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Examination of the relationship between entrepreneurial capital and the profitability of smallholder farmers in Analamanga's rural areas

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A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Management in Entrepreneurship and New Venture Creation (MMENVC)

Johannesburg, 2019

ABSTRACT

Apprehending the role of entrepreneurship in economic success and poverty eradication is a fascinating topic, at the centre of scholars' cares when inquiring into the field of new venture creation. This one-of-a-kind, ground-breaking study sought out to examine the nature of the relationship between entrepreneurial capital (entrepreneurial competence x entrepreneurial commitment) and the profitability of smallholder farmers in Analamanga's rural areas.

The use of a non-experimental cross-sectional survey was deemed to be most suitable for the purpose of the research. A cluster sampling method with a quota approach was adopted to determine the sample size and select the survey participants. The survey participants were questioned by a team of trained interviewers, equipped with a structured questionnaire, which served as a way to generate data that would be processed. Simple and multiple linear regression were the major statistical tests performed to analyse and interpret the data.

The ensuing observations revealed a partially significant relationship between entrepreneurial competence and the profitability of smallholder farmers in Analamanga's rural areas. A similar result was observed when testing the correlation between entrepreneurial commitment and profitability. Finally, the multiplicative interaction between entrepreneurial competence and entrepreneurial commitment - engendering the entrepreneurial capital paradigm - was proven to feature a significantly positive relationship with the dependent variable i.e. profitability.

Considering the alarming magnitude of rural poverty in Madagascar, the outcomes of the study could function as the foundation of research-based policies and services delivered to smallholder farmers in the central region of the island to authentically satisfy their needs as a means to ensure their economic success and alleviate rural poverty in the country.

DECLARATION

I, Radomalala Ratsimanetrimanana, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Management in Entrepreneurship and New Venture Creation (MMENVC) in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

_____
Radomalala Ratsimanetrimanana

Signed at _____

On the _____ day of _____2019

DEDICATION

I would love to dedicate this Master's thesis to my parents. Their love, energy and passion for excellence have always inspired me to run the extra mile and live a bountiful life. This 120-pages research report is the least I could do as a gift of gratitude for them.

Special thoughts as well to my younger self from ten, twenty and even twenty-five years ago: an empathic dreamer, filled with a humble hope for a better tomorrow. Hold on boy, for the best is yet to come.

Last but not least, I have devoted this work to the hope of empowering the business incubators, policy makers and smallholder farmers in Madagascar, so that in their daily activities, they may succeed and together, we will eradicate rural poverty from the country.

ACKNOWLEDGEMENTS

At first, I would love to thank my supervisor, Dr. McEdward Murimbika, a very noble man of letters who has never hesitated to share his considerable wealth of personal knowledge and experience to benefit his students and proteges, not only for the purpose of the research but for their entire career.

Special thanks as well to the team of lecturers and staff members at the Wits Business School during the MMENVC programme 2018, led by Prof. Boris Urban and Mrs. Meisie Moya. They never told us that this year would be easy and indeed, it was very challenging but most importantly we have been growing, each of us, in our own attitude and intellectual capability, which, in the end, turned out to be quite a sweet victory.

My gratitude also goes to the team of interviewers and the survey participants, counselled by myself, as the researcher, and my colleague, Mr. Desire Randrianarivelo. They have achieved a great work that should never be taken for granted. Without them, this study would have never been completed.

Last but not least, I would love to thank, once again my parents (my birth givers) - Mr. and Mrs. Fenosoa and Vololona Ratsimanetrimanana, my two brothers - Rivo and Rova, and my business partner - Mrs. Chrisne Myburg. They are the only family that I have, and I cannot imagine the sacrifices they have made until I complete this Masters' degree. From the bottom of my heart, I thank them and definitely, I will always live in pain if the sweat from their foreheads ever drops in vain.

To conclude this section, I wish to praise God, the Lord Almighty, ***"What shall I return to Him for all His goodness to me?"*** (Psalm 116:12).

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CHAPTER 1: INTRODUCTION

1.1. Introduction

Despite their key role in promoting food security across the globe, smallholder farmers feature among the poorest proportion of the world's active population (Ayuya, Gido, Bett, Lagat, Kahi and Bauer, 2015). An estimate of half the world's starving population are smallholder farmers and probably about 75 percent of the hungry people in Africa (Harvey, Rakotobe, Rao, Dave, Razafimahatratra, Rabarijohn, Rajaofara and MacKinnon, 2014). In Madagascar, they represent the largest group of professionals in a country where 82 percent of the rural population live below the poverty threshold (Harvey et al., 2014). This research seeks to address these persisting issues by exploring the relationship between entrepreneurial capital and the profitability of smallholder farmers in Analamanga's rural areas, a region localised in the central environs of Madagascar. This chapter highlights the purpose of the research as well as its background context. The problem statement enumerates the main problem and sub-problems tackled through this study. The research objectives, its significance and a list of assumptions that have been made, close the chapter.

1.2. Purpose of the research

Say (1803) orthodoxly established entrepreneurship as the full-time endeavour of an individual, commonly referred to as the entrepreneur whose assignment consists of transferring scarce economic resources from a place of suboptimal exploitation into an area of growth and prosperity where they thrive dexterously and generate a greater yield. That is to say, entrepreneurship is a value creation activity, mobilising resources to shift from a less productive pursuit, into a more productive venture (Minniti, 2016). Venter and Urban (2015) concurs on this conceptualisation of the field by stressing on the pivotal role of economic capital in the inception of entrepreneurial capital, a self-employment success triggering paradigm that the scholars (Venter and Urban, 2015) credit with the attribute to turn primitive resources into considerable material advantages, stimulating profitability.

As such, with the ultimate vision to eliminate rural poverty in Madagascar and taking into consideration the inadequate earnings of smallholder farmers in the country (Harvey et al., 2014), the research aims to enquire into this lucrative virtue of entrepreneurship by verifying its compatibility with the distinctive context of smallholder farmers in the central region of the island, through an extensive investigation on the nature of the relationship between the magnitude of their entrepreneurial capital and their level profitability.

1.3. Background of the study

1.3.1. Madagascar: the island nation

Analamanga, is the most populous of the twenty-two regions of the Republic of Madagascar (Ministère de l'Economie et du Plan, 2009). Madagascar itself is an island located 400 km from Mozambique, off the south-east coast of Africa, in the Indian Ocean (Figure 1). It is the fifth biggest island in the world, after Australia, Greenland, New Guinea, and Borneo, and the 47th largest nation with a land area of 581,540 km^2, a water area of 5501km^2 and a population of 24.92 million people (Figure 1) (World Atlas, 2015; World Bank, 2017).

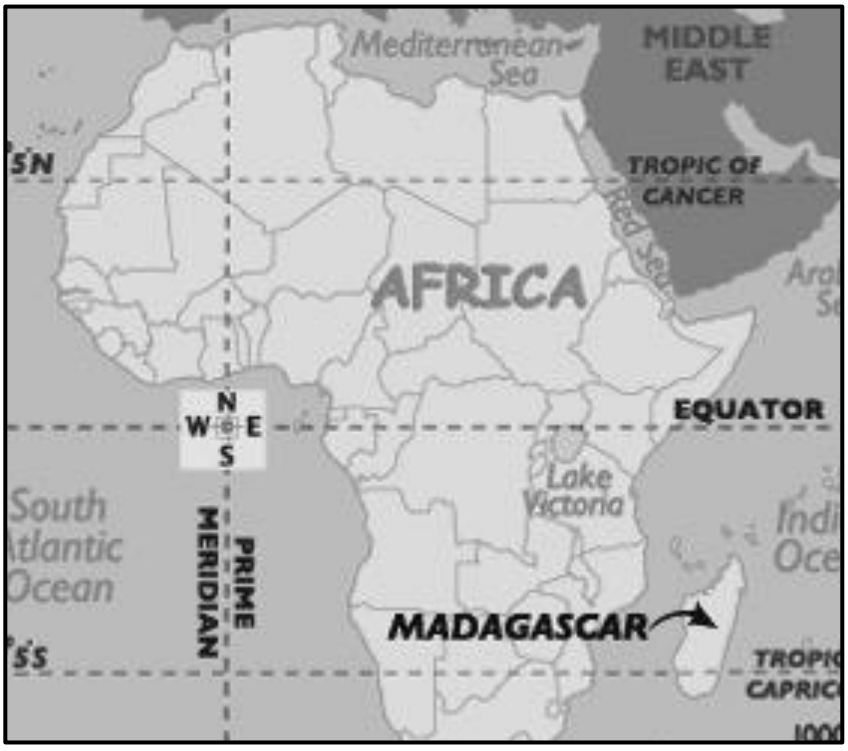


Figure 1: Localisation of Madagascar in Africa (World Atlas, 2015)

