Journal of
Economics and
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Table of Content

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Full Length Research Paper

Financial inclusion: Is it a precursor to agricultural commercialization amongst smallholder farmers in Uganda? A comparative analysis between Lango and Buganda sub-regions

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This study examines the contributions of financial inclusion in supporting agricultural commercialization amongst smallholder farmers in Uganda in Lango and Buganda sub-regions. The researcher adopted a comparative study and cross-sectional survey design where descriptive, bivariate and multivariate data analysis was used. Chi square procedure was run to test the hypothesis that financial inclusion does not affect agricultural commercialization amongst smallholder farmers in Lango and Buganda sub-regions. Regression analysis was specifically used to predict the level of change in agricultural commercialization due to changes in financial inclusion. The study identified financial inclusion as one variable that can predict the success of agricultural commercialization, though it varies from one region to another. In Lango, efforts by government to increase financial access is a positive factor to agricultural commercialization while in Buganda, it is a negative factor. In Lango, land is communal and not individually owned. Therefore, smallholder farmers need to access finances to purchase land for commercial farming. In Buganda, however, land is freehold, which makes smallholder farmers to own chunks of land from their parents. The study has established some common factors that limit agricultural commercialization in both Lango and Buganda, that is, expensive equipment and fluctuating prices while poor infrastructure is no longer a big worry. This paper recommends that, financial service providers should revise their lending terms downwards to reach smallholder farmers, some of whom lack collateral security to pledge for credit. While the government takes credit for improving infrastructure, government, through her policy organs like ministry of agriculture, should provide buffer prices against price fluctuations.

Key words: Financial inclusion, agricultural commercialization, smallholder farmers.

INTRODUCTION

Many agencies, development partners and governments the world over have adopted financial inclusion as having the ability to support inclusive transformation in the community and rural areas (IFAD, 2016). Financial inclusion is a cross cutting issue where the policy makers need to develop policies that are linked to those

operating in the financial sector. Demirguc-kunt et al. (2015) note that adequate progress has been achieved in raising financial inclusion levels globally where the unbanked people have drastically reduced by 20% to two billion in the period 2011-2015.In Uganda, the number of adults who could access formal financial services rose from 28% in 2009 to 54% in 2013 (CARE International, 2014). Mobile money brought about a sharp rise in financial inclusion. This report further reveals that about 15% of the adults have no access to formal financial services. In 2018, financial inclusion in Uganda stood at 58%, which is almost double of what it was in 2009. The introduction of Agent Banking in 2016 and shared agent platform/switch to facilitate access to bank agents in 2018 account for the notable rise in financial inclusion (Alliance for Financial Inclusion, 2019). However, the position remains low if compared to the global position of 69% in 2017 and 63% in Sub Saharan Africa. The same report establishes that 77% of the adults in rural areas have formal financial inclusion, majority of who are men (63%). These statistics imply potential contributions of financial inclusion to the agricultural sector in Uganda, where 43% of household-based enterprises belong (Uganda Bureau of Statistics, 2016).

Uganda's economy predominantly depends on agriculture since the 1920s, where cotton and coffee accounted for 90% of the total exports (Goobi et al., 2017). Around the years of independence, economic growth and development in Uganda was impressive, growing at an average annual rate of 6.7%. Around the same period, agriculture contributed more than one-third of the country's GDP. The expansion in the food processing industries at that time gave rise to this historical rate of economic growth and development (Uganda Bureau of Statistics, 2016). From mid-1960s, Uganda implemented agricultural and lending schemes that resulted in the establishment of two public sector banks (Uganda Commercial Bank and Cooperative Bank) to serve as a conduit for government lending schemes. These banks made losses for failure to follow commercial practices (Kilimani, 2007). However, political instability, poor governance and economic mismanagement that swept the country in the 1970s and early 1980s saw Uganda's persistent decline in the economy, casting it among the world's poorest and least developed countries. The real decline in GDP stood at 38%, with a greater effect on agriculture and trade sectors. The increasing insecurity at the time and the unattractive prices paid to farmers affected coffee prices significantly (Ministry of Finance, Planning and Economic Development, 2010; Brownbridge, 1996; Goobi et al., 2017). According to Uganda Bureau of Statistics (2016), agriculture contributed 24.0% to Uganda's GDP in 2014/

2015 year and 80% of Uganda's exports, with coffee alone contributing 20% (Goobi et al., 2017).

The integration of smallholder farmers into agricultural commercialization is significant to agriculture's contribution to economic growth thus enhancing financial inclusiveness. Dehaas (2016) states that Uganda registered 12 percent of smallholder farmers as the sellers of farms products and the net buyers stood at 66 percent; therefore, accessibility to the market and transiting from subsistence farming to commercial farming can lead to economic growth. Uganda Bureau of Statistics (UBOS) (2015) observes that agricultural sector had grown faster by contributing 26 percent from 24 percent to the GDP of Uganda, which is commendable as after embracing value addition. The importance of agricultural commercialization has significantly grown with the development of various strategies, which shifted from subsistence to commercial (FAO, 2013). Agriculture provides the primary source of income for the world economy and supporting agricultural commercialization may lead to an inclusive model for economic growth. Gashu et al. (2019) justifiably assert that a significant investment and creativity in agriculture is highly needed to achieve a sustainable economic growth. One way towards sustainable economic growth and development is agricultural commercialization and stimulating household incomes. Agriculture commercialization is the process of transition from subsistence farming to production-oriented marketing (Pradhan et al., 2010). The concentrations of commercial agriculture in Uganda consist of the following: Livestock farming, crop farming, fishing, forestry and recently horticulture, which have gained prominence. Majority of the population in Uganda depend on agriculture for their livelihood. They thus need an inclusive financial system to accelerate economic transaction, manage daily resources, improve lifestyle, and make investment to support growth. The Government of Uganda has supported agriculture by providing special incentives which included duty free tax on importation of plant and machinery, research and development expenditures are exempt, training and capital allowances on plant and machinery between 50-70% are exempted (Uganda Investment Authority (UIA), 2015). Agricultural modernization in Uganda may support change from subsistence agricultural system to a modern and commercialized system, though it calls for adoption of adequate interventions.

Agricultural industry is significant to the society especially where it accounts for a larger share of the economic output. Most importantly, financial inclusiveness has not been emphasized in support to small holder commercialization of agriculture. Insufficient amount of commercialization of agriculture. Insufficient amount of

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money has always been exerted to promote agricultural sustainability and development and majority of smallholder farmers and entrepreneurs focus on production and technology which has not been consistent (Seidel et al., 2013). Agricultural financial sector has also been associated to the land rush growing globally. Fairbairn (2014) argues that financial investors intending to acquire land for large scale farming is on the rise and this is a major challenge facing commercial farmers. These challenges are unique to smallholder commercial agriculturalist and financial institution face similar hurdles, which may include but not limited to high transaction costs, regulatory framework and unfavorable climatic environment (IFC, 2012). The market dynamics currently faced by smallholder farmers does not support market access for the rural dwellers thus undermining agricultural commercialization.

Economists and agriculturalist have linked the challenges in adopting innovation and technology in agricultural sector to access to credit. FAO (2015) establishes that inadequate infrastructure in the rural areas has made it difficult to support processing of agricultural produce for value addition, and other produces are perishable like vegetables, fruits, dairy products and others. Barnett et al. (2008) link the inadequate agricultural finance, which re-enforces poverty traps, and in essence, advocates for the risk-based finance programs. Despite the increasing attention and efforts by many developing countries where Uganda falls, environmental issues not withstanding delays in the adoption of technology affects smallholder agricultural commercialization (World Bank, 2016). Much emphasis on investing resources in domestic or smallholder agriculture is evident, Uganda's spending on agriculture has continuously declined despite its key role in the economy. In this respect, the low budget on this sector has negatively affected it and this affects the research on value addition, quality and regulation standards. The challenges the two regions face in agricultural commercialization amongst small holder farmers are not any different from other region. This study will help to identify key institutional issues that may support the transformation of smallholder farmers into large scale and modern agro-processing markets to achieve economic growth.

Objectives

(i) To establish the relationships between financial inclusion and agricultural commercialization amongst smallholder farmers in Lango and Buganda sub-regions
(ii) To assess the role of financial inclusion in supporting Agricultural commercialization amongst smallholder farmers in Lango and Buganda sub-regions.
(iii) To examine the factors hindering the growth of agricultural commercialization amongst the smallholder

farmers in of Lango and Buganda sub-regions.

Hypothesis

Financial inclusion does not affect agricultural commercialization amongst smallholder farmers in Lango and Buganda sub-regions.

LITERATURE REVIEW

Conceptualizing financial inclusion

Financial inclusion (FI) is the provision of affordable, timely and appropriately regulated access to financial services and products to all categories of people with the aim of improving and promoting the well-being of the population (OECD/INFE, 2012).The usage, adequacy, convenience, product knowledge, affordability and accessibility are some of the factors brought forward by many authors in describing financial inclusion (Aro-Gordon, 2016).Financial inclusion (FI) emerged as a major player in delivering financial services to the community and the disadvantaged poor at an affordable terms and conditions (Iqbal and Sami, 2017). It is important that the regulators, financial sectors and government create a conducive and enabling environment that supports the capacity of financial service providers through identification of the market demands by designing affordable products and services, which support financial inclusion (Arnold and Rhyne, 2016). Uganda has adopted the usage of mobile money services and technology that has significantly strengthened financial inclusion amongst the farmers in the rural and peri-urban areas. Digital cash transfers are most cost-effective methods of transferring money to small-scale farmers, which are scattered in rural areas. Finscope (2018) argues that mobile money services have driven financial inclusiveness to Ugandans. Out of the 58% of the population who have access to formal financial services, only 56% conduct their transaction through mobile money services.

Accessibility to digital financing is critical for the transformation of smallholder agricultural sector. Finscope (2018) states that 22% of Ugandan adults are using informal channels in accessing financial services whereas 22% are excluded financially therefore meaning that 44% of Ugandan adults are not getting the deserved services from the financial sector. Just like other developing countries in the world, Uganda has adopted the usage of telephone banking, whose penetration stands at 10% (Bruhn and Love, 2014). This is still low; however, the usage is likely to increase if most Ugandans are continuously sensitized. Callen et al. (2014) note that technology can improve savings; this can be done by using mobile point service centers to collect weekly deposits and this increases higher saving rates and

increases household income. Kast and Pomeranz (2014) argue that the reduction in the barriers to a formal saving by individuals offering free bank accounts may result in a decrease in short term debt and increased ability of coping with consumption shocks. Serrao et al. (2013) state that inequality amongst the community is widening and believed that limited access to financial services is seen as a factor responsible for the persistent and widening income inequality and slow economic growth. UNCDF (2015) notes that policy makers hope that the rising level of financial inclusiveness would reduce inequality and raise growth. Kotler and Keller (2015) observes that there are non-financial institutions legally operating in the community offering financial products and services to clients without a regulatory framework given by a financial authority.

Tania and Adalbert (2018) point out the challenges associated to financial inclusion that are linked to unfavorable business environment and ever rising transaction cost, which makes it very difficult for the sustainability of formal financial institution. DeOlloqui et al. (2015) argue that the challenges that limit financial inclusion are especially those population who are excluded, and majority are in the rural areas. The rural environment faces multiple risks such as lower rates for formal property ownership, which may lead to reduction in the range of collateral security and these affect the coverage and the quality of the availability of the infrastructure (Valenzuela and Cruz, 2017). Access to financial service providers and bank branches has proved to be problematic especially to smallholder farmers and agriculturalist who are based in rural areas where banking services are not easily available; whereas urban dwellers can access these financial services as and when they need them (World Bank, 2015). Credit services, saving and member's deposits remain the basic financial services, which can be accessible while others are outreach like networks and retail location (World Bank, 2014). Financial experts argue that access to a reasonable credit, at affordable rates to the poor will increase financial inclusiveness to the disadvantaged poor (Abdulkareem, 2019).It is significant to note that financial exclusion in developing countries affects mostly the rural dwellers and therefore it is important to applause the contribution of informal financial lenders in filling this gap. Therefore the concerned authority should provide a monitoring and supervisory role to protect the borrowers (Eton et al., 2019). Similarly, Akinlo (2014) establishes that access to financial services is a major role in the development of the rural poor by increasing income and facilitating investment in various sectors creates an opportunity for employment therefore reducing the vulnerability of the poor. Tambi (2018) states that development partners, private sector especially formal financial institution and governments should sensitize the smallholder farmers on the availability and existence of financial services.

Conceptualizing agricultural commercialization

Agricultural development economics establishes ways of breakthrough from semi-subsistence methods (in which smallholders are trapped) to the modern ways of farming which is commercial in nature (Muamba, 2011).The process involving transforming agricultural practices from the rudimentary subsistence farming to commercial farming is agricultural commercialization (Justus et al., 2016). Smallholder farmers can engage in agricultural commercialization if given all the necessary support thus, contributing to economic growth of the economy. Agricultural commercialization operates in two folds: the one, which includes food crops and the one of cash crops, which allows for production diversity (Jennifer and Tina, 2014). The current agricultural commercialization or enterprise requires investing heavily on the equipment and guard against risk associated with uncertainties from natural disasters like droughts and floods. IPCC (2012) argues that farmers in sub-Saharan Africa, Uganda inclusive suffer climatic change that affects agricultural production capacity. Importantly, agriculture in Uganda is largely rainfed therefore farmers are vulnerable to drought and floods. Climatic change has proved to be a global phenomenon that greatly affects agricultural production by causing variation in weather patterns, drought and alterations in pests and diseases and the extent of its adversity would depend on the adaptability capacity of the farmers (Gornall et al., 2010).To increase the income of smallholder farmers in developing countries, agricultural commercialization should focus on developing better policies that supports commercialization of smallholder agriculture (Muriithi and Matz, 2015).

Smallholder agricultural commercialization faces various challenges, which among others include inadequate financing for long-term growth. This is a serious challenge in the agricultural growth sector where agriculture has turned to be capital-intensive industry (Eraskine, 2014). Limited farmlands and variation in climatic conditions are some of the major challenges faced by smallholder farmers who are involved in commercial agriculture (Tambi, 2018). Technological barriers have posed as a challenge to agricultural commercialization that may prevent smallholder farmer's access to credit, thus limiting productivity and income generation (Levine, 2005). Whereas technologies effectively support agricultural commercialization, inability to access capital especially among the underprivileged rural dwellers hinders smallholder farmers in developing countries from adopting them (Shiferaw et al., 2015). Smallholder farmers with smaller plots are often constrained by their inability to invest in modern inputs, which affects their income. EKN (2015) observes that small-scale farmers cannot use tractors since farmers cannot afford the technology. As an intervention, the adoption of technology has helped link the smallholder farmers and markets and this has enhanced the

productivity by different farmers (GOP, 2015). Innovations in the agricultural sector is significant in lowering per unit cost, reduces hunger and therefore boosting the income of the rural dwellers (Maertens and Barrett, 2013). Access to usage of technology, land, infrastructure and adequate amount of rainfall significantly affects the decision of farmers in agricultural commercialization (Olwande et al., 2015). The continuous usages of poor technology, poor quality seeds, pesticides and fertilizers by smallholder farmers have greatly affected the production and markets prices. Herrmann (2017) argues that using modern farming techniques and technology can lead to production of good quality products with high demand in the market and these increase their income levels. This therefore changes the conditions of input and output prices, marketing systems, transaction cost and the risks that farmers anticipate.

Gebremedhin and Jaleta (2010) state that agricultural production has been hit by falling prices of agricultural products, inadequate technology, lack of infrastructure and inefficient marketing institutions that cause a high risk to household income. Woolverton et al. (2014) observe that smallholder farmers have continued to engage in subsistence agriculture, which is less profitable, and therefore cannot reap from the benefits arising from agricultural commercialization. Gashu et al. (2019) note that new initiatives, reforms in policies and initiatives should be supported while appropriate investments needed to be developed which supports agricultural innovation and growth. AGRA (2016) argues that a number of interventions have been made by various bodies that led to the transformation of smallholder farmers into a major source of income, employment and food for consumption. Smallholder farmers lack links to the markets locally and internationally, making them more prone to exploitation by intermediaries. The public and private sector ought to contribute towards agricultural commercialization through offering financial incentives and training (Kabiti et al., 2016).It is important to note that formation of agricultural cooperatives or partnership by farmers with already established farmers supports markets commercialization (Bitzernd and Bijman, 2014) although poor and smallholder farmers could be left out on the argument that their relevance is not felt. Olwande et al. (2015) argue that improving markets accessibility and reduction of costs affects positively the smallholder farmers market participation which my lead to marketable surplus of their produce. The approach of improving smallholder farming methods and improved accessibility to the market transforms the household economic status (Yusuf et al., 2018). The integration of cash generating crops to the line of various crops produced by smallholder farmers will increase their level of income and this motivates them (Rubhara and Mudhara, 2019). There is much support still needed for sustainability and transformation of agricultural processes in the sub-Saharan Africa to meet the sustainable development goals.

Financial inclusion and agricultural commercialization

The recent trends in developing nations have seen farmers engage in agricultural commercialization, and adoption of financial flows into less risky industries and corporations indicates that farmers are highly indebted and therefore creating avenues for financial partnerships (Sippel et al., 2017). Better financial services should improve financial accessibility to the poor, which provides support for a sound and safe spread of better modes of financial service delivery that can easily reach the poor and upscale the successful models for poor households to embrace agricultural commercialization. Soederberg (2013) notes that financialization is expanding into areas beyond traditional agricultural export nation as international organizations are promoting financial inclusiveness in most of the developing nations as a tool for development of agriculture and growth. Most development agencies and banks encourage private financing to support smallholder agricultural commercialization (Aitken, 2013). The government of Uganda, its agencies and private sector have developed strategies to aid the poor improve on agricultural commercialization in both rural and peri urban areas and this has increased incomes for the poor. The World Bank (2014) notes the critical areas where governments have to focus on lowering credit exposure to the agricultural sector and the supply chain and much concentration should be in the geographical disadvantaged areas, financial infrastructures and inadequate training amongst the smallholder commercial farmers regarding financial products and services. By lowering transaction cost in the agricultural sectors, money transfers and mobile money, users ought to protect farmers against any risks (Jack and Suri, 2014). The usage of mobile money services by smallholder farmers is associated with increased farm profits, household income and increased input usage, which supports agricultural commercialization (Kikulwe et al., 2014) .The provision of payments, insurance, credits and savings to the financially disadvantaged and poor at a reasonable cost remain basic to accessing formal financial services. Agricultural insurance products helps commercial farmers address the constraints affecting them such as limited land for cultivation, inadequate inputs for investment and risk associated to production (Norton et al., 2014).The agricultural sector globally suffers from inadequate financing, which reduces the potential of the agriculturalist in utilizing agricultural resources adequately and effectively (Gupta, 2012). Households can improve their well-being through additional income from sales of foodstuff for consumption (Beaman et al., 2014). Investing in farm inputs will eventually lead to increase in production sales.

Sanfo and Gerard (2012) state that various interventions can mitigate the adverse effects of poor climatic conditions. Such initiatives increase access to financial services at household level, and enhance the adaptability capacity, which would improve agricultural commercialization. The rural poor communities have inadequate access and insecure access to natural resources due to degradation, land fragmentation; continuous competition for the limited available resources and unfavorable government policies, which increase income inequality and financial exclusion among rural dwellers (Prato and Longo, 2012). The high demands for collateral by formal financial institutions, high-perceived risks associated lending to farmers and inadequate capacity in developing friendly credit instruments for farmers have led to under capitalization in the agricultural sector. Financial credit will be a necessity for smallholder farmers to increase their income and agricultural productivity although they are facing a challenge to access credit due to lack of collateral (World Bank, 2015). Subsistence farmers and smallholder farmers if given extensive and financial support are most likely to adopt commercialization of agriculture (Rubhara and Mudhara, 2019). Most clients have stated that high transaction cost has been a major challenge faced by households in obtaining credits from formal financial institution such as loan applications while evaluating collateral security, monitoring servicing of the loans and these eventually delays farmers which affects the planting periods (Ali et al., 2014). Banks assess loan applications for agricultural commercial farmers by taking into consideration the cash flow streams and availability of sources of income (ABA, 2014). The reduction to barriers to formal savings by offering free accounts to individuals would decrease the short-term debt and increase ability to comply with the consumption shocks and well-being of the households (Kast and Pomeranz, 2014). Subsidization of savings by elimination of minimum balances for the customers will provide a temporary interest bonus to increase bank account opening and household income (Schaner, 2015). Informal financial services have proved to be costly, restricted farmers in a particular value chain, lack diversity and this affects the processors and traders who may be operating at small scale (FAOAcademic de Centro_ America, 2016).

METHODOLOGY

The researchers adopted a comparative study and cross-sectional survey design. The opinions, trends and attitudes of the participants were collected at one point in time on financial inclusion and agricultural commercialization. This study adopted the qualitative approach to obtain naturalistic experiences of commercial farmers in both Lango and Buganda sub-regions. The study adopted the quantitative approaches to obtain quantifiable information on commercial farmers that would easily be analyzed and generalized. Primary and secondary data collection methods were also used in the study. Secondary data were majorly from government and private institutions reports.

Close-ended self-administered questionnaires were developed to provide uniformity of measurement. Bird (2009) states that a closed-ended question is easily admissible, easy to code and analyze and therefore produces a complete question that avoids irrelevant responses. The instrument was pretested on commercial farmers in some Kayunga district in Buganda sub-region. The instrument indicated a reliability coefficient of (α =.749). This was above 0.7, which is acceptable. Therefore, the instrument used was internally stable. The instrument had 11 items measuring financial inclusion, 13 items measuring agricultural commercialization, and 11 items describing challenges in agricultural commercialization. Open-ended questions were developed and administered to commercial farmers that show excellence in National Agricultural and Research Organization (NARO) demonstration projects in Lango and Buganda sub-regions. This study identified these farmers from district reports, which constituted secondary information for this study.

The study was conducted in the districts of Dokolo, Apac, and Lira in Lango sub-region while in Buganda sub-region, the study was conducted in the districts of Luwero, Masaka and Wakiso, respectively. The choice of the districts under study was due to the fact that the promotion of agricultural commercialization had taken shape as a result of the availability of market, land and increase in the number of prominent entrepreneurs engaging in smallholder agriculture for commercialization. Agricultural commercialization in Lango is characteristic of annual crops (millet, maize, simsim, groundnuts, and maize). On the other hand, agricultural commercialization in Buganda is characteristic of perennial crops (banana, pineapples, coffee, and sugarcane).

A target population of 1700 was sought for in the study and 313 respondents were considered against the total population of 6320 from which the target was drawn (Uganda Bureau of Statistics (UBOS), 2018). The sample size of the respondents was from the selected districts which included Dokolo 44, Apac 55 and Lira 60 from Lango sub-region while from Buganda sub-region Luwero 44, Wakiso 54 and Masaka. 58 districts were considered and it is from these districts where the sample size was determined using Krejcie and Morgan 1970 Table. The varying sample size per district was based on the premise that the population size of each district varied and the number of smallholder farmers dealing in commercial agriculture was also not the same. To identify the right participants, the researchers visited the office of the District Agricultural Officers, who availed lists of potential commercial farmers. Using simple random sampling procedures, sample sizes proportional to the targeted populations were drawn from each district. Creswell (2013) believes that simple random sampling eliminates potential selection bias that is likely to occur in the process of selecting participants. This procedure of sample selection was used because the population appeared finite (Amin, 2005). Numerical data collected through questionnaires were cleaned and validated to ensure accuracy and consistence. Descriptive, bivariate and mutivariate data analysis techniques were applied. Chi square procedure was run to test the hypothesis that financial inclusion does not affect agricultural commercialization amongst smallholder in Lango and Buganda sub-region. Regression analysis was adopted to predict the level of change in agricultural commercialization due to changes in financial inclusion. Verbatim statements from key informants supported quantitative data analysis.

RESULTS AND DISCUSSION

In both Lango, and Buganda, most of the participants were male constituting 51.4% and 48.6% were female respectively. In most part of Uganda, productive resource like land is majorly owned by men. Therefore, it comes as

Table 1. Correlation test.

