businesses: Principles and Practices*. Cambridge Scholars Publishing.

Gießmann, S. (2018). Money, Credit, and Digital Payment 1971/2014: From the Credit Card to Apple Pay. *Administration & Society*, *50*(9), 1259–1279. https://doi.org/10.1177/0095399718794169

Hermes, N. (1994). Financial development and economic growth: a survey of the literature. *International Journal of Development Banking* 12 (1), 3–22.

Hertzberg, A., Liberman, A., & Paravisini, D. (2015). *Adverse selection and maturity choice in consumer credit markets: Evidence from an online lender*. Working Paper.

Hoffman, D., Gibson, J., Scarpati, C., & McConchie, K. (2008). How Credit Market Conditions Expose Challenges Of Securitization Technology Systems. *Total Securitization & Credit Investment*, 1. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=bsh&AN=47463404&site=ehost-live

Hwang, B. H., & Tellez, C. (2016). The proliferation of digital credit deployments. *CGAP Brief*. CGAP 1818 H Street, NW MSN IS7-700 Washington, DC 20433 USA. https://openknowledge.worldbank.org/bitstream/handle/10986/24567/The0proliferat0l0credit0deployments.pdf?sequence=1. Accesses on 20/11/2019.

Izaguirre, J. C., Kaffenberger, M., & Mazer. R. (2018). It's Time to Slow Digital Credit's Growth in East Africa. https://www.cgap.org/blog/its-time-slow-digital-credits-growth-east-africa. Accesses on 20/11/2019.

Kar, M., Nazlıoğlu, Ş., & Ağır, H. (2011). Financial development and economic growth nexus in the MENA countries: Bootstrap panel granger causality analysis. *Economic modelling*, *28*(1-2), 685-693.

Karlan, D., & Zinman, J. (2018). Long-run price elasticities of demand for credit: evidence from a countrywide field experiment in Mexico. *The Review of Economic Studies*, *86*(4), 1704-1746.

Khan, M.S., & Senhadji, A.S. (2003). Financial development and economic growth: a review and new evidence. *Journal of African Economies* 12 (supp 2), ii89–ii110.

Kozuka, S., & Nottage, L. R. (2009). The myth of the cautious consumer: law, culture, economics and politics in the rise and partial fall of unsecured lending in Japan. *Economics and Politics in the Rise and Partial Fall of Unsecured Lending in Japan. Consumer credit, debt and bankruptcy: national and international dimensions, J. Niemi-Kiesilainen, I. Ramsay, W. Whitford, eds., Hart Publishing: Oxford.*

Kumar, N. (2013). Financial inclusion and its determinants: evidence from India. *Journal of Financial Economic Policy*, *5*(1), 4-19.

Laibson, D., & List, J. A. (2015). Principles of (Behavioral) Economics†. *American Economic Review*, *105*(5), 385-390. doi:10.1257/aer.p20151047

Levine, R., 1997. Financial development and economic growth: views and agenda. *Journal of Economic Literature* 35, 688–726.

LexisNexis study finds smaller banks, credit unions, digital lenders hit hardest by business lending fraud losses. (2019). *Equity Bites (M2)*. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=bwh&AN=86D51735899561&site=ehost-live

Matsuoka, T., & Shibata, A. (2012). Asset bubbles, credit market imperfections, and technology choice. *Economics Letters*, *116*(1), 52–55. https://doi.org/10.1016/j.econlet.2012.01.009

Mazer. R., & Fiorillo, A. (2015). Digital Credit: Consumer Protection for M-Shwari and M-Pawa Users. https://www.cgap.org/blog/digital-credit-consumer-protection-m-shwari-and-m-pawa-users. Accesses on 20/11/2019.

McDowell, H. (2017). TP ICAP invests in credit market FinTech start-up: LiquidityChain provides a platform to connect users and highlight potential trading opportunities in global credit markets. *Ai Trade News*, 1. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=bsh&AN=123809798&site=ehost-live

McKinsey Global Institute. (2016). Digital finance for all: Powering inclusive growth in emerging economies. https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Employment%20and%20Growth/How%20digital%20finance%20could%20boost%20growth%20in%20emerging%20economies/MGI-Digital-Finance-For-All-Executive-summary-September-2016.ashx. Accessed on 10/9/2019.

Mensah, W., & George, B. P. (2015). Performance Management in the Public Sector: An Action-Research Based Case Study in Ghana. *Journal of Applied Economics & Business Research*, *5*(2), 8-20.