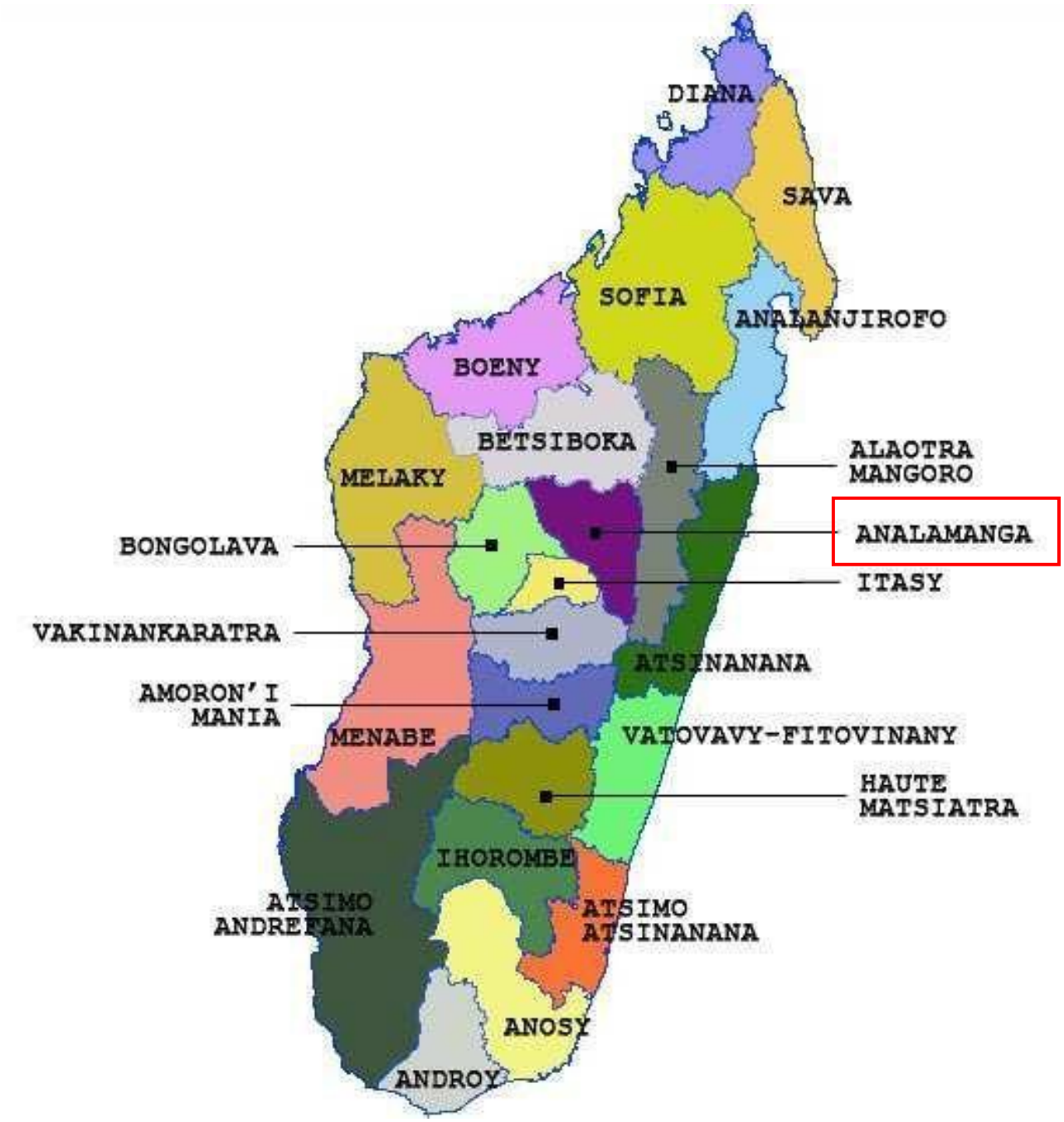


Figure 2: The 22 regions of Madagascar (Ramaroson, 2016)

Table 1 provides a summary of the country's profile according to the United Nations Statistics Division (2016).

Table 1: Madagascar country profile

Official name	Republic of Madagascar
Population name	Malagasy
Official Languages	Malagasy and French
Region	Eastern Africa
Surface area (km^2)	587295
Population	24.92 million
Population density (per km^2)	42.8
Capital City	Antananarivo
Capital population	2.61 million
Currency	Malagasy Ariary (MGA)
United Nations Membership Date	20th September 1960

Source: United Nations Statistics Division (2016)

Its rich plant biodiversity makes Madagascar unique as it accommodates about 12,000 species of vascular plants among which over 90 percent are endemic (Ganzhorn, Lowry II, Shatz and Sommer, 2001). The high plant endemism and prolific vegetation diversity in the island is indicative of its fertile soils (Reddy, Balkwill and McLellan, 2007) and favourable climate for agricultural activities (Goldblatt, 1978).

As a result, the agricultural sector occupies a significant function in both the economy and the culture of the country, with approximately 70 percent of the population being engaged in farming endeavours and 64 percent of Malagasy people living in rural areas (Harvey et al., 2014).

The agricultural industry contributes 21.3 percent to the GDP of Madagascar, according to data from the World Bank (2016). Despite this contribution, the welfare to the sharecroppers, particularly the smallholder farmers, remains at the bottom of the pyramid. More so, 71 percent of the total Malagasy farmers, responsible for producing a considerable fraction of the total national harvest, they are stuck at the bottom of the socio-economic pyramid. Furthermore, they constitute 80 percent of the poorest proportion of the population, earning an average annual income as low as 328200 MGA or 105 USD per year (Harvey et al., 2014; IMF, 2017). This brief demonstrates that rural poverty is a pivotal issue in Madagascar.

1.3.2. Rural poverty in Madagascar

The economy of Madagascar is a market economy whereby the government has only a limited intervention power and economic decision-making and the pricing of goods and services are primarily guided by the variation and interconnection of the forces of supply and demand (Adem, 2013). The island's industrial sector is dominated by firms operating in agro-food (34 percent), chemicals (12 percent), plastics (12 percent), metallurgical (11 percent) and extractive industries (9 percent) (Dayo et al., 2017).

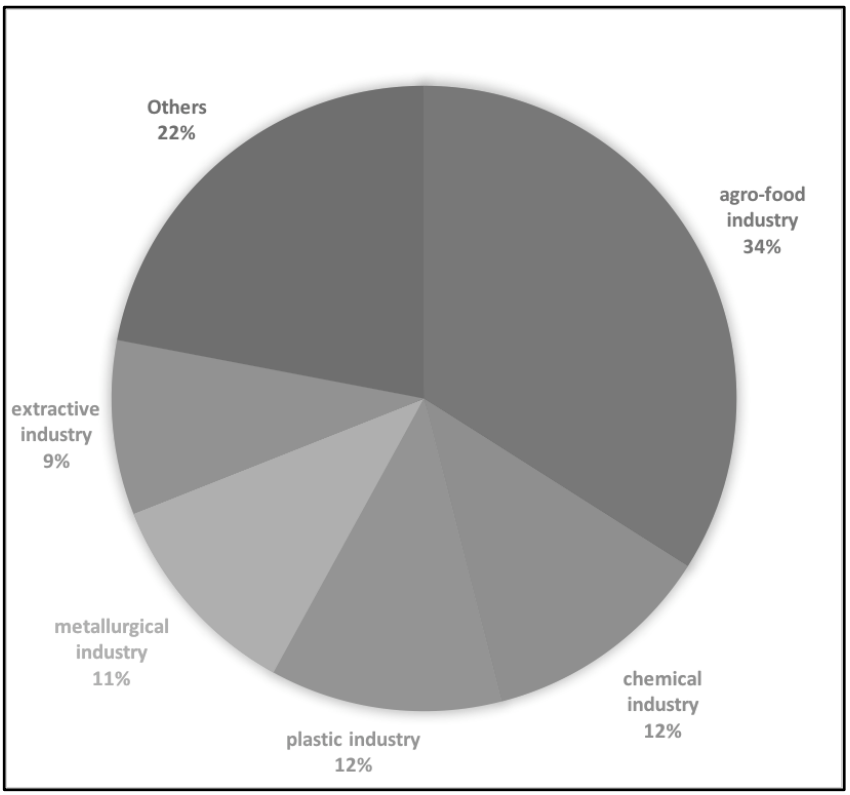


Figure 3: Composition of the industrial sector in Madagascar (Dayo et al., 2017)