Variable list	Output	Agricultural commercialization (Lango)	Agricultural commercialization (Buganda)
Financial Inclusion	Correlation	0.314	-0.340
	p-value	0.000	0.003
	N	183	73

**Correlation is significant at the 0.01 level (2-tailed).

no surprise that men dominate commercial agriculture. Even though women might have access to financial services, they lack securities to pledge to financial services providers. The lack of collateral security needed by formal financial institutions before extending credit supports Ali et al. (2014). These authors showed that the high cost of transacting loans affects households from obtaining credit, of which women are most affected. In terms of age, most of the participants from Lango were of 35-49 (44.3%) while in Buganda, most of the participants were of age 18–34 (45.2%). The difference in participation according to age suggests differences in land tenure systems. In Lango, land is communally owned. Therefore, the adults and the old are likely to own land. In Buganda, land is freehold and highly inheritable, which has seen young people owning large chunks of land. Though ownership of land may not imply participation in commercial agriculture, those with land have high chances of engaging in commercial agriculture. In both Lango and Buganda, most of the participants had attained a university degree constituting 34.4% and 39.7% respectively. In the past, participation in agriculture was an activity left to the rural poor and uneducated. With the increasing number of university graduates that are unemployed, many are turning to commercial agriculture as a source of employment. The educated are likely to transfer knowledge, and adopt improved technologies easily than the less educated. Secondly, the educated are likely to exploit the increasing opportunities of access to financial services than the less educated. In both Lango and Buganda, most of the participants used mobile money services between 5 to 9 times a week constituting 38.8% and 50.7% respectively. Though participants do not use mobile money services for commercializing agricultural practices, the mere fact that the service is available enhances commercial agriculture. This coincides with the findings on financial services commonly used by commercial farmers. In both Lango and Buganda, mobile money constituting 66.1% and 80.8% were the most used financial services. Commercial agriculture is commonly practiced in rural area where mobile money services are more common than other financial services. Though village banking might be accessible in rural areas, they are not attractive to educated farmers. Food crop constitute agricultural commercialization in Lango and Buganda, constituting

(66.1%) and 54.8% respectively. In Uganda, there is a thin line between food crops and cash crops since almost all food crops are marketable. Secondly, it is cheaper to cultivate food crops on small farmland than cash crops.

The relationships between financial inclusion and agricultural commercialization amongst smallholder farmers in Lango and Buganda sub-regions

The study employed a correlation test to establish the relationship between financial inclusion and agricultural commercialization amongst smallholder farmers. Correlation coefficient ranges from zero (no relationship) to one (perfect relationship). Correlation coefficients very close to zero indicate weak relationships while those very close to one indicate very strong relationships. Positive correlation coefficients indicate that the two variables change in the same direction while negative correlation coefficients indicate that the two variables change in opposite directions. The findings are based on a response rate of 81.8% (256 out of 313) (Table 1).

In Lango, the relationship between financial inclusion and agricultural commercialization (r =0.314; p-value =0.000) was weak. The statistics imply government's effort to promote financial inclusion is associated to a weak change to commercialization. However, the p-value shows that financial inclusion and agricultural commercialization are linearly related with 99% confidence. In Buganda, the relationship between financial inclusion and agricultural commercialization amongst small holder famers (r =-0.340; p-value =0.003) was weak and negative. The statistics imply that an effort by government to promote financial access is associated with a reduction in commercialization in Buganda. However, the p-value shows that financial inclusion and agricultural commercialization in Buganda are linearly related with 99% confidence. The findings support The World Bank (2014), which recommends that governments should focus on lowering credit exposure to geographically disadvantaged areas where commercial farmers have inadequate training in financial products and services. The report suggests that commercial farmers are not educated enough on financial products to take advantage of them. In Uganda, not all commercial farmers have enough information on agricultural financing

Table 2. Regression coefficients.

Model summary	Lango	Buganda
R	0.314(a)	-0.340(a)
R square	0.099	0.115
Adjusted R square	0.094	0.103
Std. error of the estimate	6.8653	8.42049

[a]Predictors: (Constant), Financial Inclusion, [b]Dependent Variable: Agricultural Commercialization

in commercial banks, except in Buganda, where the practice is gradually penetrating among the educated. However, the experience seems to disagree with (Kikulwe et al., 2014) who established that using mobile money services is associated with increased farm profits, household income, and input usage. These related benefits of financial inclusion to agriculture take shape in an environment that has less barriers to agricultural production than financial access. Otherwise, this study shows that a number of factors limit agricultural commercialization beyond finances. The present findings disagree with Norton et al. (2014) who draw findings from developed economics regarding agricultural insurance. In Uganda, very few commercial farmers have insured their farms against natural factors. One key informant observed:

"…*our effort to take a living out of agriculture is very constrained…the loans are available but tagged with exorbitant interest rates…this coupled with the unpredictable weather may lead to complete losses at times…*" The study observes that agricultural commercialization in Uganda is growing under tides of nature and the volatile economy. When the season is bumper, prices drop drastically making it difficult to repay agricultural loans. When weather conditions threaten crop performance, the loss is severe that repaying agricultural loans is very difficult.

The role of financial inclusion in supporting agricultural commercialization amongst smallholder farmer's in Lango and Buganda sub-regions

To assess the role that financial inclusion plays in supporting agricultural commercialization amongst smallholder farmers in Lango and Buganda sub-regions, the study adopted regression analysis. Regression is a mathematical relationship between the independent and dependent variables. The model uses R Square to assess the variation in the dependent variable accountable to the independent variable (Table 2).

Financial inclusion explains only 10% (R Square =0.099) of the variation of agricultural commercialization in Lango. In Buganda, financial inclusion explains only 11.5% (R Square =0.115) of the variation of agricultural

commercialization. The statistics imply absence of significant differences in the effect of financial inclusion on agricultural commercialization amongst small holder famers in the two sub-regions. Secondly, the effect of financial inclusion on agricultural commercialization amongst small holder farmers is low, which suggests the interplay of other factors in both regions. It should be noted that though the effects of financial inclusion appear to be low in both communities, financial inclusion increases agricultural commercialization in Lango and decreases in Buganda. These findings seem to agree with Rubhara and Mudhara (2019) who established that subsistence farmers are likely to adopt commercial agriculture if given financial support. While it is true that inadequate financial support is one limiting factor to commercial agriculture amongst small holder farmers, it is just a microcosm to the many barriers to agriculture development in Uganda. The findings further support Prato and Longo (2012) who identified inadequate and insecure access to natural resources as responsible for the increasing income inequality and financial exclusion among rural dwellers. Not to suggest that commercialized agriculture is an activity of the rural poor, financial exclusion affects mostly the poor. The negative relationship between financial inclusion and agricultural commercialization amongst smallholder farmers in Buganda supports FAOAcademic de Centro-America (2016) who observed that informal financial services tend to be costly, lack diversity, and affects borrowers on small scale. The costs associated with transacting credit tend to inch on the profits commercial farmers are likely to get. However, whether informal or formal financial services, accessing credit in Uganda is still costly, especially among the low-income earners.

Factors hindering the growth of agricultural commercialization amongst smallholder farmers in Lango and Buganda sub-regions

To assess the factors affecting agricultural commercialization amongst the smallholder farmers, the study subjected descriptive measures on a set of factors drawn from the Ugandan environment. The study used 'arithmetic mean' to show where participants' views clustered mostly, and 'standard deviation' to show where

Table 3. Factors affecting agricultural commercialization.

Variable List	Lango, N = 183		Buganda, N = 73	
	Mean	Std.	Mean	Std.
Expensive equipment	4.5	0.718	4.44	0.957
Weather changes	4.19	0.851	4.41	0.955
Droughts	3.85	1.042	3.84	1.269
Floods	3.9	1.003	3.82	1.358
Pests and diseases	4.45	0.738	4.36	0.903
Inadequate financing for long-term growth	4.27	0.75	4.41	0.879
Limited farmland	3.97	1.141	3.79	1.354
Inadequate technology	4.27	0.755	4.15	0.923
Inability to access capital	4.04	0.997	4.23	0.993
Inability to invest in modern inputs	4.11	0.811	4.11	1.061
Fluctuating prices	4.31	0.918	4.48	0.818
Inefficient marketing institutions	3.73	1.186	3.85	1.232
Poor infrastructure	3.97	1.266	3.81	1.478

Source: Field data (2020).

participants' opinions deviated mostly (Table 3). These scores were computed from a 5-point likert scale.

In Lango, the high mean scores point to expensive equipment (mean = 4.5; Std. =0.718), pests and diseases (mean = 4.45; Std. =0.738), and fluctuating prices (mean = 4.31; Std. =0.918) as key among the limiting factors to agricultural commercialization. In Buganda, high mean scores point to fluctuating prices (mean = 4.48; Std. =0.818), expensive equipment (mean = 4.44; Std. =0.957), weather changes (mean = 4.41; Std. =0.955), and inadequate financing for long-term growth (mean = 4.41; Std. =0.878) as key among the limiting factors to agricultural commercialization. The factors limiting agricultural commercialization in both communities, based on mean scores are expensive equipment, and fluctuating prices. While the mean scores do not reveal unique patterns of concentration of opinions, a comparison of standard deviations shows fluctuating prices as the most important factor limiting agricultural commercialization in both communities. In both communities, standard deviations indicate that poor infrastructure is not a worrying problem to agricultural commercialization. The findings seem to disagree with IPCC (2012) and Tambi (2018) who argued that climatic change has the greatest effect on agricultural production. Climatic change affects agricultural productivity contextually. For instance, farmers who cultivate in wetlands are least likely to be affected by climatic changes since wetlands do not dry completely. Similarly, farmers in mountainous areas are least likely to be hit by climatic changes, especially those that are situated on the windward side of the mountain. The findings in Buganda region agree with Levine (2005) and Shiferaw et al. (2015) who relate agricultural productivity to access to credit. Buganda region is near Uganda's capital city,

Kampala, where financial services are easily available. However, there are isolated pockets of commercial agriculture in Luwero and Masaka, which are known for pineapples, and coffee production respectively. Wakiso for example is a city suburb with very small pockets of commercial agriculture on limited farmland. Therefore, access to finance in this region is negatively associated to agricultural commercialization.

Hypothesis testing on financial inclusion and agricultural commercialization

The study adopted Chi-Square results under cross tabulation procedure to test whether financial inclusion and agricultural commercialization are independent. As a guide to interpretation, an asymptotic significant value (Asymp. Sig. <0.05) indicates that the variables are related while Asympt. Sig. >0.05 indicates that the variables are independent (Table 4).

In Lango, Asympt. Sig. <0.05, therefore rejecting the null hypothesis, which indicates that financial inclusion and agricultural commercialization are related. In Buganda, Asympt. Sig. <0.05, which also leads to the rejection of the null hypothesis, indicating that financial inclusion and agricultural commercialization are related. Based on the asymptotic significant values of the cross tabulation, financial inclusion and agricultural commercialization are related in both Lango and Buganda. The study rejected the null hypothesis that financial inclusion does not affect agricultural commercialization amongst smallholder farmers in both Lango and Buganda sub-regions; and accepted the alternative hypothesis that financial inclusion affects agricultural commercialization amongst small holder

Table 4. Chi-Square results.

	Lango	Buganda
	Asymp. Sig. (2-sided)	Asymp. Sig. (2-sided)
Pearson Chi-square	0.000	0.000
Likelihood ratio	0.774	1.000
Linear-by-linear association	0.000	0.003
Number of valid cases	183	73

The study set H_O: = Null hypothesis, and H_A: = Alternative hypothesis. H_O: Financial inclusion does not affect agricultural commercialization amongst smallholder farmers in Lango and Buganda sub-regions; H_A: Financial inclusion affects agricultural commercialization amongst smallholder's farmers in Lango and Buganda sub-regions.
Source: Field data (2020)

farmers in both Lango and Buganda sub-regions. The study is likely to obtain the same conclusion from over 95% of the sampled objects. Notwithstanding, directional measures indicate that financial inclusion positively affects agricultural commercialization in Lango, and not in Buganda.

CONCLUSION AND POLICY IMPLICATIONS

Agricultural commercialization is one step forward to poverty alleviation in a developing country like Uganda but its success will persistently lean on a set of economic and natural variables. This study has identified financial inclusion as one variable that can predict the success of agricultural commercialization amongst smallholder farmers, though it varies from one region to another. In Lango, government has a positive effect on financial inclusion in agricultural commercialization; while in Buganda, it is a negative factor. In Lango, land is communal and therefore smallholder farmers need to access finances to purchase or rent land for commercial farming. In Buganda, however, land is freehold, which makes smallholder farmers to inherit chunks of land from their parents. They need financial assistance to boost productivity than acquiring land. Nevertheless, these are relative positions in both Lango and Buganda because the overall input of financial access to agricultural commercialization is generally low. Of course, in Lango, farmers do not have collateral security to pledge before financial service providers while in Buganda, especially in Wakiso, land is expensive for commercial farming due to rapid urbanization. The study has established some common factors that limit agricultural commercialization amongst smallholder farmers in both Lango and Buganda that is expensive equipment and fluctuating prices while poor infrastructure is no longer a big worry. The existence of these factors and some shadows in financial access gave a strong ground to reject the null hypothesis that financial access does not affect agricultural commercialization amongst smallholder farmers in both Lango and Buganda sub-regions. We therefore recommend that, financial service providers should

continue revising their lending terms downwards to reach smallholder farmers, many of whom lack collateral security to pledge for credit. While the government takes credit for improving infrastructure, government, through her policy organs like Ministry of Agriculture, should provide buffer prices against price fluctuations. This study contributes a unique relationship between financial inclusion and agricultural commercialization amongst smallholder farmers by drawing from a plethora of a comparative analysis. Future researchers should consider examining how price fluctuation could be handled to support smallholder farmers to increase productivity.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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Institutional factors of inclusive growth: Evidence from Côte d'ivoire

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Economic growth is important but not sufficient to generate a sustainable increase in individual welfare. Inclusiveness attributes to growth, the dual virtue of widening the space of economic and social opportunities; while ensuring a better application of distributive equity. In this perspective, Ali and Son suggest that growth is inclusive when combined with high income and equity. This study tries to verify this assertion in Côte d'Ivoire. This study focuses on ARDL Bounds approach for testing cointegration to measure the contribution of institutional factors to inclusive growth in Côte d'Ivoire over the period of 1984 to 2018. The International Country Risk Guide (ICRG) Index is used as institutional factors. The findings of empirical analysis suggest that only government stability as institutional factors have greatly and statically significant effect on inclusive growth in the short and long run.

Key words: Ardl Bounds Test, Côte d'ivoire, inclusive growth, institutional factors.

INTRODUCTION

The objective of strong economic growth and sustainable development in the aftermath of independence in most sub-Saharan Africa countries, particularly in Côte d'Ivoire, is to create the deployment of means and strategies to redirect economic development policy. However, in the 1960s, the economic, financial and institutional situation did not seem to be conducive to motivate economic take-off and improve the social well-being of populations.

In the late of 1980s, a compromise was reached in order to redefine the desirable macroeconomic framework for boosting growth, promoting development and reducing poverty. According to the Washington Consensus (Williamson, 1990), the institutional arrangements put in place should lead without fail to strict budgetary discipline, broadening of the tax base, privatization, deregulation,

protection of private property and trade and financial liberalization: this is the conception of the "self-regulating" (Williamson,1990) and efficient market. However, such objective does not tend towards development according to Piketty, but would rather be vulnerable to Kuznets (1955) curse that economic growth feeds inequalities in the first phase of development (Asongu, 2015). Since the seminal publication of Acemoglu et al. (2005) on the crucial role of institutions quality and the economic development nations, a new literature is emerged (Bouzahzah et al., 2015; Asongu, 2015). A large number of economic studies conducted in recent year suggest that institutions are vital for economic development and growth. Indeed, when institutions have not good quality, they are influenced by power groups and act more in

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their favor. As a result, significant disparities affect the redistribution of the benefits of economic dynamism to disadvantage frailest social groups, including: ethnic minorities, people living in rural areas and women of the disabled (Klasen, 2010). Since the early 1990s, debates on alternatives to the inequality literature have led to a new perception of the concept of pro-poor growth (or inclusive growth). At the same time, the concept of good institutional quality and inclusive growth is on the heart of development policy discussions and conceptions. A large number of studies have examined the role of institutions factors in economic development, poverty reduction and better, in promoting inclusive growth. Indeed, the inclusiveness of growth implies dimensions other than poverty and income distribution such as the good quality of institution factors which, in any case, has an impact on income distribution. Therefore, institutional quality and inclusive growth are important to develop policy agenda, and the question arises, whether institutional factors are conducive to the inclusiveness of Côte d'Ivoire's economic growth.

This paper attempts to review a theoretical perspective on institutional factors of inclusive growth and estimate an empirical model to measure the contribution of institutional factors of inclusive growth, using Côte d'Ivoire as an example, where the kind research work has rarely been undertaken. The objective of this paper is to measure the contribution of institutional factors to inclusive growth. However, very few studies have considered institutional factors in explaining the inclusiveness of economic growth, especially in Côte d'Ivoire. To the best of the authors knowledge, this issue has not been the subject of any previous research for Africa and especially in Côte d'Ivoire. Even so, institutional variables have been ignored in the explanation of the results of this question. This study makes an empirical contribution for economic research by measuring inclusive growth using the method of Ali and Son (2007b) and the contribution of institutional factors to inclusive growth. Rather than being a study of the determinants of inclusive economic growth, this study contributes to the debate on the link between institutions and inclusive growth. From this point of view, this study differs from existing studies, which focus for the most part on its definition and ways of measuring inclusive growth (Klasen, 2010; Rauniyar and Kanbur, 2010). Only limited studies actually measure it and study the factors that determine it (Anand et al., 2013; Balakrishman et al., 2013; Abbe, 2019). However, these studies focus on Asia, North Africa and West African Economic and Monetary Union (WAEMU).

LITERATURE REVIEW

Indeed, most recent statistics show that sub-Saharan Africa has experienced high rates of economic growth over the past (Asongu and Le Roux, 2016). In addition, human development indexes have progressed considerably said they. While, there is general support for the notion of inclusive growth, there is no consensus. There are few empirical (or theoretical) studies on the relationship between inclusive growth and its institutional factors. The study's analysis of the relationship between institutional factors and inclusive growth is based on the existing research and the link between economic growths. The study also gives a theoretical background in the documentation of the relationship between inclusive growth and the international country risk guide as an institutional index.

In the late 1990s, an intense debate over how institutional factors in terms of inclusive growth has been rise to divergent views and conceptions both in economic and within the international community. A large number of empirical frameworks have examined the role of quality of institution in economic development, reducing poverty and promoting inclusive growth. The necessity to improve the quality of institutions has become an imperative of certain governments. Moreover, according to North (1990) and Doumbia (2018), the role of institution is to establish certain stable structure of human relations or interactions. Thus, it follows a complex process of essentially changing rules so that they are dynamic over time. In Africa for example, this dynamic is confronted with traditions and codes of conduct that have remained more or less and closed in themselves. Fight against poverty, inequality and all forms of social exclusion that this concept implies has since given it legitimacy, and its inclusion in international agenda and national development strategies (Nkamleu, 2017). Thus, inclusive growth is essential for restoring public confidence in the capacity of democratic institutions, technological progress and international economic integration to support greater progress to support and well-being for all (Cordemans, 2019).

According to Siyakiya (2017), the poor quality of institutions has a negative impact on the economies of poor countries and some developed countries in terms of transaction costs while increasing the decision to invest, focusing on areas that are likely to be productive by directing economic activity to productive areas and finally, building up trust and cooperation. In fact, institutional economics explains why developing countries remain poor because of their poor or less efficient institutions. In general, developing countries have weak institutions and fail to support productive investments and protect ownership rights. As a result, some poor countries enrich other countries, contributing to increased inequality (Fosu, 2017). In such cases, society will be able to achieve inclusive growth if it reforms the quality of its institutions to make them strong and to achieve poverty reduction. According to the literature, there is a close link between ownership rights and inclusive growth. This is what prompted Acemoglu et al. (2005) to argue that the

institutional drivers of inclusive growth that promote better ownership rights, create perfect conditions of competition and impact the decision to invest or not, are conducive to more inclusive growth.

Regarding the role of new middle class in inclusive growth, Wiemann (2015) argues that the greater class struggle in emerging countries, more likely it is to lead to pro-poor growth while diversifying and increasing the demand for consumer goods (which led to a media controversy triggered by the McKinsey-style projection of the market value of Chinese consumer goods and services in India and other developing countries). However, this is not primarily related to good quality institutions, as in the past, societies marked by poverty were working-class in Latin America (...) and nostalgia for order and stability combined with authoritarian government.

Furthermore, the Heritage Foundation (2019) believes that economic freedom based on the rule of law, limited government, effective regulation and open markets are factors in inclusive economic growth. To this effect, there is a literature that explains the close relationship between economic freedom and inclusive growth, as it facilitates the participation of all social strata in economic activity and in benefiting from the spillovers of this economic growth. Economic freedom can be measured by four main categories: rule of law, size of government, regulatory efficiency and open markets (Kouton, 2019). For example, in countries where individuals lack economic freedom, credit and labor market regulation has remained insufficient. At the same time, citizens are not in a position to decide for themselves. As a result, the role of the government in regulating the market through tax exemption and relief will further enable people to participate in productive economic activity. This is undoubtedly the reason why Gwartney et al. (1996) supports societies with strong economic freedom, because they are protected from repression, fraud or theft and aggression and that they are free to bargain as long as their actions do not compromise that of other individuals. For example, Murray and Press (2017) argue that economic freedom is a factor of inclusive growth of African countries. Given recent improvements, human development indicators, and growth rates in sub-Saharan Africa, promoting economic freedom appears to be a means of achieving more inclusive growth. This is the case in Asia, where demographics are large in some countries, serious policy reforms to open up to foreign trade have been implemented since the 1980s and 1990s (Rodrik, 2009).

However, inclusive growth is based on the idea that economic growth is important but not sufficient to generate a sustainable increase in welfare, which implies an equitable sharing of the growth dividend between individuals and social groups. Easterly and Levine (1997) share this view and suggest that despite the traditional determinants of economic growth such as labor supply, physical capital, and human capital, a strong focus on institution is needed in Africa. Therefore, for economic growth to be inclusive, it must be pro-poor, distribute growth equitably, and have strong institutions. Which, in any case, has an impact on income distribution? From this perspective, building effective institutions could be important for inclusive growth. Resnick and Birner (2006) argue that indicators of institutions such as political stability and the rule of law are effective in terms of economic performance, but perform poorly on how to make growth inclusive. In contrast, Doumbia (2018) finds that only institutional indicators such as effective governance and the rule of law promote inclusive growth that compromised that of other individuals.

It is generally accepted that the quality of institutions is a major determinant of the level of development (Rodrik, 2000; Collier, 2006). Looking at the quality of institutions through the lens of the six indicators of Kaufmann et al. (2005): participation and accountability, political stability, effectiveness of public power, quality of regulation, rule of law, and control of corruption, it is important to note that the weak performance of poor countries in this area, constrains seriously the inclusiveness of their economic growth. In this regard, Welch and Nuru (2006) point out that democratic governance broadens the range of options for human development. Despite recent improvements, least developed countries are facing the major challenge of creating and strengthening the institutions key of competitive democratic governance that can accommodate the objectives of authority and social inclusion (Gerring et al., 2005). Numerous empirical analyses establish the correlation between political stability and economic growth (Alesina and Perotti, 1996).

This relationship appears to be a bidirectional causal effect: on the one hand, inequality increases social discontent which in turn can lead to violent protest movements (Schock, 1996). And on the other hand, political instability, depending on the degree it has reached, can reduce the spread of the effects of growth inclusiveness by disarticulating the state apparatus and social services (health and education in particular), destroying socio-economic infrastructures, weakening territorial integrity, displacing populations, spreading diseases and reducing the agricultural population (FAO, 2005). In political stability, the large number of underdeveloped countries, particularly in sub-Saharan Africa, is experiencing political and military tensions that reduce the inclusiveness of economic growth as a result of their spillover effects. The effectiveness of public power, including the quality of public spending, especially that allocated to social sectors from which the poor are most likely to be excluded. Corruption affects significantly inclusiveness of economic growth in terms of both wealth creation and equitable redistribution (Gyimah-Brempong, 2001; Dincer and Gunalp, 2005) and multidimensional social welfare (Gupta et al., 2002; Aidt, 2010). Directly,

corruption deprives state of important resources to support public action in favor of inclusiveness through the financing of education, health and socio-economic infrastructures or simply reduces the effectiveness of programmed that are supposed to benefit the most vulnerable (Olken, 2005). Corruption also weakens governance and social justice. It also discourages investment (Asiedu and Freeman, 2009) and therefore affects economic dynamism and, even worse; it can at the same time aggravate exclusion of poorest and most vulnerable from the labor market. In terms of corruption, the situation in poor countries is worrying. As mentioned above, there is little work on inclusive growth and its institutional factors, but a few examples can be listed.

Abbe (2019) attempts to explain the role of institutions in the relationship between unemployment and inclusive growth in the ECOWAS zone (Economic Community of West African States), from 2002 to 2016. For this, he uses Kaufman indices as a measure of institutional factors and Ali and Son (2007) method to measure inclusive growth. Applying the Generalized System of Moments Method (system-GMM), he finds that unemployment has a negative but negligible impact on inclusive growth in the Economic Community of West African States. However, the interaction between the quality of all institutions and unemployment is positive on inclusive growth. Studies conducted in the late 1990s on inclusive growth emphasized the importance of economic freedom as a determining factor, particularly in developing countries.

Thus, Kouton (2019) studies the role of institutions in terms of growth inclusiveness in a panel of thirty Sub-Saharan African countries during 1996-2016. To achieve his goal, he used data on economic freedom as an index of institutional factors and GDP per person employed to capture inclusive growth. Using General Moments Methods (GMM) estimation and panel causality testing in a dynamic framework, the results confer a positive and significant effect of economic freedom on inclusive growth. Thus, evidence is provided for the causal relationship between economic freedom and inclusive growth, but not the reverse.

