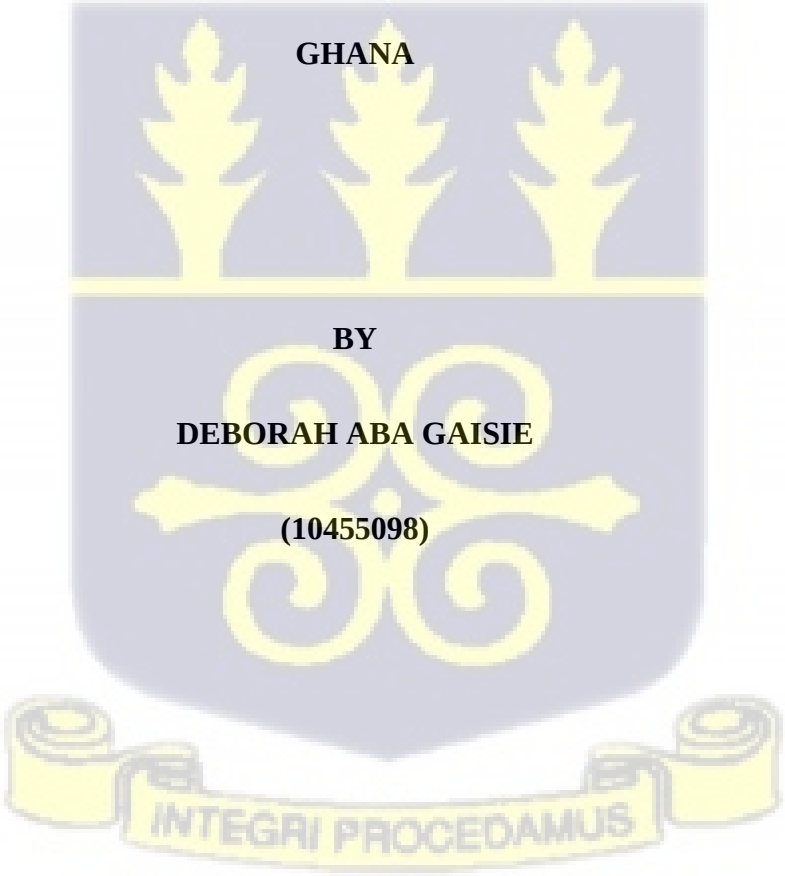
UNIVERSITY OF GHANA

RISK ATTITUDES, ENTREPRENEURSHIP DECISION AND FINANCING PREFERENCE: EVIDENCE FROM NON-FARM HOUSEHOLD ENTERPRISES IN GHANA



BY

DEBORAH ABA GAISIE

(10455098)

A THESIS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF MASTER OF PHILOSOPHY DEGREE IN FINANCE

JULY, 2020

DECLARATION

I, Deborah Aba Gaisie, do hereby declare that this thesis has not been documented for the presentation in this or any other University. I, therefore, declare that this thesis is my own work and all references have been duly acknowledged. I take sole responsibility for any shortcomings that may be found in this thesis.

...…… ……20/08/2021…….

Deborah Aba Gaisie Date

…… …… …20/08/2021……

Dr. Patrick Opoku Asuming Date

(Supervisor)

…… …23/08/2021……

Dr. Agyapomaa Gyeke-Dako Date

(Supervisor)

DEDICATION

I dedicate this thesis to my parents, Mr. Joshua Gaisie and Mrs. Stella Owusu-Oppong.

ACKNOWLEDGEMENTS

My utmost gratitude goes to the Lord God Almighty for bringing me this far. His grace and goodness have enabled me to complete this study.

I am immensely grateful to my supervisors, Dr. Patrick Opoku Asuming and Dr. Agyapomaa Gyeke-Dako for their guidance, counsel and motivation. Your attentive supervision contributed greatly to thesis and I am very thankful for that.

Special gratitude goes to Akua Obeng-Dwamena, Derek Asuman, and Charles Gyamfi Ofori for their useful comments and assistance throughout the writing of this thesis.

Finally, I would like to thank my mother, Mrs. Stella Owusu-Oppong, my sister and brother, Florence and Emmanuel Gaisie. Your constant support and encouragement kept me going.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ABBREVIATIONS

CEO	Chief Executive Officer
GLSS	Ghana Living Standards Survey
HE	Household Enterprise
NBSSI	National Board for Small Scale Industries
PSID	Panel Study of Income Dynamics
PSM	Propensity Score Matching
SOEP	German Socio-Economic Panel
SME	Small and Medium Scale Enterprise

ABSTRACT

Several theories in economics and finance suggest that risk attitudes perform a vital role in economic choices, including being an entrepreneur and the choice of finance for businesses. However, there are a limited number of empirical tests of these theories in the African context, where majority of firms are small and medium-scale enterprises. Using the 7th round of the Ghana Living Standards Survey (GLSS 7), this study characterizes the risk attitudes of Ghanaians and also estimates the influence of risk attitudes on the choice to own a household enterprise and the choice of financing by owners of household enterprises.

Using a Probit model to investigate the relationships, the results show that a high fraction of Ghanaians are risk averse. Specifically, females, married persons, people in the poorer wealth quintiles, Muslims, craft workers and individuals from urban coastal areas have a higher likelihood of being risk averse. The study finds that risk aversion has an impact on entrepreneurship: individuals who are risk averse are 7 percentage points less likely to own household enterprises. The study also finds that risk averse business owners are 5 percentage points less likely to self-finance their businesses at the start-up stage. While risk aversion has no significant impact on using loan financing as working capital, the wealth of the enterprise owner, the age and size of the enterprise were found to be significant predictors of using loan financing as working capital. The findings from this study suggest that risk attitude plays a strong role in entrepreneurial decision. Also, as risk averse owners are dependent on external finance at the early phase of business growth, strengthening access to capital has the potential of improving entrepreneurship at the household level. The findings largely hold when Propensity Score Matching technique is employed to address potential endogeneity issues. On the whole, the paper highlights that policies that target small enterprise development should

consider the important role of risk attitudes and focus on mechanisms that ease access to external finance.

CHAPTER ONE

INTRODUCTION

1.1 Research Background

The private sector of many developing economies, especially those in the sub-Saharan Africa sub-region, is largely composed of small and medium scale enterprises (SMEs) (Appiah, Osei, Selassie, & Osabutey, 2019; Jabbouri & Farooq, 2020). The Ghana Statistical Service estimates that about 43.5% of households in the country operate a non-farm household enterprise (Ghana Statistical Service, 2019). These enterprises are typically small non-farm businesses that are owned by individuals with assistance from other family or non-family members. In spite of the small scale of their operations, SMEs are essential to the economy because they serve as a form of employment and a means of diversifying economic activity out of agriculture. They contribute significantly to creating jobs and boosting economic growth (Jadoua & Mostapha, 2020). The World Bank estimates that over fifty percent of employment and more than 35% of Gross Domestic Product (GDP) of emerging markets are accounted for by SMEs (The World Bank, 2017). According to data from the latest census of business establishments in Ghana, the Integrated Business Establishment Survey (IBES II), SMEs were found to engage 71.4% of the total workforce in the country and they contributed about 70% of the country's total GDP in 2016 (Ghana Statistical Service, 2018).

Despite the contribution of SMEs to economic growth and employment creation, challenges such as poor access to finance, electricity inadequacies, political instability, competition, tax rates amongst others inhibit their growth and development (Wang, 2016). One major challenge to SME growth is access to finance, and this is especially true for developing countries (Singh & Kaur, 2019). The underdeveloped financial market in emerging countries makes it difficult for SMEs to access diversified financing options. High interest rates, coupled with steep

collateral requirements, are some issues that encumber Ghanaian SMEs from gaining access to finance (Abor & Biekpe, 2006).

Even though the primary difficulty faced by small enterprise owners in developing countries is access to finance (Chit, 2019; Wasiuzzaman, Nurdin, Abdullah, & Vinayan, 2020), the type of financing chosen by a business is not only dependent on its availability but also on the individual preferences of the business owner or manager (Karpavičius & Yu, 2019). Especially for small and medium scale enterprise (SME) owners, their preferences or attitudes towards risk have a stronger effect on their financing behaviour since these owners have an immediate influence on the operations of the entity as compared with managers/owners of larger corporations (Rao & Kumar, 2018). Rational individuals seek to maximise returns and minimise risk, and thus, the extent of risk associated with the type of financing can have an impact on the nature of capital chosen by the business owner.

SME owners, like other entrepreneurs, operate in an uncertain environment with diverse forms of risk to income and business success (Koudstaal, Sloof, & Van Praag, 2015). The choice, therefore, to commence an enterprise is not just as a result of finding a means to survive but can also be impacted by personal preferences such as the risk attitude of the individual (De Blasio, De Paola, Poy, & Scoppa, 2020). Risk preference is a key determinant in the entrepreneurship decision because starting and maintaining a business entails embracing the risks of unguaranteed income and the possibility of business failure (Skriabikova, Dohmen, & Kriechel, 2014).

Generally, risk attitudes have been found to have a strong effect on the economic behaviour of individuals (Rieger, Wang, & Hens, 2015). They influence different economic decisions such as asset allocation, insurance purchase, choice of employment, and investment in human capital, and these decisions have a potentially lasting impact on the welfare of individuals and

economic development (Cardenas & Carpenter, 2008). Given the important contributions and potential of SMEs in the development of most economies, it is imperative to investigate the influence of risk attitudes in driving this development particularly in decisions related to SME ownership and financing.

1.2 Problem Statement

Small and medium scale enterprises have received significant attention in recent years due to the growing recognition of their capability in improving economic growth and development (Jin & Zhang, 2019; Singh & Kaur, 2019). This interest has been spurred by the potential of SMEs in generating jobs and creating a more diversified economy (The World Bank, 2017). Nevertheless, the growth and sustainability of this sector is largely constrained by access to finance, both at the early and subsequent phases of development (Chit, 2019). A World Bank survey of small businesses in 119 countries worldwide provides evidence that access to finance is the foremost obstacle that small and medium scale businesses are confronted with (Wang, 2016).

Inadequate finance or the lack of it can impede the establishment, survival and development of an SME. As the business progresses from one stage to another, its financing needs change; hence, it is necessary that different forms of finance are available to meet the financing need of the business at every point in its life cycle (Stefani, Schiavone, Laperche, & Burger-Helmchen, 2019). Recognising how the longevity and growth of SMEs are impacted by access to finance, a number of governments and international organisations have committed themselves to improving accessibility of funds for SMEs (The World Bank, 2017). Nevertheless, although SMEs are strongly constrained by accessibility of financial assets, an SME's financing choices can be influenced by the personal characteristics/preferences of the

owner such as risk attitude (Berger & Udell, 1998; Rao & Kumar, 2018; Van Auken, 2005). This effect might even be more pronounced in the face of an improved financial system and increased financing alternatives for SMEs both at the early and working capital phase. It is therefore important to consider the extent of impact of these preferences on the financing choices of an SME.

Evidence from existing empirical literature show that capital structure choices of business managers are influenced by risk attitudes (Graham, Harvey, & Puri, 2013; Hernández-Pérez, Cruz Rambaud, & Lorenzana de la Varga, 2019). Theories that explain capital structure (the irrelevancy hypotheses of Modigliani and Miller (1958), Pecking Order Hypothesis, and Optimal Capital Structure theory) are founded on evidence from large listed firms in developed countries (Abor & Biekpe, 2009; Cassar & Holmes, 2003). However, these findings may not be applicable to the context of small and medium scale enterprises for a number of reasons. First, the institutional and regulatory environment in which these large corporations operate can allow for some flexibility in access to capital. This would affect the cost and accessibility of finance and the subsequent allocation decisions of these firms. Second, large corporations are typically managed by a group of executives with ownership and control dispersed. As such, it is difficult to infer how the risk attitudes of these managers directly affect their financing decisions. On the other hand, small enterprises are owner-managed (by a single individual). These owners have absolute control over the decision making of the business, and as such, his/her risk preferences would be directly reflected in the activities of the business, especially in the area of financing. Indeed, as Rao and Kumar (2018) point out, personal attributes of an SME owner/manager have a stronger influence on their financing preference, and as such, findings from large corporations in developed countries might not pertain to the setting of SMEs in other nations. To realise the full potential of SMEs to economic growth and development, it is imperative that governments and policy makers are well informed on the

impact of risk attitudes on financing so that appropriate financial allocation decisions and guidelines are made to enhance the productivity of SMEs.

Aside financing of businesses, risk attitudes have also been found to influence other economic decisions, such as investment in financial services, parental investment in children's education, migration, technology adoption and occupational choices (Caliendo, Fossen, & Kritikos, 2010; Cardenas & Carpenter, 2008; Goldbach & Schlüter, 2018; Liu, 2013). Everyday choices on employment made by individuals are largely dependent on the degree of risk that can be borne by them, and since risk goes with return, people might be motivated to take on certain levels of risk because of the returns that accrue to them. Risk attitudes have been found to significantly influence entrepreneurial decision (De Blasio et al., 2020; Zhang & Cain, 2017). Since entrepreneurship involves more uncertainties about incomes and job security, theoretically, it is usually associated with lesser risk aversion as compared with wage employment (Blanchflower & Oswald, 1998; Kanbur, 1979; Knight, 1971). Empirically, most studies have shown risk aversion to be negatively related to entrepreneurship (Cramer, Hartog, Jonker, & Van Praag, 2002; Fossen, 2011; Hvide & Panos, 2014; Van Praag & Cramer, 2001). Given how common self-employment and entrepreneurship (as seen in the number of small and medium scale enterprises) is in many emerging countries including Ghana, it necessary to examine how risk attitude is related to business ownership. Investigating the influence of risk preferences will inform policy makers on the specific measures to take to mitigate the risk associated with business ownership and thus boost entrepreneurship and economic development.

Furthermore, heterogeneity in risk attitudes, which reflects in the variation in economic decisions and social behaviour of individuals, can be credited to several reasons. Certain factors like age, gender, wealth and other background characteristics that differ across individuals can substantially explain differences in risk attitude and, thus, have further implications on the

nature of economic decisions (Dohmen, Falk, Huffman, Sunde, Schupp, & Wagner, 2011). The influence of these elements has received extensive investigation in existing literature. However, this is largely concentrated in developed countries (Dohmen et al., 2011; Goldbach & Schlüter, 2018; Königsheim, Lukas, & Nöth, 2017; Liu, 2013; Outreville, 2013; Sakha, 2019; Tabetando, 2019; van Huizen & Alessie, 2019). Findings from these studies cannot be generalised to the developing-country context because of certain differences that exist. To begin with, compared with developed countries, a lot of households in developing countries depend largely on volatile income from agriculture, with few assets and insurance to absorb shocks. Such instability in income and absence of substantial assets and insurance can make people more averse to taking certain risks (Sakha, 2019). Also, the financial and governmental institutions in developing countries are not as advanced as that of advanced economies. This has strong implications on the risk associated with dealing with these institutions. Stable credit and capital markets with good political and business climate can make investors and ordinary citizens develop some level of trust in the financial system, which can increase their risk appetite. The opposite, however, is true (and typically the case) of most developing countries. It is therefore necessary to investigate the determinants of risk aversion for a large representative sample in a developing country like Ghana. This will provide useful insights in exploring the sources of heterogeneity in risk attitudes so that policies and mechanisms that take cognizance of these differences can be effectively structured to address the needs of different groups.

1.3 Research Objectives

The objectives of this study are:

1. To investigate the determinants of risk aversion of Ghanaian households.
2. To analyse the effect of risk attitudes on ownership of household enterprises.

3. To analyse the effect of risk attitudes on the choice of financing for Ghanaian household enterprise owners.

1.4 Research Questions

1. To what extent are Ghanaian households risk averse?
2. Are risk averse people more likely not to own a household enterprise?
3. Do risk averse household enterprise owners go for self-financing as opposed to debt financing?

