FINANCIAL LITERACY AND HOUSEHOLD INVESTMENT CHOICES IN UGANDA

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Abstract

This study, aims at establishing the levels of financial literacy among households in Uganda and then investigate whether financial literacy is associated with household investment choices. Financial literacy is measured using three questions that capture an understanding of the basic financial concepts of interest rate, discounting and borrowing. Specifically, the study establishes whether households with high financial literacy levels are more likely to choose to invest; through a bank investment account, with an informal group, in a personal business or invest in Agriculture. We use both univariate and multivariate analysis techniques and a Probit model to tease out the levels of financial literacy, its determinants and its impact on household investment choices. The study results reveal low levels of financial literacy in Uganda. Also, the study reveals that financial literacy is significantly associated with household socio-demographic factors. The study finds that, financial literacy is positively and significantly associated with household investment choices. These results contribute to the government's National Financial Literacy Strategy by establishing the population segments that is most/least financially literate hence such initiatives should be directed towards such population groups with low financial literacy levels. The study also establishes a key investment venture of Agriculture which requires to be revamped since it is neglected yet it is still very essential to the country's economy.

Key words: Financial literacy, household investment choices, Developing countries, Uganda.

1. Introduction

Uganda Vision 2040 is a policy plan that provides development paths and strategies to transform the country from a one which is predominantly peasant and low income, to a one which is in a competitive upper middle income. The Vision points out on financial literacy as the biggest impediment to access to finance and subsequently, affecting the economy's competitiveness. There are arguably low levels of financial literacy in Uganda and financial information and advice is basically received via the radio and from friends and family, FinScope Uganda (2013).

Economic theory explains that growth is brought about by stock of both physical and human capital as well as progress in technology, Romer (2001). This implies that, firm and household level investment aids the accumulation of this stock directly. In fact, financial literacy leads households to make sound and informed investment decisions that lead to future income and consequently to economic growth. Claessens, *et al.*, (2009) contends that financially literate households have greater opportunities of access to financial services that enable them to plan for the future and invest in education and health (contributing to human capital), start a new business, expand an existing business or invest in land and shelter, and to utilize productivity-enhancing assets such as fertilizer, better seeds, machinery, and other equipment (contributing to physical capital and subsequent technological progress). In general terms, financial decisions like savings, investment, the type of financial assets to deal in, and the type of financial institution to use; all require a certain degree of financial literacy if someone is to make viable decisions (Lusardi 2008; Miller *et al*., 2009).

The financial economies of developing countries are fragile and unpredictable which makes financial knowledge not only a matter of convenience but also an essential survival tool. There are concerns both in the developed and developing countries that financial consumers lack a working knowledge of financial concepts and do not have the tools they need to make sound financial decisions most advantageous to their economic well-being (Braunstein & Welch, 2002; Perry, 2008; Lusardi & Tufano, 2008, and Gallery *et al*., 2011a). Such financial literacy deficiencies impact on a household's day-to-day money management and ability to save for long-term goals like financing retirement and hence, lead to habits that make households susceptible to stern financial crises.

Households need a certain level of financial understanding in order to evaluate and compare financial products, such as bank accounts, saving products, credit and loan options, payment instruments, investment choices, insurance coverage, and so forth (Miller *et al*., 2009).

Financial literacy has become a global concern whereby, it is currently a key thematic area of global institutions like World Bank. As a result, an increasing number of countries have embarked on developing national financial education strategies and making more investments in related programs (Calderone, 2014).

A number of national governments has taken initiatives in promoting the area of financial literacy. For example, the United States' government set up a president's advisory council on financial literacy to promote financial education and to help improve financial accessibility. Similarly, the Indonesian government also increased financial literacy by declaring 2008, a year of financial education. Also, India's Reserve Bank launched financial literacy and credit counseling centers across the country to offer free financial education throughout the country (Kefela, 2010). In

Uganda, financial literacy has become a major topic on the policy agenda of the country's financial system in the recent past that has culminated into a financial literacy strategy that was launched in 2013 (Ministry of Finance, 2013). All this has been done due to evidence that the global financial crisis of 2008 portrayed; that investors were financially illiterate in that, some of them took financial products without actually understanding their features and the risks involved. Lusardi & Mitchell (2014) assert that "around the world, more than five years after the tragedy befell the global economy, people have alarmingly low personal financial management knowledge and skills (Lusardi & Mitchell, 2014).

Various studies have indicated that there is an association between financial literacy and financial decisions such as personal savings, retirement planning, financial market participation and investment (Rooij *et al*., 2011; Lusardi & Mitchell, 2011; Alessie *et al*, 2011; Crossan *et al*., 2011 and Brown & Graf, 2012), which directly or indirectly results in improved welfare and eventually in economic growth. However; most of the studies in this field were conducted in the context of a developed country with economies that have developed and well-functioning financial markets. Less attention has been given to exploring specifically the relationship between financial literacy and household investment choices in the context of a developing country, a gap which the current study intends to close with reference to Uganda.

In an attempt to provide the needed evidence to increase our understanding, the current study establishes first; the levels of financial literacy among households in Uganda; second, the impact of financial literacy on household investment choices in Uganda and third, the impact of household background factors (sources of financial information and advice, risk attitudes and the socio-demographic factors) in influencing financial literacy and on household investment choices in Uganda.

Documenting the current levels of financial literacy and its influence on financial decisions specifically investment choices at a household level is of great importance at a policy perspective because financial education programs and household welfare are salient on many of both developed and developing countries' financial sector policy agendas.

The current study uses the 2013 Nationwide Finscope survey data with both univariate and multivariate analysis techniques to investigate both the factors that influence financial literacy itself and its impact on household investment choices in Uganda. To capture the measure of financial literacy, we use the responses based on the basic financial literacy concepts of interest rates, discounting and borrowing whereby; a person who answered all the three questions pertaining to these concepts correctly was deemed to be financially literate. We also employ the descriptive statistics techniques to tease out the levels of financial literacy in Uganda.

Overall, the study produces interesting results whereby first; it contributes to the existing literature that reports low levels of financial literacy worldwide by documenting similar observations from Uganda. Actually, only, 19.6 percent of the total sample were able to answer all the three basic financial literacy questions correctly. Second, like the previous studies conducted in developed countries, the current study documents the population segment that displays lower levels of financial literacy. In particular, individuals with lower levels of education and income, unemployed, aged and females, displayed lower levels of financial literacy. Similarly, respondents who are risk averse, those who seek financial information and advice from informal sources and those located far away from the formal financial institutions, all displayed lower levels of financial literacy. Third and most interesting is that, the current study extends the existing literature by documenting that financial literacy is a strong predictor of household investment choices in Uganda. Household heads who managed to answer all the three financial literacy questions correctly are more likely to choose to invest through an investment account, invest with an informal group and choose to invest in a personal business unlike their financially illiterate counterparts respectively.

The remaining part of this paper is therefore arranged as follows: Part two presents a summary of empirical literature that concerns financial literacy and financial decisions. Part three presents the methods of analysis, part four presents the empirical results and then part five concludes.

2. Empirical Literature Review:

2.1. Defining Financial Literacy:

The term financial literacy has been perceived and viewed in different ways by different scholars and researchers.

According to Schagen & Lines (1996), financial literacy is "the ability to make informed judgments and taking effective decisions regarding the use and management of money."

Mandell (2001) and Hilgert *et al*, (2003) give a precise and narrow definition of the concept by simply focusing on basic instruments of management of money. These instruments according to the authors include; budgeting, saving, investing and insurance.

Worthington (2006) on the other hand looks at financial literacy in terms of a more "general understanding of economics and how household decisions are affected by economic conditions and circumstances."

Crossan *et al*, (2011) sums up the above definitions when the authors argue that financial knowledge for purposes of surveys is defined as "the ability to make informed judgments and to take effective decisions regarding the use and management of money." The authors consent that each survey aimed at testing various areas of personal financial knowledge which include; money management, goal setting, savings, budgeting, debt management, managing risks, financial planning, home loans and mortgages, investment and planning for retirement (Crossan *et al*, 2011).

However; on top of the contextual definitions highlighted above, financial literacy is also defined in terms of levels (in form of its attainment) or in terms of dimensions (in form of mathematical and financial expression) (Gallery *et al*., 2011a).

Rooij *et al*., (2007) conducted a financial literacy study of the Dutch households and designed a survey tool with two distinct modules. The authors mainly aimed at measuring basic financial literacy by looking at the working of inflation and interest rate, and also the more advanced financial literacy by looking at assessment of understanding of financial market instruments. Lusardi & Mitchell, (2007) in their study tested for basic and advanced financial literacy, developing their analyses on the Dutch study of Rooij *et al*, (2007). In their study, the term 'sophisticated financial knowledge' was employed to mean 'advanced financial literacy' and it focused entirely on knowledge, skills and understanding of investment products and stock markets.