Doumbia (2018) uses the Panel Smooth Transition Regression (PSTR) model to examine the importance of good quality institutions (governance) in terms of pro-poor and inclusive growth for a panel of 112 countries. She uses data from World Government Indicators (WGI) proposed by Kaufmann et al. (2005) and the share of poor people to measure inclusive growth. The results show that all indicators of governance only, government effectiveness and the rule of law are favorable to inclusive growth. In sum, all of these authors studied the link between institutions and inclusive growth, but in a multi-country and short-term perspective. They have therefore not taken into account data from the Political Risk Component by International Country Risk Guide and did it in a short period of time. And only Khan et al. (2016)

and Abbe (2019) measured inclusive growth and used this index in econometric framework respectably in time series and panel data.

EMPIRICAL FARMEWORK

This part of this paper presents data and econometric framework. Institutional quality is used to capture the role of democracy and governance and improve the quality of population life. Indeed, a large literature has accumulated to show that macroeconomic stability is not sufficient to lead to economic growth and inclusiveness (Acemoglu, 2008; Keho, 2012). To be effective, the classical factors of economic growth (labor and capital) must be accompanied by residual factors such as the exercise of democracy and political stability.

Data analysis

The measure of the effect of institutional factors of inclusive growth has been analyzed using the proxies as four parameters of governance in the Political Risk Component by International Country Risk Guide (ICRG) reports respectively between 1984 and 2018 (Iftikhar and Khalid, 2011). Base on the empirical work, four institutional factors and indicators were selected: (i) Government Stability, (ii) Corruption, (iii) Bureaucratic quality, and (iv) internal conflict. Government stability measures the government's ability to carry out its planned programs and to sustain itself. The corruption indicator measures the extent of corruption and the manner in which public power is exercised for private purposes. The indicator of bureaucracy quality measures the capacity of administration to conduct day-to-day business without major policy changes or disruption to public services. Finally, internal conflict assesses the level of political violence (civil war, coup threat, terrorism, civil unrest) in a country and its actual or potential impact on governance.

These indicators are scored according to the variation in scores and the best institutional quality. They are taken from the International Country Risk Guide database produced by the Political Risk Service Group (PRS Group). Whatever the methodological and statistical reservations about these indicators, they are taken seriously by foreign investors and international organizations. The advantage of these data, unlike other institutional data, is that they extend over a relatively long period from 1984 to 2018 and do not contain missing values. This main advantage gives it a dynamic analysis of the variables and their impact on the economic development and quality of institutions in each country.

In addition, investment is captured by gross fixed capital formation (%GDP), inflation is captured consumer prices (%annual) and life expectancy at birth is the determinants of growth used as control variables in this study. Investment, inflation and life expectancy at birth are taken from the World-Wide Indicators database.

Moreover, exciting results are obtained when the investment equation is introduced into the economic growth equation (Kouton, 2019). Furthermore, according to Hur (2014), in economies where the majority of the population is poor, as is the case in Africa, strategies that promote greater inclusiveness and investment have become more than a necessity. Moreover, the notion of inclusive growth has a favorable echo in the institutions in charge of development and access to socio-economic infrastructure. Sustainable investment policies can directly or indirectly create jobs and ultimately increase economic growth, making it more inclusive. One possible transmission channel for this purpose is the financing of infrastructure projects at the macroeconomic level. These projects can enable states to create additional jobs.

Inflation is the loss of the purchasing power of money that allows for macroeconomic recovery. Indeed, according to the UNDP definition, the redistribution of the benefits of inclusive growth is not obvious and disappears in an environment of macroeconomic instability. In other words, a stable macroeconomic environment is a favorable condition for inclusive growth. It is along the same lines that Kumah and Sandy (2013) found that countries that maintain a stable macroeconomic environment and have a life expectancy that is not too high have initiated inclusive growth thanks to the political and structural reforms that have been implemented (James et al., 2017). Life expectancy at birth shows how long, on average, a newborn can live, if current death rates do not change. In fact, life expectancy at birth has risen steadily in most 1970 OECD (Organization for Economic Co-operation and Development) countries and increasing by over ten years, on average 1970 (James et al., 2017).

Inclusive growth measurement

To be sustainable and effective, economic growth must be inclusive. In other words, it must require an income growth and equity, equality of opportunity and protection of markets and labor transitions. In absence of consensus on measurement, inclusiveness of growth can be seen in Ali and Son (2007), Anand et al. (2015) and ABBE (2019) who applied in an econometric model. Ali and Son (2007) started from a utilitarian social function integrating both dimensions of growth and equity in a unified framework to measure inclusiveness of growth. This function based on a generalized concentration curve, the social mobility curve, such as follows:

$$S^c = \left(y_1, \frac{y_1 + y_2}{2}, \frac{y_1 + y_2 + y_3}{3}, ..., \frac{\int_j^n y_i}{n} \right)$$

(1)

Where $n$persons in the population with incomes are $y_1, y_2, ..., y_n$, y_1 is the poorest person and y_n is the richest. The study used social mobility curve S^c to calculate an index called

Social Mobility Index (SMI), defined as follows: $\overline{y}^* = \int_0^{100} \overline{y}_i d_i$.

The greater $\overline{y}^*$ is, the greater will be the income. If people have same income (perfect or equitable distribution of income), then $\overline{y}^* = \overline{y}$. An Equity of Income Index (EII) defined as follows:

$$\omega = \frac{\overline{y}^*}{\overline{y}}$$

(2)

Similarly, the equity of income index equals to 1 when income distribution is perfectly equitable (that is, everyone has same income, $\overline{y}$), and 0 when income is inequitable (that is only one person holds the totality of national income) was obtained by re-ordering Equation 2: $\overline{y}^* = \omega \overline{y}$

Deriving Equation 2 gives Equation 3

$$d\overline{y}^* = \omega d\overline{y} + \overline{y}d\omega$$

(3)

Equation 3 shows the change in the social mobility index is a weighted average of the in income and equity trends. In other words, inclusive growth is a weighted average requiring an increase in income and equity where the coefficient of one component matches the level of the other. Thus, when average income (equity) is high, the contribution of the change in equity (income) is higher and vice versa (Ali and Son, 2007).

Inclusive growth $\overline{y}^* \rangle 0$, Equation 3 shows the inclusive can be obtained by increasing $\mathbf{y}$, that is increase the income, or by increasing index, or through the combination of both (Abbe, 2019). The reformulation of Equation 3 gives Equation 4 which combines growth and equity into an inclusive growth (as percentage of change of $\overline{y}^*$) as follows:

$$\frac{d\overline{y}^*}{\overline{y}} = \frac{d\overline{y}}{\overline{y}} + \frac{d\omega}{\omega}$$

(4)

Therefore, like Anand et al. (2013), Hussein et al. (2017) and Abbe (2019), who apply $\overline{y}^*$ the noted growth ($\frac{d\overline{y}^*}{\overline{y}^*}$) as a proxy for inclusive growth and at the same time as a dependent variable in the regressions. This definition implies that an increase in ($\frac{d\overline{y}^*}{\overline{y}^*}$) corresponds to greater inclusiveness of growth.

Model specification

Note that the authors who used the measure of inclusive growth in an econometric model have done it on a panel of countries. As mentioned above, empirical work on this subject is non-existent. So, to measure the effect of institutional factors on inclusive growth time series econometric methodology has been employed to avoid the problem of spurious results. In neo-classical production function, the sources of growth are the accumulation of production factors and improvement of aggregate factor productivity. The starting point of this modeling is the Cobb-Douglas production function defined as follow:

$$Y_{it} = F(A_{it}, L_{it}, K_{it}) = A_{it} K_{it}^\alpha L_{it}^\beta , \qquad \alpha \text{ and } \beta \rangle 0$$

(5)

Where Y_{it} is real GDP per capita in the country i at time t, L_{it} was a set of labor force; K_{it} physical capital stock and A_{it} total factor productivity.

The study reconsiders the consumption model in the following autoregressive form:

$$\frac{d\overline{y}^*}{\overline{y}_t^*} = \alpha_0 + \alpha_1 F_t + \alpha_2 X_t + \alpha_3 F_{t-1} + \alpha_4 X_{t-1} + \varepsilon_t$$

(6)

Table 1. Descriptive statistics.

Variables	Mean	Std. deviation	Min	Max
Inclusive growth	2.692	3.857	-4.387	10.706
Bureaucratic quality	1.314	1.470	0	3
Government Stability	6.736	4.866	-1.106	26.081
internal conflict	8.222	1.091	6.208	10
Corruption	2.777	0.670	1	4
Investment	13.166	4.722	4.703	23.484
Life expectancy	52.507	2.234	49.475	57.442
Inflation	3.391	4.865	-0.107	26.081

Where ($\frac{\overline{dy}^*}{\overline{y}^*}$) is inclusive growth index, F_t is ICRG (International Country Risk Guide) index (that is Government Stability, Corruption, Bureaucratic quality and internal conflict), X_t captures control variables, namely investment (gross capital formation), inflation (consumer price index), and life expectancy at birth. The subscripts *t= 1, 2, …T* is the period and ε_t is the idiosyncratic error term.

By developing Equation 6, Equation 7 was obtained as follows:

$$\frac{\overline{dy}^*}{\overline{y}^*} = \alpha_0 + \alpha_1 Govst_t + \alpha_2 Corr_t + \alpha_3 Intercon_t + \alpha_4 Burq_t + \alpha_5 Invest_t + \alpha_6 Infl_t + \alpha_7 Lifex_t +$$

$$\alpha_8 Govst_{t-1} + \alpha_9 Corr_{t-1} + \alpha_{10} Intercn_{t-1} + \alpha_{11} Invest_{t-1} + \alpha_{12} Infl_{t-1} + \alpha_{13} Lifex_{t-1} + \varepsilon_t$$

(7)

Where Govst (Government Stability), Corr (Corruption), Intercon (Internal Conflict), Burq (Bureaucratic Quality) Infl (inflation), Invest (Investment) and Lifext (Life Expectancy) are the independent variables and the dependent variable is $\frac{\overline{dy}^*}{\overline{y}^*}$ (inclusive growth index).

Measuring the effect of institutional factors on inclusive growth is dynamic that is evolves over time. Indeed, this dynamism can be assessed in the long and short term, and the ARDL (Autoregressive Distributed Lage) bound testing model of Pesaran and Shin (1999) and Pesaran et al. (2001) is the most appropriate for differentiating the measurement of its effects in such situations in the estimation of Equation 7. The ARDL model is the model par excellence for explaining small-sample models as it combines series of different orders of cointegration.

The study justifies the choice of the estimation of Equation 7, which is a dynamic autoregressive equation using the ARDL (Autoregressive Distributed Lag), for reasons justified in the empirical macroeconomic growth literature. First, this model, which is in the family of dynamic models, allows the estimation of short- and long-term effects even for series of different order of integration, as seen with the limit test approach of Pesaran et al. (2001). Finally, the latter have the particularity of integrating temporal dynamics (adjustment delay and expectations) into the explanation of a variable (time series), thus improving forecasts and the effectiveness of policies (decisions and actions), unlike the simple (non-dynamic) model, whose instantaneous explanation (immediate effect or effect not spread over time) only restores part of the variation of the variable to be explained. Another advantage of this approach is that it does not take into account the order of integration of the regressors, unknown or mixed (I(0) or I(1)), which is not possible with conventional cointegration tests (Pesaran and Shin, 1999; Sam et al., 2019). However, it is possible to fall into the degenerate cases of non-cointegration from the ARDL limit test. This possibility has often been ignored in empirical application.

This technique of ARDL bounds testing has been used in several works to solve economic problems in both micro and macroeconomics and more frequently in problems of public spending and taxation (Afonso and Rault, 2009). This Bound test technique provides a perfect explanation of how the variables tested are cointegrated and the order of their integration. Thus, if the case of the lagged independent variable case is met, the ARDL equation is summarized to Dickey-Fuller unit roots and the independent variable is shown as I(0); otherwise, it is I(1). If the test suggests degenerate dependence or non-cointegration, it indicates that the dependent variable is not included in the cointegration equation embedded in this ARDL equation. The motion of the dependent variable does not respond to the motion of the independent variables, again indicating non-cointegration.

RESULTS AND DISCUSSION

The descriptive statistics results

Descriptive statistics can be used to better decide on the reliability of the data. Two important measures are used to check the reliability of the data. One is the measure of trend and the other is the measure of dispersion. Usually, the mean, median and mode are used as a measure of central tendency and the standard deviation, quartile, range and mean deviation are used as a measure of dispersion (Khan et al., 2016). The results show that the mean and median are almost identical, that there is no evidence of skewness, and that almost all variables have small standard deviation, indicating low variation and low consistency in the data (Table 1).

The stationary tests results

To begin, all the variables mentioned in this document were submitted to the tests of Augmented Dickey-Fuller and Philip Perron for their stationarity. Despite the fact that inflation is integrated of order zero, life expectancy, corruption, inclusive growth and internal conflicts are integrated of order (1). In contrast to the last variables,

Table 2. Stationary test of the variables.

Variable	ADF		PP	
	level	1st differenced	level	1st differenced
Inclusive growth	-3.204 (-4.221)	-3.548 (-5.594) ***	-3.204 (-4.221)	-3.689 (-10.758) ***
Bureaucratic quality	-8.067***(-4.252)	-8.067***(-4.252)	-2.808(-4.243)	-8.067***(-4.252)
Government Stability	-5.723***(-4.252)	-2.828*(-3.639)	-2.596(-4.243)	-5.716***(-4.252)
internal conflict	-0.824(-2.632)	-6.652***(-4.252)	-2.382(-4.243)	-6.639***(-4.252)
Corruption	-1.961(-4.243)	-6.007**(-4.262)	-1.976(-4.243)	-8.015***(-4.252)
Investment	-8.067***(-4.252)	-8.067***(-4.252)	-2.808(-4.243)	-8.067***(-4.252)
Life expectancy	-0.292(-4.309)	-6.145**(-4.309)	-0.023(4.252)	-15.601***(-3.646)
inflation	-6.723***(-4.356)	-4.016**(-4.309)	-4.405**(-4.243)	-6.639(-4.252)

*, **, *** indicate statistical significance at 10%, 5% and 1% levels. ADF= Augmented Dickey-Fuller; PP= Philip Perron.

Table 3. Result of ARDL bound test.

H0: No co-integration	Value	5% critical bounds		1% critical bounds	
		I(0)	I(1)	I(0)	I(1)
Computed F statistic	4.101	1.97	3.18	2.54	3.91

Source for critical value: Pesaran et al. (2001). The computed F values at 1% of significance indicating a long run relationship

Table 4. Long-term estimates (ARDL (1.0.0.1.0.0.0.0) selected based on R-BAR Squared Criterion).

Regressor	Coefficient	t-statistic	prob
Bureaucratic quality	-0.359	-1.084	0.288
Government stability	-0.317*	-2.047	0.057
Internal conflict	0.410	1.006	0.323
corruption	0.204	-0.561	0.579
investment	0.360***	6.427	0.000
Life expectancy	-0.079	-1.289	0.209
inflation	-0.128*	-2.911	0.007

The dependent variable is inclusive growth index.

investment, bureaucratic quality and government stability are integrated of order zero and order one respectively. This confirms the hypothesis of Pesaran et al. (2001), which states that the variables should have an order of integration of either I(0) or I(1) to use the Bound test. However, the ARDL Bound test is more preferable to the ARDL because it is applied when the series are stationarily integrated in the same order and are cointegrated, or with an appropriate difference in integration. Also, the Bound test can be used when the series have a mixed order of integration (some being stationary, others non-stationary) but provided that none of the series is beyond I(1) (Pesaran and Shin, 1999; Pesaran et al., 2001). In the end, the limit test is in fact a test of co-integration between integrated series of different orders below I(2). Then, the ARDL test procedures were applied to estimate the long-term relationship (Table 2).

The bounds tests results

Table 3 shows the results of the bounds test. Indeed, the ARDL bounds test is a new technique developed by Pesaran et al. (2001) in order to test the presence of long-term relationships (cointegration) between variables using the Wald test. Since the value of the F-statistic is above the limit, then the null hypothesis of the non-existence of cointegration is rejected. Therefore, there is a long-term relationship between inclusive growth and institutional factors. The next step will be to assess the effects of institutional factors on inclusive growth in Côte d'Ivoire in the long and short term. These results are shown in Tables 4 and 5.

Table 5. Short-term estimates.

Variable	Coefficients	t-statistic	prob
Bureaucratic quality	-0.009	-0.159	0.874
Government stability	0.460**	2.493	0.019
Internal conflict	0.244	0.638	0.529
Corruption	-0.596	-1.514	0.124
Investment	0.340***	5.717	0.000
Life expectancy	0.095	0.193	0.848
Inflation	-0.166***	-4.511	0.000
CointE q (-1)	-1.161***	-7.644	0.000

The dependent variable is inclusive growth.

Table 6. Diagnostic tests of ARDL regression result.

Tests	Probability values
Breusch-godfrey serial correlation LM test	0.229***
ARCH Heteroscedasticity tests	0.508***
Normality test	2.55***

*** denotes acceptance of null hypothesis.

Short and long run contemporaneous estimates

Table 4 shows all the long run estimates in explaining the dependent variable. While government stability is significant at 10% level of significance, the investment is significant at 1% level of significance and the inflation is significant at 5% level of significance. Table 5 shows all the short run estimates in explaining the dependent variable. While government stability is significant at 10% level of significance, the investment and inflation are significant at 1% level of significance. The error cointegration term is negative and significant which means that any exogenous shock in one of the variables will lead to convergence towards the equilibrium. An exogenous shock in the inclusive growth will lead movement towards the original equilibrium every year, thus equilibrium is stable.

The diagnostic test of the ARDL result

Table 6 highlights the results of the tests of error autocorrelation, heteroskedasticity and error normality. The Breusch and Godfrey test allows testing an autocorrelation of order greater than 1 and remains valid in the presence of the lagged endogenous variable among the explanatory variables. Heteroskedasticity qualifies data that do not have a constant variance. Error heteroskedasticity does not prejudice the estimation of the coefficients, but rather the statistical tests since the estimated standard errors of the coefficients are not

adequate. The normality test verifies whether the data follow a normal distribution. All three tests show statistically significant results at the 1% threshold, so these values lead us to reject the null hypothesis of the absence of autocorrelation, heteroskedasticity and error normality.

DISCUSSION

The findings from Tables 4 and 5 indicate the long-run and short-term estimate respectively. Unexpectedly, both tables give same results. It reveals that only government stability as institutional factor affects the inclusiveness of growth. So, there is a strong relationship between government stability and inclusive growth. The explanatory variables such as inflation and investment are statically significant and affect the inclusive growth in short and long run. A result in line with the literature shows a positive sign and statistically significant of investment at 1% of significance in affecting positively the growth inclusiveness. Though, this result shows that there is positive relationship between investment and inclusive growth. This necessarily means that investments have a positive influence on the development of the financial sector (Keho, 2012). It indicates that the improvement in investment has resulted in a deepening of the financial sector in the country. For example, coefficient of investment that 1% change in the investment causes 0.360% change in the inclusive growth index in long-term. The result shows a diminishing impact of
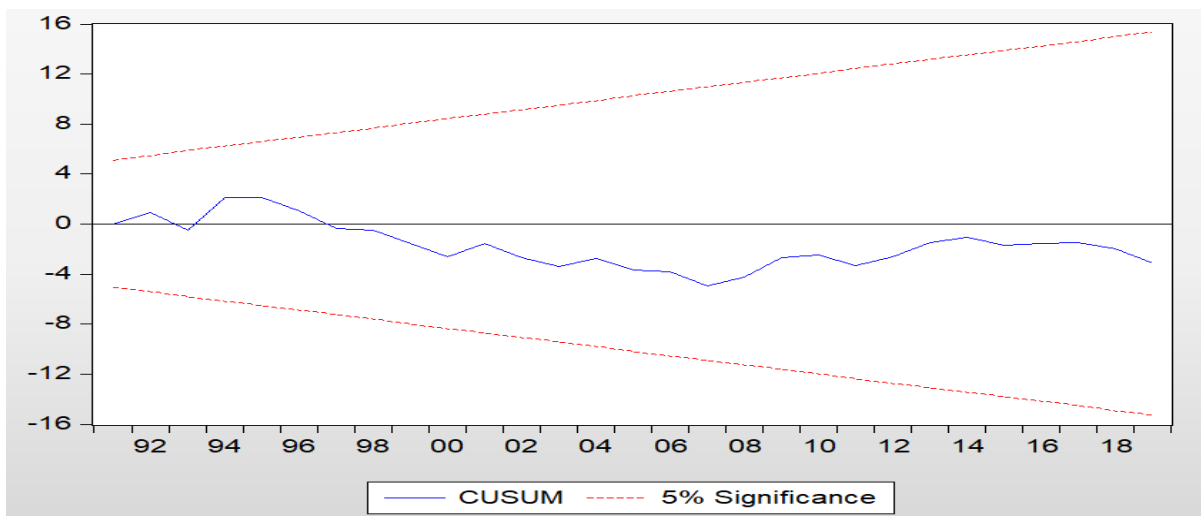
Figure 1. CUSUM tests results.
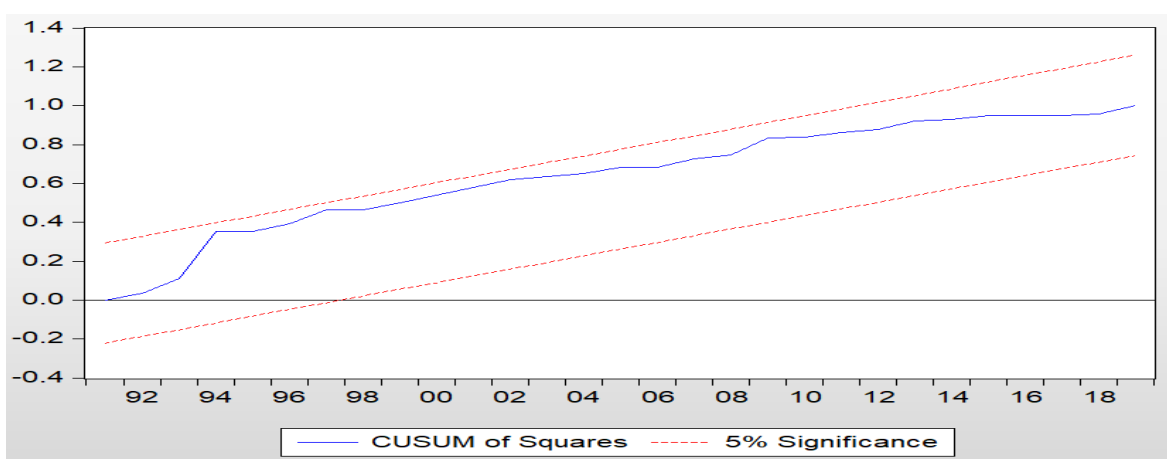
Figure 2. CUSUMQ tests results.

investment on inclusive growth. However, this support findings of Kouton (2019), James et al. (2017) and Kumah and Sandy (2013) that said, the impact of investment value added on inclusive growth is still positive. Thus, investment will help to develop the country in order to improve the living conditions of Ivoirians people and better, conducive to inclusive growth. Other result demonstrates that macroeconomic stability is represented by inflation. There is a negative and significant effect of inflation on inclusiveness at 1 and 5% especially in short and long-term. This result suggests that a policy aimed at reducing the rate of inflation will favor the inclusiveness of the country's growth. Thus, higher inflation is associated with less poverty reduction, through lower average welfare growth as well as with an adverse contribution to distributional effects confirm by Kouton (2019). In particular, poor households are usually

more affected by food price inflation as they need to spend disproportionately more on food, and substitution possibilities are limited. Therefore, they are generally more affected by inflation (Khan et al., 2016).

According the interpretation that give ICGR (2019), a score of 0 points equates to very high risk. The unexpected sign is the negative sign and is significant of government stability at 10%. This would imply that a 1% decrease in government stability would result in an increase in the inclusive growth rate of 0.317% points. Indeed, this would not mean that government stability negatively affects the inclusiveness of growth, but the political stability process of Côte d'Ivoire has not been accompanied by an improvement of people welfare.

The CUSUM and CUSUMQ tests dispense with prior knowledge of the date of rupture (Figures 1 and 2). These tests are based on recursive residues. CUSUM

uses cumulative sum of the recursive residuals while CUSUMSQ uses square of the recursive residuals. If the curves exit the corridor stylized by the dotted lines, it is concluded that there is instability in the model. Otherwise, the model can be considered stable over the entire period. Here, none of the CUSUM and CUSUMQ statistics crossed the lines. The study can therefore conclude that the model has remained stable over the entire study period.