Due to the occurrence of frequent political crises (Aisen and Vega, 2011), the country is struggling to gain consistent economic take-off, culminating towards a sustainable development. Political instability, especially when associated with a mass civil protest, has been proven to decrease productivity and physical and human capital accumulation, worldwide (Aisen and Vega, 2011). As Madagascar is not immune to these adverse effects, the violence, strikes and civil unrest arising during the 2009 political crisis caused a 6.5 percentage point downgrade to the GDP growth of the country: from 7.1 percent in 2008 to 0.6 percent in 2009 (World Bank, 2010). Madagascar's growth outlook prior to the outbreak

was much higher than that of the other concurrent countries. Nevertheless, when the crisis occurred, the island's projected GDP growth in 2010 was the lowest in the entire African continent: -1 percent; as opposed to 4.5 percent in comparable low-income African countries (Rakotomanana, Razafindrakoto, Roubaud and Wachserberger, 2010).

Consequently, despite a promising economic recovery after the completion of the democratic election in 2014, and a GDP growth rate exceeding its demographic analogous by 2.8 percent in the same year, and 4.1 percent and 4.2 percent respectively in 2015 and 2016, Madagascar still ranks among the poorest nations in the world. Some statistics even suggest that it is the single poorest country in Sub-Saharan Africa (IMF, 2017; Osborne, 2016). Apart from the Democratic Republic of Congo and Liberia, two nations which have gone through periods of civil war, Madagascar is the only country which, by 2010, recorded a real GDP per capita lower than that of what was achieved in 1960 (Osborne, 2016). As a result, it is no surprise that the island inscribes such a high poverty rate with 77.8 percent of its population living with an income below 1.90 USD a day (World Bank, 2016).

Poverty, in Madagascar, is mainly a rural phenomenon, affecting 82 percent of the rural population (Harvey et al., 2014). Smallholder farmers (farmers, usually living in rural areas and possessing less than 2 ha of land) comprise the largest group of professionals in the country and similarly to in the rest of the world, most of them constitute the poorest proportion of the active population. There are around 450 to 500 million smallholder farmers worldwide. Among them feature half of the hungry people on the planet and probably three-quarters of the hungry in Africa (Harvey et al., 2014). Smallholder farmers, in the island, are facing additional challenges with the recurrent manifestation of natural disasters, which is mostly reflected through the high cyclone rate in the country. Resultantly, 87 percent of the Malagasy smallholder farmers live below the national poverty line (Rakotobe, Harvey, Rao, Dave, Rakotondravelo, Randrianarisoa, Ramanahadray, Andriambolantsoa, Razafimahatratra, Rabarijohn, Rajaofara, Rameson and McKinnon, 2016).

Nowadays, researchers, such as Ayuya, et al. (2015), Chiputwa, Spielman and Qaim (2015), and Leonardo, van de Ven, Kanellopoulos and Giller (2018), grow in interests in the study of the financial lives of smallholder farmers with the aim to provide recommendations on the types of assistance and services that can be implemented to help improve their lives (World Bank, 2016). This research is in line with these burgeoning tendencies with a particular focus

on exploring the relationship between entrepreneurial capital and the profitability of smallholder farmers in Madagascar's rural municipalities. This is based on Erikson's (2002) findings suggesting that there is a pivotal impact engendered by entrepreneurial capital on the business performance of emerging ventures.

1.4. Problem statement

1.4.1. Main problem

Examine the nature of the relationship between entrepreneurial capital and the profitability of smallholder farmers in Analamanga's rural areas.

The sub-problems are determined considering the formula suggesting that (Venter and Urban, 2015, p.59):

Entrepreneurial Capital (EC) = Entrepreneurial Competence x Entrepreneurial Commitment

1.4.2. Sub-problem 1

Scan the nature of the relationship between entrepreneurial competence and the profitability of smallholder farmers in Analamanga's rural areas.

1.4.3. Sub-problem 2

Scrutinise the nature of the relationship between entrepreneurial commitment and the profitability of smallholder farmers in Analamanga's rural areas.

1.4.4. Sub-problem 3

Explore the nature of the relationship amongst the multiplicative interaction between entrepreneurial competence and entrepreneurial commitment, and the profitability of smallholder farmers in Analamanga's rural areas.

1.5. Research objectives

The study seeks to explore Erikson's (2002) findings on the importance of entrepreneurial capital in emerging ventures' business performance and to determine:

(i) The magnitude of the entrepreneurial competence of smallholder farmers in Analamanga's rural areas.

(ii) The magnitude of the entrepreneurial commitment of smallholder farmers in Analamanga's rural areas.

(iii) The magnitude of the entrepreneurial capital of smallholder farmers in Analamanga's rural areas.

(iv) The range of profitability of smallholder farmers in Analamanga's rural areas.

(v) Whether entrepreneurial capital is positively correlated with the profitability of smallholder farmers in Analamanga's rural areas or not.

1.6. Justification for the research and its potential significance

Established to be positively correlated with economic development (Baumol and Strom, 2007), entrepreneurship could be the answer to the persisting rural poverty problem in Madagascar. Nevertheless, only a few studies have been made on the entrepreneurial aspects of country-dwellers in the island. Among the most prominent of them are:

- Harvey et al.'s (2014) study on the extreme vulnerability of smallholder farmers to agricultural risks and climate change in Madagascar;

- Urban and Ratsimanetrimanana's (2015) research on the influence of cultural dimensions on entrepreneurial intention in Madagascar's rural areas; and

- Rakotobe et al.'s (2016) exploration of the strategies of smallholder farmers for coping with the impacts cyclones have in Madagascar.

Based on this observation, no in-depth study is available on the entrepreneurial capital of smallholder farmers in Analamanga's rural areas. Thus, this research seems to be a pioneer in that specific region of the island.

At practical level, the outcomes of this research can be used to provide recommendations advising business incubators and policy makers on the best assistance, services and trainings that should be developed to improve the lives of smallholder farmers and alleviate rural poverty in Madagascar.

1.7. Assumptions

The main data collection tool used was in the form of a questionnaire, distributed to a sample of smallholder farmers across Analamanga's rural areas. Correspondingly, the following assumptions was made with regard to the study:

- The respondents are able to understand the questions and respond to them to the best of their ability.

- The respondents have a high response rate.

- The respondents are not offended by questions related to their competence, commitment and profitability.

- The relevant official authorities at all levels of the administrative pyramid grant the researcher the permission to ask respondents questions about their competence, commitment and profitability.

- The sample respondents are representative of all smallholder farmers in Analamanga's rural areas.

CHAPTER 2: LITERATURE REVIEW AND CONCEPTUALISATION

2.1. Introduction

The connection between business performance and entrepreneurship is a central theme in entrepreneurial research (Erikson, 2002; Lechner and Gudmundsson, 2014; Venter and Urban, 2015; Englen, Gupta, Strenger and Brettel, 2015). Many studies, including those undertaken by Erikson (2002), Venter and Urban (2015), Kuratko, Morris, and Shindehutte (2015), Johnson, Stevenson and Letwin (2018) and Shepherd, Wennberg and Suddaby (2018), describe the entrepreneurial capital model as a multiplicative function of entrepreneurial competence and entrepreneurial commitment. Subsequently, in-depth research into the relationship between these two entrepreneurial capital components and a venture performance indicator such as profitability finds here its rationale.