However; Lusardi (2008) defined the concept by focusing on the basic financial literacy whereby, the author defined it as "a required knowledge on basic economic concepts needed to make reasonable financial decisions." The author expressed this basic knowledge to be in form of compound interest, risk diversification and differences between nominal and real values.

From this review we reveal that financial literacy contextually concerns an understanding of personal financial management. However, in terms of levels and dimensions, financial literacy is defined in terms of both basic and advanced financial literacy.

2.2. Levels of Financial Literacy around the World and its Relationship with Financial Decision Making.

Empirical literature has tried to create an establishment concerning whether people across the world are well equipped with sufficient and acceptable financial literacy skills relevant to make sound financial decisions. Majority of these studies have concluded that there are generally low levels of financial literacy amongst people world over.

Hilgert *et al*, (2003) report that in the U.S, a great number of American citizens lack an understanding of basic financial literacy concepts like mutual funds, stocks and bonds. This evidence is being echoed by the empirical results of Lusardi & Mitchel, (2008). The authors used data from a special module concerning planning and financial literacy in the '2004 Health and Retirement study'. The study results reveal that American women displayed relatively much lower levels of financial literacy than the older American population as a whole (Lusardi & Mitchell, 2008). Similarly, the OECD, (2005) report documented that there are widespread low levels of financial literacy across developed countries in Europe. This argument is attested to by the empirical works of Christelis *et al*, (2010). From the survey of 'Health, Aging and Retirement in Europe', the authors reveal that a great number of respondents scored miserably on financial numeracy and literacy scales. However, in Australia, ANZ survey (2015) results reveal that much as a number of the Australian population scored relatively well on the basic financial literacy questions, a section of the population especially young people, those with lower levels of wealth and income and the least educated population displayed lower levels of financial literacy (ANZ survey, 2015).

In the context of developing countries here in Africa, similar findings that indicate low levels of financial literacy are being reported. Xu & Zia (2012) reveal that in such countries like Malawi, Mozambique and Nigeria, a large proportion of the population is lacking awareness of financial concepts and products like interest on savings, savings accounts, loans and insurance (Xu & Zia, 2012, pg.9).

The above review reveals low levels of financial literacy across the world. However; financial literacy levels at a household level is yet to be established, and that is what this current study is intending to achieve.

Away from the financial literacy levels, a number of studies have also examined the association between financial literacy and retirement planning. Lusardi & Mitchell, (2008) reveal that financial literacy is crucial in determining retirement planning and preparedness in the United States (Lusardi & Mitchell, 2008). Similarly, Allesie *et al* (2011) conducted a study in Netherlands to explore the relationship between financial literacy and retirement preparedness based on the surveys conducted before and after the onset of the global financial crisis. After controlling for demographic and socioeconomic variables, the results reveal that financial literacy is positively and significantly associated with retirement planning.

Studies from New Zealand and Australia have however yielded mixed results which are contrary to the above conclusions. From a sample of 850 respondents in a survey conducted in New Zealand, Crossan *et al*, (2011) did not find any significant association between financial literacy and retirement planning. Similarly, Agnew *et al*, (2013) used a survey data from a sample of 1,024 Australian respondents and revealed that respondents who were unemployed, least educated and the young were found susceptible to the risk of failure to take part in planning for retirement. Hasting & Mitchell, (2011) used experimental evidence from Chile to investigate how financial literacy and impatience influence retirement wealth and investment behaviors. The authors reveal that much as financial literacy is associated with accumulated retirement savings, their study results at the same time indicate that financial literacy appears to be a weaker predictor of retirement savings due to sensitivity to framing in investment decisions.

Apart from retirement planning, literature also reveals that financial literacy is strongly associated with investment decisions. Al-Tamimi & Bin Kalli (2009) aimed at assessing the financial literacy levels in United Arab Emirates as well as establishing the relationship between financial literacy and the influence of other factors that affect the investment decisions. The authors report a significant relationship between financial literacy and investment decisions. Gallery *et al*, (2011b) examined the impact of financial literacy of the members of a large Australian public sector-based superannuation fund and investment decisions. The results of this study reveal that superannuation members who are highly financially literate are capable of making informed superannuation investment decisions. Similarly, Brown & Graf (2012) used a novel representative survey to document the level of financial literacy among Swiss households and to examine how financial literacy is related to household investment and borrowing. The results reported reveal that financial literacy is strongly associated with household investment decisions and financial market participation in Switzerland.

In the context of a developing country, an Indian study by Subha & Priya (2014) reveal that financial literacy improves the knowledge and understanding of investment options which helps in reducing financial risks and thus help to optimize earning from smaller financial resources of poor individuals from the developing countries (Subha & Priya, 2014). In Contrast however; studies like, Heiltjes & Patora (2013) and Kakande *et al*, (2013) for Ethiopia and Uganda respectively, find no impact of financial literacy on financial outcomes of transaction costs in the two countries, and on the awareness of messages concerning bank account uptake and usage in Ethiopia.

On the other hand, as financial matters world over are turning out to be more complex, yet individuals are expected to be fully responsible for their own financial matters, governments, employers and Non-Government Organizations have been urged to embark on financial education programs that aim at improving financial literacy of their people. There is therefore literature which has come up to explore and examine the effectiveness of such programs on improving financial decisions.

Bayer *et al*, (1996) undertook an analysis of financial education programs provided by employers to study the behavioral effects of financial education in the workplace by using survey data collected from employers who sponsor pension plans from the U.S. The study results indicate that both participation in and contributions to voluntary savings plans are significantly higher when employers offer retirement seminars.

Similarly, Bernheim & Garret (2003) in their study used a novel cross-sectional survey of US households to investigate the efficacy of employer-based financial education. Holding fixed of a wide range of observable characteristics, pension status inclusive, the study concludes that virtually all measures of retirement accumulation that is both stocks and flows, are significantly higher on average when the respondent's employer offers financial education. The study also finds that, rates of participation in 402(k) investment plans are significantly higher, both for the respondent and for his or her spouse, when financial education is available.

Similar results are reported from Africa, specifically with reference to Uganda, Kenya and Tanzania. Messy & Monticone, (2012) report that an evaluation of financial education programs like, "Promoting Financial Capability in Kenya and Tanzania" and "Uganda Microfinance Consumer education Program" indicate that individuals who participate in these programs are more likely to hold a bank savings account, increase their personal and group savings, financial planning and budgeting and above all, their financial knowledge is likely to be higher compared to those who are not members of these programs (Messy & Monticone, 2012).

In contrast to the above literature however, Willis (2008) argues that research to date is yet to provide reliable and statistically significant evidence of the effectiveness of financial literacy programs on improving consumer financial decision making. In the same argument comes the results from the Meta analysis research of Fernandes *et al*, (2014). The authors observed that financial literacy or financial education programs that are aimed at improving individuals' financial literacy are capable of explaining just 0.1 percent of the variances observed in the studied financial behaviors of individuals, with weaker outcomes found in low income samples (Fernandes *et al*, 2014).

In summary, this section has revealed that a number of studies have been conducted concerning financial literacy and financial decisions in different aspects. Of particular interest, whereas there are studies on the relationship between financial literacy and investment decisions (Al-Tamimi & Bin Kalli, 2009; Gallery *et al*, 2011b; and Brown & Graf, 2012), these studies appear to be few and limited. More particularly, apart from Brown & Graf, (2012), there are appear to be no studies that examine financial literacy in the context of household investment. Specifically, to the knowledge of the researchers of this current study, there is no study that examines financial literacy and household investment choices in the context of a developing country more so in Africa. The current study therefore aims at addressing this critical gap in literature.

2.3. Factors that Influence Financial Literacy and Investment Choice Decisions.

Financial Risk Attitude/Tolerance

Risk tolerance is defined by Davey & Resnik (2008) as "the extent to which a consumer is willing to risk experiencing a less favorable financial outcome in the pursuit of a more favorable financial outcome." (Davey & Resnik, 2008). Literature suggests that risk tolerance can be proxied by some aspects of risk that include but not limited to investment, insurance and borrowing (see, Davey & Resnik, 2008 and McCarthy, 2009). Understanding risks that are associated with investment products especially those that require complex decisions needs someone to possess a certain level of financial literacy. Therefore; empirical studies have shown that risk averse individuals are less likely to be financially literate and are thus likely to be less confident in exercising investment choice decisions (Falk *et al*, 2010; and Benjamin *et al*, 2013). Similar to those conclusions is the Dutch study of Rooij *et al*, (2011) which also reveals that differences in wealth accumulated is explained by risk attitudes of individuals whereby; the risk averse ones do possess fewer wealth holdings and net assets (Rooij *et al*, 2011). Brown & Graf, (2012) also confirm that household investment is strongly associated with risk attitudes and present biased preferences. Like previous conclusions, the authors confirm that risk averse and myopic households are substantially less likely to invest in financial markets and to possess a retirement account (Brown & Graf, 2012).

Source of Financial Information and Advice.