Conclusion

An investigation into the measure of institutional factors using International Country Risk Guide on inclusive growth in Côte d'Ivoire is the focus of this study. The study employed a data span of 34 years using the Autoregressive Distributed Lage Model bounds tests and Ali and Son (2007b) method to measure inclusive growth. The study revealed that only government stability as institutional factor affects inclusive growth significantly and negatively in short run but affects positively in long run. Though, this result shows that there is a relationship between government stability and inclusive growth. Inflation and investment affect significantly inclusive growth in short and long run. In view of the above, this study appeals to competent authorities that they should first reform their institutional system before fully embarking on the path of inclusive growth. Clearly, government would gain to set up a government unit, a strong legislation and assistance in the effective population for more inclusive economic growth. The establishment of such institutions is a long and even delicate process.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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Capital structure, credit risk management and financial performance of microfinance institutions in Uganda

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The paper examines the relationship between capital structure, credit risk management and financial performance of microfinance institutions (MFIs) in Uganda based on agency theory. The study adopted a cross–sectional research design to examine 64 MFIs in Uganda. Correlation and multiple regression analysis were performed to analyze the data. The results reveal that credit risk management significantly contributes to sound financial performance. Second, capital structure is not significantly related to financial performance. Therefore, credit risk appraisal, credit risk monitoring and credit risk mitigation are essential in achieving sound financial performance of MFIs. However, the structure of debt or equity does not necessarily affect financial performance. Hence, managers should endeavor to instill risk preventive and control mechanisms so as to mitigate credit risks and achieve positive financial performance of MFIs.

Key words: Agency theory, capital structure, credit risk management, financial performance, microfinance institutions.

INTRODUCTION

Financial performance is an essential measure of the financial health, competitiveness, efficiency, cost effectiveness and productivity of a business enterprise. Invariably, financial performance is very instrumental in determining the growth and sustainability of microfinance institutions. Evidently, MFIs that experience sound financial performance exhibit high profits, portfolio quality and operational efficiency as well as improved competitive edge (Quayes, 2015). Additionally, good financial performance of microfinance institutions (MFIs) leads to realization of MFIs' profit maximization objective, reduction in the dependency rate, improved competitive

edge and promotion of entrepreneurial ventures as well as economic development in a country (Bassem, 2012; Otieno et al., 2016). As a result of sound financial performance, MFIs are able to improve the welfare of people through wealth creation and poverty reduction.

However, global empirical evidence observes that microfinance institutions experience poor financial performance, epitomized by low profitability, low portfolio quality, low operating efficiency and high operating costs. Similarly, in Africa, MFIs also manifest poor financial performance as evidenced by low efficiency ratios, declining net operating margins and declining portfolio

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yield, a rise in operating costs, low relative productivity and profitability (Daher and Erwan, 2015). In the context of Uganda, the trend is the same, as illustrated by this statistical evidence; decrease in portfolio yield from 54.6% in 2015 to 52% in 2016, increase in operating costs from Ug. Shs. 270,887 in 2017 to Ug. Shs. 543,770 in 2018, the increase in cost of funds ratio from 12% in 2016 to 19.4% in 2017, a reduction in capital adequacy ratio from 50.12% in 2015 to 45.7% in 2017 and low levels of liquidity ratio of 10.54% against the benchmark of 15% (AMFIU, 2017/2018a). Hence, in view of the above evidence, the present study attempts to explore the contribution of capital structure and credit risk management to financial performance.

Empirically, earlier research collection on financial performance focused on investigating the determinants, challenges and cause-effect relationship; credit allocation, age, asset holding, yield on gross portfolio, number of loan officers and personnel productivity of MFIs (Mirza and Javel, 2013; Ssekiziyivu et al., 2017). Furthermore, previous studies underscored the role of asset base, regulation and macro-economic conditions in fostering financial performance (Caro, 2017). Other earlier studies explain the independent analysis of the relationship between capital structure, credit risk management and financial performance of financial institutions (Warsame, 2016). In this paper, extant empirical evidence is extended by exploring the combined contribution of capital structure and credit risk management to the financial performance of MFIs discourse. Therefore, this paper aims to examine the direct relationship between capital structure, credit risk management and financial performance of MFIs. In addition, the study explores the combined effect of capital structure and credit risk management on the financial performance, achieved through adoption of agency theoretical framework, quantitative approach and cross-sectional survey on 64 MFIs in Uganda. Thus, the key research question under investigation is whether a combined effect of capital structure and credit risk management positively influences financial performance of MFIs.

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

Theoretical foundation

The study is founded on Agency theory (Jensen and Mackling, 1976). The theory posits that there exists a contractual relationship between a principal and an agent who works for the principal. It is based on three important elements; first is the existence of a contract between the principal and the agent, the second is the performance of a service by the agent, the third element is the delegation of authority by the principal to the agent. The theory is applicable because it focuses on resolving problems that can exist in agency relationships due to unaligned goals or different aversion levels to risk. In the present research, the problem of concern is the declining financial performance of the MFIs. The shareholders of the MFIs (principals) invest capital, which is the capital structure comprising equity and debt. While MFIs (Agents) design operational risk management strategies to maximize returns on investment.

Study concepts

Capital structure is defined as the various means of financing a firm, that is, the proportionate relationship between debt and equity. The indicators of capital structure include; long term debt, short term debt or total debt and long term equity, short term equity or total equity (Vatavu, 2015). In this article, capital structure means debt and equity funds employed by MFIs. Credit risk management is the identification, measurement, monitoring and control of risk arising from the possibility of default from loan repayment. It therefore encompasses; appraisal, identification, measurement, matching, mitigation, monitoring and control of the credit risk exposures (Lalon, 2015). Contextually, credit risk management means credit risk appraisal, credit risk monitoring and credit risk mitigation of MFIs.

Financial performance is a measure of operational strength of a firm in relation to its revenue and expenditure as revealed by its financial statements. According to Hoskisson et al. (1993), the indicators of financial performance include; profitability, productivity, return on assets, return on equity, portfolio quality and operational efficiency. For this study, profitability, portfolio quality and operational efficiency measure financial performance.

Capital structure and financial performance

High debt/equity ratio contributes to improvement in firms' financial performance in terms of liquidity and profitability (Adesina et al., 2015). Relatedly, Kpwe (2017) affirms that capital structure significantly affects the financial performance of MFIs. Nevertheless, other scholars discount the relevance of capital structure in boosting the profitability and financial performance of firms (Mutenheri and Munangagwa, 2015; Ikapel and Kajirwa, 2017). Conversely, the present study explores further the effect of credit risk management on financial performance beyond just the capital structure analysis. The reviewed literature is paramount in deciphering the value of debt and equity capital in financial performance examination in the present study. Based on the aforementioned narrative, we developed and tested hypothesis.

H1: Capital structure significantly contributes to financial

performance.

Credit risk management and financial performance

Credit risk management promotes financial performance of financial institutions (Kimotho and Gekara). Likewise, Kariuki (2017) reveals that credit risk identification, credit risk analysis, credit risk monitoring and credit risk control, improve the financial performance of MFIs. However, other studies also affirm that credit risk management does not have a positive effect on financial performance of financial institutions (Obamide et al., 2015; Warsame, 2016). Nonetheless, the current study extends knowledge discourse by investigating the contribution of both capital structure and credit risk management to financial performance of MFIs. In light of the related literature reviewed, we formulated and tested hypothesis *H2: Credit risk management significantly contributes to financial performance.*

Capital structure, credit risk management and financial performance

The level of credit risk management, capital structure, competitive strategies and managerial competence influence financial performance of microfinance institutions. Gizaw et al. (2015) posited that for better financial performance, there is need for appropriate capital structure mix accompanied by high level of credit risk management. Similarly, Alshatti (2015) affirms that credit risk management and capital structure affect the financial performance of financial institutions. However, Paulino et al. (2018) in their study on commercial banks in Juba City concluded that credit risk management variables of credit risk identification, credit risk analysis and appraisal are not significantly related to financial performance while Sivalingam and Kengatharan (2018) in their study on Commercial banks in Sri Lanka concluded that there is a significant negative relationship between capital structure and financial performance of the said financial institutions. In this study, the combined effect of capital structure and credit risk management on financial performance is investigated in the microfinance industry. Based on evidence unveiled above, we suggested and tested the hypothesis *H3: Capital structure and credit risk management significantly contribute to financial performance.*

MATERIALS AND METHODS

Research design

The present study adopted a cross sectional design and quantitative research approach to collect quantitative data in a given timeframe. A pre-tested semi structured questionnaire anchored on a five-point Likert-scale was employed to collect data

to ascertain construct validity.

Study population, sample size and sampling procedure

Based on Krejcie and Morgan (1970)'s sample size determination method, the researchers established a sample size of 70 MFIs from a population of 85 registered MFIs in Uganda (AMFIU, 2017/2018b). However, the responses were gathered from 64 MFIs accounting for 91.4% above 70% threshold recommended by Kothari and Gang (2014). The targeted MFIs comprised; non-regulated MFIs, SACCOS, credit institutions, micro deposit taking institutions (MDIs) and commercial banks that offer microfinance services. They were selected using simple random sampling technique since the population size was relatively small and representative in nature. Conversely, purposive sampling method was used to select the respondents; the manager, credit officers and accountant from the selected MFIs. The selection criterion was founded on their managerial and operational roles and responsibilities that are critical in influencing financial performance.

Measurement of variables

Financial performance measures of profitability, portfolio quality and operational efficiency were adopted (Hoskisson et al., 1993). Meanwhile; capital structure was measured by debt and equity (Vatavu, 2015). Additionally, credit risk management measures of credit risk appraisal, credit risk monitoring and credit risk mitigation were considered (Kariuki, 2017). All the measurement items used by the cited scholars were modified and fitted to the microfinance setting in Uganda.

Reliability and validity of instruments

Table 1 results show that all the study variables had an alpha co-efficient of above 0.7 (equity α =0.931; debt α=0.788; credit risk appraisal α=0.862; credit risk monitoring α=0.720; credit risk mitigation α =0.815; profitability α=0.851; portfolio quality α=0.832 and operational efficiency α =. 841. Thus describing the internal consistency of the instrument scale and hence the reliability as recommended by Cronbach (1951). Meanwhile, the content validity Index (CVI) values are as follows: (capital structure CVI=0.86; credit risk management CVI=0.80; financial performance CVI=0.86). The CVI indices were all above 0.7 as recommended by Amin (2005), suggesting that the data adequately explained the study constructs.

Data management

The study controlled for response bias to avoid measurement errors by ensuring the question items were simple, precise, concise and no double questions were asked. Also checking for missing values and outliers due to data capture and entry errors was done. Mcar test was performed to test whether the data were missing completely at random or not. The results showed that the data were missing completely at random with p-value=0.023. The missing values were then corrected using linear interpolation method. Meanwhile, Z-score analysis was undertaken to check for outliers, whereby values with + or – 2.5 were deleted. The square root transformation method was further employed to correct the outliers in the data.

In addition, diagnostic tests to check for the fulfillment of normality, homogeneity and multi-collinearity assumptions in the data were performed. First, skewness and kurtosis tests statistical values were close to zero (skewness statistics ranging 0.000 to

Table 1. Reliability test results.

Variable	Number of items	Content validity index (CVI)	Cronbach average Alpha coefficient (α) per Variable	Average
Capital Structure	12/14	0.86		
Equity	5		0.931	
Debt	4		0.788	0.860
Credit Risk Management	12/15	0.80		
Credit Risk Appraisal	6		0.862	
Credit Risk Monitoring	2		0.720	
Credit Risk Mitigation	4		0.815	0.799
Financial Performance	12/14	0.86		
Profitability	4		0.851	
Portfolio Quality	4		0.832	
Operational Efficiency	4		0.841	0.841

Source: Primary data.

Table 2. Kaiser Meyer Olkin (KMO) and Bartlett's test results.

Component	KMO measure of sampling adequacy	Bartlett's test of sphericity	Df	Sig.
Capital structure	0.752	396.703	36	0.000
Credit risk management	0.803	382.814	66	0.000
Financial performance	0.744	443.135	66	0.000

Extraction Method: Principle Component Analysis; Rotational Method: Varimax with Kaiser Normalization.

0.156 and kurtosis statistics between (-0.001 to-1.050). Therefore, confirming the normality of the data as supported by Field (2009). Meanwhile, homogeneity of variance assumption is confirmed by the levene test results indicating a p-value > 0.05 (capital structure, p= 0.646; credit risk management, p= 0.223), implying that all the data were sourced from the sample population. Further, multi-collinearity test results showed a variance inflation factor (VIF=1.028) and (tolerance value =0.093); values of less than 5 and greater than 0.02 respectively, ruling out association between the independent variables. Hence, all the parametric assumptions were satisfied and data fit for further statistical analysis.

Furthermore, the researchers conducted exploratory factor analysis to test for the factor loading for each of the study constructs using principal component matrix-varimax method. The results reveal that the question items of the different study variables had communalities above 0.5. The communalities values for capital structure ranged between (equity=0.831 to 0.909; debt=0.666 to 0.837). Whereas absolute values for credit risk management (credit risk appraisal=0.598 to 0.837; credit risk monitoring=0.0759 to 0.877 and credit risk mitigation=0.709 to 0.776) and finally the communalities statistics for financial performance (profitability=0.624 to 0.918; portfolio quality=0.643 to 0.885 and operational efficiency=0.663 to 0.890). Hence, the extracted question items adequately explained the study constructs. In addition, Kaiser-Meyer Olkin (KMO) values for capital structure=0.752, credit risk management=0.803, financial performance=0.744) were above 0.7 as recommended by Field (2009), inferring the study sample was adequate to explain the study variables. Meanwhile, Bartlett's test of sphericity results was significant at p<.05 (capital structure p-value=0.000, credit risk management p-value=0.000, financial performance p-value=0.000), indicating sufficient correlation among the measurement items of each study variable as seen in Table 2.

Data analysis

To obtain the hypothesized study results, descriptive frequency analysis was performed using SPSS computer package. First; to determine the organizational characteristics of the MFIs and test for parametric assumptions of the study. Second, Spearman's correlation was performed to test for the degree of association between the study variables. Furthermore, multiple regression analysis was carried out to test for the relationship between capital structure, credit risk management and financial performance.

RESULTS AND DISUSSION

Descriptive statistics

For better understanding and discussion of the empirical, theoretical and conceptual framework of the study varia-bles, we provide the organizational characteristics of MFIs under study. The statistics indicate that out of the 64 MFIs sampled for the study, they comprise non-regulated MFIs (45.3%), SACCOS (34.4%), Micro Depos-it Taking Institutions (9.4%), commercial MFIs (6.3%) and credit institutions (4.7%). On the distribution of capital structure (type of capital employed), the majority of MFIs employ both equity and debt finance (56.3%); whereas other MFIs employ only equity finance (40.6%) and debt finance (3.1%) in their operations. For the number of years in operation, the results indicate that a biggest

Table 3. MFI characteristics.

MFI Characteristics	Frequency	Percentage	Cumulative percent (%)
Category of the institution			
Commercial Bank	4	6.3	6.3
Credit institution	3	4.7	10.9
Micro Deposit Taking Institution (MDIs)	6	9.4	20.3
SACCO	22	34.4	54.7
Other Non-Regulated Microfinance institutions	29	45.3	100.0
Total	64	100.0	
Type of capital employed			
Debt	2	3.1	3.1
Equity	26	40.6	43.8
Hybrid	36	56.3	100.0
Total	64	100.0	
Number of years in operation			
20 years and above	21	32.8	32.8
15-19 years	15	23.4	56.3
10-14 years	12	18.8	75.0
5-9 years	11	17.2	92.2
Less than 5 years	5	7.8	100.0
Total	64	100.0	
Debt/Equity ratio			
Less than 20%	38	59.4	59.4
20-39%	19	29.7	89.1
40-59%	4	6.3	95.3
60-79%	1	1.6	96.9
80% and above	2	3.1	100.0
Total	64	100.0	

Source: Primary data.

number of MFIs (32.8%) have been in operation in Uganda for a period of 20 years and above. In addition, 23.4% have been in operation between 15-19 years, 18.8% have operated for a period between 10-14 years, 17.2% have been in business for a period between 5-9% years. Meanwhile, 7.8% have been active for a period less than 5 years. Majority of MFIs (59.4%) had debt/equity ratio below 20% and other MFIs (3.1%) registered a ratio greater than 80% as shown in Table 3.

Spearman's correlation analysis

Spearman's correlation coefficient was performed to examine the relationship between the study variables. The results in Table 4 show that there is no significant association between capital structure and financial performance (r = 0.124, p>0.01). This implies that a unit change in the way MFIs are financed using equity or debt is not necessarily associated with the change in the financial performance. The results further reveal that there is a significant positive relationship between credit risk management and financial performance (r=0.535, p<0.01). In essence, effective credit risk identification, credit risk monitoring and credit risk mitigation contribute to sound financial performance of MFIs.

Multiple regression analysis

The results in Table 5 demonstrate that capital structure and financial performance of MFIs are not significantly related (β=0.037, p>0.01). Whilst, credit risk management and financial performance are positively and significantly related (β=0.529, p<0.01). Hence debt or equity structure does not necessarily contribute to financial performance. Instead, the preventive and control measures of credit risk contribute to financial performance of MFIs. The

Table 4. Spearman's correlation matrix results.

Variable	1	2	3
Capital structure	1		
Credit risk management	0.164	1	
Financial performance	0.124	0.535[**]	1

** Correlation is significant at the 0.01 level (2-tailed).

Table 5. Multiple regression results.

Model	Co-efficients[a]				
	Unstandardized coefficients		Standardized coefficients	T	Sig.
	B	Std. error	B		
(Constant)	0.441	0.684		0.644	0.522
1 Capital structure	0.038	0.111	0.037	0.337	0.737
Credit risk management	0.692	0.143	0.529	4.827	0.000

R=0.536[a], R Square =0.287, Adjusted R Square = 0.264, F Statistic = 12.304, Std. error of the estimate = 0.6574, Sig. =0.000.

predictor power of the model (R^2 =0.287) accounting for 29% explanatory power implies that combining appropriate debt or equity volumes together with effective credit risk appraisal, credit risk monitoring and credit risk mitigation contribute to better financial performance of MFIs. Overall, the model is well specified (F= 12.304, p<0.01), suggesting that both capital structure and credit risk management adequately explain financial performance of MFIs.

DISCUSSION

The discussion expounds on the direct relationship between capital structure, credit risk management and financial performance of MFIs. In addition, it also details the combined effect of capital structure and credit risk management on financial performance.

First, the evidence shows that capital structure and financial performance are positively but not significantly related. Hence hypothesis H1 was not supported. This implies that a positive change in capital structure does not necessarily contribute to a positive change in financial performance. Indeed, the type and nature of debt or equity alone does not necessarily contribute to financial performance of MFIs. Exemplified by the fact that, whether the debt/equity ratio is small or large in size, secured or unsecured, public or private, it may be susceptible to tendencies of delinquency or default risk once disbursed, which may adversely affect financial performance. Hence, without established operational measures in place that influence the quality of debt such as; appraisal, tracking and recovery mechanisms, debt

will not positively contribute to financial performance. Similarly, prior studies affirm that capital structure is not relevant in determining the financial performance of a firm (Mutenheri and Munangagwa, 2015; Ikapel and Kajirwa, 2017). However, other scholars observe a positive relationship between debt/equity ratio and financial performance (Adesina et al., 2015; Kpwe, 2017). All in all; we affirm that debt/equity ratio alone does not necessarily contribute to the quality of financial performance. Instead, the structural operational measures in dispensing the debt or equity are the most important in determining the financial performance of MFIs.

Second, the results confirm a significant relationship between credit risk management and financial performance. Thus, hypothesis H2 was supported. This means that a positive change in credit risk management contributes to a positive change in financial performance of MFIs. In reality, MFIs carry out due diligence, loan structuring, loan tracking and loan recovery processes as means of preventing and controlling credit risk. For instance, in the course of appraisal, MFIs endeavour to establish the capital, collateral, character and capacity position of the potential clients. Similarly, credit officers routinely monitor and supervise disbursed loans to ensure the borrowers do not default and to effect full recovery of the disbursed loans. MFIs also ask for collateral as a safeguard for delinquency and default of borrowers. Penalties and fines are imposed on those who have defaulted as a control measure. As a result of credit risk preventive and control measures, MFI portfolio quality is healthy thus contributing to sound financial performance. The study evidence is in consonance with earlier studies that underpinned the relevance of credit

risk identification, analysis, monitoring and control in the performance of financial institutions (Lalon, 2015; Kimotho and Gekara, 2016; Kariuki, 2017). On the contrary, Obamide et al. (2015) and Warsame (2016) argue that credit risk management does not necessarily contribute to financial performance of financial institutions. However, this study underscores the value of credit risk prevention and control due to the complexity of the microfinance business environment in the 21st centenary.

Third, hypothesis H3 was supported because the results demonstrate that capital structure and credit risk management combined have a high explanatory power on financial performance of MFIs. This implies that a positive change in capital structure and credit risk management variables when combined contributes to a positive change in financial performance of MFIs. In Uganda, MFIs extend loans to borrowers from both borrowed and personal loan capital sources. Nevertheless, for these loans to be productive and revenue generating, there is need to prevent and control operational risks through a comprehensive risk mitigation strategy that includes; risk identification, analysis, control and management. For instance, MFIs carry out pre-disbursement due diligence of the repayment capacity and risk levels of potential clients. They also carry out thorough approval of loans and verification of documents before disbursement. Once the loans are disbursed, the MFIs then effect; close monitoring and supervision of loans to guarantee a healthy loan portfolio. Therefore, once the risks are prevented, controlled and managed, the MFIs will have a healthy loan portfolio that is productive and contributing to sound financial performance. The findings are in agreement with the insights that credit risk management positively contributes to financial performance of financial institutions.

Conclusion

The study set out to examine the contribution of capital structure and credit risk management to financial performance of MFIs in Uganda. The study based on agency theoretical composition, quantitative approach and employed cross-sectional design to survey 64 MFIs in Uganda to obtain the study results. First, the results confirm that capital structure and financial performance are not significantly related. Second, the evidence affirms that there is a significant relationship between credit risk management and financial performance. Third, capital structure and credit risk management combined effect have a strong explanatory power on financial performance of MFIs. In essence, debt and equity capital alone do not necessarily contribute to financial performance of MFIs. On the other hand, credit risk measures are vital in fostering financial performance of MFIs. However, combined effect of borrowed or equity finance together with credit risk preventive and control mechanisms significantly contributes to sound financial performance.

Deductively, the above anecdote shows that disbursing any form of loan capital is not enough without an appropriate risk management strategy.

The aforementioned evidence is consistent with previous studies that indicate capital structure and credit risk mechanisms are essential in fostering positive financial performance (Gizaw et al., 2015; Alshatti, 2015). The study evidence is useful to policy makers; governments should create a flexible and an enabling regulatory policy environment that allows MFIs to develop operational risk management strategies. At institutional level, managers should endeavor to develop and strengthen risk preventive and control operational strategies in order to identify, monitor, control and mitigate the different operational risks including credit risk. The study was limited in perspective, since it was cross-sectional in nature and pegged to a quantitative approach. Nevertheless, future studies may adopt a longitudinal dimension and mixed method approach to cater for quantitative and qualitative findings.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

ACKNOWLEDGEMENT

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Multidimensional measures of deprivation in Tunisia

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The multidimensional apprehension of poverty is largely accepted today given the considerable contribution to understanding and acting against the manifestations of this phenomenon. Amartya Sen's capability approach is the basis of the recent developments on the subject. In this perspective, the present work aims to study the application of multidimensional deprivation measures on Tunisian data. This paper investigates the nature of deprivations in the country using the measures proposed by Alkire and Foster, based on a two-threshold identification method. Our work proposes measures of deprivation in four dimensions. In addition to the dimension of economic resources, we consider the deprivations in terms of housing, education and health. The study employed the national survey on household budget, consumption and standard of living 2010. The results are useful in identifying the most widespread deprivations and the most vulnerable population groups. In fact, with the monetary approach it is not possible to target all vulnerable groups and to detect all the deprivations suffered by the population. According to the results of this work, the western and southern regions of the country record the highest deprivation rates. The results are also indicative of the most widespread deprivations and the most affected socio-economic groups.

Key words: Capability approach, monetary poverty, deprivation, poverty measurement, Alkire and Foster measures, Tunisia.

INTRODUCTION

Nowadays, the multidimensional understanding of poverty is universally recognized by the work on Amartya Sen's approach to capabilities, which places a central value on the notion of positive liberty (Sen, 1985, 1987, 2003). The influence of this approach has affected not only the study of deprivations, but also the areas of education, health, gender inequality, sustainable development as well as the protection of the environment.

Poverty cannot be reduced to the lack on monetary resources, but must take into account the dimensions of a dignified and respectable human life. Alkire and Santos

(2013) discussed three reasons to consider income to be inadequate indicator of poverty. First, the existence of needs met by non-market or institutional goods (access to services: water, education). Secondly, the ability of individuals to transform income into functioning depends on their physical states, activity, location, level of education. Finally, participatory surveys show that poor people identify in priority other dimensions of deprivation such as: nutrition, health, access to drinking water, exclusion, violence. At this level, the exploration of other facets of deprivation helps to complete the image drawn

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and offers a better view of the disadvantages suffered by the poorest individuals.

Studies on multidimensional poverty continue to grow. Many of these works link poverty to several dimensions of human life. We refer here, for example, to Brandolini and D'Alessio (1998), Chiappero-Martinetti (2000), Lelli (2001) and Maître et al. (2014). The results reveal the contribution of multidimensional perception to the understanding of poverty.