1.5 Significance of the Research

This study is important because it will provide insights on the influence of risk attitude on non-farm household enterprise ownership and its subsequent effect on the financing decisions of these enterprise owners. Particularly, financial institutions in Ghana will be better informed on the risk preferences of customers, and this will enable them to set-up improved structures in their provision of finance to clients. With regard to public policy, the study will inform policy makers on the regulations and interventions to implement to address the effect of risk aversion in other sectors of the economy. Also, they will be better informed on how risk attitudes can be used to promote desirable financial behaviour.

1.6 Chapter Outline

The study is made up of five chapters. The second chapter looks at the assessment of existing theoretical and empirical literature, focusing on works which have been done pertaining to the research topic. Chapter three focuses on the adopted methodology and general research

approach, such as research design, sample size and sampling technique. Chapter four presents the results gained from the data analysis. Chapter five concludes the research by summarizing the findings and recommending policies based on the results. Areas to be explored in future research are also proposed in the final chapter.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section reviews the literature on risk aversion and financing choices for household enterprises. The literature review considers the theoretical and empirical evidence on risk aversion and capital structure. It also considers the measurement of risk aversion and its effects on business ownership. The review ends with an outline of the gaps that the study seeks to address and contributions that this research will make to literature.

2.2 Background on Household Enterprises in Ghana

The private sector of most developing economies is largely characterised by small and medium scale enterprises (Jabbouri & Farooq, 2020). It is estimated that over 50% of total employment and more than 35% of GDP in emerging markets are accounted for by these enterprises (The World Bank, 2017). Household enterprises are "small businesses engaged in non-farm activity, and are operated by a single individual (the owner) or with the assistance of family members or no more than five non-family workers on a casual basis" (The World Bank, 2011). These enterprises are usually engaged in small-scale vending, manufacturing, construction, services and repair activities. The Ghana Living Standards Survey (Round 7) provides data that shows that 43.5% of households in Ghana own a non-farm household enterprise. Out of this, a greater percentage (50.5%) are located in urban centres with 34.6% of enterprises located in rural areas (Ghana Statistical Service, 2019).

Despite the small size of their operations, household enterprises have been recognised as playing a pivotal role in creating jobs and reducing poverty. Data from the most recent survey on living standards of Ghanaians (Ghana Living Standards Survey Round 7) indicates that

about 6.6 million persons in 2016/2017 were engaged by approximately 3.8 million non-farm household enterprises in the country (Ghana Statistical Service, 2019). This represents about 23% of the total population of the country in 2017. It goes to show how important this sector is in contributing to improving the livelihood of many Ghanaians.

Given the important contribution of household enterprises to the economy of the country, the Ghanaian government has, over time, shown commitment to support the sector. The National Committee for Informal Economy was established in 2010 to provide an institutional framework and deliver policies that will drive the sector. The National Board of Small-Scale Industries (NBSSI) was also formed to specifically provide technical support and business development advice to help small and medium scale enterprises. Owing to such key commitment to promote small and medium scale enterprise growth, it is imperative to understand the dynamics of household enterprises, especially in relation to their financing. This will inform government on the appropriate policies and structures to put in place that can boost the growth of household enterprises and their contribution to economic growth.

2.3 Theoretical Review

2.3.1 Risk Aversion

Risk aversion can be explained as the attitude of individuals who, when confronted with uncertainty, try to reduce that uncertainty. As such, a risk averse individual, when faced with any arbitrary risk, will prefer a certain outcome which is the same as the expected value of the risk to the risk itself (Menezes & Hanson, 1970). To explain this, suppose we establish a gamble between two choices, A and B, and the probability of obtaining choice A is $\propto$ while that of B is $1-\propto$, will an individual prefer the expected value of the gamble with certainty or the gamble itself? To explain further, would an individual like to receive GHC 10 for sure or prefer a

gamble/lottery that offers GHC 100 with 10% probability or GHC 0 with 90% probability? The choice made by the individual from these options reflects his or her degree of risk aversion.

Economics is about how people and societies decide to allocate scarce resources and distribute wealth. Hence, it is necessary to understand the choices people make and the methods involved in those choices. In the face of uncertainties, choices such as investments in financial markets, insurance uptake, human capital investments, and occupational choices are all affected by the risk preference of an individual, and this goes a long way to affect economic growth, subsequently leading to wealth accumulation.

2.3.1.1 Formation of Risk Attitudes

It is the assumption of standard economic models that individuals are endowed with stable risk preferences that do not change over time (Stigler & Becker, 1977). However, emerging literature shows that risk preferences can be shaped and altered by the economic and cultural environments in which people grow and the formation of risk preferences is largely dependent on individual experiences in the formative years (Alesina & Fuchs-Schündeln, 2007; Guiso, Sapienza, & Zingales, 2008; Osili & Paulson, 2008). This can be explained by the Impressionable Years Hypothesis which describes that between late adolescence and early adulthood, individuals are highly susceptible to attitude changes and form durable attitudes (Krosnick & Alwin, 1989). This explains that exposure to particular economic or cultural shocks during critical life periods has implications on people's willingness to take risk. These shocks can influence people's trust in financial institutions (Guiso, Sapienza, & Zingales, 2004; Osili & Paulson, 2008), stock market participation (Guiso & Paiella, 2008), social policies (Alesina & Fuchs-Schündeln, 2007), belief in the free market (Di Tella, Galiant, & Schargrodsky, 2007) and general investment behaviour. Both financial and non-financial

shocks (such as conflict/violence and natural disasters) have been documented to affect risk preferences with varying evidence on the direction of impact (Chuang & Schechter, 2015). Although the effect of non-financial negative shocks on risk aversion is less clear, there exist consistent evidence on the role of financial crises in promoting risk aversion (Chuang & Schechter, 2015; Schildberg-Hörisch, 2018).

2.3.1.2 Risk Aversion Modelling

The idea of risk aversion is originally built on the framework of expected utility theory propounded by Morgenstern and Von Neumann (1953). Over time, other theories have been introduced to model risk aversion of individuals. These models still maintain the fundamental structure of expected utility but include other sources of risk which might impact on risk aversion. One of such theories is the Prospect theory developed by Kahneman and Tversky (1979). This section reviews these two main theories which form a framework for modelling risk aversion.

2.3.1.2.1 Expected Utility Theory

Utility describes the satisfaction a person derives from an activity or a thing. The expected utility function attaches a "utility" to every outcome. As such, the total utility/satisfaction from risky prospects is defined as the weighted mean of utility from every probable outcome (Mongin, 1998). Hence, the option chosen by the individual is the one that offers the most utility. Using the framework of the expected utility theory, Arrow (1965) and Pratt (1964) characterise a person to be risk averse if the shape of his utility function over wealth is concave-shaped (Rabin, 2000). This explains that the individual is ready to reduce his expected payoff so as to circumvent risk. As such, a risk averse person will choose a sure payment over a lottery

when the sure payment is the same as the expectation of the lottery (a lottery can be used to describe a risky choice). For instance, an individual can be faced with two options: a sure payment of GHC 5 and a lottery with 50% probability of gaining GHC 10 and 50% probability of gaining GHC 0. Although the sure payment (GHC 5) equals the expected value of the lottery, a person who is risk averse will opt for the sure payment over the lottery to avoid any risk even though there is a 50% chance of gaining GHC 10. If the second derivative of the utility function is positive, negative or zero, a person can be categorised as risk loving, risk averse or risk neutral correspondingly (Chavas, 2004). The extent of risk aversion varies, depending on the expected value of the lottery and the sure amount. Given different lotteries with different expected values and a fixed sure amount, a highly risk averse person will prefer the sure amount for all the alternatives but another person will opt for the gamble if his/her risk aversion is small. In relation to this study, it is predicted that risk averse persons will prefer wage employment to self-employment since the former offers guaranteed earnings (sure amount) as compared with the latter. Similarly, individuals with lesser risk aversion have a higher likelihood of going into self-employment.

In the context of expected utility theory, Arrow (1965) and Pratt (1964) independently defined a measurement for absolute and relative risk aversion. Absolute risk aversion looks at the risk aversion of a person when wealth varies but risk is unchanged (Menezes & Hanson, 1970). Alternatively, relative risk aversion, considers an individual's risk aversion as wealth and risk are altered proportionally (Yesuf & Bluffstone, 2007). Arrow (1965) and Pratt (1964) hypothesized that investors exhibit a decreasing absolute risk aversion (DARA) (Levy, 1994). Decreasing absolute risk aversion is exhibited when, as wealth increases, a person is more willing to take on a risky prospect (Yesuf & Bluffstone, 2007). Over time, there has been evidence in existing literature to support DARA (Levy, 1994; Szpiro, 1986). Relative risk aversion, just like absolute risk aversion, may also be constant, decreasing or increasing. When

individuals are less prone to give up a fraction of their wealth to risk when they are at higher levels of wealth, they are said to be exhibiting increasing relative risk aversion (Carson et al., 2018).

The expected utility model, however, has been found to have a flaw. Rabin (2000) points out that the model is not completely adequate in interpreting decisions over little and moderate incentives simultaneously. However, this challenge of calibration may not be a huge problem when the stakes are similar in sizes. Due to some flaws identified with the expected utility theory, a number of variants of the theory have been expounded. Amongst them is the Prospect Theory by Kahneman and Tversky (1979).

2.3.1.2.2 Prospect Theory

Alternative models to the expected utility theory have been developed over the years to model risk aversion. The prospect theory by Kahneman and Tversky (1979) challenges the expected utility theory and is the founding theory of behavioral economics and behavioural finance (Levy, 1992). The theory explains that when people are faced with probable outcomes and uncertain outcomes, the weight placed on probable outcomes is less than that placed on certain outcomes. Hence, people tend to exhibit risk aversion with decisions related to certain gains and tend to be risk loving when the decisions encompass sure losses. Compared with expected utility theory, prospect theory replaces probabilities with decision weights. It also allocates values to losses and gains in place of final assets.

The prospect theory has two components: probability weighting and loss aversion. The loss aversion model is made up of two main features. First, there exists a particular reference point to which an individual compares options with regard to losses and gains. Second, in comparing gains and losses of the same size, the weight of a loss' negative value is greater than the weight

of a gain's positive value. This goes to explain that when faced with potential losses and gains, individuals exhibit greater concerns for losses as compared with the prospective gains. For instance, with an initial wealth of GHC 10,000 and a fifty percent possibility of winning GHC 12 and a fifty percent possibility of losing GHC 10, under loss aversion, the individual compares having a sure amount of GHC 0 with a fifty-fifty probability of obtaining a value of negative (-) GHC 10 or the value of positive (+) GHC 12. Hence, the individual is willing to bear certain amounts of risks in order to avoid the possibility of a loss. As a result of the greater weight individuals put on probable losses in comparison with probable gains of the same size, investors (for instance, individuals looking to commence their own business) have a higher likelihood of putting more emphasis on the possible risks associated with the investment as such they are more likely not to make a financial decision that might lead to a loss. This can be a possible explanation to why most people would not prefer to start their own businesses in the face of all the possible risks and likely losses that may occur.

Probability weighting is now gradually gaining more usage in economic applications. With probability weighting, people weigh their outcomes using modified probabilities/decision weights and not just the objective probabilites associated with the outcome occuring. The decision weights are calculated using a weighting function with the objective probability as its argument. This function is then related to the cummulative probability of every single outcome, which subsequently results in an overweighting of the tails of any distribution (overweighting of unlikely extreme outcomes). This component of the prospect theory started seeing recent application in literature, and is, as such, still being refined. O'Donoghue and Somerville (2018) note that "different variants of probability weighting can predict risk aversion or risk seeking for such gambles (50:50 gambles)", and hence, a deeper insight is needed into its features.

2.3.1.3 Risk Aversion Measurement

Different measures of risk aversion have emerged that enable comparisons of risk preferences across populations. Three main approaches exist: the investment portfolio approach, the lottery choice menu approach, and the pricing task approach (Holt & Laury, 2014). For the investment approach, risk aversion is inferred from a single choice made from alternative lotteries. This choice is usually related to investment funds that are divided amongst safe and risky assets. Thus, a highly risk averse person will put less investment in risky assets. This approach is rooted in the expected utility theory. As Hanna and Lindamood (2004) observe, people compare the increased benefits of more wealth, assuming their investments do well, to the loss of wealth if investments go badly. It is against this comparison and the degree of risk that can be borne by the investor that people allocate their wealth between risky and safe assets. This method, however, has some limitations. Using this approach (i.e. observing actual portfolio allocation), it would be difficult to infer the risk aversion of households who do not have any portfolio to allocate between risky and safe assets (Hanna, Gutter, & Fan, 2001).

The lottery choice approach on the other hand, presents a list of two-outcome choices consisting of safe and risky lotteries. A person's degree of risk aversion is determined by the number of safe choices made or the point where on the person changes a safe choice to a risky one. With the pricing task approach, risk aversion is inferred from the variation between the expectation of the gamble and a derived certainty equivalent value.

One main issue which is considered when measuring risk using any of these approaches is whether to use real incentives or hypothetical incentives. For real incentives, respondents are presented with choices involving actual monetary payoffs. Their behaviour with respect to the choices they make is then observed. Support for the use of real incentives indicates that such experiments mimic real life scenarios. As such, the actual risk taking behaviour of the

respondent can be observed, and this would reduce the "noise" in the measurement (Holt & Laury, 2014). This method is, however, costly (both administratively and financially) especially when the research is being conducted on a wide scale (Dohmen et al., 2011). As such, the hypothetical incentives have also been accepted as a valid means of measuring risk aversion especially on a large-scale sample. Indeed, Kahneman and Tversky (1979) note that the hypothetical choices method enables the investigation of a large number of theoretical questions. They support this with the assumption that in situations of choice, people already know their actual behaviour and they have no exclusive motive to disguise their preferences.

Aside these three main approaches, another approach that can be used to measure risk is the use of a set of general questions that require individuals to rank their overall willingness to take risk (this is usually done on a Likert scale). With this, risk attitude is directly self-reported (Dohmen et al., 2011).

2.3.2 Capital Structure Theories

A vital element to the development and sustenance of any business is access to finance (Beck & Demirgüç-Kunt, 2008; Borgia & Newman, 2012). The type of finance chosen by a firm is critical to its survival, and this is dependent on several reasons, like the size of the company, availability of finance and the nature of the business. Capital structure refers to a firm's combination of all likely financing sources (debt and equity) that offers the least cost of capital to fund its processes (Abor & Biekpe, 2009).

The seminal work of Modigliani and Miller (1958) formed the groundwork for the development of subsequent capital structure theories. Their work (the theory of irrelevancy) explains that under perfect market conditions (completely developed financial markets, zero taxation and transaction cost), the value of a company is not influenced by the type of capital structure

chosen (Yartey, 2011). By relaxing some of the restrictive assumptions imposed by this theory, evidence from existing literature has shown that a firm's market value can be impacted by capital structure decisions (Yartey, 2011). Modifications to the irrelevancy theory were developed, leading to other capital structure theories – agency cost theory, pecking order theory, and static trade-off theory.

The static trade-off theory, propounded by Kraus and Litzenberger (1973), explains that the amount of debt or equity finance used by a business depends on the costs and advantages of each option. Hence, to make a choice on the optimal level of debt and equity, a firm considers the balance between the advantages of interest-shield tax and the cost of bankruptcy (Osei-Assibey, 2013). Myers and Majluf (1984), who formulated the pecking order theory, point out that the financing behaviour of firms follows a natural hierarchy. In the early phases of growth, business owners prefer to fund their businesses using internal resources. Nevertheless, when it becomes necessary to consider external financing, debt is preferred to equity. Because investors have less information than managers or owners, they require a premium on their investment in the business, which raises the cost of capital of the business. Hence, the first preference of every business is to raise funds internally, and if there is the need to seek for external funds, debt is considered less risky than equity financing. Meckling and Jensen (1976) developed the agency cost theory. As a result of separation of ownership and control in many large corporations, conflicts of interest can arise between shareholders (principal) and managers (agent). This is because the priorities of the agent might differ from those of the principal. This conflict leads to agency costs which have implications for the type and extent of financing method chosen by the business.