It is notable that, it is almost impossible to make financial decisions without seeking consultation. Literature has revealed that social dealings/interactions can influence retirement savings and decisions (see, Duflo & Saez, 2003 and Bailey *et al*, 2004).

The studies of Lusardi & Mitchell (2006) for USA, and that of Rooij *et al* (2011) for Netherlands both reveal that individuals who use informal sources of financial advice like friends and family are less likely to be financially literate. Similarly, those with high levels of financial literacy are more likely to rely on formal financial advice like professional financial advisors. Bucher-Koenen & Koenen (2011), a study conducted in Germany on the other hand reveals that individuals who seek and solicit financial advice are more likely to be financially literate compared to those who do not seek advice at all.

However; much as the above review is informative, none of the reviewed studies focused on the relation between source of financial information and financial literacy and investment choice decisions at a household level specifically in the context of a developing country.

Socio-demographic Factors.

Literature has established that there is a strong relationship between socio-demographic factors and financial literacy and financial decisions (Bailey *et al*, 2003; Agnew & Szykman, 2005; Lusardi & Mitchell, 2007, 2008, 2011; Worthington, 2008; Al-Tamimim & Bin Kalli, 2009 and Rooij *et al*, 2011).

Empirical studies from extensive population surveys have consistently found that age is strongly associated with financial literacy. Many have concluded that financial literacy and age follow an inverted "U" shape pattern, indicating that financial literacy is highest during the mid-age of an individual and lowest when young and old (Alessie *et al*, 2011; ANZ surveys, 2011;2015; Crossan *et al*, 2011; Lusardi & Mitchell, 2011; Rooij *et al*, 2011and Brown & Graf, 2012). Specifically, Crossan *et al* (2011) finds age to be statistically significant in influencing retirement planning.

However, in their Australian study of superannuation fund members, it was evidenced by Gallery *et al*, (2011b) that the relationship between age and financial literacy is not in the form of an inverted "U" shape, but that rather, financial literacy increases with age, with the elderly being more literate.

On the other hand; from developing country context, studies by Al-Tamimi & Bin Kalli (2009), and Hawat *et al*, (2016) from United Arab Emirates and Malaysia respectively, find age to be insignificant in determining financial literacy. Though that of Thapa & Nepal (2015) from Nepal finds age to significantly influence financial literacy and financial behavior. These findings are supported by a specific pension plan study in the U.S by Dvorak & Hanley (2010). The authors report that age is not a statistically significant variable in influencing financial literacy and financial decision making.

When it comes to gender, previous studies report mixed results with regards to the relationship between gender and financial literacy and as well with financial decisions. However; most of these studies report a wider gap concerning basic financial literacy between genders whereby; female gender displays relatively lower basic financial knowledge than their male counterparts (Lusardi & Mitchell, 2008; Dvorak & Hanley, 2010; Alessie *et al*, 2011; Bucher-Koenen & Lusardi, 2011; and ANZ Surveys, 2011; 2015). Similar results from a developing country context are reported by Kumar *et al*, (2013) from India and Hawat *et al*, (2016) from Malaysia which both reveal significant gender differences in determining financial literacy with female gender displaying lower literacy scores.

In contrast however; Wagland & Taylor (2009) do not find gender to be a significant variable in impacting the level of basic financial literacy across a sample of the business degree students in an Australian University. Similarly, gender is found to be insignificant in determining retirement planning by Alessie *et al*, (2011) and Crossan *et al*, (2011). Similar results in a developing country context are reported by Thapa & Nepal (2015) from Nepal, who find that gender is insignificant in influencing financial knowledge from a sample of the college students.

The literature reviewed indicates that most of the studies are being conducted from the Over-Seas developed countries with none being conducted in Africa and none is done at a household level and in the context of a developing country. It therefore doesn’t establish the relationship between gender, financial literacy and investment choice in the context of household and in the context of a developing country from Africa.

Similarly, concerning education, previous studies have consistently found that education is strongly associated with financial literacy. A case in point is the paper of Lusardi & Mitchell (2011) that aimed at summarizing financial literacy and retirement planning studies across the world. The study reveals that there exists a stronger correlation between higher education attainments with financial literacy. These results mirror the Dutch study by Rooij *et al*, (2011); Al-Tamimi & Bin Kalli

(2009) for the United Arab Emirates, (Gallery *et al*, 2011b, and ANZ surveys, 2011; 2015) for Australia; Crossan *et al*, (2011) for New Zealand and Brown & Graf (2012) for Switzerland.

From a developing country context, similar to the above results, education is consistently found to be significant and positively associated with financial literacy and with financial decisions (see, Kumar *et al*, 2013; Thapa & Nepal, 2015, and Hawat *et al*, 2016).

It is however cautioned in the study of Rooij *et al*, (2011) that much as there is a strong correlation between education and financial literacy, education level does not guarantee knowledge and skills to make informed investment decisions. Therefore; The Dutch study of Alessie *et al* (2011) and Brown & Graf (2012) for Switzerland both find that the variable, education is not statistically significant in determining retirement planning and household investment respectively.

The above reviewed literature however indicates that the association between levels of education with financial literacy and investment decisions is not well established in the context of household investment choice decisions and in the context of a developing country, hence this study intends to fill this gap.

On the other hand, empirical literature consistently reveal that financial literacy scores are generally found to be associated with household income levels and thus; households with higher incomes, score highly on financial literacy questions compared to their low income counterparts with less financial literacy scores (see, Al-Tamim & Bin Kalli, 2009, Christeris *et al*, 2010; Hasting & Mitchell, 2011; Gallery *et al*, 2011b; Brown and Graf; 2012 and ANZ survey 2015).

Similar results are reported by studies from a developing country context from Asia that unanimously reveal that income levels significantly and positively influence financial literacy and financial decision making (see, Kumar *et al*, 2013; Thapa & Nepal, 2015, and Hawat *et al*., 2016).

The studies reviewed however do not provide for specific effect of income on household investment choice decisions in the context of a developing country especially in Africa; a gap which the current study seeks to fill.

Also, literature has consistently found employment status and type to be associated with financial literacy. Worthington (2008) suggests that financial literacy scores are relatively higher across individuals employed in professional and managerial occupations. This revelation is supported by the study of the United Arab Emirates by Al-Tamimi & Bin Kalli, (2009) which reveals that employed individuals in the field of finance, banking or investment display higher levels of financial literacy than employed workers in other occupations. On the other hand however; the Dutch study of Alessie *et al*, (2011) in contrary, reveals that self-employed respondents display high levels of financial literacy compared to the employed, unemployed and retirees.

The above conclusions are in agreement with the previous findings of Worthington (2008) and the later findings of ANZ surveys (2011; 2015) which consistently reveal that respondents who are unemployed possess lower financial literacy knowledge compared to those who are self-employed and those who are employed.

However; studies from the U.S and the Netherlands that is; Lusardi & Mitchell (2009) and Rooij *et al*, (2011) respectively, find that employment status is not significant in influencing financial literacy and financial decisions. Specifically, Rooij *et al*, (2011) find that the variable of self-employed in the model, is not significantly associated with financial literacy, total net worth and with participation in stock markets.

The above review reveals that all the literature comes from Over Seas developed countries and none establishes relationship between employment status and type with financial literacy and financial decisions in the household context of investment choice decisions and in the context of a developing country, a gap which the current study seeks to address.

Distance to the financial institutions is considered to be an essential measure of financial inclusion and thus individuals and households who stay closer to financial institutions are expected to be financially included (Ellis *et al*, 2010) and hence are financially literate. Closeness to financial institutions is expected to influence individuals to seek financial advice from banks so as to make informed financial decisions since transport costs are minimized. Kefela (2010) argues that long distances between banking facilities make engagement in financial decisions less possible. However; Ellis *et al* (2010) assume that distance to a bank branch does not affect investment decision in any way (Ellis *et al*, 2010).

It is revealed from the review that empirically, the impact of geographical distance to the nearest financial institution on financial literacy and on financial decisions is not yet well explored and thus the current study aims at addressing this literature gap.

In Summary, this section has presented literature on factors that directly and indirectly influence financial literacy and financial decisions and behavior respectively. Most of these studies are conducted in Over-Seas developed countries and few of them do investigate this relationship, in the context of household level analysis. Of particular interest, few of them examined the impact of these factors on financial literacy and household investment choice decisions (as a component of financial decision and behavior). The current study therefore aims at closing this gap by examining the impact of these factors on financial literacy and financial decisions of households in a context of a developing country (a case of Uganda).

3. Study methodology.

3.1 Data Type and Sources

This study uses a cross-section survey data that covered 3,401 households sampled with full information out of 501 enumeration areas in Uganda. However, since this study focusses on household level analysis, data is collapsed to capture only those households whose respondents were household heads, hence the number of observations is reduced to 1,333 households. These households were interviewed in 2012 FinScope household survey that was conducted by Reev consult international with technical assistance from Bank of Uganda (BOU), Uganda Bureau of Statistics (UBOS) and Economic Policy Research Centre (EPRC). The survey was drawn from the whole country hence making the sample nationally representative. Only data from FinScope 2012/2013 is analyzed hence the findings relate to the period covered by the data set.