2.2. Entrepreneurial capital theories

2.2.1. Definition and a glance at the history of entrepreneurship

Entrepreneurship is a term coined by French economist Richard Cantillon in the 17th century to label a business phenomenon that has existed since the medieval age. Originally, between the years 1250 and 1500, preeminent entrepreneurial traits, such as the ability to innovate, take risks and judge opportunities, were observed to be displayed by merchants, the church and members of the royal court (Casson and Casson, 2014).

Entrepreneurship can be defined according to: the function of the entrepreneur, their role, their personality and their specific behaviour. Regarding the function of entrepreneurs, Schumpeter (1934), one of the most distinguished researchers on this subject, characterized entrepreneurs as innovators or, more precisely, the champions of innovations that push the human race forward. Schumpeter (1934) recognized five main categories of innovation: (i) the launch of a new product or a new series of an existing product, (ii) the application of new production or sales methods, (iii) the opening of a new market, (iv) the acquirement of new sources of raw material or finished goods and (v) the creation of new industry structure (such

as the establishment or destruction of monopoly position). He stressed that beyond barely being innovators, entrepreneurs are also savvy business people deploying all the necessary resources to auspiciously bring their inventions to the market.

About the role of entrepreneurs, Knight (1921) advocates that entrepreneurs are individuals who bear the risks of financial loss from the possible failure of their firms. Additionally, Hayek (1949), Kizner (1973), Penrose (1959), and Audretsch and Keilbach (2006) argue on the entrepreneurs' responsibility in identifying propitious opportunities and making the most out of them, with most of them being adamant on the fact that small firms are usually more adept at recognizing opportunities that large firms neglect.

Concerning the entrepreneurs' personality, it is a combination of traits, including imagination, intuition, alertness, ambition, need for achievement and positive attitude towards risk, which inspire entrepreneurs to engage into entrepreneurial activities (Casson and Casson, 2014).

In the 13th Century, the Roman Catholic Church dominated the religious climate in England. Churchmen such as bishops, abbots and priors embraced business principles to manage vast estates. The adoration of the business life was even observed to surpass that of the spiritual life among certain monastic orders such as the Cistercians, also known as the Bernardines, famous for the innovations they promoted in the sheep-breeding business that allowed them to produce top quality wool to a high-end niche market (Donkin, 1958). With respect to the bishops, they pioneered the present-day tourism industry through their involvement in the pilgrimage trade, an activity, which started off as a religious obligation compelling churchgoers to travel and visit Christian sanctuaries to ease their passage through Purgatory - the intermediate state after physical death that people are meant to undergo in order to be purified and achieve holiness before going to heaven. It quickly turned into a fructiferous business venture under the management of evidently entrepreneurial bishops who started to provide accommodations and other related services to the pilgrims and made sure that the pilgrimage offered the believers a well-deserved holiday from their work and daily routines. Eventually, different pilgrimage centres began to compete, and this helped to promote exponential growth and perpetual amelioration of the business (Birch, 1992).

During the 14th century, an ingenious English merchant named William de la Pole, who knew how to take advantage of the Hundred Years War and wool exportation, demonstrated the entrepreneurial flair needed at the time (Casson and Casson, 2014). William de la Pole was a wool merchant who displayed a high risk-taking propensity when he provoked royal displeasure and challenged the threat of imprisonment to sustain his business. Initially, the entrepreneur was hired by the royal court to assist in boosting revenues in wool exporting to ensure adequate funding of the Hundred Years War, against France, from the year 1337 onwards. Despite the charges that Pole already faced due to the failures of his dealings with the King, he continued concealing information from the crown and was even known to be smuggling goods – a serious crime if caught – as a way to prosper and intensify his influence in England (Horrox, 1983).

By the 17th century, British politicians finally caught up with the paroxysm of the phenomenon and started their entrepreneurial journey. Their interests in entrepreneurial activities were flourishing during a time when foreign trade was expanding and a higher interest and determination in doing business arose (Casson and Casson, 2014). Entrepreneurs started exploring the world to increase their capital of resources and multinational competitions and collaborations were dawning (Casson and Casson, 2014).

Eventually, Richard Cantillon introduced the word *'entrepreneurship'*, from the French '*entreprendre'* - which means '*to undertake'* - to name this business activity, whereby someone, the entrepreneur, takes the risk of a business in return for the profits (Casson, 2002). In the late 2000's, entrepreneurship developed into a legitimate academic discipline with just over 1500 papers published during that decade. Nowadays, the mean growth rate of the amount of entrepreneurship papers is equal to 12.1 percent. More than 5000 articles have been issued on the subject since the beginning of the 2010's. Areas of focus can be classified into the five following clusters: (i) cognitive aspects of entrepreneurship, (ii) demographic and personality determinants of entrepreneurship, (iii) theoretical perspectives on entrepreneurship, (iv) entrepreneurial and innovation finance, and (v) eclectic approaches on entrepreneurship (Meyer, Libaers, Thiis, Grant, Glänzel and Debackere, 2013).

This research forms part of the second cluster - *demographic and personality determinants of entrepreneurship* - for its major focus is to study a demographic determinant of the discipline, i.e. entrepreneurial capital (Meyer et al., 2013).

2.2.2. The concept of entrepreneurial capital

Entrepreneurial capital is an intangible resource contributing to the prepotency of successful enterprises (Erikson, 2002). It represents the entrepreneurs' ability to derive profit generating assets to sustain their company's competitive advantage - i.e. the firm's unique value creating strategy. (Erikson, 2002).

A group of scholars, Hofer and Shendel (1978), Bygrave (1989), Becker (1964), Bordieu (1983), Libenstein (1968), Glade (1967), Johanisson (1988), Nahapiet and Ghoshal (1998), Dollinger (1995), and Tomer (1987), maintain that entrepreneurial capital embraces not only physical and financial capital, but also human, social and organisational capital. Nonetheless, another group of scholars, Brush, Greene, Hart, and Edelman (1997), and Shaver and Scott (1991), are challenging this perspective by arguing that not one of these dimensions pays attention to the enormous influence of the *naissant* entrepreneur who founded and is running the new venture.

Erikson (2002) developed an avant-garde entrepreneurial capital framework describing the concept as a composite of: entrepreneurial competence and entrepreneurial commitment. This frame of reference is more favoured by present-day academics like Venter and Urban (2015) who concur on the claim that the relationship between the two constructs is multiplicative - as described in the subsequent formula - for both of them should be strongly present for entrepreneurship to occur:

Entrepreneurial Capital (EC) = Entrepreneurial Competence x Entrepreneurial Commitment

Entrepreneurial competence is the ability of an entrepreneur to recognise opportunities and mobilise all the necessary resources to exploit and explore them (Erikson, 2002). This construct can be further broken down into: entrepreneurial skills (perceived capability and perceived opportunities) and entrepreneurial personality (less fear of failure and role models) (Barazandeh, Parvizian, Alizadeh and Khosravi, 2015):

(i) **Perceived capability** is the entrepreneur's apprehension of their own ability to achieve entrepreneurial tasks (Shapero and Sokol, 1982).

(ii) **Perceived opportunities** reflect individuals' awareness of the opportunities that they can exploit and explore as entrepreneurs (Renko, Shrader and Simon, 2012).

(iii) **Less fear of failure** relates to a reduced intention to avoid failure and the expected shame connected to it during evaluative situations (Sagar, Busch and Jowett, 2009).

(iv) **Role models** refer to the individuals whose ability to inspire others through their behaviour is imitated by the entrepreneur (Merriam-Webster, 2018).

Entrepreneurial commitment is the capacity of an individual to relentlessly work until the successful establishment of their business into a reliable and a sustainable enterprise, able to support itself while consistently delivering a top performance, faithful to the standards originally defined by the company's values, mission and vision statements (Erikson, 2002). It involves the following constituents: normative commitment, affective commitment and continuance commitment (Tasmin, Said, Mariani, & Zainuddin, 2013):

(i) **Normative commitment** relates to an individual's devotion to their company based on a sense of obligation (Yousef, 2017).