2.3.3 Capital Structure of SMEs

One key feature of the capital structure theories discussed above is that they were developed based on evidence from large corporations in developed countries (Borgia & Newman, 2012). The scale of operations of these organisations and the institutional setting in which they operate make the applicability of these theories to other firms, especially small and medium scale enterprises, questionable (Cassar & Holmes, 2003). These large organisations operate in economies with developed financial and regulatory systems. As such, the cost and obtainability of financing alternatives would not be the same for small and medium scale enterprises in emerging economies. The institutional and regulatory arrangements in these developed economies would influence how financial resources are allocated to these businesses. Hence, theories that have been formed based on evidence from large corporations are poor in explaining the financing choices of small and medium scale enterprise owners (Borgia & Newman, 2012).

Additionally, in recent times, the influence of individual heterogeneity on the financing and governance of corporations has gained attention in behavioural finance (Graham et al., 2013). Disparities in the capital structure choices of big corporations and small businesses may also be a direct function of the personal preferences and characteristics of the owner/manager (Berger & Udell, 1998; Graham et al., 2013). Large corporations are typically characterised by a wide range of dispersed owners (shareholders) who contract a group of managers to manage the company on their behalf. The wide dispersion of ownership and the separation of ownership from management makes it difficult for the characteristics of shareholders (owners) to directly affect the financing and governance choices of the firm (Borgia & Newman, 2012). SMEs on the other hand are usually owner-managed. As such, the owner might introduce other personal factors/characteristics in the management of the business that can influence capital structure (Rao & Kumar, 2018). Some of these factors are the owner/manager's degree of risk aversion,

disinclination to control, and educational and experience level (Berger & Udell, 1998). As a result of these differences, alternative theories/frameworks that capture the structure of small businesses and the influence of personal characteristics of the owner have been developed to describe an SME's financing choices. Auken (2005) presented a framework which highlights the importance of owner/managerial characteristics in decisions related to capital structure. The characteristics identified were: growth intentions, risk preferences, relationships (networking), and experience.

One theory that has also been widely accepted as suitable for the structure of small businesses is the Life Cycle Theory by Berger and Udell (1998). According to the Life Cycle Model, the financing behaviour of small enterprises is characterised by a growth cycle where the financial needs and options of the business change with business growth, experience and transparency with information. The smaller/younger/opaquer a firm is, the more it relies on insider finance (funds from the entrepreneur's own earnings, family and acquaintances), and as the business continues to grow, it obtains more accessibility to intermediate funds. If the firm continues to exist for a long time, increases in size and becomes less informationally opaque, it gains access to finance from the public market.

Since risk attitude is the main owner/manager characteristic that is being considered in this study, the literature review throws more light on risk aversion and some theories on which risk aversion is modelled. It also considers the different risk aversion measurement methods in literature.

2.4 Empirical Review

According to the study objectives, this segment assesses the empirical literature on the influence of risk attitude on capital structure and entrepreneurship. It also highlights the determinants of risk aversion.

2.4.1 Risk Attitude and Capital Structure

The literature on risk aversion and its impact on the financing behaviour of business owners/managers is sparse and largely limited to large corporations (Karpavičius & Yu, 2019). Existing findings from this literature show that because debt financing comes with a consequence of insolvency and the possibility of transfer of ownership to debt holders, risk averse managers are likely to use less debt financing so that the overall risk of the firm can be reduced (Abdeldayem & Sedeek, 2018; Hernández-Pérez et al., 2019; Karpavičius & Yu, 2019). Li and Li (2008) examined the financing behaviour of firms listed on the Dow-Jones China Index from 2000-2004. Their findings show that with the control of other variables, the impact of risk aversion on debt financing is negative. For this study, the vega of the CEO was used as the risk preference measure. Vega is measured as a change in the wealth of the CEO per one percent change in the volatility of stock returns, after controlling for industry effects. The Vega is used as a measure of risk because it is calculated as the partial derivative of the Black-Scholes (1973) option pricing model with reference to stock return volatility. The dollar value of vega is used to measure the size of incentives given to a CEO to increase risk. The higher the vega, the less risk averse the manager is. Abdeldayem and Sedeek (2018) also investigated the influence of managerial behaviour on the capital structure decisions of 31 companies on the Egyptian bourse from 2011 to 2013. Their results showed that as compared with non-risk averse managers, risk averse managers are less inclined to finance their firms

using debt. Hernández-Pérez et al. (2019) also investigated the influence of personal traits of CEOs on the financing decisions of large private corporations in Spain from 2001 to 2014. The traits considered were optimism, risk attitude and affect heuristic (a mental procedure that lets individuals form decisions swiftly). Their results showed a negative relationship between risk aversion of CEOs and long-term debt financing.

Regarding small and medium-scale establishments, the connection between owner/manager characteristics and financing behaviour has received some attention in literature. Berger and Udell (1998) document that the risk aversion level of the owner/manager can affect an SME's capital structure decisions. Borgia and Newman (2012) built on the theoretical framework of Auken (2005) and tested the association between managerial characteristics and financing behaviour of 154 small and medium scale establishments in China. Controlling for particular firm characteristics, including size, age and profitability, his findings showed that managers with a greater risk propensity lean towards using more leverage (debt). A recent study by Rao and Kumar (2018) is closely related to ours. They investigated the impact of demand-driven elements such as business goal, risk attitudes, networking ties and other personal attributes on the capital structure choices of 309 Indian small-scale businesses. They specified five categories of financing preference, namely: internal equity finance, short term finance, long term finance, other alternate financing methods and external equity finance. In terms of risk attitudes, they identified that SME owners generally avoid risk and that their initial preference is internal finance. As such, they do not fully take advantage of external sources of finance.

2.4.2 Risk Aversion and Entrepreneurship

Theoretically, it has been established that risk propensity influences entrepreneurial choice since entrepreneurs are required to embrace certain levels of risks that wage workers might not

be exposed to (Blanchflower & Oswald, 1998; Kanbur, 1979; Kihlstrom & Laffont, 1979; Knight, 1971). Nevertheless, the empirical examination of this relationship has yielded mixed results in existing literature. A number of studies have identified risk aversion to be negatively associated with entrepreneurial choice (Cramer et al., 2002; De Blasio et al., 2020; Fossen, 2011; Hvide & Panos, 2014; Van Praag & Cramer, 2001). Cramer, Hartog, Jonker, and Van Praag (2002), using a survey that directly records individual risk preferences, tested the theoretical notion that persons with lower levels of risk aversions choose entrepreneurship. Using about 1700 persons in the Netherlands, they discovered that risk averse persons have a lesser likelihood of being entrepreneurs. De Blasio et al. (2020) also examined the influence of risk attitudes on entrepreneurial choice using six different rounds of the Bank of Italy Survey of Household Income and Wealth (2004-2014). Their results indicated that risk aversion is negatively related to the likelihood of being an entrepreneur. Koudstaal et al. (2015) combined a survey and experimental approach to measure risk aversion. With the survey approach, they found that, compared with managers, entrepreneurs see themselves to be less risk averse. However, with the experimental incentivized approach, a significant variation does not exist between the risk attitude of entrepreneurs and managers. Notwithstanding, the two groups (entrepreneurs and managers) perceive themselves to be less risk averse as compared with employees.

In the context of small and medium scale businesses in emerging countries, Araar et al. (2019) investigated the risk attitudes of 1,445 micro and small scale entrepreneurs in Ethiopia. Their findings indicated that the entrepreneurs were mostly risk averse. Agwu (2020), in contrast to theoretical predictions on risk aversion and entrepreneurs, found that risk aversion is positively related to entrepreneurship in rural non-farm enterprises. Using a sample of 1,528 entrepreneurs in Nigeria, he found that risk averse persons have a higher likelihood of owning non-farm enterprises as compared with less risk averse persons. He explained that ownership

of rural enterprises can serve as an insurance policy for rural households which typically face significant variances in their income. As such, risk aversion would encourage enterprise ownership.

2.4.3 Determinants of Risk Aversion

Risk attitudes vary among individuals, and comprehending the elements that determine the particular risk attitude of an individual and how it can predict subsequent behaviour is essential (De Paola, 2013). Existing literature has identified gender, age, marital status, wealth, and education as significant determinants of risk aversion (Ackah, Aikins, Sarpong, & Asuman, 2019; Dohmen et al., 2011; Eckel & Grossman, 2008a; Grable, 2008; Halek & Eisenhauer, 2001).

The link between gender and risk aversion has received wide attention in literature (Ackah et al., 2019). Prevailing evidence on this reveals that females are more risk averse than males (Charness & Gneezy, 2012; Croson & Gneezy, 2009; Dohmen et al., 2011; Eckel & Grossman, 2008b; Tavor, 2019). Dohmen et al. (2011) examined the determinants of risk attitudes using a large representative survey of more than 22,000 Germans. They also complemented the survey-based measurement of risk aversion with an incentivized field experiment involving lotteries with real payoffs. They found that the gender of an individual can throw more light on variations in risk attitudes; their results showed that females are less prone to take on risk in all the contexts considered in the study. Charness and Gneezy (2012) investigated willingness to take financial risks among more than 1000 participants. Using an incentivized experiment approach, they found that women had a lower likelihood of investing in risky assets as compared with men. In spite of this prevailing evidence on the gender factor, some studies have shown that significant variations in the risk attitudes between males and females do not exist if

attention is given to the measurement of risk aversion and the influence of cultural contexts (Andersen et al., 2006; Nelson, 2015; Yusof, 2015). Nelson (2015) reviewed data from 35 existing works on gender disparities in risk aversion. The findings highlighted considerable mixed evidence on the gender effect. It was concluded that when appropriate attention is given to differences in cultural context and risk measurement, risk attitude does not vary significantly amongst men and women.

Generally, the existing literature on age indicates a positive association between age and risk aversion (i.e. age is negatively related to risk-taking). Dohmen et al. (2011) investigated the determinants of risk aversion on a large sample of adult Germans. Their findings indicated that age is negatively related to the willingness to take risk. Specifically, as an individual advances in age, their willingness to take risks reduces. Similarly, De Paola (2013), using a sample of 3,789 university students, found that older students have a higher likelihood of being risk averse than younger students. On the contrary, Halek and Eisenhauer (2001), using a sample of 2,376 adult household heads, also found that as individuals increase in age, their risk aversion decreases. They added an indicator for respondents aged 65 years and above and their results showed that risk aversion tends to rise as individuals attain 65 years and above. Riley and Chow (1992) also found similar results. The varying results seem to indicate a non-linear (hump-shaped) association between age and risk attitude.

Although not dominant, there exists some evidence on the relation between marriage and risk aversion (Halek & Eisenhauer, 2001; Hartog, Ferrer-i-Carbonell, & Jonker, 2002; Roussanov & Savor, 2012; Sunden & Surette, 1998). Married persons have a higher likelihood of being risk averse, considering the fact that they might have possible dependants. As such, the incentive to take on certain levels of risk reduces. Halek and Eisenhauer (2001) showed that the risk aversion of married household heads increased by 29% as compared with their unmarried counterparts.

Substantial attention has been given to the link between risk aversion and wealth. Existing literature finds that lower risk aversion levels are related to increased wealth (Guiso & Paiella, 2008; Halek & Eisenhauer, 2001; Shaw, 1996; Tsigos & Daly, 2016; Yesuf & Bluffstone, 2009). The presence of more wealth or income can induce an individual to take certain risks since this wealth will serve as a cushion against the impact of possible losses. Tsigos and Daly (2016), using 3 waves of a longitudinal survey of Australian households (2002-2010), found lower risk aversion levels amongst wealthier households. Guiso and Paiella (2008) also find that risk aversion reduces with wealth.

Lastly, on the relationship between risk attitudes and education, evidence shows that higher stages of educational achievement are related to lesser risk aversion (Cardak & Wilkins, 2009; Goswami, Hazarika, & Handique, 2017; Guiso & Paiella, 2008). Goswami et al. (2017) investigated the financial risk attitudes of micro-entrepreneurs in North-East India. Their results showed that education increases the risk-taking ability of these entrepreneurs since they are equipped with adequate knowledge to evaluate opportunities.

2.5 Summary of Gaps and Contribution to Literature

This chapter has looked at some existing theories on capital structure. The review showed that existing capital structure theories were based on evidence from large corporations in developed countries. As such, these theories may not be adequate enough to describe the financing choices of small businesses due to differences in the institutional/regulatory arrangements coupled with the ownership structure of large and small establishments. The literature review then established the role of the personal characteristics of business owners, specifically risk attitudes, on capital structure. It also examined the empirical literature on the determinants of risk attitudes and the influence of risk attitude on capital structure and entrepreneurship.

Generally, the review showed an existing gap in literature on the role of risk attitudes in capital structure. This gap is even wider when considering the role of risk preferences on the capital structure decisions of small businesses in developing economies like Ghana. Given the prevalence of small and medium scale enterprises in emerging countries and their significant contribution to employment and economic growth, a study such as this will provide useful insights into some mechanisms that drive the growth of these enterprises. It will help government and other institutions tailor programs that will tackle the specific necessities of these businesses, particularly in the area of finance.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter details the statistical procedures carried out to fulfil the study objectives. Specifically, it highlights the tools and methods used to show the factors that affect risk attitudes and the influence of risk attitude on business ownership and financing choice. The chapter consists of the research design, data source, and the data analysis tools and procedures.

3.2 Research Design

The framework that is used to collect and analyse data is referred to as the design of a study. The particular design chosen influences a researcher's decisions in the various processes of the research. The essential features of a research design are the data collection and analysis approach, in addition to the strategies adapted for the research. This study adopts a quantitative approach to achieve the research objectives. Bryman (2016) asserts that the substance of quantitative research is to gather numerical data to explain a certain phenomenon. With this approach, data is collected and subsequently subjected to different statistical tests and analysis based on the objectives of the researcher (Abraham, Asor, Torviawu, Yeboah, & Laryea, 2018). Where is it necessary to draw statistical inferences and relationships from different variables, the quantitative approach must be used. As such, findings from the analysis can be generalised for a broad section of the population. The purpose of this study is to use survey data to analyse the effect of risk attitudes on financing choices and business ownership in order to suggest a course of action. It is therefore appropriate to adopt a quantitative approach since the study seeks to analyse and interpret numerical data on risk attitudes and other outcomes.

3.3 Data Source

The study uses data from the Ghana Living Standards Survey (GLSS) round 7, conducted by the Ghana Statistical service. This is a nationally representative household survey carried out in 2016/2017, which sought to collect information for measuring welfare and living conditions of Ghanaians. The survey collected data on demographic characteristics, education, health, employment, housing conditions, access to and use of financial services, household agriculture, amongst others, of a representative sample of the Ghanaian population. The 7th round of the GLSS is unique and well-suited for the purpose of the study because, for the very first time, the survey collected information on risk attitudes of respondents.

The survey covered 14,009 households in 1000 enumeration areas with urban households representing 42.96% and rural households representing 57.04%. Since the aim of the study is to estimate individual risk aversion levels and their effect on ownership of business and source of financing for household enterprises, the analysis was restricted to persons aged 12 and above. This is because the key information needed, that is, the questions that measure risk attitudes were asked for only persons aged 12 and above. Thus, the total number of observations was 37,945 persons.

3.4 Risk Attitudes Measurement

Different approaches have been developed over the years to measure risk attitudes with an aim to accurately capture the heterogeneity in risk attitude. Several studies have employed survey questions which determine risk attitudes based on self-reported personal traits and willingness to take risks. These questions require respondents to make their own judgements about their willingness to take risks in particular areas. Other survey measures have also employed hypothetical lottery questions to elicit risk preferences. For instance, Holt and Laury's (2002)

measure of risk aversion uses hypothetical lotteries to derive the constant risk aversion parameter of an individual. The multiple price list of Holt and Laury (2002) is employed to determine risk aversion through the differences in volatility. Originally, the respondents were given two different lotteries with 10 choices which vary in the level of gain. The lottery with the least difference outcome is classified as the certain choice. Due to some issues raised by Dohmen, Falk, Huffman, and Sunde (2010); Hardeweg, Menkhoff, and Waibel (2013); Vieider et al. (2015) concerning the complexities associated with dealing with two lotteries, the method can be simplified to having a fixed certain amount and a lottery that increases in the level of gain as the choices (alternatives) increase. A number of economists have raised concerns about certain factors such as inattention, lack of understanding, individualistic predispositions and preconceived motivations that can misrepresent the disclosed risk attitudes of respondents (Dohmen et al., 2011). Experimental lotteries that use real money stakes were also developed to measure risk aversion. However, this method is very expensive and difficult to be carried out on a large scale.