3.2. Variable Specification and Measurement:

Measuring Financial Literacy:

This process intends to derive the indicators of financial literacy variable-a key variable in the current study's analysis. This variable is measured in terms of basic financial understanding and the basic financial concepts upon which it is being constructed are; interest rates, discounting and borrowing. Each component is constructed in a quiz format to test an individual's knowledge.

Insert Table 1 here

Insert Table 2 here

Table 2 in Appendix reports the extract of these questions as were designed in the survey questionnaire: Therefore; a respondent who answered all the three basic financial literacy questions correctly is considered financially literate. Hence a variable FL-Overall is an ordinal variable which is coded 1 if answered all the three questions correctly and thus is financially literate and 0 if otherwise. Similarly, subsidiary variables constructed from individual questions are specified to enter in the first regression model as dependent variables.

They are used to show how strong a given variable might be significant in association with FL-Overall (If a variable is significant on at least two of the individual questions, it is deemed strongly correlated with FL-Overall). Therefore, a variable FLINT is 1 if answered correctly a question on interest rates and is 0 if otherwise. A variable FLDIS is 1 if answered correctly the question on discounting and is 0 if otherwise, and a variable FLBOR is 1 if answered correctly the question on borrowing and is 0 if otherwise. Brown & Graf (2012) made similar constructs in the study conducted in Switzerland.

Dependent Variable: Household Investment Choice Outcomes.

In order to measure the applicability of the knowledge of financial literacy, the dependent variable is labeled CHOICE. It is a variable which represents whether households decided to make an investment choice or not. This variable takes a form of 4 investment options each taken as a dichotomous variable coded 1 if household exercised investment choice and 0 if otherwise. (These investment options include, having an investment account with a financial institution, investing with an informal group, having a personal household business and investment in Agriculture), hence CHOICE takes values 1, 2, 3, 4 respectively.

Independent Variables: Source of Financial Information and Advice:

The variable INF is dichotomous and is coded 1 if respondent sought financial information and advice from formal sources (T.V, Banks, Newspapers, Colleagues at work, Insurance companies, Employer, SACCOS, and Internet) and coded 0 if respondent sought advice from informal sources (Friends, relatives and family, Radio, Church/Mosque, or never accessed this advice/information at all).

Independent Variables: Financial Risk Attitudes/Tolerance:

Since our data does not directly capture risk attitudes like the prior empirical studies of (Clark & Strauss 2008; Rooij *et al*, 2011 and Brown & Graf, 2012), we use financial loan as a proxy for household risk tolerance. A household that currently has a loan and/or that which borrowed money in the last 12 months with a financial institution is considered to be risk tolerant. Davey & Resnik (2008) and McCarthy (2009) suggest that risk tolerance can be manifested in some financial risk aspects which include; investment, insurance and borrowing. The variable RISK is therefore, a dummy which is coded 1 when respondent reported to currently have a loan with a financial institution/borrowed (hence risk tolerant) and 0 if otherwise.

Independent Variables: Socio-demographic Factors:

- Age is named AGE and is captured as an ordinal variable which is coded 1 if younger (<35 years), coded 2 if mid-age (35-59 years) and coded 3 if older (>59years).
- Education is named EDU and is captured as an ordinal variable which ranks the highest attained levels of education of the respondent. It is coded 1 for highly educated if respondent completed form five and above (>=form 5) and is coded 0 if otherwise.
- Gender is named GEN which is captured as a dichotomous variable, it is coded 1 for male gender and 0 if otherwise.
- Employment status named as EMP, is a dichotomous variable which is coded 1 for self-employed, 2 for employed, 3 for unemployed and 0 for others.
- Household Income is named as HHINC which represents household's total annual incomes. It is an ordinal variable coded 0 if household income is less than UGX 1,000,000 for low income earners; coded 1 if household income is UGX 1,000,000-10,000,000 for middle income earners and coded 2 if household income is above UGX 10,000,000 for higher income earners.

- Distance is a continuous variable captured as DIST, which represents the geographical distance of the household to the nearest financial institution in terms of kilometers.

3.3. Methods of Analysis:

The current study's data analysis is done in two steps whereby; the first step is univariate and the second is multivariate analysis. Univariate data analysis is done in order to establish the financial literacy levels among households in Uganda as well as understanding the population segment that is likely to be more financially literate as well as more likely to make household investment choice decisions. The multivariate regression analysis on the other hand is conducted to test the hypotheses that seek to establish the relationship between financial literacy and household investment choices, and also, household background factors with financial literacy as well as with investment choice decisions.

The Univariate Analysis:

In order to establish financial literacy levels among Uganda's households, we conduct a descriptive statistics analysis of the responses regarding the measure of financial literacy. Similarly, we use the financial literacy variable FL-Overall to test the dependent variable CHOICE outcomes, as indicated in the previous section. Therefore, a univariate analysis is conducted to test the linkage between exercising the investment choice on each of the explanatory variables. We do this by performing tabulation and cross-tabulations technique as a means of investigating the differences between the literacy scores frequencies and percentages between respondents who exercised choice and those who did not.

The Multivariate Regression Analysis.

To investigate the association between the household's financial sources of information and advice, risk attitudes and the socio-demographic factors and financial literacy as well as with investment choice decisions, we run a multiple regression model. This model assumes that the variables are a linear additive function with an error term. During this analysis, we borrow a leaf from prior studies like (Lusardi *et al*., 2010; Al-Tamimi & Bin Kalli, 2009; Rooij *et al*., 2011 and Brown & Graf, 2012), to conduct a 2-stage regression analysis so as to test the corresponding hypotheses.

Financial Literacy Model:

The first stage of the regression analysis comprises an examination of household financial literacy levels across a range of independent variables that are likely to explain the observed variations in the variable of financial literacy. A Probit regression model is employed to test for a joint effect of the explanatory variables which are anticipated to be related to financial literacy levels. The model is thus specified as:

(1)

$$pr(FL_i = 1) = ø(\beta_0 + \beta_1 INF_i + \beta_2 RISK_i + \beta_3 AGE_i + \beta_4 EDU_i + \beta_5 GEN_i + \beta_6 EMP_i + \beta_7 HHINC_i + \beta_8 DIST_i + \varepsilon_i)$$

Where: FL_1=Financial Literacy – Overall Performance (FL)

FL_2=Financial Literacy – Interest Rates (FLINT)

FL_3=Financial Literacy – Discounting (FLDIS)

FL_4=Financial Literacy – Borrowing (FLBOR)

ε_i is the error term; all model variables are coded, measured; and summarized in Table: 1.

Model of Investment Choice Outcomes.

Stage two of the regression analysis presents household investment choice decisions as the dependent variable which is expected to be associated with financial literacy and other independent variables. It is however anticipated that the other explanatory variables in the model are associated with the variable of financial literacy (FL) as well as with the dependent variable of investment choices. Hence, we suspect a potential econometric problem of endogeneity between variables in our model. We therefore; save the Probit regression residuals from the first regression model as a new variable to represent financial literacy (It is named as RFL) before we use it in the second Probit regression model. This is intended to partial-out the impact these variables might have on the variable of financial literacy. Terza, (1998) and O'Malley *et al*, (2011) adopted a similar approach and they do suggest that with large enough sample, the response residuals tend to lead to a consistent estimate. Our sample is thus large enough (1,333) to yield consistent estimates as recommended. The Probit regression model to investigate the combined effects of other explanatory variables and financial literacy which are predicted to be related with household investment choice is thus given as:

(2)

$$pr(CHOICE_i = 1) = \o(\beta_0 + \beta_1 RFL_i + \beta_2 INF_i + \beta_3 RISK_i + \beta_4 AGE_i + \beta_5 EDU_i + \beta_6 GEN_i + \beta_7 EMP_i + \beta_8 HHINC_i + \beta_9 DIST_i + \varepsilon_i)$$

.

Where: $CHOICE_1$ = Investment Account (INVES_ACC)

$CHOICE_2$ = Investment with Informal groups (INFORMAL_INVES)

$CHOICE_3$ = Household Personal Business (EXIST_BIZ)

$CHOICE_4$ = Agricultural Investment (AGRIC_INVES)

ε_i = Error term.

All model variables are coded, measured; and summarized in Table: 1.

4 EMPIRICAL RESULTS AND INTERPRETATION

4.1 Financial Literacy Levels among Households in Uganda:

Here, we present the responses of households to the basic financial literacy concept questions (as presented in Appendix, Table: 2) which were used to measure financial literacy knowledge and the overall levels of household financial literacy in the country.