(ii) **Affective commitment** is an individual's devotion to their company based on desire (Yousef, 2017).

(iii) **Continuance commitment** refers to an individual's devotion to their company based on a feeling of need (Yousef, 2017).

The entrepreneurial capital framework can be summarised as follows (Figure 4):

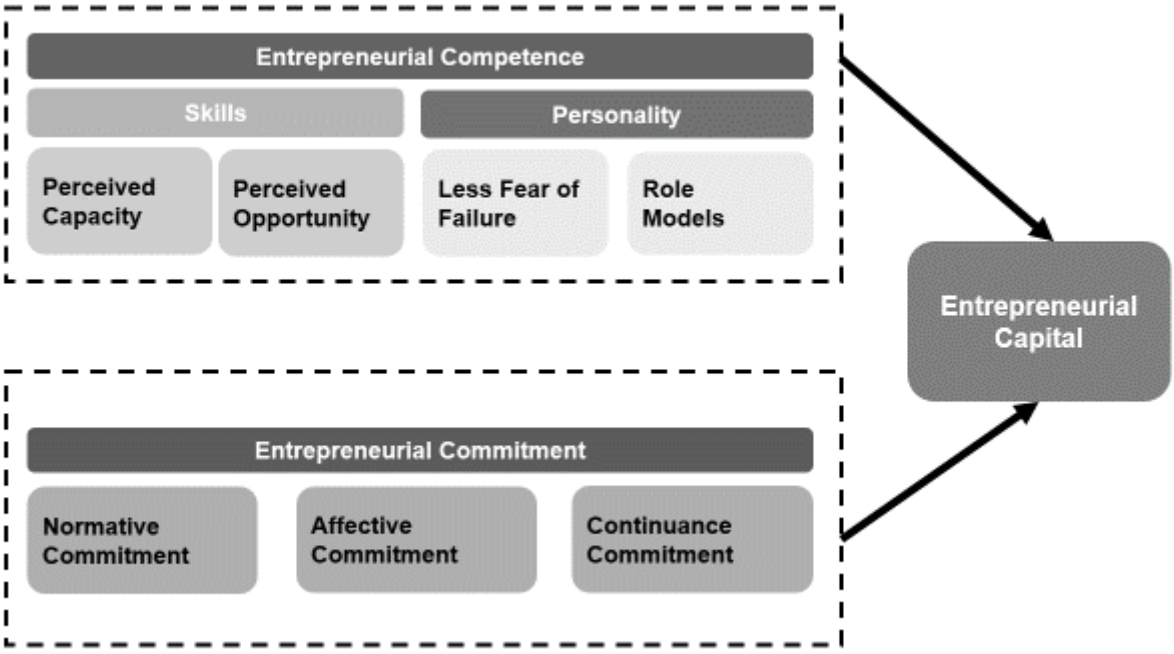


Figure 4: Entrepreneurial capital framework (Venter and Urban, 2015 ; Barazandeh et al., 2015 ; Tasmin et al., 2013)

2.3. The smallholder farming business

Smallholder farmers are food growers who possess and work on less than 2 ha of land (Harvey et al., 2014). The smallholder farming business is generally a family-owned business whereby traditional cultivation techniques are transmitted from one generation to the next. In the present-day, there are an approximate number of 525 million smallholder farmers in the world, of which 33 million farm in Africa. Many practice this profession for survival reasons, as there is a shortage of more profitable opportunities for them to earn a living (World Bank, 2013).

Smallholder farmers cultivate 12 percent of the World's agricultural land (Lowder, Skoet and Raney, 2016). They also make up half of the hungry people around the world and probably three-quarters of the hungry in Africa (Harvey et al., 2014). They solely depend on agricultural productivity for their survival. Their lives are greatly affected by events such as pest and disease outbreaks, extreme weather conditions and market shocks, which are highly pronounced in the tropics (Harvey et al., 2014).

Researchers are now starting to grow interests in studying the financial difficulties faced by smallholder farmers with the aim to develop adequate training and services which would help them improve their lives (World Bank, 2016).

In Madagascar, smallholder farmers are particularly vulnerable due to exceptionally high rates of cyclones in the island. As a result, they represent the poorest proportion of the population with 87 percent of them living below the national poverty line (Rakotobe et al., 2016).

2.4. Demographics and entrepreneurship

Entrepreneurship activities are not solely dependent on economic factors. The entrepreneurial procedure, all the steps required to create and manage a new venture, necessitates the entrepreneur to hold a number of qualities. They include: (i) a progressive mindset, (ii) a desire to be profitable while creating relevant values in the lives of the target market, and (iii) an ability to competently run a business while ensuring a first-class execution of breakthrough ideas. All of these attributes are contingent upon demographic antecedents such as: gender, age, and education level (Globerman and Clemens, 2018).

2.4.1. Gender

In spite of the congenial depiction of entrepreneurship as an equitable economic discipline whereby its adepts' potentials are weighed up based on their unveiled ability, an in-depth observation confirms that there exists a non-negligible barrier of entry into the field due to a male chauvinist belief that women are not as capable as men (Sullivan and Meek, 2012). Female entrepreneurs are viewed as futile and remotely disassociated from the reality of entrepreneurship and the entrepreneurial community (Manzanera-Roman and Brandle, 2016). Some even suggest that they are 'incomplete men' and compared to the indisputably established masculine standard; femininity represents lack and deficiency (Sullivan and Meek, 2012).

In a world where the business environment is disproportionally male-dominated, women get culturally prejudiced to the point that they underestimate their own entrepreneurial potential

and record a lower intention than their male counterparts to start a new venture (Markussen and Roed, 2017).

Women tend to look for opportunities in less productive and not so much resource intensive industries, in contrast with the inclination of men (Alsos, Isaksen and Ljunngren, 2006). The more an industry is capital exhaustive, the more male entrepreneurs are attracted to it (Alsos et al., 2006). It is no surprise then that men-owned businesses are much more profitable, count more personnel and grow faster than those owned by female entrepreneurs. Another reason contributing to the lower profitability of women-owned businesses is their over reliance on family members and external collaborators to aid them to confront corporate related issues (Boden and Nucci, 2000). If a female entrepreneur recruits a great deal of reliable professionals to assist her with her business, the magnitude of her profitability will certainly increase (Greve and Salaff, 2003).

Both the women's experience and their contacts are from low growth, i.e. less capital intensive, industries (Sullivan and Meek, 2012). These sectors become their primary area of focus when entering the *metier* of entrepreneurship as they presume that concentrating on them will help to heave up their chance of success (Sullivan and Meek, 2012).

Due to women's dependence on family members as collaborators, it has been observed that when they come from an entrepreneurially competent family, female entrepreneurs can gather all the necessary information and resources to triumph through new venture creation related matters (Greve and Salaff, 2003). There is also an evidence that when women meet face-to-face with weak-tie networks, they are more likely to acquire extra accounting related materials (Jones and Tullous, 2002).

Strong-tie relationships, such as friends and family, are instrumental in female entrepreneurs' search for investors to sponsor their business. In contrast with men, who'd rather borrow the required financial capital from traditional lenders, women tend to source most of their corporate finance from strong connections (Carter, Shaw, Lam and Wilson, 2007). There are plenty of possible reasons for this. One of them is that women may choose to engage in entrepreneurial activities requiring less financial capital. Another point to be mentioned is the aspect that when women are more capable of developing weak-ties, they can usually manage to borrow a higher amount of loan (Sullivan and Meek, 2012). This highlights the unfortunate

reality that women are often less likely than men to receive financial support for their business (Singh and Lucas, 2005). It is partly due to the fact that they are more drawn towards low growth industries, whereby the companies' profitability is similarly low. Hence, only their ability to persuade and reassure their weak-tie connections enable them to receive a larger amount of funding (Sullivan and Meek, 2012).

2.4.2. Age

An individual's age is a very important factor, significantly affecting their intention to plunge into entrepreneurship (Globerman and Clemens, 2018). People tend to be particularly motivated to enter this discipline between the age of 25 and 49 years old. At age 25, an individual's motivation to start a business begins to take hold, then, it reaches a ceiling and starts declining up till the age of 49 before turning out to be non-existent (Globerman and Clemens, 2018).