MSC, SPTF, Smart Campaign, and AFD (2019). *Making digital credit truly responsible: Insights from digital credit in Kenya.* https://www.microsave.net/wp-content/uploads/2019/09/Digital-Credit-Kenya-Final-report.pdf   -   . Accessed on 20/11/2019.

MSC, SPTF, Smart Campaign, and AFD, (2019). Making digital credit truly responsible. Insights from analysis of digital credit in Kenya. https://www.microsave.net/wp-content/uploads/2019/09/Digital-Credit-Kenya-Final-report.pdf. Accesses on 20/11/2019.

Niinimaki, J.-P. (2016). Spatial competition in the banking system: Alternative lending technologies and collateral assets. *Journal of Multinational Financial Management*, *35*, 93–109. https://doi.org/10.1016/j.mulfin.2016.03.003

Ouma, S. A., Odongo, T. M., & Were, M. (2017). Mobile financial services and financial inclusion: Is it a boon for savings mobilization? *Review of development finance*, *7*(1), 29-35.

Pagano, M., & Jappelii, T. (1993). Information Sharing in Credit Markets. *Journal of Finance (Wiley-Blackwell)*, *48*(5), 1693–1718. https://doi.org/10.2307/2329064

Peters, A. (2019). Banks fall further behind Fintechs in personal lending. *American Banker*, *184*(36), 1. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=bsh&AN=134828549&site=ehost-live. Accessed on 12/09/2018.

PR Newswire. (2019, October 9). Alternative credit scoring fintech CredoLab partners with novation to fight credit fraud. *PR Newswire US*. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=bwh&AN=201910090900PR.NEWS.USPR.HK88009&site=ehost-live

Robinson, J. (1952). The Generalization of the General Theory, the Rate of Interest and Other Essays. Macmillan, London, 67–142.

Rom, R. (2014). *The Impact of Unsecured Lending on the Financial Wellbeing of Consumers* (Doctoral dissertation, University of Pretoria).

Rosen, B. A. R. B. A. R. A. (2010). The Experience of Participants in Both an Incentivized Savings and CCT Program in Rural Peru. *Estudio. Proyecto Capital, Instituto de Estudios Peruanos, Lima*.

Sanchez, J. M. (2018). The information technology revolution and the unsecured credit market. *Economic Inquiry*, *56*(2), 914-930.

Sánchez, J. M. (2018). The Information Technology Revolution and the Unsecured Credit Market. *Economic Inquiry*, *56*(2), 914–930. https://doi.org/10.1111/ecin.12519

Schumpeter, J. (1911). The theory of economic development. Harvard Economic Studies. Vol. XLVI.

Sedunov, J. (2017). Does Bank Technology Affect Small Business Lending Decisions? *Journal of Financial Research*, *40*(1), 5–32. https://doi.org/10.1111/jfir.12116

Song, Z., & Zhang, X. (2018). Lending technology and credit risk under different types of loans to SMEs: Evidence from China. *International Review of Economics & Finance*, *57*, 43–69. https://doi.org/10.1016/j.iref.2018.02.012

Thaler, R., & Sunstein, C. (2008). Nudge: The gentle power of choice architecture. *New Haven, Conn.: Yale.*

Trew, A. (2006). Finance and growth: a critical survey. *Economic Record*, *82*(259), 481-490.

Van Loo, R. (2018). Making Innovation More Competitive: The Case of Fintech. *UCLA Law Review*, *65*(1), 232–279. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=bsh&AN=128768579&site=ehost-live

Van Loo, R. (2018). Making Innovation More Competitive: The Case of Fintech. *UCLA Law Review*, *65*(1), 232–279. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=bsh&AN=128768579&site=ehost-live

van Thiel, D., & van Raaij, W. F. (Fred). (2019). Artificial intelligence credit risk prediction: An empirical study of analytical artificial intelligence tools for credit risk prediction in a digital era. *Journal of Risk Management in Financial Institutions*, *12*(3), 268–286. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=bsh&AN=137835193&site=ehost-live – Accessed on 12/09/2018

Williamson, O. E. (1989). Transaction cost economics. *Handbook of industrial organization*, *1*, 135-182.

Williamson, O. E. (2008). Transaction cost economics. In *Handbook of new institutional economics* (pp. 41-65). Springer, Berlin, Heidelberg.

Wisniewski, M. (2018). Fintechs find another untapped market: New immigrants needing credit. *Nationalmortgagenews.Com*, 1–4. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=bsh&AN=128401548&site=ehost-live. Accessed on 12/09/2018