Despite some of the challenges with survey questions, as highlighted above, they are capable of delivering reliable insights on risk attitudes of individuals, especially for large representative surveys like what is being used in this study. Specifically, for GLSS 7, a section was dedicated to ask the respondents different questions that can be utilized to estimate their risk attitudes. The questions that were used for the risk aversion measure for this study are presented below:

Suppose you want to invest some money. Which option do you prefer?

OPTION 1: Investing in a business where I cannot lose money but has low profits.

OPTION 2: Investing in a business where there is a small chance I can lose money but potentially brings high profits.

The two options presented in the question can be used to gauge the extent of risk an individual is prepared to take. For instance, a respondent who chooses option 1 can be seen as someone who is willing to avoid any loss and gain little profit. The one who chooses option 2 on the other hand can be seen as someone who can risk making some losses just to gain a higher profit. From the two scenarios, it can be realised that the one who chooses option 1 is more risk averse and the respondent who chooses option 2 is more willing to take risks. Hence, two categories of risk aversion were developed based on the responses given

i. Choosing option 1 - Risk averse

ii. Choosing option 2 – Not risk averse

3.5 Empirical strategy

3.5.1 Econometric model specification

To address the first objective of the study, which is to analyse the determinants of risk aversion, the following model was employed, following that of Dohmen et al. (2011), with additional covariates to suit the context of this study:

$$riskaversion_{ih} = \propto_1 + \propto_2 agegrp_{ih} + \propto_3 gender_{ih} + \propto_4 educ_{ih} + \propto_5 occu_{ih} + \propto_6 loc_{ih} + \propto_7 wealthquintile_{ih} + \propto_8 mstatus_{ih} + \propto_9 relig_{ih} + \propto_{10} region_{ih} + \mu_{ih} \quad (1)$$

where *i* denotes an individual in household *h*, *agegrp* represents the age group the respondent falls in, and is measured as a categorical variable, *gender* denotes whether the respondent is male or female. *educ* denotes the educational attainment of the respondent while *occu* represents the occupation of the respondent. *loc* denotes the location of the respondent while *wealthquintile* represents the wealth level of respondents. *mstatus* represents the marital status of the individual and *relig* denotes the religion of the respondent.

For the second objective, which is to investigate the effect of risk aversion on household enterprise ownership, the model is based on existing studies on risk aversion and entrepreneurship (Koudstaal et al., 2015). The following model is estimated:

$$Busown_{ih} = \beta_1 + \beta_2 riskaversion_{ih} + \beta_3 agegrp_{ih} + \beta_4 gender_{ih} + \beta_5 educ_{ih} + \beta_6 loc_{ih} + \beta_7 wealthquintile_{ih} + \beta_8 mstatus_{ih} + \varepsilon_{ih} \quad (2)$$

where *i* represents an individual in household *h*, *busown* is a dummy variable which denotes whether the individual owns a business or not, and risk aversion denotes the risk aversion level of the individual (categorised as risk averse or not risk averse). The other variables are the same as explained under Equation 1 above. Estimations for the first and second objective are done on the large sample of Ghanaians.

3.5.2 Explanatory variables for determinants of risk aversion and household enterprise ownership

To realise the first two objectives of the study, a number of independent variables were used in the analysis. The variables were selected based on existing literature (Sakha, 2019; Treibich, 2015).

Gender- Gender refers to the sex of the respondent, whether the respondent was male or female. 'Male' was used as the reference category. Existing literature has shown that females are more risk averse than males and this is the expected relationship for the study.

Age group- Age group variable categorises the ages of the respondents into 7 different categories (Under 20 years, 20-29 years, 30-39 years, 40-49 years, 50-59 years, 60-69 years and 70+ years). The reference category used is 'Under 20 years'. It is often the case that the youth are associated with more risk-taking behaviour than adults. As such, a concave

relationship is expected between risk aversion and age - risk aversion is lower with younger ages but increases as a person increases in age.

Marital Status- This variable specifies whether the respondent is never married, married or separated/divorced/widowed. The reference category used is 'never married'. Those who are not married usually have no commitment to spouses or children. Hence, it is predicted that they are less risk averse as compared with those who have married or are divorced/separated/widowed.

Wealth Quintile- The wealth quintile of the respondent was estimated to proxy for individual income. It is usually difficult to obtain the actual incomes of individuals from large scale surveys such as the GLSS. Hence, wealth scores are estimated using the consumption expenditure of the household. An index is constructed and further split into quintiles (poorest, poor, middle, rich and richest). As such, the wealth of the individual is dependent on the quintile he or she falls in. The reference category for wealth quintile is 'poorest'. It is expected that wealth is negatively related to risk aversion.

Religion- Existing literature shows that religion and other cultural factors influence risk attitudes and self-employment. Thus, religion is added to the variables considered in this study. The categories for religion are Christian, Islam and Other (Traditionalists, other religions, no religion). 'Christian' is used as the reference category. The expected association between risk aversion and religion is ambiguous.

Location- The "Location" variable measures the location of the respondent. Instead of using the generic classifications of urban and rural residence, specific geographic locations are employed which include Accra, urban coastal, urban forest, urban savannah, rural coastal, rural forest, and rural savannah, with 'Accra' as the reference category. Even though Accra is also an urban location, it was separated because it is the most urbanized location in the country, and

as such, it can contribute to certain differences that may be observed in the results. The location variable is included to see whether the location of an individual influences risk attitudes and self-employment. This is because economic and social conditions significantly differ between rural and urban settings and this can influence the degree of risk tolerance of individuals.

Education- This variable looks at the highest education level attained by the respondent. It was categorised into 6 groups. Those without formal education, those educated up to the primary level, those with JHS/Middle school certificates, those who have completed up to Secondary, those who have had tertiary education (this also includes PhD and professional certificate holders). Those without formal education are used as the reference category. A person who is educated is better equipped with knowledge and experience to take certain risks. Hence, a negative relationship is expected between risk aversion and educational level.

Occupation- "Occupation" variable measures the type of occupation engaged in by the respondent. The categories specified for the variable are 'managers/professionals', 'technicians/machine operators', 'clerical/service workers', 'armed forces/elementary occupations', 'skilled agriculture/fisheries/forestry', 'craft workers' and 'unemployed/not in labour force'. The unemployed/not in the labour force is used as the reference category. The nature of work and the income associated with the occupation can affect a person's risk attitude. It is expected that individuals who are in occupations that are associated with guaranteed income will be more risk averse as compared with those whose occupations have volatile incomes and are inherently risky.

Region – The variable region is also controlled for in the study. 10 regions are classified, which include Western, Central, Greater Accra, Volta, Eastern, Ashanti, Brong Ahafo, Northern, Upper East and Upper West regions. Western region is used as the reference category.

To achieve the third objective of the study, which looks at the effect of risk aversion on the source of finance for household enterprises, two models were estimated for this objective. These models rely on an earlier study by Osei-Assibey et al. (2012), and they have been slightly modified to suit the context of this study. The first looks at the effect of risk aversion on the decision to use self-financing as **start-up capital**. Risk aversion is expected to be positively related to self- financing. This implies that the more risk averse the business owner is, the more likely he or she is to go for self-financing. The second model looks at the effect of risk aversion on the choice to use loan financing as **working capital**. A negative relationship is expected between risk aversion and loan financing. This means that a business owner is less likely to use loan financing if he is risk averse. These two models are estimated on a sample of household enterprise owners.

Self-financing as start-up capital

$$self\_fin_{ih} = \gamma_1 + \gamma_2 riskaversion_{ih} + \gamma_3 firm\_age_{ih} + \gamma_4 firm\_size_{ih} + \gamma_5 enttype_{ih} + \gamma_6 access\_fin_{ih} + \gamma_7 wealthquintile_{ih} + \gamma_8 loc_{ih} + \epsilon_{ih} \quad (3)$$

Loan financing as working capital

$$loan\_fin_{ih} = \gamma_1 + \gamma_2 riskaversion_{ih} + \gamma_3 firm\_age_{ih} + \gamma_4 firm\_size_{ih} + \gamma_5 enttype_{ih} + \gamma_6 access\_fin_{ih} + \gamma_7 wealthquintile_{ih} + \gamma_8 loc_{ih} + \varepsilon_{ih} \quad (4)$$

Self_fin is a dummy variable denoting self-financing, with 1 = using self-financing as start-up capital and 0 = Not using self-financing as start-up capital. *i* represents an individual in household *h* and *riskaversion* denotes the level of risk aversion of the individual. *Firm_age* is a continuous variable representing the number of years the enterprise has been operating and *firmsize* is a categorical variable denoting the size of the enterprise. *Enttype* also represents the nature of business of the enterprise (manufacturing and construction activities, wholesale/retail trade, services other than wholesale/retail, preparation and sale of meals). *Access_fin* is a

dummy variable which measures if an individual has access to finance or not. *Wealthquintile* and *loc* are the same as explained in the previous models.

3.5.3 Explanatory variables for risk aversion and source of financing for household enterprises

In achieving the last objective of the study, these explanatory variables were used. The variables were chosen based on existing literature (Osei-Assibey et al., 2012; Rao & Kumar, 2018).

Firm age – The age of the establishment was classified as a continuous variable. It is measured as how long the household enterprise has been operating. Within the capital structure literature, the age of an establishment is considered as a means of measuring reputation (Abor, 2008). The older the business, the higher the probability of obtaining access to external capital, since it is in a position to build substantial asset structure and long-standing relationships with suppliers and credit providers. The age of the business is expected to be positively associated to loan financing.

Firm size – The enterprise size is proxied by the number of employees engaged by the enterprise. This variable is categorised as "no employee" (enterprise operated by a single individual), "micro-sized" (1-5 employees), "small-sized" (6-30 employees), and "medium-sized" (31-100 employees). Just like firm age, a positive relationship between firm size and loan financing is predicted.

Enterprise type – The type of enterprise variable is separated into four categories, based upon the principal activity of the household enterprise. The categories are: "manufacturing and construction activities", "wholesale/retail trade", "services other than wholesale/retail", and "preparation and sale of meals". The nature of business of the enterprise can determine the type

of financing sought for. It is expected that businesses that require substantial investments of resources will be more prone to going in for external finance.

Access to finance – The access to finance variable seeks to measure the ease with which household enterprises can obtain funds for their businesses. Specifically, it measures the presence of a financial institution such as a bank, microfinance, etc in the community the household enterprise owner is in. Access to finance is predicted to be positively associated with loan financing and negatively associated with self-financing.

Wealth quintile– Wealth quintile is also controlled for in achieving the third objective. The measurement is the same as described above. It is expected that wealth is negatively related to self-financing and positively related to loan financing. This is because greater wealth signifies more credit worthiness. As such, it will be easier for a richer household enterprise owner to obtain external credit as opposed to a poorer one.

Location – The measurement for location of the household enterprise owner is the same as described above. The location variable is included to see whether the financing options chosen by household enterprise owners vary with location.

3.5.4 Estimation Technique (Probit Regression)

As a result of the binary feature of the dependent variables for all the models estimated for the three objectives, a Probit regression was used for the analysis and marginal effects was computed.

When the dependent variable has a binary outcome (i.e., takes on two values), a Probit or Logit model can be used. The Probit model estimates the probability that y (a dependent variable) = 1 and is a function of the independent variables:

$$p = pr[y = 1|x] = f(x'\beta) \quad (5)$$

For the Probit model, $F(x'\beta)$ is the cumulative distribution function of the standard normal distribution:

$$F(x'\beta) = \varphi(x'\beta) = \int_{-\infty}^{x'\beta} \emptyset\,(z)dz \quad (6)$$

The limits of the predicted probabilities lies in $[0, 1]$

The difference between the Probit and logit model is not much. As such, there is no practical reason for choosing one over the other. The difference lies in the link function ($F(x'\beta)$); for the logit model, the link function is the logistic distribution's cumulative distribution function. The limits of the predicted probabilities, just like the Probit model, lies in $[0, 1]$. All estimations are done using STATA 15 and the *svy* suite in STATA is used to take into consideration the complex survey design of GLSS 7. The standard errors are also clustered at the primary sampling unit, which happens to be the enumeration area in the data used for this study to allow for possible correlation amongst observations in the same enumeration area.

3.5.5 Robustness Tests (Propensity Score Matching)

Considering the objectives of the study, it can be observed that there might be possible endogeneity in the risk aversion variable. Risk aversion can influence the outcome variables (household enterprise ownership and financing preference) and at the same time, these outcome variables can influence risk attitude. In addition, it can also be observed that the models to be estimated are more of a system i.e., some factors such as gender, education, wealth, amongst others shape risk attitudes and then risk attitudes impact the decision to own a household enterprise and also the choice of financing for the household enterprise. The risk attitude variable is not random as such estimators like the Propensity Score Matching technique that

accounts for such a system can complement the Probit estimations and control for possible endogeneity. This technique was first introduced by Rosenbaum and Rubin (1983). A propensity score is first estimated for each observation in the sample which predicts the probability that an observation receives a treatment based on their observed characteristics. Based on the propensity scores, observations in the treated group are matched to similar observations in the control group, then the average treatment effect is estimated. The methodology is further explained with this:

Let D represent a binary variable that indicates whether an observation received the treatment or not. Hence $D = 1$ for treated observations and $D = 0$ for the control observations. The technique uses a probit/logit model to estimate propensity scores that observations receive the treatment while controlling for *x* variables that may influence the likelihood of being assigned to the treated group. The model is specified below:

$$p(x) = prob\,(D = 1|x) = E(D|x) \qquad (7)$$

p (propensity score), is the conditional probability of receiving the treatment given the pre-treatment characteristics of x.

The propensity scores of the treated and control groups are then matched using different matching techniques such as kernel, nearest neighbour, stratification and radius.

D is the dependent variable and x are the independent variables.

CHAPTER FOUR

FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter provides an analysis of the data used for the study. The first part shows a descriptive analysis. The second part provides an analysis of the determinants of risk aversion of the respondents. The third part describes the relationship between risk aversion and self-employment. The relationship between risk aversion and household enterprise financing is then analysed and the final part provides an analysis of the robustness tests.

4.2. Descriptive Characteristics

Table 4.1 presents the descriptive characteristics of the sample used for the analysis. The first and second columns report summary values for individuals who fall in the different categories of risk aversion (not risk averse and risk averse respectively). The last column reports values for the full sample. The information used to measure risk aversion was collected only for respondents aged 12 years and above, and as such, the sample was restricted to 37,945 individuals from 14,009 households. Out of this, risk averse individuals represent the larger category (83%) while 17% of individuals are not risk averse. This suggests that a high fraction of Ghanaians is risk averse.

Considering the gender dimension, the table shows that more than half of the participants (53%) are female. As expected, females are more likely to be risk averse than males (54% compared with 48%).