Among the origins of this phenomenon is the need for both creativity and work experience to enhance success in the field (Khyareh and Mazhari, 2016). People between 25 and 49 years of age are the top contenders as they hold a more flexible way of thinking. They also have an adequate exposure providing them with professional credentials to properly create and manage an enterprise (Liang, Wand and Lazear, 2014).

Creativity demands a flexible way of thinking, characteristic of the younger generation (Demmert and Klein, 2003). It is defined as the propensity to bring about a new mindset that disrupts what has been done in the past with a novel invention that looks forward into the future (Liang et al., 2014).

There is a great deal of relationship between an individual's age and their possession of the characteristics of a successful entrepreneur (Globerman and Clemens, 2018). Successful entrepreneurs divulge two main qualities. Firstly, they are knowledgeable about the exploitable opportunities and the different ways that could be advanced to address the needs of their community. Secondly, they have the necessary skills to suitably found and run their own company (Khyareh and Mazhari, 2016).

Risk perception also varies according to the age of an individual due to the need for stability in their revenues and their generated net income (Khyareh and Mazhari, 2016). When an individual reaches the senior age, they have a limited time to spare to collect savings (Globerman and Clemens, 2018). As they age, people become ill disposed to taking risks (Khyareh and Mazhari, 2016). They become more reluctant to venture in the unknown and prefer traditional occupations that offer them financial security.

2.4.3. Education

Education is another fundamental demographic factor influencing the dynamic of an entrepreneurial venture (var der Sluis, van Praag and van Witteloostuijn, 2007). An employee working in a conventional job makes 6.5 percent additional income for every supplementary year of studying (Harmon, Oosterbeek and Walker, 2003). This figure drops to 5.5 percent additional profits for each surplus year of education for entrepreneurs operating in developing countries and 6.1 percent for those in high-income nations (var der Sluis and van Praag, 2008).

Mincer (1974) developed the following formula to compute the return of investments received from education:

$$\ln(\text{profits}_i) = \alpha + \beta_1\, \text{age}_i + \beta_2\, (\text{age}_i)^2 + \beta_3\, (\text{education}_i) + y\mathbf{X}_i + \varepsilon_i$$

Literally, it suggests that: *"The log of profits of firm is regressed on the education of its owner, using his or her age as a proxy for experience (which is assumed to have a positive but decreasing marginal effect), and controlling for a vector of other firm- and owner-specific variables Xi"* (Kolstad and Wiig, 2015:4).

The return on investments received from education, however, is not stable but varies according to the number of educated people (Shudde, 2018). When the number of educated people increases, the return on investments received from education decreases. When the number of educated people decreases, the return on investments received from education increases. In other words, it is an inversely proportional relationship, suggesting that when more people, especially from lower social classes, gain access to education, the return on investments acquired diminishes (Schudde, 2018).

It has been noticed that entrepreneurs residing far away from educational institutions are usually not as educated as their peers living closer to schools (Kolstad and Wiig, 2015). As a consequence, the amount of profits generated by business owners dwelling in rural areas, where the number of schools is generally limited, is much lower than that enjoyed by those residing around cities (Kolstad and Wiig, 2015).

2.5. Established relationship between entrepreneurial capital and business performance

2.5.1. Relationship between entrepreneurial competence and profitability

Feurer and Chaharbaghi (1994) define competence as a group of connected knowledge, attitude and skills that an individual possesses and utilises to deliver a distinguished achievement in a particular area of responsibility. Lopa and Bose (2014) suggest there are six major components of entrepreneurial competence (opportunity, organising, relationship, strategic, commitment and conceptual competencies) and summarise the positive correlation between the latter and business performance with Figure 5.

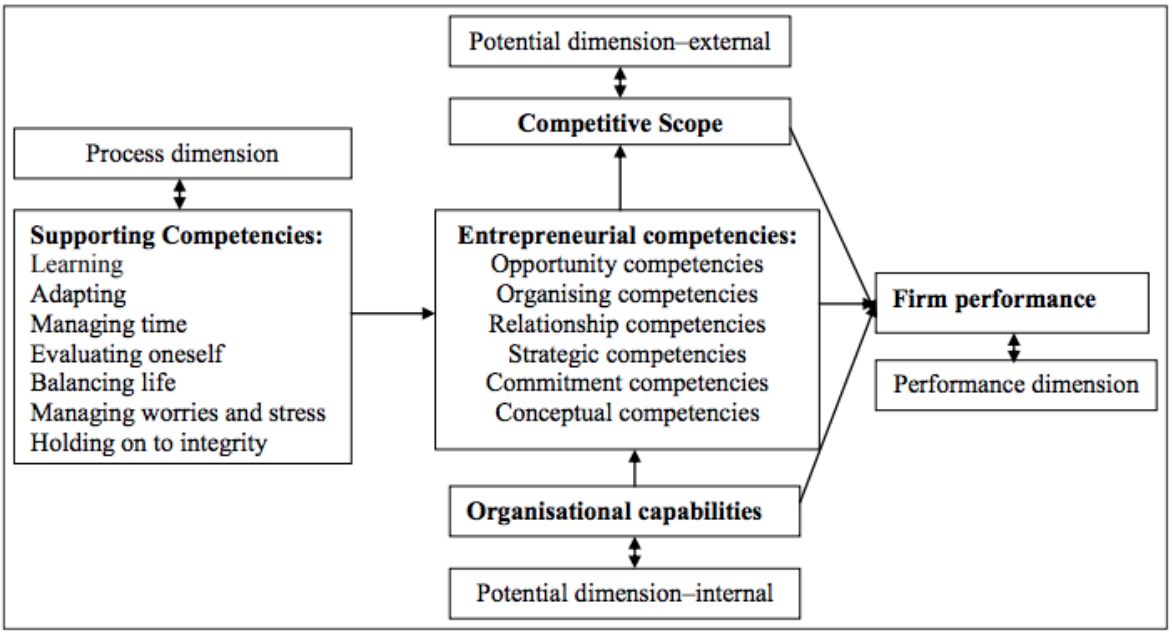


Figure 5: Relationship between entrepreneurial competence and business performance (Lopa and Bose, 2014, p.3)

Table 2 provides a description of the different entrepreneurial competence components.

Table 2: Different components of entrepreneurial competence

ENTREPRENEURIAL COMPETENCE	BEHAVIOURAL FOCUS	PRELIMINARY ELEMENTS
Opportunity competencies	Use of different ways to identify opportunities	Opportunity seeking Opportunity identification Opportunity development
Organising competencies	Abilities aligned with the organisation of resources	Organising, planning, controlling and leading
Relationship competencies	Abilities connected with networking with individual or groups of people	Communication, networking
Strategic competencies	Abilities connected with the choice, the evaluation and the implementation of strategies for the venture	Conceptualisation Strategic thinking Goal setting
Commitment competencies	Abilities connected with the persistence to move on and strive to achieve the venture's objectives	Perseverance Taking initiative
Conceptual competencies	Conceptual abilities observed in the entrepreneurs' behaviour	Analysis, problem-solving, decision-making, innovating, risk-taking

Source: Lopa and Bose (2014)

The established relationship between entrepreneurial competence and business performance enables to define the first hypothesis for the study:

Hypothesis 1: There is a significant relationship between entrepreneurial competence (perceived capacity, perceived opportunity, less fear of failure and role models) and the profitability of smallholder farmers in Analamanga's rural areas, where demographics (gender, age and level of education) play a role.

2.5.2. Relationship between entrepreneurial commitment and profitability

'Endurance', 'perseverance', 'passion' and 'self-determination' are four words that have been particularly highlighted by Tasnim and Singh (2016) when describing commitment within the context of entrepreneurship. Tasnim and Singh (2016) maintained that entrepreneurial commitment is an essential factor stimulating not only a potent venture performance, but also new venture establishments, entrepreneurial munificence, new product development, and internationalisation. As a matter of fact, Tasnim and Singh (2016) further stipulated that entrepreneurial performance is a by-product of normative commitment, while affective commitment nourishes entrepreneurial passion and supports the overall business performance.