Insert Table 3 here

Table: 3 indicates that for the three basic financial literacy questions (see Table 2, in Appendix, for exact wording), the percentage of the responses that are correct range from 47.4 percent to 54.6 percent. The results reveal that much as a number of respondents correctly answered each individual basic financial literacy questions, the percentage of those who attempted to answer them all correctly is only 19.6 percent. Hence, much as many households in Uganda display an understanding of some financial concepts, the overall basic financial literacy is not widespread in the country.

We observe from the Table that 50.8 percent of the surveyed households responded to the interest rate question correctly whereas, 54.6 percent of the households responded correctly to the question on discounting. The share of non-responses to these two questions of (27.5% and 25.8%, respectively) is substantially much higher than the share of incorrect answers of (21.7% and 19.6%, respectively). Correct responses to the question on borrowing were slightly much lower at 47.4 percent. This question also displays the highest share of both non responses (28.5%) and incorrect responses (24.1%) compared to the first two questions.

Much as previous similar studies mostly from Over Seas developed world used different basic concepts such as compound interest, inflation and risk diversification as indicators of overall financial literacy, the performance on each individual questions were far much higher from these studies compared to the observations from the current study which has somewhat much easier concepts to answer.

Studies like; Lusardi & Mitchell (2009) for the U.S; Rooij *et al* (2011) for the Netherlands and Brown & Graf (2012) for Switzerland reported respectively 69 percent, 76.2 percent and 79 percent of the individuals responding correctly to the question of compound interest. Similarly, on the question of inflation, 87.1 percent of the respondents answered it correctly in Lusardi & Mitchell (2009) for the U.S; 82.6 percent got it correct in the study of Rooij *et al* (2011) for the Netherlands and 78 percent in the study of Brown & Graf (2012) for Switzerland respectively. In the current study however; none of the questions was answered correctly with a score of above 55 percent, an indication of lower levels of financial literacy in Uganda compared to the rest of the developed world.

Similarly, only 19.6 percent of the surveyed households responded to all the three questions correctly in the current study. Comparably, the share of the households that responded to all the three questions correctly is not even close to the range of the scores documented by the previous similar studies. In the studies that focused on basic financial literacy measures, Bucher-Koenen & Lusardi (2011) for Germany, reports 53 percent, Alessie *et al* (2011) for Netherlands, reports 45 percent and Brown & Graf (2012) for Switzerland, reports 50 percent of respondents who answered all the questions correctly. In fact the least share of the respondents who answered all the questions correctly from the reviewed previous studies is documented by Lusardi & Mitchell (2011) for the U.S at 30 percent. The observed differences may be partly explained by the fact that financial markets in developed countries are highly advanced and that the population is highly financially included unlike in developing countries like Uganda where this study is conducted.

However, much as these results are comparably lower than those from prior studies, they add to the existing literature by documenting the increasing tendency of low levels of financial literacy in the world, by providing evidence from Uganda. These results therefore support those from prior studies such as, Hilgert *et al*, (2003) for U.S; Lusardi & Mitchell, (2008) for U.S; Christelis *et al*, (2010) for European

Countries; Xu & Zia (2012) for the cases of Malawi, Mozambique and Nigeria, and ANZ survey, (2015) for Australia; all of which document low levels of financial literacy in those respective countries.

4.2 Factors Associated with Financial Literacy

This section explores the relationship between household background factors and financial literacy. Table 4 reports the univariate comparisons while Table 5 reports the multivariate results. All dependent variables in Table 5 are dummy variables; the Table therefore presents marginal effects of the Probit estimates.

Insert Table 4 here

Insert Table 5 here

Financial Literacy and Source of Financial Information and Advice:

From Table: 4 and 5, we observe significant differences between households that seek financial information and advice from formal sources and those which seek it from informal sources. Table 4 indicates that households that seek financial advice from formal sources, performed better across all financial literacy measures with 48.9 percent answering all three questions correctly compared to only 8.4 of those who get information from informal sources. This is consistent with regression results in Table 5 that indicate that source of financial information and advice (INF) is a significant predictor for household financial literacy levels. We observe that households which consult formal sources are (24 percentage points) more likely to respond to all the three questions correctly compared to those who seek similar information from informal sources. These results mirror those from previous studies specifically those documented by Butcher – Koenen & Koenen (2011) for Germany who report that individuals who seek and solicit financial advice are more likely to be financially literate compared to those who do not seek advice at all. Similarly, Lusardi & Mitchell (2006) for U.S and Rooij *et al*, (2011) for the Netherlands found that individuals with high levels of financial literacy are more likely to rely on formal financial advice like from professional financial advisors, unlike their illiterate counterparts who seek similar information from informal sources like friends and family.

Financial Literacy and Household Risk Attitudes:

The univariate results in Table 4 indicate that the share of the overall financial literacy by households which are willing to take risks is higher at 29 percent compared to only 12.1 percent of those which are risk averse. This implies that household financial risk attitudes (RISK) is significant and positive. Rooij *et al* (2011) documented that individuals who are risk tolerant tend to rate themselves high on the knowledge concerning financial matters via self-assessed tests. Actually, from Table 5 we observe that risk tolerant households are (7 percentage points) more likely to answer all the three questions correctly compared to their risk averse counterparts. They are thus more likely to be financially literate compared to risk averse households.

Financial Literacy and Household Socio-Demographic Characteristics:

From the univariate results in Table 4, we observe an inverted 'U' shaped relationship between financial literacy and age. Respondents between 35 – 59 years display the highest levels of financial literacy with 23.9 percent responding to all the three questions correctly. In contrast, for the young (34 years and below) and the aged (60 years and above), only 19.1 percent and 10 percent responded correctly to all the three questions respectively. Similarly, taking a closer look at the percentages, one can argue that financial literacy increases as one grows, reaches a maximum when one is in the middle age and declines as one ages. Thus older individuals display lower levels of financial literacy compared to the young and those in middle age of their life cycle. This observation is confirmed by the Probit regression results in Table 5, which reveal that variable AGE is significant and positively associated with financial literacy. These findings mirror those documented by Rooij *et al* (2011); Lusardi & Mitchell (2011); Crossan *et al* (2011) and Brown & Graf (2012) who all consistently found a significant relationship between age and financial literacy. The dummy variable younger is significant at conventional levels ($p<0.1$) and mid – age is significant at ($p<0.05$). Thus the households in the younger age group are (7 percentage points) more likely to respond to all the three questions correctly compared to those in the older age group. Similarly, those in the mid – age group are (6 percentage points) more likely to answer all the three questions correctly compared to those in the older age group. These absolute values of the marginal effects with respect to old age are diminishing meaning, financial literacy is increasing with age, reaches a maximum and then falls as one approaches old age hence confirming the univariate comparisons. Also these results dispute those documented by Lusardi *et al*., (2010); Rooij *et al* (2011) Alessie *et al* (2011) and Brown & Graf (2012) who found low financial literacy levels amongst the young population.

From the results we also reveal that financial literacy increases with the levels of education. Table: 4 indicates that 51.1 percent of the respondents who had completed form five and above, responded correctly to all the three questions compared to only 14.7 percent of their less educated counterparts (those who had completed form four and below). Similarly, the regression results in Table 5 reveal that the variable EDU is significant at ($p<0.01$. Households with higher levels of education are (13 percentage points) more likely to respond to all the three questions correctly and are thus more likely to be financially literate compared to those with lower education levels. These findings attest to those documented by (Al-Tamimi & Bin Kalli, 2009; Lusardi & Mitchell, 2011; Rooij *et al* 2011; Gallery *et al* 2011b; ANZ surveys, 2011 & 2015; Kumar *et al*, 2013; Thapa & Nepal, 2015 and Hawat *et al*, 2016).

Also, the results on gender show that there are statistically significant differences in gender with respect to financial literacy. The univariate comparisons Table 4, show that males outperform females on all the three questions whereby, 22.9 percent of males responded to all the three questions correctly compared to only 12.6 percent of females. Similarly, the Probit regression analysis in Table 5 reveal that male gender is (4 percentage points) more likely to answer all the three questions correctly compared to the female gender. These significant gender differences identified in the current study mirror those documented by the previous studies from a wider range of contexts and countries (see, Al-Tamimi & Bin Kalli, 2009; Alessie *et al*, 2011; Crossan *et al*, 2011; Bucher – Koenen & Lusardi 2011; ANZ surveys, 2011 & 2015; Kumar *et al*, 2013 and Hawat *et al*, 2016).

The univariate comparisons reveal significant differences in financial literacy across the employment status groupings with the unemployed displaying the lowest levels of financial knowledge. We can reveal that 34.2 percent of the respondents who are employed answered all the three questions correctly. Similarly, 20.7 percent of those in self-employment category answered all the three questions correctly and only 8.8 percent and 5.3 percent of those employed in other minor activities (Others) and the unemployed respectively managed to respond to all the three questions correctly. This observation suggests that unlike their working counterparts, the unemployed household heads associate less with financial and money issues since they don’t have access to frequent or periodic earnings so as to make regular financial plans on expenditures, savings and borrowing. However; the regression results indicate that household employment status (EMP) is significant at conventional levels with only self-employed dummy significant. Therefore, we conclude that households with self-employed heads are (8 percentage points) more likely to answer all the three questions correctly compared to those in formal employment, those employed in other minor activities and those who are unemployed, and are thus more likely to be financially literate compared to them all. These findings confirm previous results documented by Alessie *et al*, (2011) for Netherlands who revealed that self-employed respondents display high financial literacy levels compared to the employed, unemployed and retirees. The possible explanation could be; this group of the working class is regularly engaged in daily money and financial transactions and budgeting hence, they are likely to learn from daily experiences compared to the rest of the groups.