Table 4. 1 Background Characteristics of Study Respondents

VARIABLES	Not Risk Averse	Risk Averse	All
Individual Characteristics			
Number of Observations	17.20% (6,514)	82.80% (31,350)	37,864
Gender			
Male	52.49%	45.91%	47.04%
Female	47.51%	54.09%	52.96%
Age group			
Under 20 years	28.81%	26.85%	27.19%
20-29 years	22.75%	21.45%	21.67%
30-39 years	17.04%	17.14%	17.12%
40-49 years	12.85%	12.90%	12.89%
50-59 years	8.44%	9.33%	9.17%
60-69 years	5.08%	6.09%	5.92%
70+ years	5.02%	6.25%	6.04%
Marital Status			
Never married	47.53%	41.79%	42.78%
Married	42.48%	45.85%	45.27%
Separated/Divorce/Widowed	9.99%	12.36%	11.95%
Wealth Quintile			
Poorest	31.59%	29.94%	30.23%
Poor	16.73%	22.04%	21.13%
Middle	14.05%	17.75%	17.11%
Rich	16.36%	15.43%	15.59%
Richest	21.26%	14.84%	15.94%
Religion			
Christian	70.28%	67.71%	68.15%
Islam	17.50%	85.81%	21.22%
Other	12.22%	10.30%	10.63%
Location			
Accra	5.04%	3.36%	3.66%
Urban Coastal	16.10%	10.36%	11.41%
Urban Forest	14.49%	14.63%	14.59%
Urban Savannah	8.06%	8.86%	8.70%
Rural Coastal	8.77%	7.45%	7.67%
Rural Forest	14.81%	21.18%	20.06%
Rural Savannah	32.73%	34.15%	33.92%
Occupation			
Unemployed/Not in labour force	43.53%	39.81%	40.45%
Managers/Professionals	5.01%	3.62%	3.86%
Technicians/Machine Operators	4.13%	3.28%	3.43%
Clerical/Service Workers	12.73%	11.74%	11.91%
Armed Forces/Elementary Occupations	2.34%	2.43%	2.41%
Skilled Agric/Forestry/Fisheries	23.24%	30.60%	29.33%
Craft Workers	9.02%	8.52%	8.60%
Education			

VARIABLES	Not Risk Averse	Risk Averse	All
None	22.10%	24.66%	24.22%
Primary/JHS/Middle School	57.31%	60.25%	59.74%
Secondary	12.15%	9.44%	9.90%
Tertiary	8.45%	5.65%	6.13%
Business Ownership			
Yes	79.80%	69.26%	12.72%
No	20.20%	30.74%	87.28%
Enterprise Characteristics			
Number of observations	1,032	5,729	6,761
Access to Financial Services			
Yes	46.94%	41.74%	42.50%
No	53.06%	58.26%	57.50%
Nature of Business Capital			
Loan	9.70%	12.14%	11.77%
Gift	13.87%	16.03%	15.70%
Self-financed	76.43%	71.83%	72.53%
Enterprise Type			
Manufacturing and Construction	15.99%	19.28%	18.78%
Wholesale/Retail Trade	45.74%	44.75%	44.90%
Services other than wholesale/retail	25.10%	21.36%	21.93%
Preparation and Sale of Meal	13.18%	14.60%	14.39%
Average enterprise age	7.39	7.90	7.82
Average enterprise size (total workers)	1.36	1.09	1.14

Notes: This table reports the proportion of respondents for the variables considered in the study under the different categories of Not risk averse, Risk averse, and Total sample. It also presents the characteristics of household enterprises used in the study.

The table also shows that individuals in the sample are quite young. A large proportion of the total sample is less than 30 years (27%). A study of the age distribution shows that the age structure of both risk averse and non-risk averse persons is quite similar. It is observed that persons aged 29 years and below are characterised with less risk aversion. However, beyond that age, individuals are more likely to be risk averse. The proportion of married persons is slightly higher than individuals who have never married (45% compared with 43%). Among risk averse persons, a high fraction are married while amongst non-risk averse persons, a high fraction are never married.

A greater proportion of individuals belong to the poorest wealth quintile (30%) while about 16% are considered to be very rich. The wealth distribution of risk averse and non-risk averse persons is quite different. It can be observed that risk aversion seems to decrease as wealth increases. 15% of risk averse persons belong to the richest wealth quintile, as compared with 21% of non-risk averse persons, who belong to the richest quintile. A large proportion of individuals are Christians, followed by Muslims. Amongst risk averse persons, Muslims are the majority while a high fraction of non-risk averse persons are Christians.

In addition, more than half of the respondents (62%) stay in rural areas, with the largest proportion staying in the rural savannah. In terms of location distribution, persons from rural areas have a higher likelihood of being risk averse than those from urban areas. Table 4.1 also shows that majority of the individuals in the sample are either unemployed or not in the labour force. This is consistent with the observation made above that the sample is quite youthful, and as such, a significant proportion of individuals might not be in the working force yet.

Risk aversion is fairly low amongst these occupations: managers/professionals and technicians/machine operators. Greater levels of risk aversion are linked with skilled agriculture/forestry/fisheries workers, armed forces/elementary occupations and craft workers. In terms of education, it can be observed that a large proportion of the sample had received education up to the primary level. The distribution of education is fairly similar amongst risk averse and non-risk averse persons. A large proportion of the sample (87%) do not have their own businesses.

In terms of the enterprise characteristics, Table 4.1 shows that a little over half of household enterprise owners do not have access to financial services (58%), and this proportion is similar across the risk aversion categories. In addition, an overwhelming percentage of household enterprises depend on self-financing as start-up capital. Out of this proportion, household

enterprise owners who are not risk averse are about 5 percentage points more likely to use self-financing. Enterprises that engage in wholesale and retail trade are the most common enterprise type. In addition, the average household enterprise has operated for about 8 years and employs one worker. These characteristics are similar across the risk aversion classifications.

4.3 Determinants of Risk Aversion

Table 4.2 presents the results of the determinants of risk aversion. The table reports the marginal effects from a Probit regression with standard errors reported in parentheses. The outcome variable is an indicator variable that takes a value of 1 if the individual is risk averse and zero otherwise.

The results indicate that females are more likely to be risk averse as compared with males. Specifically, females are 3 percentage points more likely to be risk averse than males, and this is significant at 1 percent. This finding is consistent with empirical literature (Ackah et al., 2019; Charness & Gneezy, 2012; Croson & Gneezy, 2009; De Paola, 2013; Dohmen et al., 2011; Eckel & Grossman, 2008b). This gender difference can be useful in explaining differences in the social behaviour and economic decisions of Ghanaians. For instance, Asravor (2019) examined the risk preferences of farmers in Northern Ghana and the risk management strategies they adopt. Their results showed that female headed households were more likely to manage risk through the use of inorganic fertiliser and herbicides on their farms compared with male-headed households. This behaviour can be attributed to the general unwillingness of females to take risks as compared with males. As such, they are more likely to adopt strategies that will lower their risk level.

The study did not find a significant effect of the age variable. Findings from the study also suggest that individuals who are married are 4 percentage points more likely to be risk averse

in comparison with individuals who have never married, and this is significant at 1 percent. Similarly, those who are separated, divorced or widowed are 5 percentage points more likely to be risk averse as opposed to those who have never married.

Table 4. 2 Determinants of Risk Aversion

Variables	Marginal Effect	Standard Errors
Gender		
Male (ref)		
Female	0.033***	(0.007)
Age group		
Under 20 years (ref)		
20-29 years	-0.002	(0.011)
30-39 years	0.003	(0.013)
40-49 years	-0.017	(0.014)
50-59 years	-0.012	(0.016)
60-69 years	0.009	(0.016)
70+ years	0.018	(0.017)
Marital Status		
Never married (ref)		
Married	0.036***	(0.010)
Separated/Divorce/Widowed	0.046***	(0.014)
Education		
None (ref)		
Primary	0.007	(0.010)
JHS/Middle	0.011	(0.011)
Secondary	-0.020	(0.015)
Tertiary	-0.030	(0.019)
Wealth Quintile		
Poorest (ref)		
Poorer	0.038**	(0.018)
Middle	0.044**	(0.020)
Rich	0.012	(0.023)
Richest	-0.003	(0.025)
Religion		
Christian (ref)		
Islam	0.040**	(0.017)
Other	-0.046***	(0.015)
Location		
Accra (ref)		
Urban Coastal	-0.132**	(0.054)
Urban Forest	0.076	(0.062)
Urban Savannah	0.072	(0.072)
Rural Coastal	-0.084	(0.059)

Variables	Marginal Effect	Standard Errors
Rural Forest	0.075	(0.060)
Rural Savannah	0.092	(0.064)
Occupation		
Unemployed/Not in labour force (ref)		
Managers/Professionals	-0.007	(0.015)
Technicians/Machine Operators	-0.009	(0.017)
Clerical/Service Workers	-0.004	(0.011)
Armed Forces/Elementary Occupations	0.005	(0.022)
Skilled Agric/Forestry/Fisheries	0.008	(0.012)
Craft Workers	-0.024**	(0.011)
Observations	37,647	37,647

Notes: This table presents marginal effects from a Probit regression model. The sample used for this regression are all respondents aged 12 years and above. Standard errors are reported in parentheses and in all regressions, standard errors are clustered at the enumeration area level. Although not reported, the model controlled for the variable *region.* *** p<0.01, ** p<0.05, * p<0.1

This is consistent with existing findings from Dohmen et al. (2011); Halek and Eisenhauer (2001); Hartog et al. (2002); Roussanov and Savor (2012). Dohmen et al. (2011) conducted a study of German adults using the 2004 round of the German Socio-Economic Panel (SOEP). Their results showed that, compared with those who have never married, married and widowed persons are less prone to take risks. Earlier findings of Halek and Eisenhauer (2001); Hallahan, Faff, and McKenzie (2004) and Kim and Lee (2012) also show that risk aversion increases for married respondents. These findings are justified because the presence of a partner and possibly, children can make a person more likely to avoid risky behaviour. The education variable was found not to have a significant effect on risk attitude.

Consistent with expectations, the results from Table 4.2 show a negative relationship between risk aversion and wealth and this relationship is significant at 5 percent. In effect, wealthier persons are less likely to be risk averse. In fact, individuals who belong to the "richest" category are 0.3 percentage points less likely to be risk averse as against those in the poorest quintile. This finding shows that the individuals considered in the study exhibit decreasing absolute risk aversion. This finding is not surprising because larger levels of wealth can cushion an

individual from losses that may be incurred from risky choices. Guiso and Paiella (2018) found that amongst risk averse consumers, the extent of risk aversion decreases with individual endowment. Dohmen et al. (2011a) also included wealth or income as part of their controls when investigating the determinants of willingness to take risk using the SOEP, and their results showed that wealth is positively and significantly related to risk attitudes. Focusing on the Ghanaian context, Hillesland (2019) examined gender variations in the asset allocation decisions of women using a gender-disaggregated survey on household asset and wealth carried out in Ghana in 2010. They found evidence that showed that wealth is positively and significantly related to their risk aversion measure.

The religious or cultural beliefs of a group of people may either inhibit them from engaging in certain activities or influence them to take up certain behaviours. The results suggest that respondents who practise Islam are 4 percentage points more likely to report being risk averse as compared with Christians, and this is significant at 5 percent. Those who belong to other religions and individuals with no religion are 5 percentage points less likely to be risk averse as compared with Christians. The general belief is that persons who are not affiliated to any religion are not affected by any risk-limited doctrines, unlike other religious individuals, who might consider the moral and ethical implications of certain activities, which is likely to make them risk averse. Ayifah et al. (2020) estimated the influence of religion on the risk attitudes of rural Ghanaian women and found a negative effect of religion on willingness to take risks; specifically, compared with non-religious women, Protestants, Catholics, Muslims and Traditionalists are less willing to take risks. Köbrich and Pfeifer (2017) also examined the association between risk attitudes and religious affiliation and participation using the German socio-economic panel data of households from 1984-2006. Their findings indicated that Catholics and Protestants are more likely to be risk averse than non-religious persons while Muslims are likely to be more risk averse than Catholics and Protestants.

The empirical estimations also indicate that respondents from coastal areas (both rural and urban) have a lower likelihood of being risk averse as compared with those from Accra. On the contrary, those from forest and savannah zones (both rural and urban) have a higher likelihood of being more risk averse than individuals from Accra.

Furthermore, the type of occupation reported by the respondent can influence risk aversion level. The results suggest that respondents who have occupations in skilled agriculture, fisheries, forestry and armed forces or elementary occupations are about 1 percentage point more likely to report being risk averse as against those who are unemployed or not in the labour force. On the other hand, managers/professionals, technicians/machine operators, clerical/service workers and craft workers are less likely to be risk averse in comparison with the unemployed and those not in the labour force.

4.4 Effect of Risk Aversion on Business Ownership

Table 4.3 presents the results on the effect of risk aversion on business ownership. The table reports marginal effects from a Probit regression model along with the standard errors. The results from Table 4.3 show that risk aversion is a significant determinant of owning a business. Relative to individuals who are not risk averse, risk averse persons are 7 percentage points less likely to own their own businesses (household enterprise). This finding is in consistency with existing literature and in line with expectations.

Table 4. 3 Risk aversion and Business Ownership

Variables	Marginal Effect	Standard Errors
Risk aversion		
Not risk averse (ref)		
Risk averse	-0.069***	(0.024)
Gender		
Male (ref)		
Female	0.057***	(0.016)
Age group		
Under 20 years (ref)		
20-29 years	0.059	(0.046)
30-39 years	0.019	(0.048)
40-49 years	-0.037	(0.051)
50-59 years	-0.035	(0.052)
60-69 years	-0.015	(0.055)
70+ years	0.017	(0.079)
Marital Status		
Never married (ref)		
Married	0.007	(0.025)
Separated/Divorce/Widowed	-0.015	(0.032)
Education		
Primary (ref)		
JHS/Middle	0.018	(0.015)
Secondary	0.007	(0.029)
Tertiary	-0.042	(0.032)
Wealth Quintile		
Poorest (ref)		
Poorer	0.038	(0.036)
Middle	0.041	(0.036)
Rich	0.096**	(0.039)
Richest	0.121***	(0.039)
Location		
Accra (ref)		
Urban Coastal	-0.022	(0.036)
Urban Forest	-0.072**	(0.035)
Urban Savannah	-0.071	(0.048)
Rural Coastal	-0.236***	(0.056)
Rural Forest	-0.309***	(0.043)
Rural Savannah	-0.304***	(0.049)
Observations	5,045	5,045

Notes: This table reports marginal effects from a Probit regression model. The sample used for this regression are all respondents aged 12 years and above. Standard errors are reported in parentheses and in all regressions, standard errors are clustered at the enumeration area level. Although not reported, the model controlled for the variable *region.* *** p<0.01, ** p<0.05, * p<0.1

Block et al. (2015) tested the hypothesis that a positive relationship exists between opportunity entrepreneurs and the willingness to take entrepreneurial risk. Using a sample of 1,526 early-stage entrepreneurs in Germany, they found that risk attitude has an impact on the drive to commence a venture. Segregating the entrepreneurs between opportunity and necessity entrepreneurs, their results show that individuals with a higher risk tolerance are more likely to start their businesses for opportunity reasons (i.e., to take advantage of a business opportunity). Similarly, Brachert et al. (2017) investigated the relationship between risk attitudes and entrepreneurship using the German Socio-Economic Panel (SOEP) from 2003 to 2012. Their results show that becoming self-employed influences an individual's willingness to take risks. Particularly, when an individual is more willing to take risks upon becoming self-employed, the possibility of remaining in self-employment also increases. Starting a business requires identifying a business prospect, embracing all the risks it comes with and taking advantage of the opportunity to earn income. As such, individuals who are less risk averse have a higher likelihood of starting their own business.

Table 4.3 also shows that females are 6 percentage points more likely to own a business as compared with males, and this relationship is significant. A further investigation into the data shows a distinct gender gap in the ownership of household enterprises. Out of those who own household enterprises, 31% are male and 69% are female. Fox and Sohnesen (2012) indicated that "this gender specialization has existed and persisted for many years" in Ghana. A possible explanation for this could be that since majority of these household enterprises do not require large investments and are on a small scale, most women go into it while men take up more effort demanding and rewarding jobs in order to earn extra income for the household. It is worth noting that this gender segregation does not exist in other African countries. Countries such as Uganda, Mozambique, Burkina Faso, Congo, Rwanda and Cameroon have a fair

representation of both genders in the ownership of household enterprises (Fox & Sohnesen, 2012).

The results show that age, marital status and education are not significant determinants of business ownership; however, wealth and location are. With regard to wealth, the results indicate a positive relationship between wealth and business ownership. Compared with individuals who belong to the "poorest" category, wealthier persons are more likely to own their own businesses. This indicates that wealth is an important factor in explaining the entrepreneurial decision; specifically, those who fall in the "richest" wealth quintile are 12 percentage points more likely to be self-employed than persons who are considered to be very poor. Existing literature shows evidence that individuals from wealthier households are likely to undertake self-employment due to the start-up capital requirements (Childers, 2011; De Blasio, De Paola, Poy, & Scoppa, 2018; Skriabikova et al., 2014). Blasio, Paola, Poy, and Scoppa (2018), using multiple rounds of the Bank of Italy Survey of Household Income and Wealth, find a positive relationship between wealth and the decision to be self-employed. To consider the possible impact of risk aversion on business ownership in the presence of financial constraint, wealth was interacted with risk aversion but the effect was not significant. The results have however been presented in the appendix.