These observations have been echoed by Simon, Stachel and Covin (2011) who corroborated the positive relationship between entrepreneurial commitment and business performance after undertaking a study on 126 small, high technology firms. The scholars argued that the greater commitment entrepreneurs have, the more focused and consistent they are in refining strategies used and actions taken until they succeed. Accordingly, commitment provides entrepreneurs with the freedom to act and ensures them to remain in control of their achievements.

The established relationship between entrepreneurial commitment and business performance allows to define the second hypothesis for the study:

Hypothesis 2: There is a significant relationship between entrepreneurial commitment (normative commitment, affective commitment and continuance commitment) and the profitability of smallholder farmers in Analamanga's rural areas, where demographics (gender, age and level of education) play a role.

2.5.3. Relationship between entrepreneurial capital and profitability

The abovementioned findings (Feurer and Chaharbaghi, 1994; Simon et al., 2011; Lopa and Bose, 2014) suggest an undeniable relationship between entrepreneurial competence and profitability. A positive correlation between entrepreneurial commitment and profitability was also highlighted (Tasnim and Singh, 2016). Correspondingly, considering the fact that entrepreneurial capital is a multiplicative function between entrepreneurial competence and entrepreneurial commitment, it can be advanced that a positive relationship also exists between entrepreneurial capital and profitability (Venter and Urban, 2015).

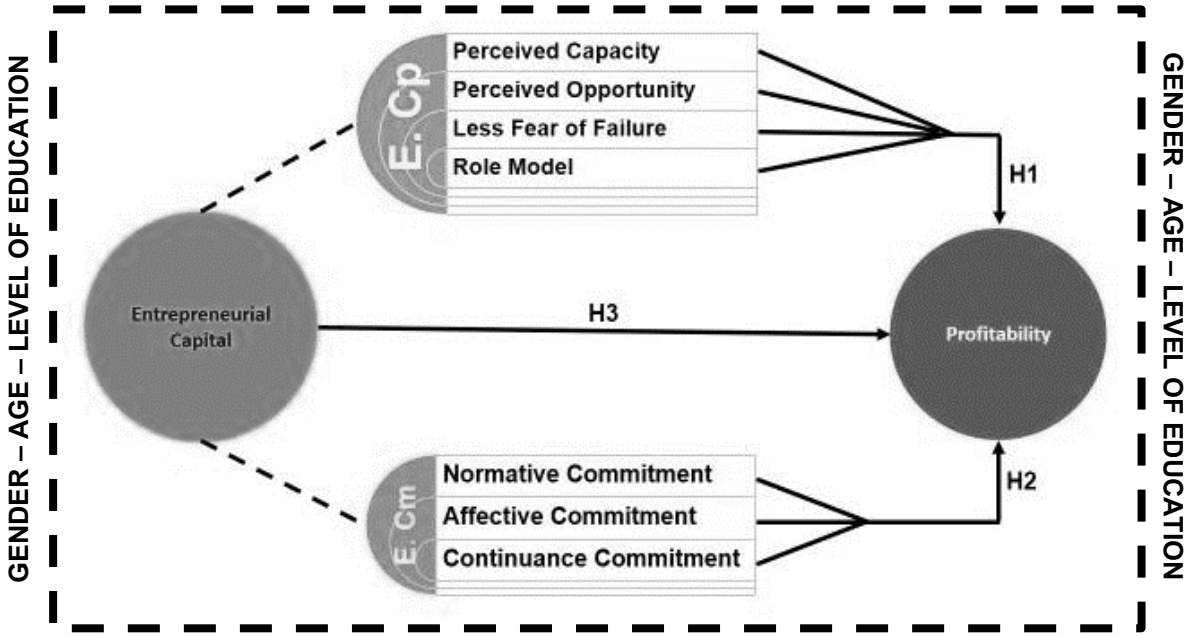
Audretsch and Keilbach (2004) confirm this deduction by contending that entrepreneurial capital affects a firm's economic performance by shaping output and productivity.

The established relationship between entrepreneurial capital and business performance enables to define the third hypothesis for the study:

Hypothesis 3: There is a significant relationship amidst the multiplicative interaction between the entrepreneurial competence and entrepreneurial commitment constructs – engendering the entrepreneurial capital paradigm – and the profitability of smallholder farmers in Analamanga's rural areas, where demographics (gender, age and level of education) play a role.

2.6. Research conceptual framework

Based on the previous section, Figure 6 exhibits the research conceptual framework.



E.Cp: Entrepreneurial Competence - E.Cm: Entrepreneurial Commitment

Figure 6: Correlation conceptual framework for the research (Feurer and Chaharbaghi, 1994 ; Lopa and Bose, 2014 ; Tasnim and Sign, 2016 ; Simon et al., 2011 ; Venter and Urban, 2015 ; Audretsch and Keilbach, 2004)

Table 3 summarises the problem and sub-problems addressed by the research, as well as the hypotheses.

Table 3: Problem, sub-problem and hypotheses

Problem: To examine the nature of the relationship between entrepreneurial capital and the profitability of smallholder farmers in Analamanga's rural areas.	
Sub-problem	**Hypotheses**
Sub-problem 1: To scan the nature of the relationship between entrepreneurial competence and the profitability of smallholder farmers in Analamanga's rural areas.	**Hypothesis 1:** There is a significant relationship between entrepreneurial competence (perceived capacity, perceived opportunity, less fear of failure and role models) and the profitability of smallholder farmers in Analamanga's rural areas, where demographics (gender, age and level of education) play a role.
Sub-problem 2: To scrutinise the nature of the relationship between entrepreneurial commitment and the profitability of smallholder farmers in Analamanga's rural areas.	**Hypothesis 2:** There is a significant relationship between entrepreneurial commitment (normative commitment, affective commitment and continuance commitment) and the profitability of smallholder farmers in Analamanga's rural areas, where demographics (gender, age and level of education) play a role.
Sub-problem 3: To explore the nature of the relationship amongst the multiplicative interaction between entrepreneurial competence and entrepreneurial commitment, and the profitability of smallholder farmers in Analamanga's rural areas.	**Hypothesis 3:** There is a significant relationship amongst the multiplicative interaction between the entrepreneurial competence and entrepreneurial commitment constructs – engendering the entrepreneurial capital paradigm – and the profitability of smallholder farmers in Analamanga's rural areas, where demographics (gender, age and level of education) play a role.

Source: Author

2.7. Conclusion of the literature review

The entrepreneur's defining personality traits, the extent of their knowledge and skills, along with their ability to identify opportunities and mobilise the necessary resources to capitalise on them produce, therefore, a foreseeable outcome on the profitability of an enterprise. This mechanistic discovery championed by Erikson (2002), Audretsch and Keilbach (2004) and Venter and Urban (2015) could serve as the structural basis of a forward-looking supportive platform implemented to add fuel to the economic performance of less lucrative wealth producing businesses such as those run by smallholder farmers in the central region of Madagascar. Nevertheless, as this theory only provides an impressionistic understanding of the influence of entrepreneurial capital on the profitability of a business owner, an in-depth study of its applicability within the context of smallholder farmers in Analamanga's rural areas, appears as a must.

CHAPTER 3: RESEARCH METHODOLOGY

3.1. Introduction

This chapter describes the methodology that was adopted for the implementation of the research. At first, a broad description of the research methodology used is presented. It is followed by a thorough elucidation of: research design, population and sample, research instrument, procedure for data collection, approach used for data analysis and interpretation, limitations of the study and research validity and reliability.

3.2. Research methodology

Considering its purpose, associated problems, sub-problems as well as the formulated hypotheses, the research seeks to validate evidence, test hypotheses and look at correlations among different variables. It suggests that there was a need to collect data and analyse the related statistics to be able to accept or reject the hypotheses. Subsequently, the use of a quantitative approach was recommended.

Although critics argue that the quantitative research approach may fail to truthfully represent many traits of people such as their identities, beliefs, and perceptions, which cannot be meaningfully reduced to numbers, this method has been proven to (Choy, 2014):

(i) promote a fast data collection and analysis process: a quality that is crucial in such a research undertaken in a very limited amount of time

(ii) and ensure easy comparisons among the data collected from different groups or organisations: a strength that rightly responds to the purpose of the research.