The univariate results show that financial literacy increases with an increase in household income. The results reveal that 85.7 percent of households in the highest income quintile responded correctly to all the three questions compared to 35.9 percent and 6.4 percent of the middle income and lower income quintiles respectively. Similarly, the regression results reveal that household income is significant and positively associated with financial literacy. In fact, household income (HHINC) is significant at ($p<0.01$) across all the regressed financial literacy questions. Households in the mid – income quintiles are (21 percentage points) more likely to answer all the three questions correctly whereas, those in the higher – income quintile are (62 percentage points) more likely to answer all the three questions correctly compared to households in the low – income quintile respectively. These results confirm those from previous studies such as Al-Tamimi & Bin Kalli, (2009) for United Arab Emirates, Hastings & Mitchell (2011) for Chile and Brown & Graf (2012) for Switzerland.

Finally, we find that distance is significant and negatively associated with financial literacy at ($p<0.01$). Households that are located too far away from the nearest commercial bank are (0.1 percentage points) less likely to respond to all the three questions correctly compared to those which are closer and are therefore less likely to be financially literate. These findings contribute to the existing literature by providing new evidence since the relationship between financial literacy and distance is still not well established. Similarly, none of the reviewed literature incorporated this variable into their models to establish such a relationship empirically.

4.3 Association between Household Investment Choice Decision with Financial Literacy and With Other Background Factors.

In this section, we aim at establishing the relationship between financial literacy and household investment choice decisions. We control for household background factors including household risk tolerance, household source of financial information and advice and household socio-demographic characteristics. (See, Table: 1 for the definitions of the Variables).

Insert Table 6 here

Insert Table 7 here

Therefore, a closer look at Table 6 reveals that households which responded to all the three questions correctly (those financially literate) are more likely to choose to possess an investment compared to those who failed to answer all the questions correctly. This implies that, the share of household investment choice options is higher amongst those who are financially literate and is lower amongst those who are financially illiterate.

First and foremost, we find that from the overall sample, Investment account takes the biggest share (10.4%) followed by investments in personal business (9.9%), followed by investments with the informal group (6.8%) and Agriculture is the least favored investment with only (3.2%).

We therefore, observe that financially literate households are more likely to own an investment account (42.9%) than their illiterate counterparts (2.4%). Similarly, financially literate households are more likely to invest with informal groups (27.2%) Compared to their illiterate counterparts (1.9%). Also, they are more likely to own a personal business (34.9%) compared to their financially illiterate counterparts (3.8%). Financially literate households are also more likely to invest in Agriculture (8.8%) compared to those who are financially illiterate (1.8%).

Consistent with these univariate comparisons, the results from the Probit regression analysis in Table 7, reveal that with the exception of Agricultural investment, financial literacy is positively and significantly associated with the likelihood to exercise investment choices by households in Uganda. Household heads who managed to answer all the three questions correctly (hence financially literate), are (0.6 percentage points) more likely to choose to invest through an investment account, are (2 percentage points) more likely to choose to invest with an informal group, and in household existing personal business respectively, compared to their financially illiterate counterparts in that order respectively. The fact that financial literacy is positively and significantly associated with owning an investment account, implies that financially literate households are more likely to participate in financial markets compared to their financially illiterate counterparts.

These results therefore mirror those documented by Rooij *et al,* (2007; 2011) for the Netherlands and Brown & Graf, (2012) for Switzerland. A number of empirical studies have been conducted to establish the relationship between financial literacy and financial behavior/decisions world over. However, many of them have been focusing on the impact of financial literacy and financial decisions in the context of; personal savings (Bucher-koenen & Lusardi, 2011); Retirement planning (Lusardi & Mitchell, 2008; Alessie *et al*, 2011); Financial Market Participation (Rooij *et al*, 2007; 2011). Similarly, much as studies like (Al-Tamimi & Bin Kalli, 2009; Gallery *et al*, 2011b; and Brown & Graf, 2012) have established the relationship between financial literacy and investment; firstly, these studies with exception of Brown & Graf, (2012), focus on individual analysis not households. This study therefore contributes to the existing literature by providing evidence concerning the relationship between financial literacy and household investment choices in the context of a developing country.

Similarly, a focus on the background factors reveals that households which seek financial information and advice from formal sources are more likely to choose to invest across all the investment choice options compared to those who seek information from informal sources. This is reflected in the regression analysis which reveals that sources of financial information and advice (INF) is positively and significantly associated with household investment choices. Households which seek financial information and advice from formal sources are (5 percentage points) more likely to choose to invest through an investment account, are (6 percentage points) more likely to choose to invest with an informal group and are (7 percentage points) more likely to choose to invest in a household existing personal business compared to those who seek information from informal sources respectively.

Also, risk tolerant households displayed a higher likelihood of choosing to invest across all the investment choice options compared to those who are risk averse. This is consistent with the regression analysis results which confirm that household risk attitudes (RISK) is positively and significantly associated with the likelihood to choose an investment for the household at ($p<0.05$). Households which love taking risks are (1 percentage point) more likely to choose to invest with an informal group. These results confirm those from the previous studies documented by Roiij *et al* (2007) and Brown & Graf (2012). Specifically, Rooij *et al* (2007) used self-assessed financial literacy and found that investors who possess higher risk tolerance are more likely to prefer investor autonomy in choosing pension plans (Rooij *et al*, 2007).

Considering age, we observe that households in the mid-age group are more likely to choose to invest via an investment account (12.9%), invest with an informal group (9.3%) and invest in a personal business (12.9%) compared to the younger age at (10.3%), (4.5%) and (8.1%) respectively and to the older age at (4.1%), (5.4%) and (6.2%) respectively. However; we find that older people are more likely to choose to own an agricultural investment (7.1%) compared to the younger (2.2%) and those in mid-age (2.3%) respectively. This is proven by the regression results in Table 7 which reveal that AGE is significant and negatively associated with the likelihood to choose to invest in Agriculture. From the results, we find that the younger age is (2 percentage points) less likely to choose to invest in Agriculture, while the mid-age group is (3 percentage points) less likely to invest in Agriculture compared to the older age group respectively. Our results prove that households pick more interest in the issues of investment later in their working time when retirement becomes more salient, hence older heads of households who are closer or reached retirement, are more likely to make an investment choice in preparation for their retirement.

We also confirm that employment status (EMP) is significantly associated with household investment choices. We find that employment status (Others) is (3 percentage points) more likely to choose to invest through an investment account than their unemployed counterparts. Similarly, self-employed is (4 percentage points) more likely to choose to invest through an investment account and is (1 percentage point) more likely to choose to invest in Agriculture compared to their unemployed counterparts respectively. However; those employed are (0.7 percentage points) less likely to invest in Agriculture compared to their unemployed counterparts.

The multivariate regression results Table 7 reveal that gender (GEN) is strongly and significantly associated with household investment choice. The results reveal that males are (1 percentage point) more likely than females to choose to invest through an investment account, but are (2 percentage points) and (4 percentage points) respectively, less likely than females to choose to invest with informal groups and invest in household existing personal business. These results reflect the real nature of the female gender in Africa, who bank very much on their husband for the future livelihood. Hence they perceive the responsibility of saving for the future as the spouse's duty. These results contradict those documented by (Agnew *et al*, 2003; Rooij *et al*, 2011) and they help contribute to the wealth of existing literature by documenting gender differences in investment choices in the context of households from a developing country setting.

Considering the levels of education, we find that households with higher levels of education are more likely to choose to invest in all but one of the investment choice options. Highly educated households are less likely to choose to invest with informal groups (6.7) compared to (6.8) of the less educated, though the difference is very insignificant. This is confirmed by the regression results which also reveal that education levels of households (EDU) is significantly associated with the likelihood to choose a household investment. We confirm that highly educated households are (5 percentage points) more likely to choose to invest through an investment account, and are (2 percentage points) less likely to invest with informal groups compared to their low educated counterparts respectively. These results mirror those documented by Rooij *et al*, (2007; 2011) in the Netherlands studies for exercising choice in pension schemes and stock market participation respectively. This study therefore, provides evidence of the influence of education levels in exercising investment choice in the context of households from a developing country setting.