In terms of the residential location of the individual, the results from Table 4.3 show that location has an impact on owning a business. The likelihood of being self-employed for persons in locations other than Accra is lower, and this relationship is significant. A closer examination of the results reveals that in comparison with Accra, individuals from rural areas have a greater likelihood of not owning their business in comparison with persons from urban areas. For instance, persons from urban coastal regions are 2 percentage points less likely be self-employed as compared with those from Accra while persons from rural coastal regions are 24 percentage points less likely to be self-employed. Two possible explanations exist for this

finding. Firstly, the primary employment of most rural dwellers is farming, and hence, they are more likely to engage in farming than other non-farm employment such as owning a household enterprise. Secondly, urban inhabitants and migrants to Accra might see starting a household enterprise as a means to earn income. As such, there is a higher chance for them to be self-employed.

4.5 Risk Aversion and Sources of Financing for Household Enterprises.

Two Probit regression models were estimated to investigate the effect of risk aversion on source of financing. The first model considers the effect of risk aversion on using self-financing as start-up capital while controlling for variables such as enterprise age, size, enterprise type, wealth quintile, access to finance and location. The second model looks at the effect of risk aversion on using loan financing as working capital with the same controls used in the first model.

Table 4.4 reports the effects of risk aversion on the modes of financing. Column one presents the results for using self-financing as start-up capital while column two presents the results for using loan financing as working capital. In both cases, marginal effects from Probit regressions are reported, with standard errors in brackets.

4.5.1 Self-financing as start-up capital

The results indicate that risk aversion significantly predicts the use of the self-financing option as start-up capital for household enterprises. Specifically, relative to individuals who are not risk averse, risk averse household enterprise owners are 5 percentage points less likely to self-finance their business at the start-up stage. This explains that risk averse business owners are

more likely to resort to other forms of financing, such as loan financing to start their businesses. This finding is in contrast to our expectations that risk averse business owners are more likely to self-finance their business so as to avoid the risks of external financing. This difference could stem from the fact that Ghanaian household enterprise owners might perceive using their personal funds to finance a new venture, risky. Given that entrepreneurs will select financing options that they perceive as less risky shows that household enterprise owners associate less risk with external forms of finance as compared with their own funds. This is because they might not be certain of the outcome of the business, whether it might succeed or fail. Such persons might rather be comfortable saving their hard-earned money or engaging in less risky investments such as Treasury bills, which can guarantee them more financial rewards. If such risk averse persons decide to start their own business, it is highly probable that they will look to other external sources for funds, sources where they bear less risk.

In addition, due to the issue of information asymmetry, together with the aim of lowering risk, financial institutions such as banks and micro-finance institutions require small and medium scale enterprises to prove creditworthiness before extending credit to them. Because of improper book keeping and poor managerial skills, most SMEs are unable to obtain external finance (Tagoe, Nyarko, & Anuwa-Amarh, 2005). Since these financial providers usually bear the most risk when offering credit facilities to business owners, it can explain the reason why risk averse persons are more likely to prefer loan financing. It also explains why access to finance is the primary limitation for small-scale business owners in the country. As majority of Ghanaians have been found to be risk averse, the results show that improved access to credit has the potential of increasing entry into entrepreneurship in the country, which will subsequently improve economic growth.

The results also indicate that enterprise age is a significant determinant of using self-financing as start-up capital. The likelihood of using self-financing increases by 0.3 percentage points

with an additional 1 year increase in the age of the enterprise. The results did not show a significant effect of enterprise size. The type of enterprise also has an influence on using self-financing as start-up capital for a household enterprise. The results show that relative to manufacturing and construction activities, firms that engage in wholesale/retail are 7 percentage points less likely to use self-financing as start-up capital for their business. This implies that those who engage in wholesale and retail businesses are more likely to look to other external sources such as trade credit or loans to start their business. Because of the quick turnover that is usually associated with retail businesses, it is relatively easier for such businesses to obtain credit from others to start the business. Table 4.4 also shows that enterprises that are engaged in services other than wholesale/retail have a higher likelihood of self-financing their businesses in comparison to manufacturing and construction activities. Also, enterprises that deal in the preparation and sale of meals are 9 percentage points less likely to opt for self-financing to start their business as compared with manufacturing and construction activities. The overall results highlight that enterprise type is a significant determinant of the type of financing chosen by a business owner.

Although not significant, the results show that business owners who have access to financial services (with regard to proximity of financial institutions to their community) are less likely to use self-financing as start-up capital for their businesses. The insignificance of the access of finance variable to the choice of financing for business suggests that even though capital/credit deficiency is a major challenge to start-up and expansion of household enterprises, this challenge is not entirely due to lack of access to financial institutions (it should be noted that the access to finance variable was proxied as the presence of a financial institution in the community). Over the years, a lot of efforts have been made by the government and other development agencies to increase access to financial services through formal (banks) and semi-formal (non-bank financial institutions) means for a lot of small and medium scale

establishments. As such, the capital constraint problem is probably due to inadequacies in financial literacy and business skills as well as low confidence in the ability of business owners to fulfil their debt obligations. Hence, this might hinder financial service operators from extending credit to these business owners. It can also be attributed to inadequate financial products that address the needs of small businesses. The World Bank (2011) conducted a 2-year study of household enterprises in Ghana to understand the dynamics of their operations, the risks faced as well as ways to mitigate these risks and raise the productivity of household enterprises in Ghana. On the issue of access to finance, they discovered that unlike other sub-Saharan African countries, household enterprises in Ghana have better access to financial services. However, the "lack of appropriate banking products for household enterprises and high interest rates" are some factors that contribute to the inadequate capital problem.

Controlling for the wealth levels of household enterprise owners, the results indicate that the rich business owners are less likely to use self-financing at the start-up stage. This result indicates that the more wealth a business owner possesses, the more credit-worthy he/she appears; hence their risk is less as compared with poor persons who would like to start an enterprise. This result is in line with Osei-Assibey and Twerefou (2011), who investigated the determinants of financing behaviour of microenterprise owners in Ghana and whether the financing pattern follows the Pecking Order Hypothesis. Their findings revealed that the household assets of the business owner are a significant and positive determinant of debt or external financing at the start-up level. They explained that the owner is likely to obtain external finance if he or she is in a position to post assets as collateral for the loan.

In terms of the location of the household enterprise owner, the results showed that location is a significant determinant of the use of self-financing as start-up capital for household enterprises. Compared with household enterprise owners in Accra, owners in all other locations are less likely to use self-financing as start-up capital. Specifically, those from the urban forest

zone are 7 percentage points less likely to start their own business, and this is significant at 10 percent. This suggests that household enterprises in other areas apart from Accra are more likely to opt for other forms of financing other than self-financing.

Table 4. 4 Risk aversion and source of financing of household enterprises

VARIABLES	Self-financing as start-up capital	Loan financing as working capital
	(1)	(2)
Risk aversion		
Not risk averse (ref)		
Risk averse	-0.047*	0.009
	(0.026)	(0.017)
Firm age	0.003***	0.002***
	(0.001)	(0.001)
Firm size		
No employee (ref)		
Micro-sized (1-5 workers)	0.013	-0.002
	(0.019)	(0.015)
Small-sized (6-30 workers)	0.007	0.058
	(0.059)	(0.043)
Medium Size (31-100 workers)	-	0.625**
		(0.312)
Enterprise Type		
Manufacturing and Construction Activities (ref)		
Wholesale/Retail Trade	-0.069***	0.053***
	(0.020)	(0.016)
Services other than wholesale/retail	0.014	-0.024
	(0.024)	(0.015)
Preparation and Sale of Meals	-0.094***	0.051***
	(0.029)	(0.018)
Access to finance	-0.029	-0.012
	(0.026)	(0.02)
Wealth Quintile		
Poorest (ref)		
Poorer	0.001	0.033**
	(0.026)	(0.015)
Middle	-0.035	0.030**
	(0.028)	(0.015)
Rich	-0.025	0.069***
	(0.029)	(0.018)

VARIABLES	Self-financing as start-up capital	Loan financing as working capital
Richest	-0.056*	0.054***
	(0.030)	(0.017)
Location		
Accra (ref)		
Urban Coastal	-0.061	0.000
	(0.045)	(0.035)
Urban Forest	-0.071*	-0.022
	(0.040)	(0.025)
Urban Savannah	-0.061	0.007
	(0.045)	(0.03)
Rural Coastal	-0.020	-0.023
	(0.046)	(0.032)
Rural Forest	-0.052	0.047
	(0.046)	(0.036)
Rural Savannah	-0.047	0.046
	(0.046)	(0.039)
Observations	**5,137**	**5,138**

Notes: Table 4.4 presents marginal effects from 2 Probit regression models. The sample used for this regression are all respondents aged 12 years and above. Standard errors are reported in parentheses and in all regressions, standard errors are clustered at the enumeration area level. *** p<0.01, ** p<0.05, * p<0.1

4.5.2 Loan Financing as working capital

To fulfil the third objective of this paper, the study also considered a second model that estimates whether risk aversion determines the likelihood of using loan financing as working capital to run the operations of a household enterprise. The controls used in the second model are the same as the first.

Working capital of a business is seen as the capital that is used in running the everyday activities of the business. It is the difference between the current assets (cash, account receivable, inventory) and the current liabilities (account payable), and it also measures the financial health, operational efficiency and the liquidity of a business. A company has the potential to grow and invest if it has a positive working capital. On the other hand, a negative working capital signals poor performance of the business. Against this backdrop, it can be

realized that in the course of running a business, debt cannot be used as working capital; rather, it would only be used to cater for any expansion or investment need such as revamping the business or adding another product line to the business. The results for this section will therefore be interpreted in this light.

Table 4.4 shows that unlike self-financing, risk aversion is not a significant determinant of using loan financing as working capital for the operations of household enterprises; however, some other variables are.

The age of the firm is a significant determinant of using loan financing as working capital for household enterprises. The results indicate a positive relationship between age and the likelihood of using loan financing as working capital. This result is very plausible because older firms have more capacity to secure external finance unlike newer firms, who might not have built substantial asset structure and established business relationships with suppliers and external finance institutions. This result is in consistency with the finding of Osei-Assibey and Twerefou (2011), that age is a significant determinant of the type of financing chosen by an SME. Their results show that in comparison with new enterprises, mature enterprises are more likely to prefer external formal finance for the working capital and future financing needs; however, newer firms are likely to opt for internal financing and less risky financing options, such as SUSU schemes or trade credit.

The results also show that enterprise size is a significant determinant of using loan financing as working capital. Specifically, compared with enterprises which are operated by single individuals, medium-sized enterprises are about 63 percentage points more likely to use loan financing as working capital. The number of employees working in the enterprise gives a clue to the scale of operations/activities of the enterprise. A household enterprise that operates on

a sufficiently large scale might find its internal finances inadequate to further expand or invest in the business. As such, it is probable that such an enterprise might look for external financing.

Results from Table 4.4 show that the type of enterprise is a significant determinant of using loan financing as working capital. The results show that relative to enterprises involved in manufacturing and construction activities, wholesale/retail enterprises are 5 percentage points more likely to go in for loan financing as working capital. On the other hand, enterprises that engage in services other than wholesale and retail are 2 percentage points less likely to go for loan financing as working capital. Enterprises that engage in the preparation and sale of meals are 5 percentage points more likely to go in for loan financing as working capital. It can be observed from the results that enterprises that are likely to opt for loan financing as working capital are less likely to choose self-financing as start-up capital, and vice versa. This goes to explain that the very nature of an enterprise can cause it to opt for a particular type of financing. Hence, external finance providers can target their services and products to enterprises that are more prone to use their services.

The results also show that access to finance is negatively related to the probability of using loan financing as working capital, although this is not significant. On the wealth of the enterprise owner, the results from Table 4.4 show that wealth is a positive and significant determinant of using loan financing as working capital. It indicates that the wealthier the enterprise owner, the higher the likelihood of using loan financing. Just as the results for the wealth variable was explained under the self-financing section, it shows that wealthier individuals are perceived to be more credit worthy and less risky. As such, they have a greater likelihood of getting loans from external finance providers as against household enterprise owners who are very poor.

4.6 Robustness Checks

The relationship between risk aversion and household enterprise ownership or financing preference of enterprise owners may be influenced by endogeneity issues possibly emanating from the selection bias or the association between risk attitude and the outcome variables. To address this possible endogeneity concern, the propensity score matching technique is employed to estimate the effect of risk aversion on the outcome variables.

Generally, the PSM results show largely similar findings to the Probit estimates. Table 4.5 presents the results. First, for the effect of risk aversion on household enterprise ownership (Column 1) and then for the effect of risk aversion on self-financing (Column 2) and finally for loan financing (Column 3). Results are presented for average treatment effect (using nearest neighbour matching).

When each subject in the treatment group (risk averse) is matched to one other subject in the control group (non-risk averse) (Nearest neighbour matching $= 1$), the estimate of the ATE of risk aversion on household enterprise ownership shows that on average risk averse persons are 8 percentage points less likely to own household enterprises compared to persons who are not risk averse. Similar results are also obtained when a risk averse person is matched to at least 2 non-risk averse persons. Risk averse persons are about 7 percentage points less likely to own their business.

For self-financing, the average treatment effect shows that risk aversion is not a significant determinant of using self-financing as start-up capital. However, when a risk averse person is matched to two non-risk averse persons, the effect is significant. Risk averse persons are 4 percentage points less likely to use self-financing as start-up capital. Similar to the Probit regression, the effect of risk aversion on loan-financing as working capital is not significant.

Table 4. 5 Propensity Score Matching: Treatment Effects

Variables	(1)	(2)	(3)
Average Treatment Effect (Nearest neighbour matching = 1)	-0.081***	-0.024	0.007
	(0.020)	(0.022)	(0.014)
Average Treatment Effect (Nearest neighbour matching = 2)	-0.073***	-0.039**	0.009
	(0.018)	(0.019)	(0.014)
Observations	**5,045**	**5,139**	**5,138**

The table presents the treatment effects estimation for the effect of risk aversion on household enterprise ownership and choice of finance using propensity score matching. Results are presented for the average treatment effects (ATE). Standard errors are reported in parenthesess. *** p<0.01, ** p<0.05, * p<0.1

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This is the concluding chapter to this study. It summarizes the findings generated from the study. The conclusion is drawn from the summary and then recommendations are made for policy and further research.

5.2 Summary

Risk attitude has a strong influence on the economic decisions of people, such as the choice to be self-employed and the choice of finance for businesses. The private sector of many emerging countries, particularly countries in Sub-Saharan Africa, is largely composed of small and medium scale establishments that are crucial to the economy. It is therefore necessary to gain more insights into how risk attitudes influence the financing behavior of owners of household enterprises and the occurrence of self-employment in Ghana. Using data from the 7th round of the Ghana Living Standards Survey (GLSS 7), this study estimates the effect of risk attitudes on the decision to own a household enterprise and the choice of financing by owners of household enterprises. It also analyses the determinants of risk aversion of Ghanaians.

Specifically, the study sought to achieve the following objectives: first, to examine the determinants of risk aversion of Ghanaian household members; second, to analyse the influence of risk attitudes on the probability of owning a household enterprise; and third, to analyse the effect of risk attitudes on the choice of financing for Ghanaian household enterprises. To achieve the three objectives, the study employed a Probit regression model to estimate the

relationships while controlling for variables including gender, age, marital status, wealth quintile and other firm characteristics.