In the same perspective, the construction of multidimensional measures has largely developed. Deutsch and Silber (2005) presented a comparison of four approaches based on fuzzy set theory, information theory, efficiency analysis and axiomatic approach. In 2010, the United Nations Development Program (UNDP), in collaboration with the Oxford Poverty and Human Development Initiative (OPHI), launched the Multidimensional Poverty Index calculated for a hundred countries.

Official statistics in Tunisia show that poverty in the country is in constant decline. However, this regression cannot hide the existence of a very significant differential, particularly according to the region and the area of residence (Institut National de la Statistique INS, 2010 and 2015). In addition, the study of poverty in Tunisia focused on monetary terms with a dominance of the work carried out by national and international institutions (African Development Bank, 2011; INS, African Development Bank and World Bank, 2012; World Bank, 2016).

Belhadj (2011) constructed a multidimensional poverty index using fuzzy set theory, applied to Tunisian data from the 1990 budget and consumption survey. The work retains 3 dimensions relating to: the region of residence (by differentiating between rural and urban coastal and interior environments as well as the urban region of the capital Tunis); the activity and level of education of the head of household. The results show that poverty is more severe for: residents in interior regions; households headed by a worker or illiterate.

Likewise, Nasri and Belhadj (2017) used household expenditure to analyze regional multidimensional poverty, by only retaining expenditure related to three headings: food, health and education. Other works such as Belhadj (2012); Hasnaoui and Belhadj (2015); Zedini and Belhadj (2015) have adopted the same logic. They exclude expenses relating to communication, leisure.

The approach to our work is completely different from this vision. Indeed, the contribution is to consider an understanding of multidimensional poverty that takes into account monetary and non-monetary aspects. This is at the heart of recent developments in the study of poverty.

The objective of this paper is to analyze poverty in Tunisia from a multidimensional perspective. For this purpose, we apply the method of Alkire and Foster (2009) to obtain the multidimensional poverty measures. These measurements are based on an identification method with two thresholds (Between and within dimensions). The

aggregation step is done through the fitted Foster-Greer and Thorbeck family of measures. The application is based on Tunisian data from the 2010 National Household Budget, Consumption and Standard of Living Survey.

Multidimensional measures

Fundament

The definition of poverty in terms of lack of capabilities and functioning aims to defend the right to a decent life for all individuals. Although income is essential to meeting needs, it is not the primary objective. Income is a means and not an objective in itself.

Functioning expresses all the possibilities of choice and actions, from the most basic to the most complex, accessible to an individual (being well fed, in good health, participating in social life). Capability is a combination of functioning that represents a certain way of life. Achievements consist of all the modes of functioning that a person actually exercises. It is necessary to differentiate between achievement on one side and freedom of achievement on the other. Sen's legal approach places a significant value on the freedom to achieve in the sense that it extends the choice possibilities of an individual.

For Sen, the "Capability" space is more appropriate for the study of poverty and inequality. First, the real freedoms admit an intrinsic importance for all individuals. The possibility to choose independently is a goal that everyone seeks to achieve. This provides to capabilities the basic role for a dignified and fulfilling human life. Second, economic and monetary conditions are not the only factor influencing the production of capabilities. Political freedoms, housing conditions, health status are important elements in people's perception. Finally, the relationship between monetary poverty and poverty in capabilities remains variable. This justifies the existence of situations where people suffering from various deprivations are not identified by a monetary approach. This relationship depends on several factors that influence the conversion of resources into functioning.

Construction

The measures of Alkire and Foster (2009) consisted of a two-step identification method (identification step) combined with a family of measures based on the Foster et al. (1984) index (aggregation step).

Identification: The population considered is composed of n individuals (denoted i; $i = 1, ..., n$). Individual achievements are counted in d dimensions (denoted j; $j = 1, ..., d$). The matrix of achievements is therefore noted:

$X = [x_{ij}]_{n \times d}$.

The element x_{ij} denotes the achievement of the individual i in the dimension j. The line vector represents the individual achievements in the different dimensions. On the other hand, the column vector represents the distribution of one-dimensional achievements with respect to the entire population. The first identification step is based on setting a threshold for each dimension. For any dimension j, a deprivation threshold z_j is defined. The threshold vector is denoted $z = (z_1, ..., z_d)$. To any matrix of achievement x_{ij} corresponds a deprivation matrix $g^0 = [g_{ij}^0]$ defined by:

$$g_{ij}^0 = \begin{cases} 1 & if \ x_{ij} < z_j \\ 0 & if \ x_{ij} \geq z_j \end{cases} \tag{1}$$

The value 1 indicates that the individual i is considered poor in dimension j. Counting the deprivation dimensions determines the account matrix $c = [c_i]$ where c_i the deprivation number.

$$c_i = \sum_{j=1}^{d} g_{ij}^0 \tag{2}$$

In the case where a weighting system is $w = (w_1, ..., w_d)$, the elements of the deprivation matrix consist of :

$$g_{ij}^0 = \begin{cases} w_j & if \ x_{ij} < z_j \\ 0 & if \ x_{ij} \geq z_j \end{cases} \tag{3}$$

And the account matrix will be interpreted as the weighted number of deprivations. In the case where the achievement is defined by cardinal variables, the matrix of normalized deprivation differences $g^1 = [g_{ij}^1]$ admits as typical element (whose value is between 0 and 1):

$$g_{ij}^1 = \begin{cases} \frac{z_j - x_{ij}}{z_j} & if \ x_{ij} < z_j \\ 0 & if \ not \end{cases} \tag{4}$$

The elements of this matrix are non-negative, between 0 and 1. A non-zero value indicates the deprivation intensity felt by the individual i in the dimension j. This matrix can be generalized for a rank α ($\alpha > 0$) : $g^\alpha = [(g_{ij}^1)^\alpha]$

The second stage of identification is based on the number of individual deprivations k. The function of multidimensional deprivation is therefore:

$$\rho_k(x_i; z) = \begin{cases} 1 & if \ c_i < k \\ 0 & if \ not \end{cases} \tag{5}$$

The union approach ($k = 1$) considers as poor any individual in a state of deprivation in at least one dimension. On the other hand, in the intersection approach ($k = d$), the individual is poor when he is deprived in all dimensions. Eliminating data on non-poor individuals allows the construction of the matrix $g^0(k) =$

$[g_{ij}^0(k)]$; with:

$$g_{ij}^0(k) = \begin{cases} g_{ij}^0 & if \ c_i \geq k \\ 0 & if \ not \end{cases} \tag{6}$$

Aggregation

The incidence of poverty H, percentage of the poor population, is the most used measure.

$$H(X, z) = \frac{q}{n} \tag{7}$$

where

$$q = q(X, Z) = \sum_{i=1}^{n} \rho_k(x_i, z) \tag{8}$$

represents the number of individuals identified as poor by the multidimensional method.

In defining the matrix:

$$g^\alpha(k) = [g_{ij}^\alpha(k)], \tag{9}$$

$$g_{ij}^\alpha(k) = \begin{cases} g_{ij}^\alpha & if \ c_i \geq k \\ 0 & if \ not \end{cases} \tag{10}$$

it is possible to propose a family of measures M_α such as (for a vector v, $\mu(v)$ represents the average of all elements):

$$M_\alpha(X, k) = \mu[g^\alpha(k)] \tag{11}$$

The α parameter is an indicator of poverty aversion. It is also interpreted as an elasticity of individual poverty relative to the poverty deficit. A 1% increase in the deficit results in a α % increase in the poverty measure.

For a value $\alpha = 0$, the measure obtained is:

$$M_0(X, k) = \mu[g^0(k)] = |c(k)|/nd \tag{12}$$

Where $|v|$ denotes the sum of all elements for the vector v.

DATA AND DEPRIVATION DIMENSIONS

Data

The empirical work done is based on data from the 2010 National Survey on Houshold Budget, Consumption and Living Standards. Conducted by the National Institute of Statistics (INS), the five-year survey took place between June 2010 and main 2011 on a sample of 13,400 households. The purpose of the survey is to provide information on three aspects: household consumption expenditure, food consumption and household access to health and education services made with a sample halved.

The merging of the data provided by the three components made it possible to obtain a sample composed of 5,690 house- holds representing 25,055 individuals of which 64.66 % live in a urban

Table 1. Distribution of households (in%) by marital status.

Status	Male	Female	Total
Single	1.59	4.12	1.99
Married	95.89	21.29	84.13
Widowed	2.13	66.44	12.27
Divorced	0.40	8.14	1.62
Total	100.00	100.00	100.00

area. Male-headed households account for 84.24% of the sample. In 95% of these cases, the head of household is married. When a woman is in the position of household head (15.76% of the total households), the dominant marital status is "widowed" representing 64.44% of households headed by females. Households headed by females are, on average, smaller in size. Half of the households in the sample, the head is between 40 and 60 years old (Table 1).

Dimensions and indicators

The choice of dimensions and associated indicators follows two possible approaches (Guio, 2009; Guio et al., 2009):

i. the normative approach: consists of proceeding in a logical way, by attributing indicators to specific dimensions previously chosen (Multidimensional Poverty Index IPM built by the UNDP, poverty in living conditions in France);
ii. the descriptive approach: uses the CFA (Confirmatory factor analysis) analysis techniques to identify groups of indicators according to the degree of correlation (Nolan and Whelan, 1996).

Monetary dimension

In this dimension, households that have an amount of consumption expenditure below a monetary poverty line, are considered in a state of deprivation. The threshold calculated by the INS is the sum of food and non-food components. It is calculated for three areas: metropolitan, communal (urban) and non-communal (rural). The respective values are estimated at 1277, 1158 and 820 dinars (Tunisian currency) per person / year.

Housing dimension

Housing is an essential dimension in the well-being of households. Deprivation in this dimension is assessed according to the comfort and availability of essential services. Four indicators were selected:

i. the number of persons per room: the threshold chosen is 3. Thus, a household will be judged in deprivation if the value of the indicator is greater than 3;
ii. the availability of electricity;
iii. the availability of potable water: provided by SONEDE (National Company of Exploitation and Distribution of Waters). Households who obtain drinking water by means of: public fountain, sellers, public or private wells as well as waterways are considered deprived;
iv. the Connection to the sewerage network.

Education dimension

Deprivation in the education dimension is assessed in relation to the education level of the household head. The household is deprived if the head has never studied.

Health and social security dimension

Two indicators are used to represent deprivation in this dimension. For the first indicator, a household will be considered poor if one of these members is suffering from a long-term illness without having care coverage (through: CNAM National Health Insurance Fund, a mutual or a group insurance, free of charge, with a family member). The second indicator concerns the affiliation of the household to a social security organization (Caisse Nationale de Sécurité Sociale, CNSS or Caisse Nationale de Retraite et de Sociale, CNRPS). Deprivation in this indicator is confirmed when the head of household is not affiliated.

RESULTS AND DISCUSSION

Deprivation by dimension

When the dimension is represented by more than one indicator, the household is considered deprived if it accumulates deprivations in at least 50% of the indicators. Tables 2 to 4 summarize the information on the indicators by dimension (reporting the threshold and frequency of deprivation).

The data show that income poverty affects 14.24% of households. The proportion of the poor in this dimension is even higher:

i. in the rural area (19.74%) compared to the urban area (11.23%);
ii. in the inner regions of the country, the poverty rate is 28.77 % in the Midwest, while it is 5.34 % in the Center East;
iii. for larger households;
iv. when the head of the household belongs to the category of unemployed or farm workers. As for the monetary poverty, the deprivation of education is more widespread in the rural area (48.41 % against 22.68 % in the urban area), as well as in the interior regions (in particular in the center west and North West). At the national level, 31.76% of household heads have never studied. In fact, the geographical distribution of schools is uneven between regions. This compromises development and increases the hardships of the inhabitants of some regions of the country. In rural areas, schools are devoid

Table 2. Deprivation Rate (in %) by dimension.

Dimension	Deprivation rate
Monetary	14.24
Housing	20.83
Education	31.76
Health	36.68

Table 3. Housing dimension.

Indicator	Threshold	Deprivation (%)
Number of person/ room	Greater than 3	10.93
Electricity	No electricity	0.77
Potable water	No connection SONEDE	17.29
Sanitation	No connection	45.13

Table 4. Dimension of health and social security.

Indicator	Threshold	Deprivation (%)
Long-term illness	Patient without care coverage	11.49
Affiliation to social security	Not affiliated	36.41

of equipment and lack of maintenance and teaching staff.

The regional differential of deprivation seems even more important in the housing dimension. While the proportion of households in deprivation is 2.08 % in Tunis agglomeration, it reaches 48.19 % in the center west. At the national level, the rate of housing deprivation is 20.83%. Official data on housing in Tunisia indicate a sustained evolution of the housing stock. However, as Zaafrane (2014) points out, the living conditions and the households' comfort vary according to their socio-economic characteristics. Thus, the poorest households live in very difficult conditions. Housing policy must take into account social and regional parameter.

For the health and social security dimension, the deprivation rates in each indicator are shown in Table 4. The proportion of households in deprivation in the dimension is estimated at 36.68%. Despite the large offer of care, it remains characterized by strong disparities. Belhadj et al. (2016) note that community care structures in several regions can only provide one medical consultation per week. In addition, there are financial difficulties in accessing healthcare, particularly because of the non-affiliation of a large part of the population to the CNAM.

It is therefore necessary to carry out reforms that guarantee access to care and overcome the financial difficulties encountered by users. Also, it is necessary to reduce the imbalances between the regions by revising the health map and by giving priority to the regions of the

west and south of the country. On this point, Achour (2011) underlines the significance of regional inequalities which is manifested by indicators such as the concentration of beds, equipment and health personnel in the coastal regions (the eastern regions of the country).

The results (Table 6) also show that households headed by women are more exposed to the risks of deprivation, particularly in the education and health dimensions. According to the socio-professional category, it appears that deprivation affects more severely the farmers and farm workers in the housing, education and health dimensions. The inactive and households without support also experience high rates in the education and health dimensions.

Poverty measures

The identification of multidimensional poor households as well as the measures depends on the threshold k, which indicates the number of deprivation dimensions needed to consider them as poor (Table 5). Equal weighting was adopted in construction measurements. The debate is very open for this choice and the literature is rich in contributions: Decancq and Lugo (2008) and Anand and Sen (1997) as examples.

Table 6 shows the different measures according to the values of k. When $k = 1$ (union approach), it suffices that a household suffers from deprivation in at least one

Table 5. Multidimensional poverty measures by the threshold *k*.

Threshold	Rate (%)	$M_0(k)$
$k = 1$	56.59	25.87
$k = 2$	31.28	19.55
$k = 3$	12.58	10.2
$k = 4$	3.04	3.04

Table 6. Deprivation and poverty measures according to the households' characteristics.

Characteristics	Deprivation rate (in %)				Multidimensional measures (in %)			
	Monetary	Housing	Education	Health	k=1	k=2	k=3	k=4
Gender								
Male	14.31	20.85	25.45	31.92	51.72	27.08	11.00	2.73
Female	13.82	20.73	65.44	62.11	82.61	53.73	21.07	4.68
Marital status								
Single	12.39	25.66	25.66	57.52	69.91	34.51	14.16	2.65
Maried	14.98	21.52	25.78	33.19	52.41	28.12	11.82	3.11
Widowed	10.32	16.9	73.21	54.01	81.23	52.29	18.05	2.87
Divorced	7.61	8.7	35.87	60.87	70.65	32.61	8.70	1.09
Household size								
1 to 2	4.58	19.35	53.69	47.14	68.89	41.21	13.01	1.66
3 to 4	8.88	17.23	24.50	33.29	49.06	24.50	8.97	1.37
5 to 6	18.03	20.73	25.39	33.16	52.69	28.34	12.59	3.68
7 to 8	30.77	29.78	40.04	41.03	70.81	43.39	20.51	6.90
more than 8	42.53	47.70	45.40	46.55	82.18	56.32	31.03	12.64
Regions								
Tunis Aglomeration	7.81	2.08	20.36	18.97	35.57	11.96	1.58	0.10
North east	8.03	18.68	32.63	35.92	57.37	28.03	7.63	2.24
North west	20.41	40.22	42.92	51.76	73.27	49.94	25.52	6.56
Center east	5.34	9.2	23.11	27.35	42.54	17.40	4.05	1.01
Midwest	**28.77**	48.19	45.85	59.30	80.23	59.53	33.68	8.65
South east	16.89	18.69	28.69	34.10	56.56	30.98	9.18	1.64
South west	17.46	11.95	33.46	33.82	60.29	27.21	8.09	1.10
Area of residence								
Rural	19.95	54.02	48.79	57.39	83.92	58.59	29.60	8.04
Urban	11.16	2.97	22.59	25.54	41.89	16.59	3.43	0.35
Socio-professional categories								
Higher managerial and professional occupations	0.00	1.81	1.81	3.26	4.71	1.81	0.36	0.00
Intermediate occupations	2.67	4.58	3.44	8.40	14.89	3.44	0.76	0.00
Other employees	7.64	6.74	8.99	16.85	27.42	10.11	2.47	0.22
Small employers	7.78	10.07	14.65	25.86	39.13	14.65	4.12	0.46
Own account workers	10.63	6.25	9.38	26.25	36.25	13.75	2.50	0.00
Workers	22.02	24.97	22.96	42.24	63.52	33.67	12.18	2.81
Farmers	18.13	50.09	48.29	57.81	80.79	56.55	28.55	8.44
Agricultural workers	37.50	49.04	43.27	63.46	81.73	63.46	36.54	11.54
Non employed	37.84	38.74	32.43	73.87	89.19	55.86	29.73	8.11
Retired	5.94	9.94	36.23	8.91	44.80	13.26	2.63	0.34
Other inactive	13.39	20.37	71.65	60.11	84.90	54.99	21.37	4.27
Support outside the household	22.85	40.45	60.30	84.27	92.13	70.04	35.58	10.11

Table 7. Correlation between deprivations.

Dimension	Monetary	Housing	Education	Health
Monetary	1			
Housing	0.2469*	1		
Education	0.1272*	0.2331*	1	
Health	0.2493*	0.2967*	0.3112*	1
*Significant at 5%				

Table 8. Proportions of poor households (in %) detected by the one-dimensional measures.

Dimension	Multidimensional Measures (%)			
	k= 1	k= 2	k= 3	k= 4
Monetary	25.2	38.3	59.2	100
Housing	36.8	55.6	83.5	100
Education	56.1	71.3	86.5	100
Health	64.8	84.7	95.0	100

dimension to be considered "poor". On the other hand, for a value of $k = 4$ (intersection approach), a household is considered poor only when it experiences difficulties in the four dimensions selected.

In view of the results, it should be noted that more than half (56.59%) of the population suffers from deprivation in at least one dimension. This proportion adds up to one quarter of the total deprivation ($M_0(1) = 25.87\%$) of possible deprivations equal to $n \times d = 5690 \times 4$.

For a threshold value $k = 3$, only households with deprivations in three or four dimensions are considered poor. For this threshold, 12.58% of households are classified as poor. These households total deprivations equivalent to $M_0(3) = 10.2\%$ possible deprivations.

An analysis of deprivations by household characteristics shows that households living in the Midwest and the North West are the most vulnerable to multidimensional poverty, regardless of the value of the threshold k. The deprivations are more felt in the dimensions of housing, health and education. Globally, the multidimensional measures are higher when the head of household is a farm worker, unemployed or a farmer.

Table 6 also shows that multidimensional poverty is more prevalent in the urban area. Research studies explained the deterioration in the living conditions of rural households by the deterioration of the terms of trade for agricultural products on the one hand and the decrease in investments in the agricultural sector on the other hand (Elloumi and Dhehibi, 2009). The rural environment seems unable to follow an economic model with high productivity. This imbalance between rural and urban areas is the result of a historical cleavage between town and country as well as the result of policies and development model for decades.

The low degree of correlation between deprivations by dimension attests to the usefulness of the multi-dimensional approach (Table 7). Indeed, each dimension provides additional information regarding the poor population. Thus, 68.95% of poor households in terms of housing are not detected by income poverty. Indeed, despite suffering from deprivation in the housing dimension, they have an income above the poverty line. This proportion climbs to 74.21% for the health dimension and 79.25% for the education dimension.

Moreover, the monetary dimension can only identify 60% of the poor population in multidimensional terms (k = 3). This proportion drops to 38.3 % when k = 2 (poor households are those experiencing difficulties in at least two dimensions). For a value of the threshold k = 3, the intersection between the multidimensional approach and the housing, education and health dimensions are respectively 83.5, 86.2 and 94.5% (Table 8).

Conclusion

The objective of this work was to identify multi-dimensional poverty in Tunisia and to build adapted measures. The approach adopted considered poverty in terms of capabilities according to a set of deprivations relating to different dimensions. Based on data from the 2010 National Survey on Houshold Budget, Consumption and Living Standards, indicators in four- dimensional were selected. In addition to the monetary dimension, they concern the dimensions of housing, education and health.

The measures, built on the basis of the two-threshold counting method, proposed by Alkire and Foster (2009), was applied. The results demonstrate the importance of non-monetary deprivations. They also show that more

than half of the population suffers from deprivation in at least one dimension. These deprivations are widespread especially in the rural area as well as in the interior regions of the country. The risk of deprivation increases significantly when the head of the household is female or unemployed, working as a farmer, agricultural worker.

This work clarifies the nature of deprivation in Tunisia by introducing additional dimensions. We demonstrated the usefulness of this multidimensional approach. Indeed, the low correlation between deprivations by dimension attests to the contribution of each dimension to the understanding of poverty in Tunisia.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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Gender differences in urbanization willingness: Evidence from Henan, China

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In this work, Henan is taken as a typical study area to assess the level of gender differences of urbanization willingness in China; Henan population structure is a small representation of the whole country. Using data of Henan migrant workers' citizenization research in 2017, the evaluation index system of Henan migrant workers' urban integration degree was established based on the Maslow's demand theory. The weight was computed by combining the weight from the analytic hierarchy process and factor analysis, respectively. The urbanization willingness of different genders was calculated by using the evaluation index system. The result shows that there is no difference between the two groups.

Key words: Urbanization willingness, gender differences, synthetic evaluation.

INTRODUCTION

The central part of China mainly includes six provinces: Henan, Anhui, Hubei, Hunan, Jiangxi and Shanxi, with a permanent population of 368 million people, accounting for about 30% of the country. In the past, agriculture was the main source of economic activity in the region, and the proportion of urbanization was relatively low. This resulted in a large number of migrant workers. Especially in Henan, the urbanization rate of Henan (50.2%) is lower than the national average of 8.4% points. The total number of migrant workers in Henan is 25.43 million, ranking first in the country; it accounts for 8.9% of the total number of migrant workers in the country (Population Development Report of Henan Province, 2017).

At present, "China's economy has changed from a stage of high-speed growth to a stage of high-quality development, and it is in the key period of transforming the mode of development, optimizing the economic structure and transforming the driving force of growth". In promoting high-quality development, Huang (2018) (Institute of Macroeconomics, National Development and Reform Commission, 2018) said that urbanization is the only way to achieve high-quality development, and the urbanization of migrant workers is the primary manifestation of urbanization. The driving force for Henan's high-quality economic development lies in vigorously promoting urbanization. According to National Bureau of Statistics (2018), the number of migrant workers in China accounted for 35.2% of the permanent population in cities and towns. Migrant workers have become an important force to promote China's economic prosperity and reduce rural poverty, increase farmers' income, promote urban consumption, and increase labor

participation. On the one hand, migrant workers' employment in cities has raised their income level and improved their living conditions. While meeting their own needs, they have provided sufficient labor and consumers for urban development and promoted the coordinated development of urban and rural areas. In addition, migrant workers have enjoyed high-quality resources such as social rights, social security, employment opportunities and educational chances after their integration into cities. Therefore, this paper studies the measurement of the urbanization willingness of Henan population, and analyses the gender differences of urbanization willingness. It contributes to provide a basis for policy establishment, help promote the high-quality integration of Henan migrant workers into the city. It may have a decisive impact on the high-quality development of Henan and even the national economy.

Urbanization is a process of transition from a rural to a more urban society (Preedy, 2010). Statistically, urbanization reflects an increasing proportion of the population living in settlements defined as urban, primarily through net rural to urban migration. It is affected by many factors, such as individual characteristics, family factors, social system factors, psychological factors, urban community environment and so on. The external manifestation is different. Park et al. (1968) considers that the social integration of immigrants is a process of mutual penetration and integration of individuals or groups through economic competition, political conflict, social regulation and cultural integration. Lawrence and Berry (1998) believe that social identity covers multiple relationships such as family ties, personal social circles, membership of peer groups, class loyalty and social status. Sun (2015) contends that the value orientation of human urbanization embodies inclusiveness, equality of rights and sharing of results. Its external pursuit is a high sense of fairness in identity, rights and treatment of agricultural transfer population, and its internal requirement is the social identity of agricultural transfer population.

The measurement of urbanization intention is to measure the urbanization psychology of the migrated population. The index system of measurement can be established from the subjective level of the migrated population, such as Diener and Suh (1997) four-dimensional structure model of subjective well-being; it can also be established from different integration levels of the agricultural transferred population, such as Shi (2015) from three dimensions of economic integration, social integration and psychological integration. It can also take into account individual and social diversity. For example, Zhang (2015) examined the urbanization willingness of the agricultural transition population from four dimensions: society, economy, culture and psychology. Gordon (1964) proposed a seven-dimensional measurement system from culture, structure, marriage, identity, concept acceptance, behavior acceptance and public affairs

integration.