Also, the univariate comparisons reveal that households with higher income, display a higher likelihood of choosing to invest across all the investment choice options compared to those who seek information from informal sources, those which are risk averse and those from the lower income quintiles respectively. These observations are confirmed by the multivariate regression results which reveal that household income (HHINC) is a strong predictor of the likelihood of the households to choose an investment. From Table 7, we confirm the univariate comparisons by revealing that income is positively and significantly associated with all the four measures of household investment at ($p<0.01$). Mid-income households are more likely (5 percentage points), (9 percentage points), (1 percent point) and (5 percentage points) to choose to invest through an investment account, informal group, household personal existing business and in Agriculture, compared to their lower income counterparts respectively. Similarly, those in the higher income group are more likely (47 percentage points), (29 percentage points), (31 percentage points) and (17 percentage points) respectively to choose to invest through an investment account, informal group, household personal existing business and in Agriculture, compared to their lower income counterparts.

Finally, the most interesting results from this regression is that distance from household to nearest commercial bank is significantly associated with household investment choice decisions. From the results, as distance from the household to the nearest commercial bank increases, households are less likely (0.05 percentage points) to choose to invest through an investment account and instead are more likely (0.03 percentage points) to choose to invest with informal groups. These findings make economic sense in that since long distance hinders access to commercial banks, it's indeed almost impossible for households to open up and own a bank account but rather, utilize the community informal financial groups which are within their reach, and invest with them. This is typical of a developing country's rural setting and thus these results add new information to the existing wealth of literature since the association between distance and the likelihood to make investment choices is not yet well established. These results also counter the arguments of Ellis *et al* (2010) who suggested that distance to a bank branch does not affect investment decision in any way (Ellis *et al*, 2010).

5. Conclusion:

In the current study, we aim at establishing the levels of financial literacy among households in Uganda and then investigate whether financial literacy is associated with household investment choices. Firstly, we measure financial literacy using three questions that capture an understanding of the basic financial concepts of interest rate, discounting and borrowing. Specifically we establish whether households with high financial literacy levels are more likely to choose to invest; through a bank investment account, with an informal group, in a personal business or invest in Agriculture.

This study uses the Uganda FinScope survey data 2012 that covered 3,401 households sampled with full information out of 501 enumeration areas in Uganda. We employ both univariate and multivariate analysis techniques. Univariate data analysis is done in order to establish the financial literacy levels among households in Uganda as well as establishing an understanding of the population segment that is likely to be more financially literate as well as more likely to make household investment choice decisions. The multivariate regression analysis on the other hand is conducted to test the hypotheses that seek to establish the relationship between financial literacy and household investment choices, and also, household background factors with financial literacy as well as with investment choice decisions.

This research has extended prior financial literacy studies by assessing household basic financial literacy and its association with household investment choices in the context of a developing country.

Using descriptive statistics, the results confirm prior studies concerning the low levels of financial literacy among individuals worldwide by showing that in Uganda, there are relatively low levels of basic financial literacy. The results reveal that only 19.6 percent of Uganda households are financially literate.

Using a series of multivariate regressions and univariate comparisons, we reveal that households which seek financial information and advice from formal sources, those which are risk lovers, those headed by males, mid-age, highly educated, higher income earners, employed and whose households are closer to commercial banks display higher levels of financial literacy compared to their opposite counterparts respectively. Similarly; households which are highly financially literate are more likely to choose at least an investment. We also find that households with formal financial sources of information, those which are risk lovers, those headed by older, female, highly educated, higher income earners, self-employed and those located closer to financial institutions are all more likely to choose at least an investment compared to their opposite counterparts.

Overall, our study contributes to the Uganda government's financial literacy strategy by exposing the population segment which is more likely to be financially illiterate hence, policies directed towards improving financial literacy should be directed towards these groups. Similarly, our study reveals that Agriculture as a backbone of Uganda's economy is highly abandoned for investment by households in Uganda. This calls for government intervention in form of empowering households through providing sensitization and financial support towards agriculture investment so as to improve household food security and spurring the economic growth and development through agricultural investments and development in Uganda. The current study also informs the government to improve rural financial infrastructures to ensure inclusive financial growth.

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Appendices

Table 1: Summary Description of Variables.

Abbreviated Name	Variable Name	Measure
Dependent Variables.		
FL-Overall	Basic Financial Literacy	Coded 1 for high literacy levels and 0 for low
FLINT	Interest rate	1 if correct, 0 if wrong
FLDIS	Discounting	1 if correct, 0 if wrong
FLBOR	Borrowing	1 if correct, 0 if wrong
CHOICE OUTCOMES		
· INVES_ACC	Financial Investment Acc.	Coded 1 if yes and 0 if no
· INFORMAL_INVES	Investing with informal groups	Coded 1 if yes and 0 if no
· EXIST_BIZ	Household Existing Personal Business	Coded 1 if yes and 0 if no
· AGRIC	Investment in Agriculture	Coded 1 if yes and 0 if no
Independent Variables:		
RFL	Residual of basic financial literacy	Probit Residuals of basic financial literacy (FL) derived from model 1 (explained in section 4.6 below)
INF	Source of Financial Information and Advice	Coded 1 if consulted formal sources and 0 if otherwise.
RISK	Household Risk Attitudes and Tolerance	Proxied by having a loan in a financial institution. Coded 1 if currently having a loan and 0 if otherwise
	Socio-demographics	
AGE	Age	Coded 1 for younger (<34yrs), 2 for mid-age (35-59) and 3 for older age (>=60)
EDU	Education level	Coded 1 for higher education level (form 5 & above) and 0 otherwise
GEN	Gender	Male=1; Female=0
EMP	Employment Status	Self-employed=1, Employed=2, Unemployed=3 & Others=0
HHINC	Household Income	0=less than UGX 1,000,000; 1=UGX 1,000,000-10,000,000 & 3=UGX 10,000,000 and above
DIST	Distance	Geographical distance from household to nearest financial institution measured in K.M

Table 2: Questions Used to Construct the Measure of Basic Financial Literacy:

S/N	Question	Possible responses
1.	If you were offered a loan with 5% monthly interest rate and a loan with 20% annual interest rate, which loan would offer better value?	5% monthly interest rate.............1 20% annual interest rate.............2 Not sure..................................3
2.	If the same bicycle is on sale in two different shops at UGX 200,000 and one shop offered a discount of UGX 30,000 while the other offered a 10% discount, which one is the better bargain?	A discount of 30,000 UGX..........1 A discount of 10%.........................2 Not sure..................................3
3.	You want to borrow UGX 500,000 from a money lender (M1). He says that you can get it but you must pay him UGX 600,000 in a month. Another money lender (M2) says you have to pay UGX 500,000 back plus interest of 15% in a month. Which one do you take?	M1..1 M2..2 I don't know..............................3

Source: Uganda Finscope Survey Questionnaire (2012).

Table 3: Summary Statistics for the Three Financial Literacy Questions:

	Observations (1,333)	in %
Question One: Interest rates		
5% monthly interest rate	289	21.7
20% annual interest rate (Correct Answer)	677	50.8
Not sure	367	27.5
Question Two: Discounting		
A discount of 30,000 UGX (Correct Answer)	728	54.6
A discount of 10%	261	19.6
Not sure	344	25.8
Question Three: Borrowing		
M1	321	24.1
M2 (Correct Answer)	632	47.4
I don't know	380	28.5
Overall Performance		
At least one question is wrong/ I don't know	1,072.00	80.4
All Answers Correct	261	19.6

Table 4: Financial Literacy - Univariate Comparisons:

This Table presents the answers to the three financial literacy questions by Sources of Financial Information, Household Risk Attitudes and household socio-demographic factors (See, Table: 1 for the definitions of the Variables).

		OVERALL PERFORMANCE		INTEREST RATES			DISCOUNTING			BORROWING		
	Observations	At least one wrong (%)	All correct (%)	Wrong Ans. (%)	Correct Ans. (%)	Not sure (%)	Correct Ans. (%)	Wrong Ans. (%)	Not sure (%)	Wrong Ans. (%)	Correct Ans. (%)	Not sure (%)
Overall Sample	1,333	80.4	19.6	21.7	50.8	27.5	54.6	19.6	25.8	24.1	47.4	28.5
Information												
Informal	965	91.6	8.4	25.2	43.2	31.6	51.5	22.8	25.7	30.1	40.7	29.2
Formal	368	51.1	48.9	12.5	70.7	16.8	62.8	11.1	26.1	8.4	64.9	26.6
Risk												
Risk Averse	744	87.9	12.1	22.6	48.1	29.3	45.8	21	33.2	24.3	40.1	35.6
Risk Lover	589	71	29	20.5	54.2	25.3	65.7	17.8	16.5	23.8	56.7	19.5
Age												
Younger	493	80.9ss	19.1	21.9	50.7	27.4	57.2	22.9	19.9	25.2	51.7	23.1
Mid_age	599	76.1	23.9	19.2	54.4	26.4	58.9	17.7	23.4	24.9	51.4	23.7
Older	241	90	10	27.4	41.9	30.7	38.6	17.4	44	19.9	28.6	51.5
Education												
Lower Educ.	1,155.00	85.3	14.7	22.7	48.5	28.8	51	19.8	29.2	25.2	42.7	32.1
Higher Educ.	178	48.9	51.1	15.2	65.7	19.1	78.1	18	3.9	16.9	78.1	5.1
Gender												
Female	428	87.4	12.6	23.1	48.8	28	46.3	17.3	36.4	22.2	37.4	40.4
Male	905	77.1	22.9	21	51.7	27.3	58.6	20.7	20.8	25	52.2	22.9
Employment												
Others	159	91.2	8.8	22.6	50.3	27	49.7	23.9	26.4	33.3	39.6	27
Self_Emp.	899	79.3	20.7	22.1	50.5	27.4	53.8	18.9	27.3	22.6	47.8	29.6
Emp.	161	65.8	34.2	15.5	58.4	26.1	70.8	23	6.2	20.5	69.6	9.9
Unemp.	114	94.7	5.3	25.4	43	31.6	44.7	14	41.2	28.1	23.7	48.2
Income												
Lower Income	913	93.6	6.4	25.4	43.3	31.3	44.8	21.4	33.8	27.3	36.3	36.5
Mid_Income	315	64.1	35.9	16.8	59.7	23.5	68.6	20.6	10.8	20.6	64.8	14.6
Higher Income	105	14.3	85.7	3.8	89.5	6.7	98.1	1	1	6.7	92.4	1