For the first objective of the study (determinants of risk aversion), analysis from the Probit regression showed that amongst the control variables of gender, age, marital status, education, wealth quintile, religion, location and occupation, education and age did not significantly predict risk aversion among Ghanaian household members. The results indicated that females are more likely to be risk averse than males. Existing literature on risk aversion also reveals that males are more prone to taking risks than females. The results also indicated that marriage is a significant determinant of risk aversion. Consistent with other studies, the findings showed that married persons have a higher likelihood of being risk averse as compared with individuals who have never married. In terms of the wealth of the household member, the results showed that risk aversion decreases with wealth, and hence, the richer an individual is, the higher the likelihood of being risk averse. For religion, the study found that compared with Christians, Moslems are more likely to be risk averse while those who belong to other religions or with no religion have a lesser likelihood of being risk averse. The findings also suggest that location and occupation are significant determinants of risk aversion, and they were significant at 5 percent alpha levels.

The analysis of the data for the second objective showed a negative and significant relationship between risk aversion and the probability of owning a household enterprise. In terms of the control variables added to the regression, that is, gender, age, marital status, education, wealth quintile and location, the results showed that females are more likely to own household enterprises as compared with males, and this relationship was significant at 1 percent alpha level. Additionally, a positive and significant relationship was found between wealth and the probability of owning a household enterprise. In terms of location, the results showed that compared with Accra, individuals in all other locations were less likely to own a household

enterprise. Age, marital status and education were found not to significantly affect the probability of owning a household enterprise.

On the relationship between risk aversion and financing choice, two levels of financing were considered: start-up capital and working capital. Specifically, the analysis focused on the effect of risk aversion on the decision to use self-financing as start-up capital and the effect of risk aversion on the decision to use loan financing as working capital. For self-financing, the results suggest that risk aversion had a negative and significant relationship with the decision to use self-financing as start-up capital. This relationship was statistically significant at 10 percent alpha level. The age and type of enterprise were also found to be significant predictors of using self-financing as start-up capital. Additionally, the results showed that wealth quintile was statistically significant and negatively related to self-finance at the start-up stage. In comparison to Accra, the location of the enterprise was found to influence the use of self-financing at the start-up stage.

In terms of loan financing as working capital, the results indicate that risk aversion is not a significant predictor of using loan financing as working capital. The age of the enterprise, however, was found to positively influence the choice to use loan financing as working capital, and this relationship was statistically significant at 1 percent alpha level. The size of the enterprise was also found to be a significant predictor of using loan financing. The results suggest that the bigger the enterprise, the greater the likelihood of using loan financing. Enterprise type was also found to be a significant predictor of using loan financing. Similarly, the wealth of the enterprise owner was found to be positively related to the decision to use loan financing, and this relationship was statistically significant at 1 percent alpha level.

Results from the robustness tests show largely similar results to the findings from the Probit estimates. Risk averse persons are less likely to own household enterprises. In addition, risk

aversion has a negative effect on using self-financing as start-up capital and no effect on using loan financing as working capital.

5.3 Conclusion

On the whole, the study shows that a large fraction of Ghanaians are risk averse. The results suggest that gender, marital status, wealth, religion, location and occupation can explain differences in risk aversion levels of individuals, and these differences may provide essential insights into how risk attitudes influence diverse economic behaviour.

Although a greater part of the research on the effect of risk attitudes on entrepreneurship has been conducted in developed countries with little focus on the kind of entrepreneurship that exists in most developing countries, the results from the study provide evidence consistent with existing findings that risk aversion has a positive and significant impact on the decision to own a household enterprise in Ghana. It has become clear that even in the informal rural and urban non-farm enterprise sector, starting one's own business requires being able to embrace a certain amount of risk and uncertainty.

Also, the study has shown that risk averse persons have a higher likelihood of seeking external finance. This demand for external financing, particularly in the early phase, shows that improving ways by which household enterprise owners can access finance at both the initial and subsequent stages of business development has the potential of increasing the growth of household enterprises.

5.4 Recommendations

5.4.1 Recommendations towards Policy

Based on the findings, the study recommends the following:

Since individuals who are not risk averse are more likely to own household enterprises, it implies that business ownership is perceived as risky. It is recommended that the government and non-governmental organisations effect policies and programs to mitigate the associated risks with business ownership.

Also, bearing in mind that risk averse business owners are more likely to use external forms of financing, it shows that they perceive external financing as less risky compared with self-financing at the start-up stage. This perception shows the demand for external finance by business owners, even at the start-up stage. The government, in its commitment to improve small businesses should engage financial providers to develop appropriate products for small businesses.

Additionally, the findings that age and type of enterprise significantly determine the financing decision of household enterprise owners shows that policy makers need to take cognizance of the nature and type of enterprise in formulating policies to boost growth in the informal sector. A one-size-fits all policy will not be appropriate in addressing the peculiar needs of different types of enterprises.

Financial institutions such as banks and micro-finance institutions also need to develop appropriate products for household enterprises to tap into the market of small businesses. Products such as low-interest loans that meet the nature of their business and their cashflow generation can be advanced to household enterprises. This would make these enterprise owners more confident in assessing capital.

5.4.2 Recommendations for Future Research

Future studies could extend the analysis on the effect of risk attitudes on the sources of financing by looking at more specific sources of finance (both internal and external finance), such as informal (gifts, SUSU), semi-formal (micro-finance institutions, trade credit) and formal (bank loans).

REFERENCES

Abdeldayem, M. M., & Sedeek, D. S. (2018). Managerial behavior and capital structure decisions; do overconfidence, optimism and risk aversion matter? *Asian Economic and Financial Review*, *8*(7), 925–945. https://doi.org/10.18488/journal.aefr.2018.87.925.945

Abor, J. (2008). Agency theoretic determinants of debt levels : evidence from Ghana. *Review of Accounting and Finance*, *7*(2), 183–192. https://doi.org/10.1108/14757700810874146

Abor, J., & Biekpe, N. (2006). Small business financing initiatives in Ghana. *Problems and Perspectives in Management*, *4*(3), 69–77.

Abor, J., & Biekpe, N. (2009). How do we explain the capital structure of SMEs in sub-Saharan Africa ? Evidence from Ghana. *Journal of Economic Studies*, *36*(1), 83–97. https://doi.org/10.1108/01443580910923812

Abraham, E. M., Asor, V., Torviawu, F., Yeboah, H., & Laryea, F. (2018). Public perception of corporate social responsibility of AngloGold Ashanti in Obuasi Municipality, Ghana. *Social Responsibility Journal*, *14*(3), 485–500. https://doi.org/10.1108/SRJ-08-2016-0149

Ackah, C. G., Aikins, E. R., Sarpong, T. T., & Asuman, D. (2019). Gender differences in attitudes toward risk: Evidence from entreprenuers in Ghana and Uganda. *Journal of Developmental Entrepreneurship*, *24*(1), 1–19. https://doi.org/10.1142/S1084946719500055

Agwu, G. A. (2020). When risk-aversion promotes enterprise formation. *Applied Economics Letters*, *27*(21), 1–4. https://doi.org/10.1080/13504851.2020.1716937

Alesina, A., & Fuchs-Schündeln, N. (2007). Good-bye Lenin (or not?): The effect of communism on people's preferences. *American Economic Review*, *97*(4), 1507–1528.

Andersen, S., Harrison, G., Lau, M., & Rutström, E. (2006). Elicitation Using Multiple Price List Formats. *Experimental Economics*, *9*(4), 383-405.

Appiah, K., Osei, C., Selassie, H., & Osabutey, E. (2019). The role of government and the international competitiveness of SMEs: Evidence from Ghanaian non-traditional exports. *Critical Perspectives on International Business*, *15*(4), 296–322. https://doi.org/10.1108/cpoib-06-2018-0049

Araar, A., Awel, Y. M., Boka, J. B., Girma, H. M., Shafi, A., Yitbarek, E. A., & Zerihun, M. (2019). Entrepreneurs' Attitudes Toward Risk in Micro and Small Enterprises: Evidence from Urban Ethiopia. In *Partnership for Economic Policy* (5). https://doi.org/10.2139/ssrn.3344632

Arrow, K. J. (1965). *Aspects of the theory of risk-bearing*. Yrjö Jahnssonin Säätiö.

Asravor, R. K. (2019). Farmers' risk preference and the adoption of risk management strategies in Northern Ghana. *Journal of Environmental Planning and Management*, *62*(5), 881–900. https://doi.org/10.1080/09640568.2018.1452724

Auken, H. Van. (2005). Differences in the Usage of Bootstrap Financing among Technology - Based versus Nontechnology - Based Firms. *Journal of Small Business Management*, *2778*, 93–103.

Ayifah, E., Romm, A. T., Kollamparambil, U., & Vosti, S. A. (2020). Effect of religion on the risk behaviour of rural Ghanaian women : evidence from a controlled field experiment. *Review of Social Economy*, 1–34. https://doi.org/10.1080/00346764.2020.1725831

Barber, D., Saadatmand, Y., & Kavoori, T. (2016). Gender and Financial Risk: The US and Brazil. *Studies in Business and Economics*, *11*(1), 15–25.

Beck, T., & Demirgüç-Kunt, A. (2008). Access to finance: An unfinished agenda. *The World Bank Economic Review*, *22*(3), 383–396.

Berger, A. N., & Udell, G. F. (1998). The economics of small business finance: The roles of private equity and debt markets in the financial growth cycle. *Journal of Banking and Finance*, *22*(6–8), 613–673. https://doi.org/10.1016/S0378-4266(98)00038-7

Blanchflower, D. G., & Oswald, A. J. (1998). What makes an entrepreneur? *Journal of Labor Economics*, *16*(1), 26–60. https://doi.org/10.1086/209881

Block, J., Sandner, P., & Spiegel, F. (2015). How do risk attitudes differ within the group of entrepreneurs? The role of motivation and procedural utility. *Journal of Small Business Management*, *53*(1), 183–206. https://doi.org/10.1111/jsbm.12060

Borgia, D., & Newman, A. (2012). The influence of managerial factors on the capital structure of small and medium-sized enterprises in emerging economies. *Journal of Chinese Entrepreneurship*, *4*(3), 180–205. https://doi.org/10.1108/17561391211262148

Brachert, M., Hyll, W., & Titze, M. (2017). On the simultaneity bias in the relationship between risk attitudes, entry into entrepreneurship and entrepreneurial survival. *Applied Economics Letters*, *24*(7), 477–480. https://doi.org/10.1080/13504851.2016.1203056

Bryman, A. (2016). *Social research methods*. Oxford university press.

Caliendo, M., Fossen, F., & Kritikos, A. (2010). The impact of risk attitudes on entrepreneurial survival. *Journal of Economic Behavior and Organization*, *76*(1), 45–63. https://doi.org/10.1016/j.jebo.2010.02.012

Cardak, B. A., & Wilkins, R. (2009). The determinants of household risky asset holdings: Australian evidence on background risk and other factors. *Journal of Banking & Finance*, *33*(5), 850–860.

Cardenas, J. C., & Carpenter, J. (2008). Behavioural development economics: Lessons from field labs in the developing world. *Journal of Development Studies*, *44*(3), 311–338. https://doi.org/10.1080/00220380701848327

Carson, J., Dumm, R., Halek, M., & Liebenberg, A. (2018). What Factors Portend Changes in Household Relative Risk AVersion? *Journal of Insurance Issues*, *41*(1), 1–21.

Cassar, G., & Holmes, S. (2003). Capital structure and financing of SMEs : Australian evidence. *Journal of Accounting and Finance*, *43*, 123–147.

Charness, G., & Gneezy, U. (2012). Strong evidence for gender differences in risk taking. *Journal of Economic Behavior & Organization*, *83*(1), 50–58.

Chavas, J. P. (2004). *Risk analysis in theory and practice*. Elsevier.

Childers, R. G. (2011). Being one's own boss: how does risk fit in? *The American Economist*, *56*(1), 48–58.

Chit, M. M. (2019). Financial Information Credibility, Legal Environment, and SMEs' Access to Finance. *International Journal of the Economics of Business*, *26*(3), 329–354. https://doi.org/10.1080/13571516.2019.1645379

Chuang, Y., & Schechter, L. (2015). Stability of experimental and survey measures of risk, time, and social preferences: A review and some new results. *Journal of Development Economics*, *117*, 151–170. https://doi.org/10.1016/j.jdeveco.2015.07.008

Cramer, J. S., Hartog, J., Jonker, N., & Van Praag, C. M. (2002). Low risk aversion encourages the choice for entrepreneurship: An empirical test of a truism. *Journal of Economic Behavior and Organization*, *48*(1), 29–36. https://doi.org/10.1016/S0167-2681(01)00222-0

Croson, R., & Gneezy, U. (2009). Gender differences in preferences. *Journal of Economic*

Literature, *47*(2), 448–474.

De Blasio, G., De Paola, M., Poy, S., & Scoppa, V. (2018). Risk Aversion and Entrepreneurship: New Evidence Exploiting Exposure to Massive Earthquakes in Italy. *IZA Discussion Papers*, *12057*.

De Blasio, G., De Paola, M., Poy, S., & Scoppa, V. (2020). Massive earthquakes, risk aversion, and entrepreneurship. *Small Business Economics*, 1–28. https://doi.org/10.1007/s11187-020-00327-x

De Paola, M. (2013). The determinants of risk aversion: The role of intergenerational transmission. *German Economic Review*, *14*(2), 214–234. https://doi.org/10.1111/j.1468-0475.2011.00561.x

Di Tella, R., Galiant, S., & Schargrodsky, E. (2007). The formation of beliefs: evidence from the allocation of land titles to squatters. *The Quarterly Journal of Economics*, *122*(1), 209–241.

Dohmen, T., Falk, A., Huffman, D., & Sunde, U. (2010). Are risk aversion and impatience related to cognitive ability? *American Economic Review*, *100*(3), 1238–1260.

Dohmen, T., Falk, A., Huffman, D., Sunde, U., Schupp, J., & Wagner, G. G. (2011). Individual risk attitudes: Measurement, determinants, and behavioral consequences. *Journal of the European Economic Association*, *9*(3), 522–550. https://doi.org/10.1111/j.1542-4774.2011.01015.x

Eckel, C. C., & Grossman, P. J. (2008a). Forecasting risk attitudes: An experimental study using actual and forecast gamble choices. *Journal of Economic Behavior and Organization*, *68*(1), 1–17. https://doi.org/10.1016/j.jebo.2008.04.006

Eckel, C. C., & Grossman, P. J. (2008b). Men, Women and Risk Aversion: Experimental

Evidence. *Handbook of Experimental Economics Results*, *1*, 1061–1073. https://doi.org/10.1016/S1574-0722(07)00113-8

Fossen, F. M. (2011). The private equity premium puzzle revisited—New evidence on the role of heterogeneous risk attitudes. *Economica*, *78*(312), 656–675.

Fox, L., & Sohnesen, T. P. (2012). Household Enterprises in Sub-Saharan Africa-Why They Matter for Growth , Jobs , and Livelihoods. In *Policy Research Working Paper Series - World Bank* (Issue 6184). http://econ.worldbank.org.

Ghana Statistical Service. (2018). *Integrated Business Establishment Survey Phase II*. https://doi.org/10.1017/CBO9781107415324.004

Ghana Statistical Service. (2019). *Ghana Living Standards Survey Round 7 (GLSS7)*. https://statsghana.gov.gh/gsspublications.php?category=MTAwMjg3Mzk3NC4zMDc=/webstats/1opr93rn57

Goldbach, C., & Schlüter, A. (2018). Risk aversion, time preferences, and out-migration. Experimental evidence from Ghana and Indonesia. *Journal of Economic Behavior and Organization*, *150*, 132–148. https://doi.org/10.1016/j.jebo.2018.04.013

Goswami, K., Hazarika, B., & Handique, K. (2017). Determinants of financial risk attitude among the handloom micro-entrepreneurs in North East India. *Asia Pacific Management Review*, *22*(4), 168–175. https://doi.org/10.1016/j.apmrv.2017.07.013

Grable, J. E. (2008). Risk tolerance. In *Handbook of consumer finance research* (pp. 3–19). Springer.

Graham, J. R., Harvey, C. R., & Puri, M. (2013). Managerial attitudes and corporate actions. *Journal of Financial Economics*, *109*(1), 103–121. https://doi.org/10.1016/j.jfineco.2013.01.010

Guiso, L., & Paiella, M. (2008). Risk Aversion , Wealth , and Background Risk. *Journal of the European Economic Association*, *6*(6), 1109–1150.