Measuring tools are mostly based on psychological and statistical models, such as analytic hierarchy process, factor analysis, structural equation model, etc. Lu Haiyang (2016) used factor analysis to measure the urban integration degree of migrant workers, Zhang (2015) used the methods of fuzzy set theory and factor analysis to measure the urban integration degree of migrant workers. Chuanjiang and Cheng (2008) constructed a hierarchical model to measure the level of urbanization.

Mounding the evaluation system

Based on Maslow's demand theory and the logical framework of "integration status - influencing factors - integration consequences", this paper constructs the index system of urban integration of migrant workers. Maslow's theory divides needs into five categories: physiological needs, security needs, love and belonging, respect and self-realization, which are progressing from low to high. The main contradiction in our country has turned into the contradiction between the people's growing need for a better life and the unbalanced and insufficient development. Building on the Maslow's demand theory, various indicators were selected in this paper.

According to Maslow's theory, in addition to the first level of physiological needs, stable work and income and stable residence belong to the second level of security needs in the process of peasant workers' urban integration; understanding local life customs and language habits, having a sense of belonging to the city and psychological adaptation belong to the third level of emotional belonging needs; peasant workers enjoy employment, medical care, education, social security, social security, and so on. The urban social rights and interests in elections reflect part of the needs of respect and self-realization mainly embodies the fourth and fifth levels of needs. Therefore, according to the above theory, the first-level indicators are established from three aspects: security needs, emotional attribution and identity integration. We construct a second-level indicators system. The value of secondary indicators is adjusted to positive indicators, and the final evaluation index system of urban integration of migrant workers is in Table 1.

Model solution

The data were obtained from the Henan migrant workers' citizenization survey in 2017, which were implemented by Henan Province Bureau of Statistics. The survey is based on the annual 1% population sampling survey of the National Bureau of Statistics. The sample is selected by the household office of the National Bureau of Statistics

Table 1. Evaluation Index System of Urban Integration of Migrant Workers.

Level I indicators	Level II indicators	Variable attributes	Implication
Safety requirement	Contract signing	Categorical variable	Signing more than one year contract is 3, less than one year is 2, probation period is not signed contract is 1, no contract is 0.
	Residence stability	Categorical variable	Self-purchasing is 3, rental housing is 2, and dormitory is 1.
	Are wages in arrears?	Categorical variable	Is it 0, not is it 1
	Whether to pay housing provident fund	Categorical variable	Is it 1, not is it 0
Emotional attribution	Spare time life satisfaction degree	Categorical variable	Very satisfactory 4, relatively satisfactory 3, generally 2, not very satisfactory 1, very unsatisfactory 0
	Life Satisfaction	Categorical variable	Very satisfactory 4, relatively satisfactory 3, generally 2, not very satisfactory 1, very unsatisfactory 0
	Living fitness	Categorical variable	Very suitable for 4, relatively suitable for 3, generally 2, not very suitable for 1, very not suitable for 0
	Do you think you are a native	Categorical variable	Is it 1, not is it 0
	Family members moved	Continuous variable	Number or family members
Identity integration	Household registration restrictions	Categorical variable	Is it 1, not is it 0
	Enjoy employee health insurance	Categorical variable	Is it 1, not is it 0
	Enjoy employee pension insurance	Categorical variable	Is it 1, not is it 0
	Participation in the elections	Categorical variable	Participation is 3 for each time, sometimes 2 for each time, and 1 for family members. No participation or no application is 0.
	Participation in community organizations activity situation	Categorical variable	Frequent participation was 2, occasional participation was 1, and no participation was 0.

according to the multi-stage and PPS sampling method. The sample is highly representative. The respondents are all family members of migrant workers, including not only migrant workers, but also family members living in the same house, temporary migrants and elderly people living in rotation, family members, and school students and so on. There are inevitably some incomplete data and wrong records in the huge amount of data. According to the relevant information and research purposes, the data were cleaned and sorted out, and the data that did not belong to the scope of this study were excluded.

Finally, 1280 valid samples were obtained.

Cranach's alpha coefficient was used to test the reliability of the sample data. The reliability coefficients of the sample data of male and female agricultural transfer population were 0.882 and 0.893 respectively, which met the requirements of data quality. In order to meet the need of factor analysis modeling, KMO test was carried out on the samples. The results showed that the KMO test values of male and female agricultural migrants were 0.847 and 0.851, respectively. Bartlett spherical test showed that the probability of significance of chi-

Table 2. The key descriptive statistics of variables (N=1280).

Variable names	Mean	Standard deviation	Male (N=760)		Female(N=520)	
			Mean	Standard deviation	Mean	Standard deviation
Contract signing	2.13	0.602	2.19	0.613	2.04	0.611
Residence stability	1.41	0.577	1.34	0.485	1.51	0.589
Are wages in arrears?	0.86	0.216	0.87	0.183	0.84	0.196
Whether to pay housing provident fund	0.63	0.223	0.65	0.217	0.60	0.232
Spare time life satisfaction degree	3.23	0.786	3.26	0.811	3.17	0.697
Life satisfaction	3.54	0.821	3.61	0.805	3.44	0.814
Living fitness	3.87	0.798	3.89	0.793	3.84	0.788
Do you think you are a native	0.69	0.239	0.61	0.303	0.81	0.271
Family members moved	1.34	0.453	1.36	0.414	1.31	0.465
Household registration restrictions	0.73	0.264	0.71	0.254	0.75	0.199
Enjoy employee health insurance	0.77	0.234	0.78	0.223	0.76	0.213
Enjoy employee pension insurance	0.59	0.241	0.61	0.243	0.56	0.237
Participation in the elections	2.49	0.742	2.5	0.686	2.48	0.741
Participation in community organizations activity situation	1.94	0.655	1.91	0.671	1.98	0.582

square values was lower than that of significance. The data meet the requirements of factor analysis model.

The descriptive statistics of each variable and gender-specific descriptive statistics are summarized in Table 2. It can be seen that the values of variables of different genders are not completely equal. In order to further compare the degree of gender differences in urbanization of migrant workers, the index system of urban integration of migrant workers is empowered by comprehensive use of analytic hierarchy process and factor analysis. The results of the above two weighting methods are averaged and the combined weights are obtained as the final weights of each index (Table 3).

In factor analysis, the maximum variance method is used to rotate the factor and extract the main factor with characteristic value of 1. The results show that the load of index factor is greater

than 0.50, the significant P value is less than 0.01, and the cumulative explanatory variance is more than 70%. Therefore, factor analysis is suitable for empowerment. In the analytic hierarchy process, the consistency test index CI of the four pairwise comparison matrices is less than 0.1, and the combination consistency test index CI = 0.087 < 0.1. The weight calculated by the analytic hierarchy process is tested and can be used for comprehensive evaluation. Because the range of each measurement index is different, there will be a big deviation in the comprehensive evaluation. In order to overcome the influence of this deviation, each index is standardized using Min-max normalization, which is calculated by the following formula (indexation):

$$y_i^* = 100 \times \frac{y_i}{y_{max}}$$

Among them, the original value of each index in

the evaluation system is the maximum value (theoretical maximum value or actual maximum value). The urban integration degree of migrant workers in Henan Province in 2017 is calculated, including the overall integration degree and security needs, emotional fate, identity integration and other secondary indicators, the scores of different genders. The results are summarized in Table 4.

Gender heterogeneity analysis

Table 4 shows that there are significant gender differences in the urban integration of migrant workers, which may be due to the intra-group differences formed by different individual characteristics, or the inter-group differences caused by different gender. To identify the sources of these differences, an Oaxaca-Blinder

Table 3. Index weights.

Level I indicators	Level II indicators	Determining weights method		Combination weighting (standardized)
		ω_1 Factor analysis method	ω_2 Analytic Hierarchy Process	
Safety requirement 0.40	Contract signing	0.279	0.313	0.30
	Residence stability	0.253	0.208	0.23
	Are wages in arrears?	0.15	0.25	0.20
	Whether to pay housing provident fund	0.317	0.229	0.27
Emotional attribution 0.33	Spare timelife satisfaction degree	0.209	0.183	0.20
	Life satisfaction	0.227	0.2	0.22
	Living fitness	0.191	0.217	0.20
	Do you think you are a native	0.197	0.167	0.18
	Family members moved	0.176	0.234	0.20
Identity integration 0.27	Household registration restrictions	0.058	0.167	0.12
	Enjoy employee health insurance	0.292	0.217	0.24
	Enjoy employee Pension Insurance	0.292	0.234	0.27
	Participation in the elections	0.185	0.2	0.20
	Participation in community organizations activity situation	0.172	0.183	0.17

Table 4. Measurement of urban integration of migrant workers in Henan province.

	All samples	Male samples	Female samples
Overall score	72.30	71.94	72.50
Safety requirement	26.53	25.99	26.85
Emotional attribution	25.19	25.50	24.97
Identity integration	20.59	20.45	20.68

decomposition model was established. Table 4 shows that there are significant gender differences in the urban integration of migrant workers, which may be due to the intra-group differences formed by different individual characteristics, or the inter-group differences caused by different gender. To identify the sources of these differences, an Oaxaca-Blinder decomposition model (Jann, 2008) was established (Table 5).

$$city_f - city_m = \left(\overline{x_f} - \overline{x_m} \right) \beta_m + \left(\beta_f - \beta_m \right) \overline{x_m}$$

Among them, the urban integration degree of female migrant workers and male migrant workers respectively; the mean values of explanatory variables in the regression equation expressing the urban integration degree of female migrant workers and male migrant workers; and the regression coefficient expressing the difference equation of urban integration degree of migrant

workers of different genders. The first item on the right side of the above formula is the explanatory part of the characteristic difference of the explanatory variable, that is, the influence of the characteristic difference between different gender migrant workers on the urban integration degree, and the second one is the coefficient difference (the unexplainable part). This indicates the difference of the urban integration degree between the two groups of migrant workers caused by the coefficient difference under the same individual characteristics of different gender migrant workers.

Conclusions

This work analyzes the evaluation system of urbanization, constructs a feasible evaluation scheme, and studies the degree of urbanization and the degree of urbanization of different genders. It is found that the degree of

Table 5. The Oaxaca-Blinder decomposition.

Explanatory variable	Endowment difference value	Endowment difference rate (%)	Coefficient difference value	Coefficient difference rate (%)
Age (logarithmic)	0.2369	105.7463	1.1558	515.9781
Marriage	0.0403	17.9756	0.0564	25.1664
Working years in cities	0.0303	13.5135	-0.0301	-13.4376
Educational level	-0.0831	-37.1032	-0.033	-14.7401
Occupation	0.0154	6.894	-0.2496	-111.4338
Income (logarithmic)	-0.0145	-6.4746	-0.0092	-4.0972
Living style	0.0366	16.336	0.0617	27.524
Types of employment	-0.0344	-15.337	-0.1059	-47.2954
Government support	-0.0143	-6.3617	0.0219	9.7795
Homestead	0.0004	0.1583	0.0174	7.7574
Contracted land	-0.0001	-0.0488	0.0326	14.5389
Household registration	0.0058	2.6049	0.115	51.3239
Constant term	--	--	-1.0043	-448.329
Total score	0.2169	96.8255	0.007	3.1745

urbanization of different genders is different, and the difference is decomposed and studied, and some valuable conclusions are drawn. There is room for improvement. If the scope of the survey is increased, the use of national data will help to increase the universality and persuasiveness of the conclusion. From Table 4, we can see that the urban integration of migrant workers in Henan needs to be improved. The urban integration degree of migrant workers in Henan is 72.30, and the level of citizenization of migrant workers is low. From different degrees of integration, 14.0% of migrant workers have more than 80 degrees of urban integration, 39.6% of migrant workers have 60-80° of integration, and 46.4% of migrant workers have less than 60 degrees of integration. Therefore, it is suggested that the government create a better integration environment and atmosphere to accept migrant workers into the city.

Peasant workers have obvious differences in different dimensions. Security needs score was the highest, followed by emotional attribution, and identity was the lowest. In terms of distribution, 63.4% of the security needs are above 80, and only 6.6% of the groups with below 60 degree of integration, while 27.8 and 29.9% of the groups with below 40 degree of integration are emotional attribution and identity integration, respectively. China's urban management and the management of migrant workers have been recognized by migrant workers, but there is still room for improvement in emotional and identity aspects, especially the household registration system is still a barrier for migrant workers to integrate into the city.

There are differences in urban integration of migrant

workers of different genders. The urban integration degree of female migrant workers is slightly higher than that of male migrant workers. Female migrant workers have higher security needs and identity integration than male migrant workers, indicating that female migrant workers have more stable security in housing, provident fund, community activities, etc. Female migrant workers are lower than male migrant workers in emotional attribution, which shows that male migrant workers are more able to adapt to the urban living environment and obtain life satisfaction.

Table 5 shows that 96.8% of the differences in urban integration between migrant workers of different genders can be explained by the differences in individual characteristics of migrant workers, and only 3.2% cannot be explained. Therefore, the difference of urban integration degree between migrant workers of different genders is mainly caused by the difference of individual characteristics between the two groups, not by the difference between groups. From the point of view of sub-items, education level is the most important factor to widen the difference of urban integration between migrant workers of different genders, and the difference of endowment is - 37.1%. Therefore, strengthening the education and training of migrant workers and improving their own quality are important channels to narrow the gap of urban integration between migrant workers of different genders. Employment type, income and government support are also influencing factors that widen the gender gap of urban migrant workers. On the contrary, marriage, working years in cities, and living style can help narrow the gap of urban integration of

migrant workers of different genders to a certain extent.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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Analysing the use of electronic payments in Trinidad and Tobago

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Trinidad and Tobago is a high-income oil producing Caribbean economy that has been transitioning from the sole reliance on cash for payment, but analysis on the use of electronic payment services remains mostly unanalysed. A slow adoption rate can be a result of voluntary or involuntary financial exclusion if individuals in society choose not to access financial services or are stymied from fully accessing services. The data reveal that despite 81% bank account ownership, there were no deposits or withdrawals made from 19% of the accounts in 2017. Additionally, of the 63% debit card and 19% credit card ownership, card usage only accounted for 14% of GDP; with only 41% indicating the use of a debit or credit card to make a purchase in the past year. As such, this paper examines the use of electronic payments in Trinidad and Tobago and investigates its determinants. The parsimonious Ordinary Least Squares model suggests that financial deepening and increases in the younger proportion of the population are associated with higher use of electronic payments, while the share of the level of employment in the agricultural sector is associated with lower usage.

Key words: Electronic payments, developing economy, Trinidad and Tobago, financial exclusion.

INTRODUCTION

The global landscape for payments and transactions is changing rapidly as economies develop their financial sector and move outside the sole reliance on cash (Bech et al., 2018; Davies et al., 2016; Capgemini, 2019). Trinidad and Tobago is one such economy that has boasted of its increasing financial asset base and depth, and is at the stage of also considering a cashless society transition and the divergence from cash as the main medium of exchange (Neaves, 2019; Oxford Business Group, 2020).

The literature shows that there are many benefits to the increased use of electronic payments (e-payments). E-payments do not involve the use of cash or cheque and are defined as payments made through electronic mediums often facilitated using electronic payment platforms. They include electronic funds transfer using debit and credit cards, Real Time Gross Settlement systems and Automated Clearing House services. The increased use of e-payments have been connected to improved transparency and security and a reduction in the prevalence of money laundering, tax evasion, fraud, human trafficking, drug trafficking, black money and

counterfeit notes (Chakravorti, 2014; Frydrych et al., 2015; Herwadkar et al., 2019; Hilaire and Mahabir, 2020; Manyika et al., 2016; Organisation for Economic Co-operation and Development OECD, 2019). Several researchers including Bazarbash and Beaton (2020), Resendiz and Yazmín (2016), and Sahay et al. (2020) have also underscored the link between the increased access to e-payment and improved financial inclusion. A study by A. T. Kearney and VISA (2018) has shown that a 5% increase in digital payments per year for five consecutive years reduces the informal economy by 10.8 to 12.9%. Additionally, pooled cross-sectional time series analysis by Moody's Analytics indicates that higher card usage contributed to $296 billion in consumption between 2011 and 2015, a cumulative increase in global GDP of 0.1%, and led to an average increase of 2.6 million jobs (Zandi et al., 2016). The digitisation of government payments has also been proven by Gupta et al. (2017) to save US$220 to $320 billion annually in developing countries.

Though the benefits of financial development and the increased utilisation of e-payments are recognised, a slow adoption rate can be a result of voluntary or involuntary financial exclusion, as individuals in society that have access to bank accounts either choose not to access or are stymied from the full utilisation of e-payment services. More discussion and research are needed to understand the progress of the e-payment sector in all economies including that of Trinidad and Tobago, and to determine the current level of usage of e-payment facilities available within the financial sector. The relationship between financial sector development and financial inclusion or the use of non-cash e-payment facilities are not always guaranteed and should be examined. Published research on the empirical examination of the payment system landscape and the use of e-payment facilities for developing economies such as Trinidad and Tobago are limited.

This paper contributes to the literature as understanding the use of e-payments and its determinants are critical for any economy that wants to increase adoption to reap its benefits, and to increase the overall level of financial inclusion. Identification of the factors that affect the use of e-payment is integral and is examined, as the transition to a cashless economy with the reduced reliance on cash as the main medium of exchange can only be achieved if innovative e-payment options in the financial space are being utilised. The benefits of increasing e- payments were discussed in section one. Section two reviews the literature on the determining factors which drive the use of e-payments. The payment landscape of Trinidad and Tobago and the usage of non-e-payment facilities such as cash and cheque and e-payment facilities such as Electronic Funds Transfer at Point-of-Sales Terminals, Real Time Gross Settlement and Automated Clearing House transfers are examined in section three. Section three also provides a comparative analysis with several economies. The methodology and results of a parsimonious econometric examination of a priori determinants for the use of e-payments are explored using the Ordinary Least Squares technique and are presented in section four and five. Section six summarises the major findings and concludes with some policy recommendations to drive e-payment usage.

LITERATURE REVIEW

Drivers of E-payments

Although financial sector development plays a significant role in a country's overall level of e-payment infrastructure it does not always indicate equal demand or equal use of financial services. The literature shows a slow adoption rate for e-payments and thus financial exclusion can result from several demand and supply side factors.

Improved financial infrastructure, advancements in smartphone technology, increased mobile penetration, and an explosion of non-traditional financial supply-side solutions have created an environment for the increased use of e-payments. The empirical data presented by Herwadkar et al. (2019) show that the wider adoption of e-payment is dependent on the payments system infrastructure. PricewaterhouseCoopers, PwC (2016) also supports the ideology of infrastructure being a key determinant of a successful e-payment system, as they suggest the direct relationship between adequate acceptance infrastructure comprising ATMs, agent networks (MNO agents or retail agents) and Point of Sales (POS) terminals and the growth of e-payments. The use of e-payments can also be determined by cost. For instance, customers may not use POS terminals to avoid card surcharges (Schuh and Stavins, 2012).

Demand for e-payments is also expected to be higher when the average age of the population decreases, as older people tend to have a greater affinity for cash (Bech et al., 2018; Davies et al., 2016; Schuh and Stavins, 2012). Whilst Świecka and Grima (2019) support the conjecture that older people tend to have a greater affinity for cash, they added that younger individuals tend to use cashless instruments more frequently. Schuh and Stavins (2012) also found several distinctions among the ages of those who made e-payments. They found higher debit card use among the group ages 17 to 34, while other types of payments were most common among the middle-aged group of 35 to 54-year-olds.

When analysing the choice of the payment form by consumers' characteristics, Stavins (2002) found that higher income earners were more likely to use an electronic means of payment. She found that increasing household income by $10,000 raised the probability of using any form of e-payment by 2.7 percentage points. Panel data analysis for 20 Committee on Payments and Market Infrastructures (CPMI) member countries performed by Bech et al. (2018) showed that as GDP per

capita increases, the demand for cash usage declines. A relationship between education and the use of e-payments was also observed by Goczek and Witkowski (2015), and Bergman et al. (2007). The empirical data presented by Stavins (2002) also revealed a 7.6% point increase in the use of any type of e-payment when education was increased by one level.

Oyelami et al. (2020) employed a mixed-method approach as influenced by the data collected through both primary and secondary sources and determined that a higher share of rural population seems to be associated with lesser e-payments. Individuals that are also employed in the agricultural sector also have a lower likelihood of using e-payments (Herwadkar et al., 2019). White-collar workers classified by Stavins (2002) as those working in managerial, professional, or technical specialties were also found to have a higher likelihood of using every type of e-payment as opposed to blue-collar workers and those who were unemployed, even after controlling for income and education.

The shift in consumer behaviour towards e-payment has also been influenced by confidence and expectations. For instance, Chorzempa (2018) stated that in a 2017 survey "84% of Chinese were not concerned about leaving home without any cash-not because they relied on credit cards or checks, but because they were confident that their mobile phone payment methods like Alipay or WeChat would be accepted for any expenses they encountered". The UK Payment Markets 2019 Report also credits increased comfort and familiarity to the projection of the number of payments made via contactless cards and forecasted an increase from 19% in 2018 to 37% in 2028. The use of e-payments also tends to be habit forming and generally needs to be inculcated. A more recent study on consumers' choice of payment instrument in Poland found that the most frequently cited reason for not using innovative forms of payment is the habit of using the old forms of payment such as cash (Świecka and Grima, 2019). Structural equation modelling was utilised by Oney et al. (2017) to substantiate their hypothesis that past experience with e-payment systems has a significant and positive effect on consumers' perceived security and trust.

TRINIDAD AND TOBAGO'S PAYMENT LANDSCAPE

The payment landscape in Trinidad and Tobago has been evolving as the banking and non-bank financial institutions have focussed on revolutionising the financial sector and increasing financial sector inclusion by ensuring that citizens can have access to the banking sector, whilst upholding the regulative guidelines of the Central Bank. The Central Bank also initiated several areas of advancement in 2000 to improve the safety and soundness of the payments system (Central Bank of Trinidad and Tobago (CBTT), 2009, 2019). This involved

reform of the legal framework, improving infrastructure, introducing new technology, strengthening the operating rules and the supervision of the system, and educating and disseminating information on the payments system. Thus, over the years the financial sector has added products that would allow citizens to open new accounts and to have more options when they settle their daily transactions (Seerattan, 2000). These payment options span that of cash, cheques, payment cards, and other forms of electronic transfers.

Non-E-payments: Cash and cheque

The non-e-payment sector is mainly consisted of cash and cheque. Cash demand as proxied by cash in circulation as a ratio of GDP[1] has transitioned from initial increases and has declined from a peak of 6% in 2016 to 3% of GDP in 2019 (Figure 1). The volume of transactions carried out via cheque, and its overall value as a ratio of GDP also show a similar declining trend[2]. Figure 2 shows that the number of transactions with cheque decreased from approximately 15 million valued at approximately 190% of GDP in 2012 to approximately 12 million valued at approximately 180% of GDP in 2018.

E-Payments: Payment cards and electronic transfers

The payment system was later expanded beyond that of cheque to introduce payment cards and electronic transfers. These e-payment alternatives are facilitated via the use of three electronic payment platforms which include the Electronic Funds Transfer at Point-of-Sales Terminals (EFTPOS), the Real Time Gross Settlement (RTGS) system and Automated Clearing House (ACH) services.

Credit and debit cards are the two forms of card payments currently facilitated by EFTPOS in Trinidad and Tobago. Credit cards such as VISA and MasterCard were issued by commercial banks in the 1980's, debit cards were offered in 1996 and POS terminals introduced in 1997. Despite not having available data on the initial number of POS terminals, the number of credit or debit card accounts or the volume or value of EFTPOS from its inception, the trend in its increased availability and usage can be gleaned from Figures 3 and 4. Figure 3 shows that the number of debit and credit cards in use was over 740 thousand and 240 thousand in 2019 respectively. The number of POS terminals has also increased over the 2012 to 2019 period and amounted to approximately 24 thousand in 2019. Figure 4 shows that the volume of debit card transactions at POS terminals increased from approximately 31 million valued at TT$9 billion or 6% of

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[1] This measure has been commonly used as a proxy for cash demand, see Bech, Faruqui, Ougaard and Picillo (2018)
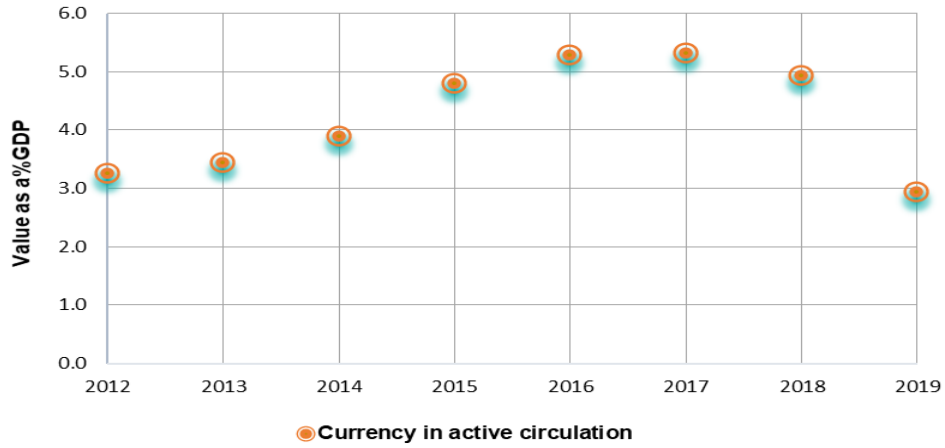[2] The volume and value for cheque transactions in 2019 were not available.