Table 5: Financial Literacy - Multivariate Analysis

This Table presents Marginal Effects of the probit model estimates with Financial Literacy Indicators as dependent variables. Omitted categories for the displayed independent variables are: INF: Informal, RISK: Risk Averse, AGE: Older, EDU: Lower Educ levels, GEN: Female, EMP: Unemployed, HHINC: Lower Income. Robust Standard errors in parentheses, variables significant at *** p<0.01, **p<0.05, *p<0.1. For variable Definition, see, Table 1.

VARIABLES	(1) FL-Overall	(2) FL-Interest	(3) FL-Discounting	(4) FL-Borrowing
INF				
Formal Sources	0.243***	0.203***	-0.0244	0.143***
	(-0.0275)	(-0.0333)	(-0.0345)	(-0.0349)
RISK				
Risk Lovers	0.0734***	-0.000245	0.129***	0.0746**
	(-0.0216)	(-0.0298)	(-0.0293)	(-0.0302)
AGE				
Younger-age	0.0717*	0.0921**	0.131***	0.193***
	(-0.0373)	(-0.0417)	(-0.0408)	(-0.0429)
Mid-age	0.0682**	0.103**	0.132***	0.167***
	(-0.0331)	(-0.0405)	(-0.04)	(-0.0421)
EDU				
Higher Educ. levels	0.137***	0.0445	0.126***	0.194***
	(-0.0422)	(-0.048)	(-0.0477)	(-0.0494)
GEN				
Male	0.0416**	-0.00885	0.0618**	0.0761**
	(-0.0208)	(-0.031)	(-0.0311)	(-0.0319)
EMP				
Others	0.0911	0.0537	-0.0272	0.137**
	(-0.0901)	(-0.0639)	(-0.0638)	(-0.068)
Self-employed	0.0876*	0.0000456	-0.0441	0.148***
	(-0.0478)	(-0.0529)	(-0.0515)	(-0.0573)
Employed	0.071	-0.00123	0.00768	0.211***
	(-0.0786)	(-0.0684)	(-0.0695)	(-0.0691)
HHINC				
Mid-income	0.215***	0.125***	0.182***	0.192***
	(-0.0316)	(-0.034)	(-0.0323)	(-0.0341)
Higher-income	0.623***	0.367***	0.467***	0.449***
	(-0.058)	(-0.0442)	(-0.0207)	(-0.0397)
DIST	-0.00197***	0.00255***	-0.000738	0.000482
	(-0.000644)	(-0.000831)	(-0.000797)	(-0.000834)
Observations	1,333	1,333	1,333	1,333
Wald Chi2	344.40	162.13	159.42	257.10
Significance	0.0000	0.0000	0.0000	0.0000
Pseudo R2	0.4068	0.0859	0.1245	0.1531
% Correctly Specified	90.4	62.19	63.62	68.12

Table 6: Household Financial Investment Decision Choices - Univariate Comparisons:

This Table presents the share of respondents with household investment choices/options by Financial Literacy, Source of Financial Information, Household Risk Attitudes and the Household Socio-demographic Factors (See, Table: 1 for the definitions of the Variables).

	Observations	Investment Account (%)	Informal Investment (%)	Household Personal Business (%)	Agric. Investment (%)
Overall Sample	1,333	**10.4**	**6.8**	**9.9**	**3.2**
FINANCIAL LIT.					
Illiterate	1,072.00	2.4	1.9	3.8	1.8
Literate	261	42.9	27.2	34.9	8.8
INFORMATION					
Informal Sources	965	2.5	2.3	4.4	2.1
Formal Sources	368	31	18.8	24.5	6
RISK					
Risk Averse	744	5.9	3.8	6.5	2.6
Risk Lover	589	16	10.7	14.3	3.9
AGE					
Younger Age	493	10.3	4.5	8.1	2.2
Mid_Age	599	12.9	9.3	12.9	2.3
Older Age	241	4.1	5.4	6.2	7.1
EDUCATION					
Low Educ. Levels	1,155.00	6.1	6.8	8.3	2.8
High Educ. Levels	178	38.2	6.7	20.2	5.6
GENDER					
Female	428	4.2	7.9	11	3
Male	905	13.3	6.3	9.4	3.2
EMPLOYMENT					
Others	159	5	0	1.9	0
Self-employment	899	9.9	8.6	11.5	4.3
Employed	161	24.8	6.2	13	0.6
Unemployed	114	0.9	3.5	4.4	1.8
HH INCOME					
Lower Income	913	1.1	1.5	3.2	1
Mid-Income	315	16.2	12.4	17.1	5.7
Higher Income	105	73.3	36.2	46.7	14.3

Table 7: Household Investment Choice Decisions - Multivariate Analysis:

This Table presents Marginal Effects of the Probit model estimates with the incidence of Investment Account, Informal Investment, Personal Business and Agricultural Investment as dependent variables. Omitted categories for the displayed independent variables are: INF: Informal, RISK: Risk Averse, AGE: Older age, EDU: Lower Educ levels, GEN: Female, EMP: Unemployed, INC: Lower Income. Robust Standard errors in parentheses, variables significant at *** p<0.01, **p<0.05, *p<0.1. For variable Definition, see Table 1.

VARIABLES	(1) Investment Account	(2) Investing with informal grp	(3) Household Personal Business	(4) Agriculture Investment
RFL	0.00648**	0.0215***	0.0268***	0.00278
	(-0.00317)	(-0.00471)	(-0.0058)	(-0.00237)
INF				
Formal Sources	0.0541***	0.0632***	0.0736***	-0.000971
	(-0.0141)	(-0.0164)	(-0.0184)	(-0.0051)
RISK				
Risk Lover	0.00604	0.0185**	0.0212	0.00105
	(-0.00605)	(-0.00905)	(-0.0134)	(-0.00573)
AGE				
Younger-age	0.0271	-0.0153	0.00621	-0.0248***
	(-0.0165)	(-0.0135)	(-0.0203)	(-0.00725)
Mid-age	0.0192	0.00166	0.02	-0.0300***
	(-0.0129)	(-0.0137)	(-0.0192)	(-0.0084)
EDU				
High Educ. Levels	0.0535**	-0.0280***	0.00969	0.0101
	(-0.0214)	(-0.0074)	(-0.0198)	(-0.0111)
GEN				
Male	0.0185***	-0.0275**	-0.0494***	-0.00254
	(-0.00655)	(-0.0118)	(-0.016)	(-0.00642)
EMP				
Others	0.301*	-	-0.0201	-
	(-0.175)		(-0.0296)	
Self-employed	0.0463**	0.00503	0.0234	0.0154**
	(-0.0194)	(-0.0191)	(-0.0244)	(-0.0074)
Employed	0.222	-0.0173	-0.00509	-0.0153**
	(-0.147)	(-0.0171)	(-0.031)	(-0.0067)
HHINC				
Mid-income	0.0595***	0.0980***	0.108***	0.0501***
	(-0.0164)	(-0.0224)	(-0.0232)	(-0.0152)
Higher-income	0.473***	0.294***	0.316***	0.178***
	(-0.071)	(-0.0609)	(-0.0583)	(-0.053)
DIST	-0.000553**	0.000373*	0.0000968	0.000143
	(-0.000239)	(-0.000216)	(-0.000345)	(-0.000206)
Observations	1,333	1,174	1,333	1,174
Wald Chi2	239.94	129.67	168.71	67.81
Significance	0.0000	0.0000	0.0000	0.0000
Pseudo R2	0.5629	0.3457	0.2727	0.2127
% Correctly Specified	94.52	93.87	91.07	96.51