Guiso, L., Sapienza, P., & Zingales, L. (2004). The role of social capital in financial development. *American Economic Review*, *94*(3), 526–556.

Guiso, L., Sapienza, P., & Zingales, L. (2008). Trusting the stock market. *The Journal of Finance*, *63*(6), 2557–2600.

Halek, M., & Eisenhauer, J. G. (2001). Demography of Risk Aversion. *The Journal of Risk and Insurance*, *68*(1), 1–24.

Hallahan, T. A., Faff, R. W., & McKenzie, M. D. (2004). An empirical investigation of personal financial risk tolerance. *Financial Services Review*, *13*(1), 57–78.

Hanna, S. D., Gutter, M. S., & Fan, J. X. (2001). A measure of risk tolerance based on economic theory. *Journal of Financial Counseling and Planning*, *12*(2), 53.

Hanna, S. D., & Lindamood, S. (2004). An improved measure of risk aversion. *Journal of Financial Counseling and Planning*, *15*(2), 27–45.

Hardeweg, B., Menkhoff, L., & Waibel, H. (2013). Experimentally validated survey evidence on individual risk attitudes in rural Thailand. *Economic Development and Cultural Change*, *61*(4), 859–888.

Hartog, J., Ferrer-i-Carbonell, A., & Jonker, N. (2002). Linking measured risk aversion to individual characteristics. *Kyklos*, *55*(1), 3–26.

Hernández-Pérez, J., Cruz Rambaud, S., & Lorenzana de la Varga, T. (2019). Economic situation, the key to understanding the links between CEOs' personal traits and the financial structure of large private companies. *PloS ONE*, *14*(7), e0218853. https://doi.org/10.1371/journal.pone.0218853

Hillesland, M. (2019). Gender differences in risk behavior: An analysis of asset allocation decisions in Ghana. *World Development*, *117*, 127–137. https://doi.org/10.1016/j.worlddev.2019.01.001

Holt, C. A., & Laury, S. K. (2002). Risk aversion and incentive effects. *American Economic Review*, *92*(5), 1644–1655.

Holt, C. A., & Laury, S. K. (2014). Assessment and estimation of risk preferences. In *Handbook of the economics of risk and uncertainty* (Vol. 1, pp. 135–201). Elsevier.

Hvide, H. K., & Panos, G. A. (2014). Risk tolerance and entrepreneurship. *Journal of Financial Economics*, *111*(1), 200–223.

Jabbouri, I., & Farooq, O. (2020). Inadequately educated workforce and financing obstacles: international evidence from SMEs in developing countries. *International Journal of Managerial Finance*. https://doi.org/10.1108/IJMF-01-2020-0002

Jadoua, Z. A., & Mostapha, N. F. (2020). The effect of access to debt on lebanese small and medium enterprises performance. *ACRN Journal of Finance and Risk Perspectives*, *9*(1), 32–44. https://doi.org/10.35944/jofrp.2020.9.1.003

Jin, Y., & Zhang, S. (2019). Credit rationing in small and micro enterprises: A theoretical analysis. *Sustainability*, *11*(5). https://doi.org/10.3390/su11051330

Kanbur, S. M. (1979). Of risk taking and the personal distribution of income. *Journal of Political Economy*, *87*(4), 769–797.

Karpavičius, S., & Yu, F. (2019). Managerial risk incentives and a firm's financing policy. *Journal of Banking and Finance*, *100*, 167–181. https://doi.org/10.1016/j.jbankfin.2019.01.013

Kihlstrom, R. E., & Laffont, J.-J. (1979). A general equilibrium entrepreneurial theory of

firm formation based on risk aversion. *Journal of Political Economy*, *87*(4), 719–748.

Kim, Y. Il, & Lee, J. (2012). Estimating risk aversion using individual-level survey data. *Korean Economic Review*, *28*(2), 221–239.

Knight, F. H. (1971). Risk, Uncertainty and Profit. *Chicago University Press*.

Köbrich, A., & Pfeifer, C. (2017). Religious activity, risk-taking preferences and financial behaviour: Empirical evidence from German survey data. *Journal of Behavioral and Experimental Economics*, *69*, 99–107. https://doi.org/10.1016/j.socec.2017.05.005

Königsheim, C., Lukas, M., & Nöth, M. (2017). Financial Knowledge, Risk Preferences, and the Demand for Digital Financial Services. *Schmalenbach Business Review*, *18*(4), 343–375. https://doi.org/10.1007/s41464-017-0040-0

Koudstaal, M., Sloof, R., & Van Praag, M. (2015). Risk, uncertainty and entrepreneurship: Evidence from a lab-in-The-field experiment. *75th Annual Meeting of the Academy of Management, AOM 2015*, 1280–1285. https://doi.org/10.5465/AMBPP.2015.114

Kraus, A., & Litzenberger, R. H. . (1973). A State-Preference Model of Optimal Financial Leverage e America. *The Journal of Finance*, *28*(4), 911–922.

Krosnick, J. A., & Alwin, D. F. (1989). Aging and susceptibility to attitude change. *Journal of Personality and Social Psychology*, *57*(3), 416.

Levy, H. (1994). Absolute and relative risk aversion: An experimental study. *Journal of Risk and Uncertainty*, *8*(3), 289–307.

Levy, J. S. (1992). An introduction to prospect theory. *Political Psychology*, 171–186.

Li, Z. L., & Li, H. M. (2008). Empirical research on managerial risk-averse and financing behavior. *2008 International Conference on Wireless Communications, Networking and*

Mobile Computing. https://doi.org/10.1109/WiCom.2008.2382

Liu, E. M. (2013). Time to change what to sow: Risk preferences and technology adoption decisions of cotton farmers in China. *Review of Economics and Statistics*, *95*(4), 1386–1403. https://doi.org/10.1162/REST_a_00295

Meckling, W. H., & Jensen, M. C. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4), 305–360.

Menezes, C. ., & Hanson, D. . (1970). On the Theory of Risk Aversion. *International Economic Review*, *11*(3), 481–487.

Modigliani, F., & Miller, M. H. (1958). The Cost of Capital, Corporation Finance and the Theory of Investment. *American Economic Review*, *48*(3), 261–297. https://doi.org/10.1257/aer.103.1.i

Mongin, P. (1998). Expected Utility Theory. In *Handbook of Economic Methodology*. London. https://doi.org/10.5860/choice.36-4259

Morgenstern, O., & Von Neumann, J. (1953). *Theory of games and economic behavior*. Princeton university press.

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, *13*(2), 187–221.

Nelson, J. A. (2015). Are women really more risk-averse than men? A re-analysis of the literature using expanded methods. *Journal of Economic Surveys*, *29*(3), 566–585.

O'Donoghue, T., & Somerville, J. (2018). Modeling risk aversion in economics. *Journal of Economic Perspectives*, *32*(2), 91–114. https://doi.org/10.1257/jep.32.2.91

Osei-Assibey, E. (2013). Source of finance and small enterprise's productivity growth in Ghana. *African Journal of Economic and Management Studies*, *4*(3), 372–386. https://doi.org/10.1108/AJEMS-03-2012-0017

Osei-Assibey, E., Bokpin, G. A., & Twerefou, D. K. (2012). Microenterprise financing preference Testing POH within the context of Ghana's rural financial market. *Journal of Economic Studies*, *39*(1), 84–105. https://doi.org/10.1108/01443581211192125

Osili, U. O., & Paulson, A. L. (2008). Institutions and financial development: Evidence from international migrants in the United States. *The Review of Economics and Statistics*, *90*(3), 498–517.

Outreville, J. F. (2013). Risk Aversion, Risk Behavior and Demand for Insurance: A Survey. *SSRN Electronic Journal*, *37*(2), 158–186. https://doi.org/10.2139/ssrn.2363877

Pratt, J. W. (1964). Risk aversion in the small and in the large. *Econometrica*, *32*(1), 122–136.

Rabin, M. (2000). Handbook of the funamentals of financial decision making: Risk aversion and expected-utility theory: A calibration theorem. *Econometrica*, *68*(5), 1281–1292.

Rao, P., & Kumar, S. (2018). Reflection of owner's attributes in financing decisions of SMEs. *Small Enterprise Research*, *25*(1), 52–68.

Rieger, M. O., Wang, M., & Hens, T. (2015). Risk preferences around the world. *Management Science*, *61*(3), 637–648. https://doi.org/10.1287/mnsc.2013.1869

Riley Jr, W. B., & Chow, K. V. (1992). Asset allocation and individual risk aversion. *Financial Analysts Journal*, *48*(6), 32–37.

Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika*, *70*(1), 41–55.

https://doi.org/10.1017/CBO9780511810725.016

Roussanov, N., & Savor, P. G. (2012). *Status, marriage, and managers' attitudes to risk*. National Bureau of Economic Research.

Sakha, S. (2019). Journal of Behavioral and Experimental Economics Determinants of risk aversion over time : Experimental evidence from rural Thailand. *Journal of Behavioral and Experimental Economics*, *80*, 184–198. https://doi.org/10.1016/j.socec.2019.03.008

Schildberg-Hörisch, H. (2018). Are Risk Preferences Stable? *The Journal of Economic Perspectives*, *32*(2), 135–154. https://doi.org/10.1017/CBO9781107415324.004

Shaw, K. L. (1996). An empirical analysis of risk aversion and income growth. *Journal of Labor Economics*, *14*(4), 626–653.

Singh, P., & Kaur, C. (2019). Factors determining financial constraint of SMEs: a study of unorganized manufacturing enterprises in India. *Journal of Small Business and Entrepreneurship*, *0*(0), 1–19. https://doi.org/10.1080/08276331.2019.1641662

Skriabikova, O. J., Dohmen, T., & Kriechel, B. (2014). New evidence on the relationship between risk attitudes and self-employment. *Labour Economics*, *30*, 176–184. https://doi.org/10.1016/j.labeco.2014.04.003

Stefani, U., Schiavone, F., Laperche, B., & Burger-Helmchen, T. (2019). New tools and practices for financing novelty: a research agenda. *European Journal of Innovation Management*, *23*(2), 314–328. https://doi.org/10.1108/EJIM-08-2019-0228

Stigler, G. J., & Becker, G. S. (1977). De gustibus non est disputandum. *The American Economic Review*, *67*(2), 76–90.

Sunden, A. E., & Surette, B. J. (1998). Gender differences in the allocation of assets in retirement savings plans. *The American Economic Review*, *88*(2), 207–211.

Szpiro, G. G. (1986). Measuring risk aversion: an alternative approach. *The Review of Economics and Statistics*, 156–159.

Tabetando, R. (2019). Parental risk aversion and educational investment: panel evidence from rural Uganda. *Review of Economics of the Household*, *17*(2), 647–670. https://doi.org/10.1007/s11150-018-9437-x

Tagoe, N., Nyarko, E., & Anuwa-Amarh, E. (2005). Financial challenges facing urban SMEs under financial sector liberalization in Ghana. *Journal of Small Business Management*, *43*(3), 331–343.

Tavor, T. (2019). Risk aversion and the character of the individual's place of residence. *Israel Affairs*, *25*(4), 726–739. https://doi.org/10.1080/13537121.2019.1626096

The World Bank. (2011). Raising Productivity and Reducing the Risk of Household Enterprises. Washington DC: World Bank

The World Bank. (2017). What's Happening in the Missing Middle? Lessons from Financing SMEs. Washington DC: World Bank

Treibich, C. (2015). Are Survey Risk Aversion Measurements Adequate in a Low Income Context? Are survey risk aversion measurements adequate in a low income context?

Tsigos, S., & Daly, K. (2016). "Fair go" for all? Wealth and Risk Aversion of Australian Households. *Australian Economic Papers*, *55*(3), 274–300. https://doi.org/10.1111/1467-8454.12064

Van Auken, H. E. (2005). A Model of Small Firm Capital Acquisition Decisions. *The International Entrepreneurship and Management Journal*, *1*(3), 335–352. https://doi.org/10.1007/s11365-005-2599-z

van Huizen, T., & Alessie, R. (2019). Risk aversion and job mobility. *Journal of Economic*

Behavior and Organization, *164*, 91–106. https://doi.org/10.1016/j.jebo.2019.01.021

Van Praag, C. M., & Cramer, J. S. (2001). The Roots of Entrepreneurship and Labour Demand: Individual Ability and Low Risk Aversion. *Economica*, *68*(269), 45–62. https://doi.org/10.1111/1468-0335.00232

Vieider, F. M., Lefebvre, M., Bouchouicha, R., Chmura, T., Hakimov, R., Krawczyk, M., & Martinsson, P. (2015). Common components of risk and uncertainty attitudes across contexts and domains: Evidence from 30 countries. *Journal of the European Economic Association*, *13*(3), 421–452.

Wang, Y. (2016). What are the biggest obstacles to growth of SMEs in developing countries? – An empirical evidence from an enterprise survey. *Borsa Istanbul Review*, *16*(3), 167–176. https://doi.org/10.1016/j.bir.2016.06.001

Wasiuzzaman, S., Nurdin, N., Abdullah, A. H., & Vinayan, G. (2020). Creditworthiness and access to finance of SMEs in Malaysia: do linkages with large firms matter? *Journal of Small Business and Enterprise Development*, *27*(2), 197–217. https://doi.org/10.1108/JSBED-03-2019-0075

Yartey, C. A. (2011). Small business finance in Sub-Saharan Africa: The case of Ghana. *Management Research Review*, *34*(2), 172–185. https://doi.org/10.1108/01409171111102795

Yesuf, M., & Bluffstone, R. (2007). Risk aversion in low income countries: Experimental evidence from Ethiopia. In *International Food Policy Research Institute*. http://www.ifpri.org/publication/risk-aversion-low-income-countries

Yesuf, M., & Bluffstone, R. A. (2009). Poverty, risk aversion, and path dependence in low-income countries: Experimental evidence from Ethiopia. *American Journal of*

Agricultural Economics, *91*(4), 1022–1037. https://doi.org/10.1111/j.1467-8276.2009.01307.x

Yusof, S. A. (2015). Household bargaining, financial decision-making and risk tolerance. *International Journal of Business and Society*, *16*(2).

Zhang, P., & Cain, K. W. (2017). Reassessing the link between risk aversion and entrepreneurial intention: The mediating role of the determinants of planned behavior. *International Journal of Entrepreneurial Behaviour and Research*, *23*(5), 793–811. https://doi.org/10.1108/IJEBR-08-2016-0248

APPENDIX

Risk Aversion and Business Ownership (with interactions)

Variables	Marginal Effect	Standard Errors
Risk aversion		
Not risk averse (ref)		
Risk averse	-0.069	(0.066)
Wealth Quintile		
Poorest (ref)		
Poorer	0.064	(0.066)
Middle	0.014	(0.074)
Rich	0.054	(0.061)
Richest	0.041	(0.064)
Risk aversion * Wealth		
Risk averse*Poorest (ref)		
Risk averse*Poorer	-0.022	(0.078)
Risk averse*Middle	0.036	(0.084)
Risk averse*Rich	0.035	(0.072)
Risk averse*Richest	0.067	(0.072)
Gender		
Male (ref)		
Female	0.051***	(0.015)
Age group		
Under 20 years (ref)		
20-29 years	0.059	(0.054)
30-39 years	0.018	(0.056)
40-49 years	-0.041	(0.058)
50-59 years	-0.033	(0.059)
60-69 years	-0.002	(0.063)
70+ years	0.053	(0.090)
Marital Status		
Never married (ref)		
Married	-0.008	(0.022)
Separated/Divorce/Widowed	-0.028	(0.029)
Education		
Primary		
JHS/Middle	0.012	(0.015)
Secondary	0.003	(0.027)
Tertiary	-0.048	(0.027)
Location		
Accra (ref)		
Urban Coastal	0.037	(0.036)
Urban Forest	-0.006	(0.054)
Urban Savannah	0.026	(0.082)
Rural Coastal	-0.128**	(0.058)

Rural Forest	-0.219***	(0.054)
Rural Savannah	-0.227***	(0.072)
Observations	**5,045**	**5,045**