Figure 1. Cash demand.
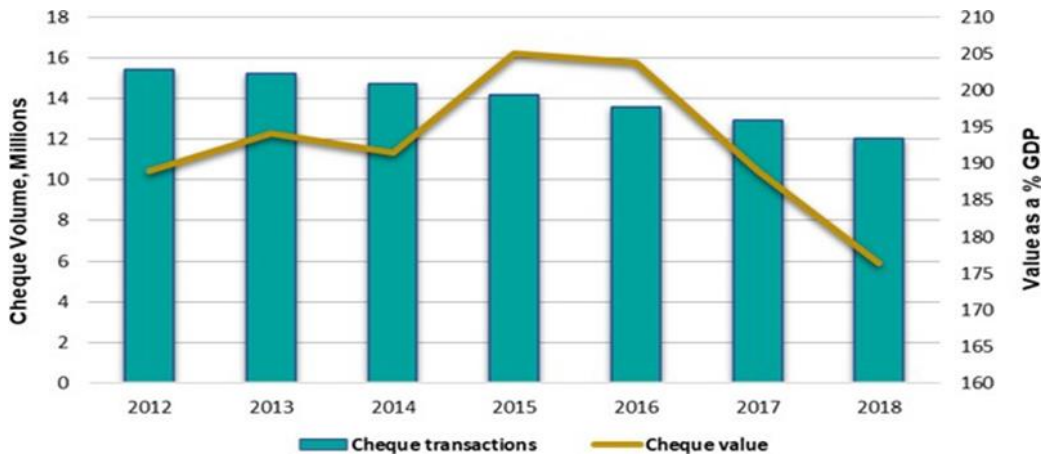Source: Central Bank of Trinidad and Tobago.

Figure 2. Cheque transactions and value.
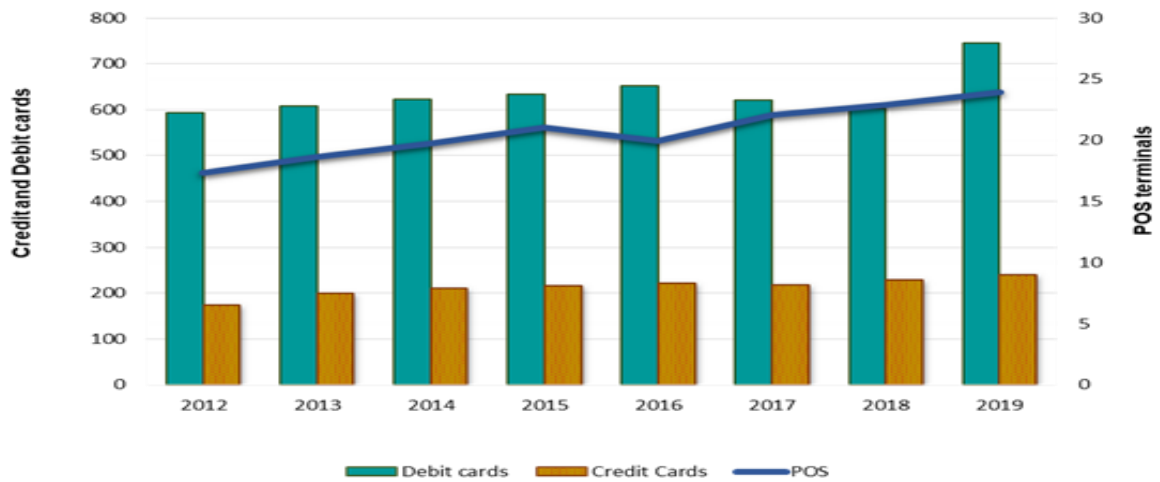Source: Central Bank of Trinidad and Tobago.

Figure 3. Number of Debit cards, Credit cards and POS terminals.
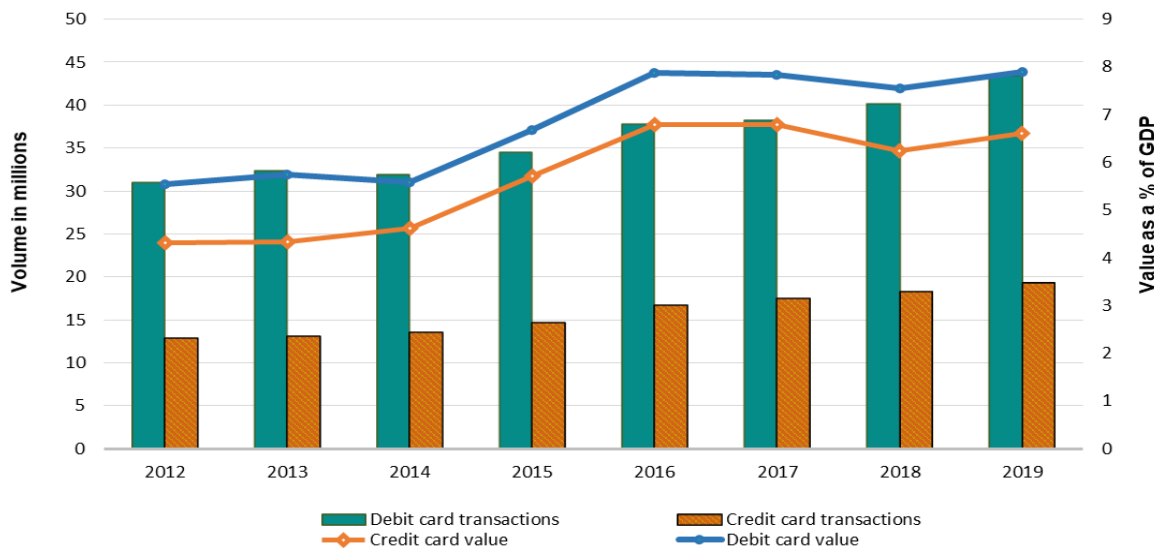Source: Central Bank of Trinidad and Tobago.

Figure 4. Debit card and Credit card transaction volume and value.
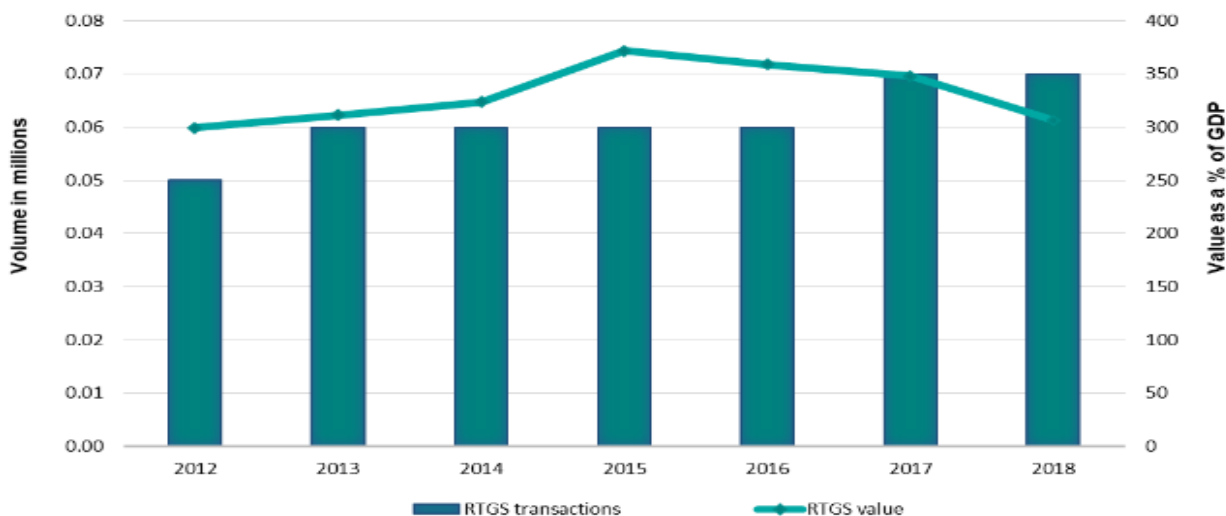Source: Central Bank of Trinidad and Tobago.

Figure 5. RTGS transaction volume and value.
Source: Central Bank of Trinidad and Tobago; CEMLA Yellow Book; World Bank Global Payment System Survey.

GDP in 2012 to 43 million valued at TT$13 billion or 8% of GDP in 2019. The volume of credit card transactions increased from approximately 13 million valued at TT$7 billion or 4% of GDP in 2012 to 19 million valued at TT$11 billion or 7% of GDP in 2019.

The e-payment platform was again extended in October 2004 with the launch of the Real Time RTGS system. The RTGS system, coined safe-TT, enabled the processing of large value ($500,000 and over) time-critical interbank payments and provided same day access to funds. Figure 5 shows that the volume of RTGS transactions increased from approximately 0.05

million, valued at over TT$496 billion or 300% of GDP in 2012 to approximately 0.07 million, valued at over TT$494 billion or 306% of GDP in 2018.

The latest payment addition was the ACH platform, Transach, which was launched in 2005 by the Trinidad and Tobago Interbank Payment System (TTIPS) Limited to facilitate the batch processing of recurrent credit and debit transactions such as salaries. Similarly, to the other components of e-payment, ACH transactions also experienced increases in the volumes and values of transactions since its inception. Figure 6 shows that ACH transactions increased from approximately 3 million,
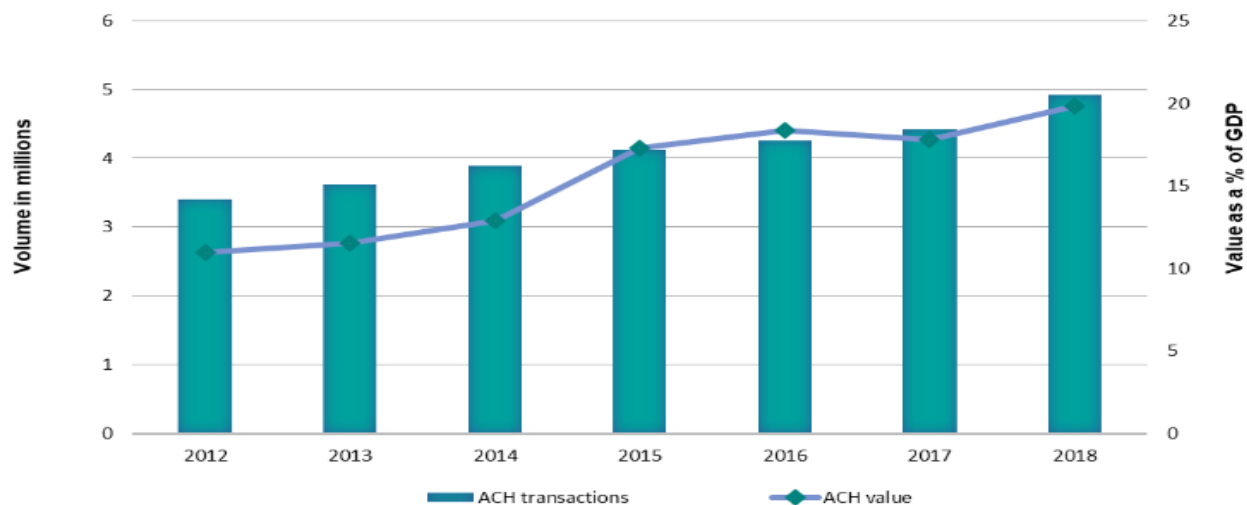
Figure 6. ACH transaction volume and value.
Source: Central Bank of Trinidad and Tobago; CEMLA Yellow Book; World Bank Global Payment System Survey
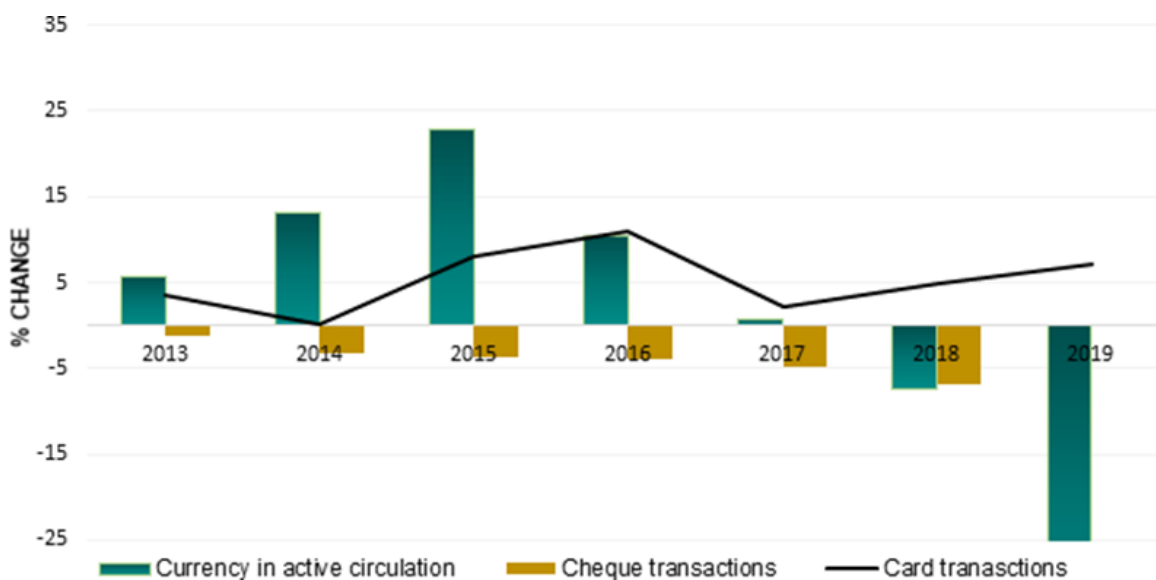

Figure 7. Percentage change in the volume of cash demand, cheque transactions and card transactions.
Source: Central Bank of Trinidad and Tobago.

valued at over TT\$18 billion or 11% of GDP in 2012 to approximately 5 million, valued at over TT\$32 billion or 20% of GDP in 2018.

The overall transaction volumes occurring through the three e-payment platforms (EFTPOS, RTGS and ACH) suggest an increased usage of e-payments and can be indicative of rising levels of confidence and future demand. The statistics presented show that debit card transactions at POS terminals was preferred, as it reflected the highest volume of transactions, with credit card transactions as a close second. Over the period 2012 to 2019, this combined growth of debit card and

credit card transactions was approximately 41% in volume and 50% in value. The changes in the growth rate of the card payments versus that of cash demand and projected cheque payment also present a clearer picture in terms of the changes in preferences when making payments; as from 2017 to 2019 only card volumes have been experiencing year on year growth (Figure 7).

Comparative analysis

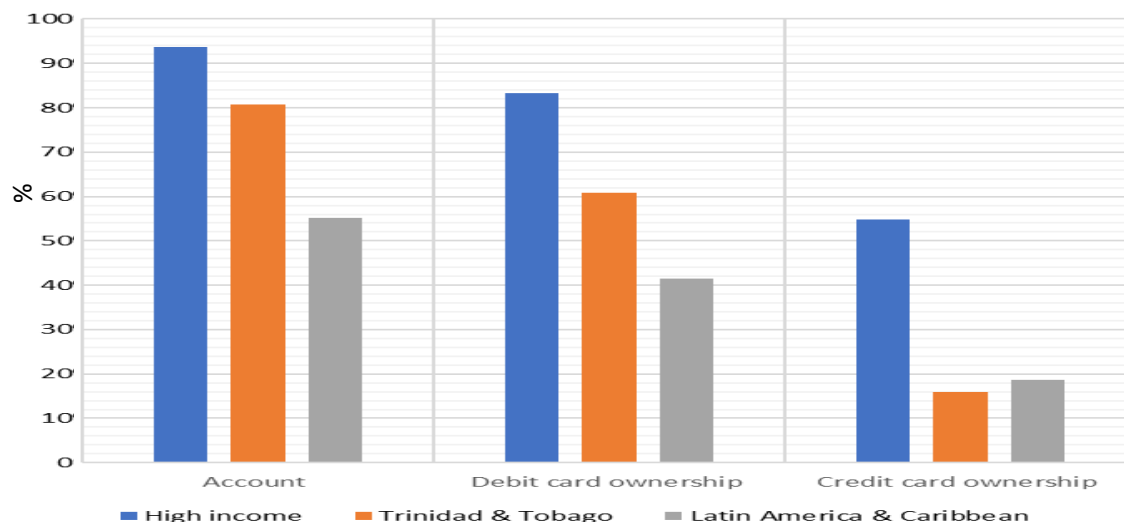Despite these increasing levels of electronic transactions

Figure 8. Account, debit, and credit card ownership, 2017.
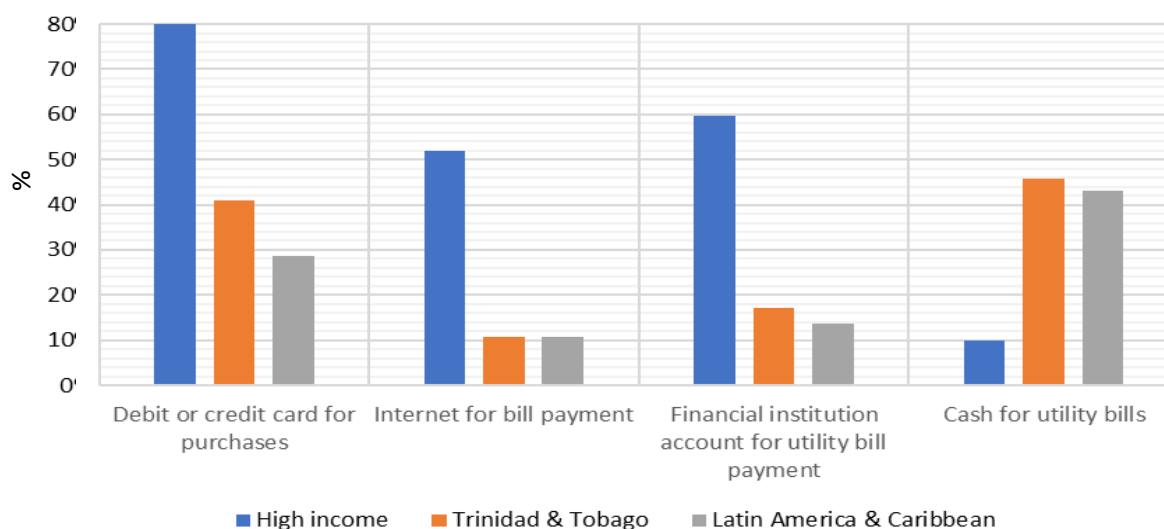Source: World Bank Global Findex Database.

Figure 9. Payment Methods chosen (% age 15+).
Source: World Bank Global Findex Database.

and discourse on new policy initiatives[3], the e-payments landscape in Trinidad and Tobago can be considered embryonic. Though 81% of the population 15 years or older had an account at a financial institution in 2017[4], only 63% of the population 15 years or older owned a debit card while 19% owned a credit card. Figure 8 shows that on comparison with the average Latin American and Caribbean country, Trinidad and Tobago has higher account and debit card ownership, but a smaller sector of the population having a credit card. Trinidad and Tobago also has lower account, debit card, and credit card ownership than other high-income economies.

The large disparity to high-income economies is also noted in the observed methods of payment for the purchase of goods and services and the payment of utility bills. Payments statistics from the World Bank Findex Database (Figure 9) reveal that the average high-income

[3] The Trinidad and Tobago E-Money Issuer Order 2020, only expanded the payment sector to allow entities registered with the Central Bank as a Payment Service Provider or Payment System Operator (PSO), Money Remitters registered with the FIU, Mobile Network Operators authorised by the Telecommunications Authority of Trinidad and Tobago, Technology Service Providers to issue e-money in August. Republic of Trinidad and Tobago (2020).

[4] However, 19% of these account holders made no deposits and no withdrawal from a financial institution account in the past year, which can also suggest a considerable level of dormant accounts.
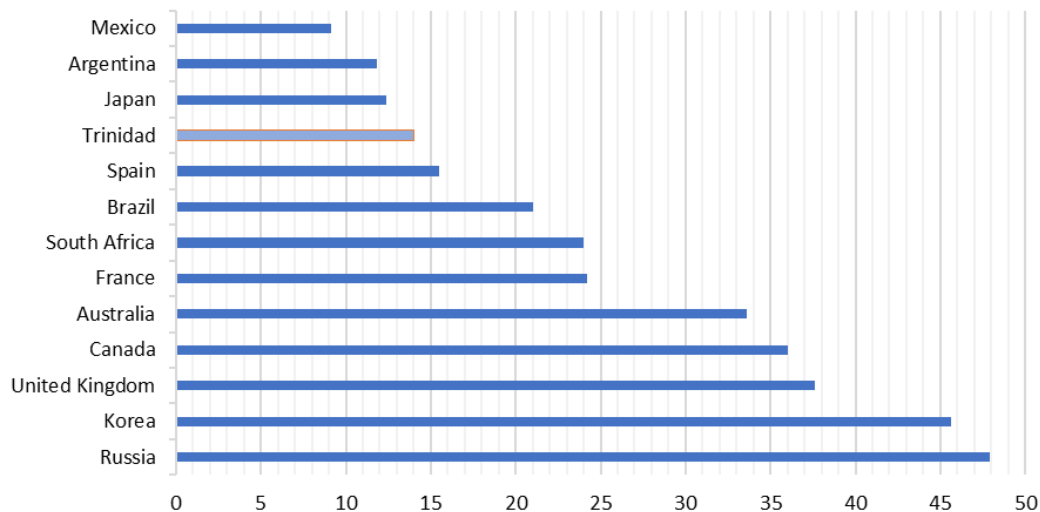
Figure 10. Card Usage (%GDP).

economy has approximately twice as many individuals in the population using debit and credit cards as a payment option. Additionally, five times more individuals in high-income economies choose to use the internet to make payments. The vast difference in payment methods used for the payment of utility bills also signals a higher inclination for cash preference in Trinidad and Tobago than the average high-income or Latin American and Caribbean economy, as a greater proportion of the population 15 years or older use cash to pay utility bills.[5]

Closer examination of the value of card transactions as a percentage of GDP in 2018 in Figure 10 indicates that at 14% of GDP, it was higher than some Latin American economies inclusive of Mexico and Argentina. However, in comparison to high-income economies such as Australia, Canada, and the United Kingdom it was approximately 50% lower and compared to Russia which is also an oil producer, it was 70% lower. The lower levels of usage of e-payment facilities by individuals as opposed to the number of individuals that have access to accounts at financial institutions signal comparatively lower uptake by the general public and can be indicative of a case of involuntary and voluntary financial exclusion being exhibited. Involuntary financial exclusion can be a consequence of financial service requirements and cost. The restrictive processes and application requirements for commercial banking customers to acquire credit cards can be responsible for the disparity between credit card and debit card ownership. Potential card applicants can believe that they have insufficient income or are of such a high risk, that a prudent financial entity will exclude them.

The affordability over accessibility of infrastructural requirements should also be considered as cost of financial services can act as a barrier against some individuals and firms that may like to use e-payment services. In this instance, the usage of payment cards can also be affected as most commercial banks in Trinidad and Tobago charge a point of sale debit card usage fee of $0.75 per transaction, whilst credit card owners have a maintenance/membership fee which can be as much as TT$625, with late payment fees ranging from TT$50.00 to 10% of the past due amount[6]. ACH transaction fees can also amount to as much as TT$5 depending on the type of account (personal or business) and the commercial banking institution, while RTGS transaction fee range from TT$40 to approximately TT$170 (US$25).

Alternatively, voluntary financial exclusion can be as a consequence of lack of trust, lack of understanding and indirect access. The latest datapoint from the Global payments database reveals that 29% of individuals without a financial institution account (15 years or older) in Trinidad and Tobago did not have one because of the lack of trust in financial institutions. This means that those individuals would be excluded from access to the current forms of e-payment such as card payments because in Trinidad and Tobago access for such services are dependent on having an account with a financial institution. The lack of trust and understanding can also be surmised as only 17% of the population 15 years or older paid a utility bill using a financial institution account, whilst 66% used cash, even though 81% of the population (15 years or older) had access to an account at a financial institution and would have no direct financial charge for its use. Indirect access is also another reason for exclusion, as 34% of the population (15 years or older) did not have an account because someone in their family had one.

The low use of what may appear to be more convenient and, in some cases, a more cost-effective choice can generally suggest the need for policies that promote financial education in accordance with the country's

culture[7]. There is a need for increase in awareness and understanding of financial products which should be targeted to the intended user. Additionally, reducing the restrictive nature of current monetary policy and the fee structure of the financial sector should be considered in Trinidad and Tobago to reduce the under banked population. However, given the high levels of excess liquidity and profitability of the banking sector, financial entities may not be as eager to expand into unfamiliar territory. There is a potential for e-money and mobile money issuers to expand the payment landscape and provide services within the low value payment chain. However, this is also another area within the electronic financial payment landscape where the Trinidad and Tobago economy is lagging, as the legislation was only expanded to include non-financial issuers on August 2020. The E-Money Issuer Order 2020, therefore has the potential to encourage new entrants to apply to the Central Bank to issue e-money and to allow the economy to move past a primarily cash and card-based system to a wider range of e-payment facilities which can utilise the high mobile penetration rates[8].

METHODOLOGY

Data analysis can help shed further light on the factors that have affected the use of e-payments in Trinidad and Tobago. Thus, a parsimonious model with established a priori determinants is specified as follows for examination.

$$EPmt = \alpha + \beta_1 Age + \beta_2 FDeep + \beta_3 Agr + \beta_4 Y + \varepsilon$$
(1)

Where:α represents the constant.β_n represents the coefficients of each determinant, where n =1,2,3,4.ε represents the error term. EPmt represents e-payments; it is proxied by debit card payments at POS terminals as a ratio of GDP[9].

Age represents the proportion of the younger population in the economy; it is proxied by the percentage of the population between the ages of 20 to 29. Age allows for an examination of how the proportion of younger individuals in the economy impact the use of e-payments as it is projected to have a positive association. FDeep represents financial development; it is proxied by the share of domestic credit provided by the financial sector as a ratio of GDP. FDeep allows for an examination of how the depth of the Trinidad and Tobago financial system has affected the use of e-payments, as wider financial depth can be reflective of a greater availability of digital infrastructure[10]and is expected to lead to greater use.

Agr represents the share of employment in the agriculture sector as a ratio of GDP. Agr allows for an examination of how changes in the agricultural sector have affected the use of e-payments. A larger agricultural sector is generally associated with greater cash usage and thus a lower usage of e-payments is expected with increases in the share of employment in the agriculture sector.

Y represents income; it is proxied by the growth in GDP. Y allows for an examination of how changes in income have altered the use of e-payment, as is not always positively related to lower cash use or the increased use of e-payments.

To ensure the regression analysis did not produce spurious results, the order of integration I(d) of all variables were determined by the Augmented Dickey Fuller tests, and non-stationary variables were converted by differencing. OLS estimation was used to investigate the determinants of e-payment usage. The significance of each model was determined by the residual, coefficient diagnostics, and stability. The predictor variables were examined to ensure they were not highly correlated. The residual of the model was tested for serial correlation, homoscedasticity, and normality at the 5% level using the ARCH LM, Breusch-Godfrey, and Jarque-Bera tests. The CUSM test assessed the stability of the residuals, and confirmed cumulative sums were located within the two standard deviation bands.

RESULTS AND DISCUSSION

The results of the stationarity test indicate that all dependent and independent variables with the exception of age are characteristic of one unit root [I(1)], with age having no unit roots [I(0)] (Table 1). Initial econometric analysis as shown in Table 2, indicated that income (Y) was a non-significant[11] determining factor and was therefore omitted from the final model as it provided no significant contribution to the explanation of the use of e-payments. The results of the final model presented in Model 2 were not affected by multicollinearity, pass diagnostic tests, indicate a normal distribution, show no sign of serial correlation or heteroskedasticity in the residual, and are thus statistically acceptable. The results confirm the significance of the independent variables on the use of e-payments and have an adjusted R^2 of 76%. The linear representation of the equation is presented by:

$$EPmt = -1.15 + 0.08 Age + 0.16 FDeep - 0.36 Agr$$
(2)

The independent age (Age) variable has a coefficient of 0.08 and indicates the direct association between the larger proportion of younger individuals to an increase in the use of e-payments. This can suggest that as the demographic of the population changes such that the current generations advance, the use of e-payments should also continue to increase ceteris paribus. The result for financial development (FDeep) is also in line with the a priori expectation, for which a percentage increase in financial development leads to an average increase of 0.16% in the use of e-payments. The results also show that a greater percentage share of employment in the agriculture sector (Agr) is associated with a

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[5] Trinidad and Tobago also experienced the highest percentage of the population (13%) receiving private sector wages in cash in 2017.

[6] Comparative schedule of fees and charges as at June 30th 2019, Central Bank of Trinidad and Tobago (2019).

[7] This leaves room for further investigation to develop surveys so that further analysis can be conducted.

[8] The mobile cellular subscriptions per 100 people was 155 in 2019 as there were 2.2 million mobile cellular subscriptions

[9] Debit card payment consisted of the largest volume of e-transactions and could provide the most statistical data points.

[10] Statistical data on other common proxies for financial infrastructure such as the number of ATMs or number of debit cards were not available for the data span.

[11] T-statistic of 1.

Table 1. Stationarity of variables, 2000-2019.

| Variable | Augmented Dickey Fuller | | | | Order of Integration |
| | Level | | First Difference | | |
	Intercept	Trend and Intercept	Intercept	Trend and Intercept	
EPmt	-1.15	-3.47	-5.15*	-5.02*	I(1)
Age	-5.90*	-6.81*			I(0)
FDeep	-1.86	-1.64	-4.84*	-5.49*	I(1)
Y	-1.29	-3.76**	-6.67*	-6.45*	I(1)
Agr	-1.60	-4.34**	-4.02*	-5.04*	I(1)

*Significant at 1%; **significant at 5%. Source: Eviews output

Table 2. Determinants of e-Payments (% of GDP): OLS estimation of 2000-2019.

OLS (Model 1) Dependent Variable: D(EPmt)		OLS (Model 2) Dependent Variable: D(EPmt)	
Constant	-1.36 (-1.71)	Constant	-1.15 (-1.50)
D(Age)	0.09 (2.02)	D(Age)	0.08 (1.83)
D(FDeep)	0.18 (7.10)	D(FDeep)	0.16 (7.85)
D(Agr)	-0.38 (-2.12)	D(Agr)	-0.36 (-2.02)
D(Y)	0.02 (0.99)		
Diagnostics			
Adjusted R^2	0.76	Adjusted R^2	0.76
Serial Correlation	0.42	Serial Correlation	0.42
Heteroskedasticity	0.84	Heteroskedasticity	0.98
Normality	0.92	Normality	0.77

t statistics are in parentheses (). Source: Eviews output.

reduction in the use of e-payments. Thus, a percentage increase in the share of employment in agriculture is associated with an average fall in e-payment use by 0.36%.

In spite of the limited data availability, which affected the time span for the study, several important details could be recognised and substantiate the need for further work in this area as more data becomes available to understand factors influencing perception towards e-payment[12]. The generated econometric results indicate that Trinidad and Tobago can increase the use of e-payments by increasing the infrastructure throughout the country, inclusive of the ease of use in the agricultural sector, and by the older segment of the population. These findings can also support the prior examination of the use of e-payment facilities in the country, as some segments of the population may appear to have a lower level of inclusion. Infrastructural expansion should be matched with educational campaigns on e-payment functionality and its benefits to increase usage amongst those in the agricultural sector and for individuals that appear to be less willing to use e-payment mechanisms.

The value chain within the agricultural sector is considerably cash based as most local farmers/market vendors generally accept cash for payment and use cash for purchase of materials. Thus, there is a need for a closer examination of the sector to increase e-payment usage. The expansion of e-payment within this sector is arguably fundamental to sustainable agricultural and growth within the sector. Increased e-payment usage can also lead to a reduction of common news headlines such as the 2020 Guardian headline 'Tableland farmer robbed of $345,000' and Loop News headline 'Five held after farmer robbed of $15,000' in 2019 (De Silva, 2020; Loop News, 2019). Increased usage does not only increase the comfort cited in many reports but can lower overall maintenance cost incurred by merchants and the implicit fixed costs of financial intermediation. Another measure to consider is the incentive for usage. Reduction in the cost of e-payment options via the use of government subsidies and infrastructural grants can also stimulate the e-payment sector and the transition from cash.

Conclusion

If there is no demand, there is no viable product. Understanding the use of e-payments is essential to the

future development of alternative payment mechanisms and regulation, as increased financial inclusion and a transition to a cashless society depends on the reduction of both involuntary and voluntary financial exclusion. Thus, a review of the use of current e-payment facilities in Trinidad and Tobago is relevant to understanding the payments system and to ensure overall expansion of the digital payment sector. The data revealed that despite increasing levels of electronic transactions and bank account ownership, which are typically above that of the average Latin American and Caribbean economies, it was substantially below similar high-income economies. The value of card transactions in Trinidad and Tobago was only 14% of GDP, while high-income economies such as Australia, Canada and the United Kingdom recorded transactions valued at more than twice that, at 34, 36 and 38% of GDP respectively.

The OLS model substantiated the possibility that changes to financial deepening and broader acceptance of e-payments in the agricultural sector and across all age groups would lead to increased usage. There appears to be a need to also alter the perception of usage, or to consider increasing uptake by reducing the cost of e-payment. Improved accessibility for e-payment in Trinidad and Tobago should occur concomitantly with improving consumer perception, as a successful payment ecosystem needs a customer base that understands the product and its benefits. This change in consumer awareness and habits can occur through educational endeavours to drive adoption initiatives and bolster better practices to allow for a reduction on both voluntary and involuntary exclusion.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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Notes

[12] The small sample size raises the issue of generalisability which future studies should seek to address.

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Socio-economic factors determining rural households' access to credit and amount of loan utilization for proposed action: The case of Omo Micro Finance

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Credit is an important instrument used to improve the welfare of the poor. It could enable the rural households in overcoming liquidity problems, enhancing productive capacity and adopting new technologies. In Ethiopia, the government is promoting microcredit services, but the participation of rural households for credit service is limited. Inappropriate use of loan money also exacerbated the challenges in achieving the desired goal, and consequently, it influenced the loan repayment performance of the household. Therefore, this study was conducted with the aim of identifying socioeconomic factors prompting farm households` participation in Omo Microfinance services and factors determining the utilization of loan money for proposed activities. To conduct this study, 120 rural households were selected randomly from 6 *kebeles* of Damot Gale District. The participation decision of the households in the credit market and factors determining the level of credit utilization for proposed activity are analyzed using double hurdle model. The study result shows that distance to formal lending institutions, education status, total livestock unit and frequency of contact with extension agents have significantly influenced access to credit. The second hurdle of the model reveals that amount of loan received, peer-monitoring system, expenditure in social festive and frequency of contact with extension agents affected the performance of loan utilization. Therefore, minimizing the barriers of access to credit and considering factors affecting loan money utilization for proposed activity is vital to achieve the desired goal.

Key words: Credit, credit market participation, loan utilization, Omo microfinance, Damot Gale.

INTRODUCTION

Credit is an important instrument to improve the welfare of the poor by enhancing their productive capacity (Okurut et al., 2004) and overcoming liquidity problems (Fuentes, 1996). If it is adequately accessed and used, it would have more impact on technology adoption and poverty reduction (Ebisa et al*.,* 2013). In Ethiopia, wide

scale financing started in 1990 with the aim of financing the Market Towns Development Project (MTDP) (Bezabih, 2010). Currently, the government of Ethiopia is promoting micro-credit service via its regulatory frame work and this increased the number and capacity of credit cooperatives and microfinance institutions in the

country. Though the government of Ethiopia has put various efforts to solve rural financial problems by extending rural financial institutions, rural households' participation in credit service is limited (ILRI, 2011). Besides that, inappropriate use of loan money also influenced its effectiveness and loan repayment performance of the household. As a result, lending institutions also faced problems of self and operational sustainability (Mengistu et al*.,* 2013). Therefore, this study identifies socioeconomic factors influencing farm households` participation in formal credit services and factors determining utilization of loan for proposed activities.

Omo Micro Finance institution is among 31 Micro finance institutions operating in Ethiopia (NBE, 2011). It is a widely used microfinance institution in Southern Nation Nationality and People Regional State in general and Damot Gale District in particular.

METHODOLOGY

This study was conducted in 120 rural households of Damot Gale District in Southern Ethiopia. The district has 31 administrative *kebeles* with a total area of 24285.861 ha. Agriculture is the mainstay of people in the district with the major crop production of wheat, *teff,* maize, and root and tuber crops. Production of cattle, sheep, goat, horse, donkey, mule and poultry is also a very common practice (WARDO, 2014). The study site is selected on the basis of access to credit providing agencies. Data for this study were obtained from randomly selected 120 households from 6 kebeles of the district in proportion to the total number in each *kebele,* where the sample size was determined using Yamane (1967) formula with 90% confidence interval (Table 1).

The data obtained from rural households were analyzed by using double hurdle model which is firstly proposed by Cragg (1971) with the assumption of that household makes two decision for purchasing an item. For this study, household participation decision in formal credit market and its determinants were identified in the first hurdle; and factors determining the amount of loan money spent for the proposed activity were determined in the second

hurdle. For the first hurdle, the dependent variable takes either 0 or 1 value. According to Heckman (1979), and Flood and Grasjo (2001), the function is:

(i) Participation decision:

$$Y_i^* = \beta_1 x_{1i} + \varepsilon_i, \ \ \varepsilon_i \sim N(0,1) \tag{1}$$

$$y_i = \begin{cases} 1 \ if \ Y_i^* > O \\ O \ if \ Y_i^* \leq C \end{cases} \tag{2}$$

(ii) Level of utilization decision,

$$Y_j^* = \beta_2 x_{2i} + \mu_i, \ \ \ \mu_i \sim N(0,\delta^2) \tag{3}$$

$$y_j = \begin{cases} y_j^* & if \ y_i = 1 \ and \ Y_j^* > 0 \\ 0 & else \end{cases} \tag{4}$$

Hence, X_{1i} and X_{2i} are independent variables that affect the two-stage decisions (participation decision and level of utilization), respectively while β_1 and β_2 are the corresponding vectors of parameters. Both variables are also assumed to be uncorrelated with their respective error terms ε_i and μ_i. Y_i* is a latent index variable that denotes binary censoring and Y_i is the observed value representing the individual's participation decision.
If $Y_i = 1$, it means the respondent is participating in credit market ($Y_i* > 0$) and 0 else. Equation 4 indicates that the level of utilization of loan money. $Y_j = 0$, when there is censoring at zero (y_j^*=0) due to faulty report or if the household did use none of loan money for the proposed action. Hence, a positive level of credit participation is observed if only a household participates in a credit market and utilizes part or all of the credit for proposed action. Assuming the error terms in equation 1 and 3 are independent, the double-hurdle model can be estimated by the following log-likelihood function (Moffatt, 2005; Aristei et al., 2007):

$$LL = \sum ln \left[1 - \varphi(\beta_1 x_{1i})\varphi\left(\frac{\beta_2 x_{2i}}{\sigma}\right) \right] + \sum_+ \left[\varphi(\beta_1 x_{1i}) \frac{1}{\sigma} \varphi\left(\frac{y_i - \beta_2 x_{2i}}{\sigma}\right) \right] \tag{5}$$

Under the assumption of independence between the two error terms, the log-likelihood function of the double-hurdle model is equivalent to the sum of the log likelihoods of a truncated regression model and a univariate Probit model (McDowell, 2003; Martinez-Espineira, 2006; Aristei et al*.,* 2007). Consequently, the log-likelihood function of the double-hurdle model can be maximized by maximizing the two components independently: the Probit model (over all observations) followed by a truncated regression on the non-zero observations (Jones, 1989; McDowell, 2003; Shrestha et al., 2006).

The estimated coefficients in the Probit model (first decision) cannot be interpreted in the same way as in a linear regression model but marginal effects have to be analyzed for which the marginal effects show the percent change of the dependent variable. The marginal effects of dummy variables are analyzed by comparing the probabilities of that result when the dummy variables take their two different values 1 and 0. While for continuous variables, the marginal effect is calculated by multiplying the coefficient estimate by the standard probability density function by

holding the other independent variables at their mean values (Wooldridge, 2002).

RESULTS AND DISCUSSION

From a total of 120 sampled rural households, 50.83% were formal credit users, while the rest were not. Out of the total credit market participants, 96.7% were borrowed from Omo Micro Finance institution of the district.

Determinants of credit market participation

The first stage of double hurdle model of this study employed the maximum likelihood estimation of the probit model in order to estimate the parameters of the

Table 1. Study sample of each kebeles

Kebele	Number of total households in the kebele (n=5797)	Number of sampled households (N=120)
Shasha Gale	679	14
Fate	672	14
Bala Koysha	904	19
Harto-Kontola	1021	21
Taba	1021	21
Harto-Burkito	1500	31
Total	5797	120

*kebele is the lower administrative scale

Table 2. Determinants of credit market participation.

Variable	Coefficient	Std. Err. level	Significance	Marginal effect
LDIST**	-0.392	0.05987	0.011	-0.153
SEX	0.364	0.44581	0.746	0.144
AGE	-0.035	0.01859	0.461	-0.014
EDU***	0.525	0.06425	0.001	0.205
PARSO	0.688	0.2724	0.352	0.254
TLU**	-0.552	0.09308	0.021	-0.215
AES***	10.596	0.24032	0.010	0.623
LANDSIZE	-0.081	0.72736	0.965	-0.032
INFCRS	0.098	0.03735	0.305	0.038
NF	-0.0002	0.00013	0.409	-0.0001
CI	0.001	0.00027	0.135	0.0004
_Cons	2.478	2.4915	0.320	

Dependent variable is credit market participation decision (crepart), N=120, Adjusted R^2= 0.8598. *** and ** stands for 1 and 5% significance level, respectively.

variables that are expected to influence the credit market participation decision of the household. In the model, 11 socioeconomic explanatory variables were hypothesized to determine households' credit market participation and out of them distance to formal lending institutions and total livestock unit were found to influence negatively, and education status of household head and frequency of contact with extension agents were found to have a significant positive impact (Table 2).

Distance of farmers' residence to the nearest lending institutions (LDIST)

In line with a research by Hussien (2007) in Ethiopia, the result of this finding showed that distance of farmers' residences from the nearest MFI is negatively associated with the participation decision of farmers at 5% significance level. The negative association implies that for a unitary increase in a distance between the farmers' residence and the credit market centers, there will be a lesser chance for participating in formal credit

market. Farm households with nearby MFIs have a location advantage and use less transportation cost than those far from the institutions. The marginal effect of this variable indicates that, keeping other variables constant, as a distance farmer travels to formal lending institutions increases by one kilometer, the probability of credit market participation decreases by 15.3%.

Education status of household head (EDU)

This continuous variable was determined in number of school years. The highest educational status of the sample respondents were college diploma. This variable had a positive relationship with household decision and found to be statistically significant at 1% significant level. At this significance level, the marginal effect of education on credit market participation decision is 0.205. The positive marginal effect of 0.205 implies that, the probability of change in credit market participation decision increases by 20.5% for a unitary increase in a class year while keeping other variables constant. This

result is actually consistent with studies done on adoption of different technologies and credit use by Musebe et al. (1993) and Hussien (2007).

Total livestock unit (TLU)

This variable was found to influence the credit market participation decision of the household negatively and significantly which is supported by the finding of Zelalem et al. (2013). Since livestock are an important source of cash in rural areas, it enables the household to have a better financial position and economic strength to purchase sufficient amount of input without needing credit services. The marginal effect of this variable indicates that, keeping other variables constant, the probability of credit market participation decision decreases by 21.5% as a total livestock unit increases by one unit at 5% significance level.

Frequency of contact with extension agents (AES)

Studies of Holloway et al. (1999) in Ethiopia; Muhongayire et al. (2013) in Rwanda and Sisay (2008) in Ethiopia show that extension contact and its frequency had a significant impact on farmers' participation decision in credit services. This variable was found to be positively associated with the participation decision of the household in credit market at 1% level of significance. The marginal effect of this variable, which is the probability of change in credit market participation decision for change in frequency of contact with extension agents, is 62.3%.

Determinants of amount of credit utilization for proposed action

Omo Micro Finance Institution, the largest supplier of loan money in the study area, provides loan for individuals who are interested to involve in either of agricultural activities, service sector, trade, construction or manufacturing sector. Among this, all of the credit users in the sampled households in the study area used a loan for agricultural activities, service sector and trade (Table 3). Out of the credit users, only 16.39% were fully utilized for the proposed activity while the remains used in different levels with maximum of ETB 6000 and mean of ETB 1550.

In order to determine variables that influence the amount of credit utilization for proposed action, 12 explanatory variables were examined and out them 7 were found to be significant. Out of these, amount of loan received, peer-monitoring system and frequency of contact with extension agents were observed to positively influence the amount of loan money utilization on proposed activity while total livestock unit, expenditure in social festive, former credit use experience and family size influenced negatively (Table 4).

Amount of loan received (AMOFORM)

This variable has strongly influenced smallholder rural household loan utilization performance. It was directly related with the dependent variable at 1% significance level. The result shows that a unit ETB increment in the amount of loan money increases the level of utilizing loan money by 0.39 units for the proposed action.

Total livestock unit (TLU)

The second stage results of the model showed that the total livestock unit is associated with the level of utilization of loan money negatively and significantly. The level of utilizing loan money for the proposed activity decreases in ETB 309.52, for one more increment of total livestock unit. This is because the household could meet its input demand from income obtained from livestock products.

Peer-monitoring system (PMS)

This dummy variable positively and significantly affects the level of utilization of loan money in proposed action at 10%. This is because if the borrowed household member has a strong monitoring system on a way of expenditure, its probability of proper utilizing of loan money increases. The study result revealed that the level of utilization increases in 500.77 units if the members have a monitoring system.

Expenditure in social festive (EXSF)

This continuous variable had a negative relationship with household utilization level of loan money for the proposed activity and it was found to be statistically significant at a 1% significance level. The coefficient -1216.33 shows that, a unit ETB changes in the expenditure of social festive affects the level of loan money utilization for proposed action by the amount 1216.33 while other variables are kept constant. The negative relationship indicates that households with more expenditure on social festivals were unable to use loan money properly than those who had less or no expenses at all.

Frequency of extension agents contact (AES)

The result of the study showed that frequency of

Table 3. Purpose of loan received in the study area.

S/N	Proposed major activities	Percentage of respondents
1	Agriculture (apiculture and fattening)	85.25
2	Trade	13.11
3	Service (cafe and restaurant)	1.64

Table 4. Determinants of amount of loan utilization.

Variable	Coefficient	Standard error	Significance level
AMOFORM***	.39	0.0693721	0.000
TLU**	-309.52	147.7427	0.036
IEB	379.72	251.8424	0.132
NF	0.06	0.0742602	0.418
PRIUNIT	63.10	87.10019	0.469
PMS**	500.77	236.1676	0.034
EXSF***	-1216.33	280.8014	0.000
AES**	766.69	340.3636	0.024
FOCREX**	-256.17	92.205	0.005
FAMSIZE**	-0.62	0.3018357	0.041
PARSO	-228.98	221.3242	0.301
CPU	-0.03	0.1124123	0.813
_cons	1083.73	1718.677	0.528
Number of observations			59
Wald chi2(8)			88.96
$Pr > \chi^2$			0.000

Source: Own computation (2015).
*** and * * represent significance at 1 and 5 % levels, respectively.

extension contact is positively and significantly associated with the level of credit utilization of rural household. The level of use from loan money for proposed action increases in 766.69 for an increase in the frequency of extension contact with extension agents. This implies that frequency of extension service had a systematic association with the level of utilization at 1% significance level.

Formal credit use experience (FOCREX)

The second stage of double hurdle model supported that former credit use experience had a negative and significant impact in level of loan money use at citrus paribus. The analysis shows that the level of utilizing from cash credit to proposed activity decreases by 256.17 units when the households had one more year of experience in credit market participation. This is because, since 85.25% of the respondents use credit for agricultural activities, the household purchase the necessary inputs from former loan money.

Family size (FAMSIZE)

This variable was statistically significant at 1% significant level and had a negative effect on the level of credit utilization for proposed activity. The negative relationship indicates that households with more number of family members consume loan money for other personal needs rather than utilizing in the proposed activity. The model output shows that for every increase in the number of household member, the level of utilization from loan money to proposed action decreases by 0.62.

CONCLUSION AND RECOMMENDATIONS

The aim of the study is to assess the socio-economic factors influencing credit participation decision and level of utilization of loan money for proposed activity. Double-hurdle model was used to analyze the data and it is found that frequency of extension service contact, amount of loan received, peer-monitoring system and expenditure in social festive affected the amount of loan utilization to be

spent in proposed activity. It is found that only 16.39% fully utilized the loan money for the proposed activity. Therefore, concerning bodies should have to work in improving the performance of loan utilization. Based on the finding of the study, the following recommendations are drawn:

(i) A frequency of contact with extension agents positively affected both accesses to credit and amount of loan utilization for the proposed activity. Therefore, high emphasis should have to be given in providing information about credit-providing institutions and in follow up of loan utilization. Moreover that, it might also help in minimizing rural households expenditure in social festivals.

(ii) Pear-monitoring system, where borrowing members monitor each other, also found as a motivating factor to influence the amount of credit used for the proposed activity. So it is better to develop a strong monitoring system where one follow-up the other. Since distance to the lending institution negatively and significantly affects households' participation decision, credit providing institutions should have to minimize the barriers by networking them with the main urban and nearby supply of the service.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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