Quantitative research is defined as:

" … the collection and analysis of data that is structured and can be represented numerically in order to build accurate and reliable measurements that allow for statistical analysis" (Goertzen, 2017, p.12).

3.3. Research design

Taking into account the resource restraints and the research purpose, which is to study correlation, a non-experimental cross-sectional survey was deemed to be most appropriate. In other words, the relationship between entrepreneurial capital and the profitability of smallholder farmers in Analamanga's rural areas was studied, at a particular point in time, through the collection of data from a selected sample of individuals according to their response to questionnaires (Check and Shutt, 2012, cited by Ponto, 2015).

3.4. Population and sample

3.4.1. Population

The population object of the research consisted of 16,800 adult smallholder farmers - individuals having and working on less than 2 ha of land (Harvey et al., 2014) - living in the rural areas of the central region of Madagascar – i.e. Analamanga - which comprises 7 rural districts with 139 municipalities altogether.

3.4.2. Sample and sampling method

Noting the requisite for scientific rigour in running the research and the available budget, the following sampling method was preferred within its framework:

- Step 1. A random selection of four rural districts (North, East, South, West) – district sample – was done;

- Step 2. In each district sample, a random selection of one municipality – municipality sample -, was carried out;

Table 4: List of district, district and municipality samples, and sample size

Location	Districts	District samples	Municipality samples	Population size
North	Anjozorobe A/rivo Avaradrano	Anjozorobe	Analaroa	3,017
East	Manjakandriana Andramasina	Manjakandriana	Ambohibary	3,206
South	A/rivo Atsimondrano	A/rivo Atsimondrano	Ampanefy	7,190
West	Ankazobe Ambohidratrimo	Ambohidratrimo	Mahabo	3,387
			Total of the population	16,800

Source: Ministère de l'Economie et du Plan (2009)

Considering that 70 percent of Malagasy population are farmers (Harvey et al., 2014) and 71 percent of Malagasy farmers are smallholders (Rakotobe et al., 2016), it could be advanced that Malagasy smallholder farmers represent 49.7 percent of the general population of Madagascar. Therefore, the use of the underneath equation (Krejcie and Morgan, 1970), in the calculation of the minimum required sample size:

$$s = X^2NP(1-P) \div d^2 (N-1) + X^2P(1-P)$$

Where:

s = minimum required sample size

X^2 = the table value of chi-square for 1 degree of freedom at the desired Confidence level (3.841).

N = the population size (16,800)

P = the proportion of smallholder farmers (0.497)

d = the degree of accuracy expressed as a proportion (.05).

After calculation, a minimum sample size of 385 farmers across the selected municipality samples was computed.

In applying the weight of the population of a specific municipality sample with regards to the total population of the overall municipality samples, the following distribution of the sample size was obtained:

Table 5: Distribution of the sample size across municipality samples

District samples	Municipality samples	Minimum required sample size (n)
Anjozorobe	Analaroa	69
Manjakandriana	Ambohibary	73
A/rivo Atsimondrano	Ampanefy	165
Ambohidratrimo	Mahabo	78
	Minimum sample required	385

Source: Author

- Step 3. From each municipality sample, a random selection of *n* smallholder farmers (see Table 5) to be interviewed, was undertaken. More specifically, at the beginning of the field data collection, the interviewers met in the middle of the village and then, from there, visited households and stopped by to run the interview if the households fulfilled the criteria of smallholder farmers.

3.5. Research Instrument

The research instrument used was a structured questionnaire inspired by those, which have been successfully tested in previous researches including:

- Perceived capability scale (Chen, Gully and Eden, 2001)
- Perceived opportunities scale (Kuckertz, Krell and Stockmann, 2017)
- Fear of failure scale (Conroy, 2003)
- Role models scale (Nauta and Kokali, 2001)
- Normative, affective and continuance commitment scales (Allen and Meyer, 1990)
- Profitability scale (Kanyua, Ithinji, Waluse and Wairimu, 2015)

Correspondingly, the questionnaire comprised four main sections, namely the: demographic information, entrepreneurial competence dimension, entrepreneurial commitment dimension and profitability dimension. All questions associated with each dimension made use of a 7-point Likert scale to answer them.

The entrepreneurial competence dimension's section consisted of:

- Perceived capability scale (with 8 items)
- Perceived opportunities scale (with 9 items)
- Fear of failure scale (with 5 items)
- Role models scale (with 9 items)

The entrepreneurial commitment dimension's section consisted of:

- Normative commitment scale (with 5 items)
- Affective commitment scale (with 7 items)
- Continuance commitment scale (with 8 items)

The profitability dimension section consisted of:

- Profitability scale (with 6 items)

Furthermore, the questionnaire was designed according to Altermatt's (2013) recommendations, listed as follows:

(i) Focus the questionnaire on the constructs to be measured, covering all of their preeminent qualities.

(ii) Use clear and unequivocal language; making sure responses would be as simple and straightforward as possible; and promoting the use of everyday language within short and simple sentences, instead of technical jargons that could be misunderstood.

(iii) Avoid questions that involve some adjectives, which would suggest participants to give a particular response.

(iv) Avoid questions that ask about two or more separate issues but allowing only a single response.

(v) Offer consistent response options to participants by, for example, keeping using seven response points Likert scale throughout the questionnaire.

An overview of the questionnaire used can be referred to in Appendix D.

3.6. Procedure for data collection

For data collection purposes, a team of five people (one supervisor, who is the researcher, and four interviewers) was created. The team was responsible for assisting respondents to complete questionnaires in all district samples. The questionnaire was administered directly to the participants by the interviewers. The team stayed in one district for five days. At the end of each day, the researcher proceeded with a verification of each completed questionnaire, then, he communicated, to the team and suggested a list of adjustments that needed to be made for the following day.

3.7. Data analysis and interpretation

The data analysis and interpretation process occurred as follows:

[1] All collected data were entered into Microsoft Excel.

[2] Once all data have been entered, the actual data analysis and interpretation process started with the breakdown of the respondents' demographics into their respective: gender, age and level of education.

[3] Then, the different measurements collected related to the variables making up entrepreneurial capital and profitability was examined, with a particular emphasis set on testing the correlation between the two constructs.

3.7.1. Testing of hypotheses 1, 2 and 3

The testing of the hypotheses 1, 2 and 3 was done according to the subsequent procedure:

[1] Data entered into Microsoft Excel were imported to IBM SPSS v.25 for statistical analyses.

[2] Descriptive statistics were used to analyse the demographics data. It involved the generation of the number and frequency of each group, convened according to participants' gender, age and level of education.

[3] Factor analysis was used to test scale validity. This process entailed the running of different tests to ensure that each item measuring wrong constructs is removed and those appraising the right ones, maintained.

[4] Cronbach's Alpha was used to test the scale reliability. This test produced the overall Cronbach's Alpha, related to each dimension, and corrected item-total correlation, related to each item. These ratios determined the homogeneity of the scale items and how they reflect the same underlying constructs.

[5] Multiple linear regression was used to test H1 and H2. It permitted the computation of regression weighs, p-values and effect size ratios establishing the nature of the relationship among the studied variables.

[6] Simple linear regression was used to test H3. It enabled the generation of p-values and effect size ratios certifying the nature of the relationship between the studied variables.

3.8. Limitations of the study

The study consisted of a non-experimental cross-sectional survey. It implies that data were collected only once at a particular point in time. Therefore, once the survey was completed, there was no follow up allowing the researcher to monitor the trend and see if the situations of the participants had changed over time. Additionally, a cross-sectional study is likely to be affected by a non-response bias if the circumstances of those who consent to participate in

the interview differ from that of those who don't, resulting into a sample, which is not representative of the population.

3.9. Validity and reliability

3.9.1. Test of scales validity

To test the validity of a scale, the procedure advocated by Taherdoost (2016) was adopted. Henceforth, at first, the ***ratio of cases to variables*** was checked to ensure that the minimum requirement of ***5 to 1*** is respected. Subsequently, the presence of substantial correlations was examined to ascertain the appropriateness of the factor analysis, necessitating the observation of ***some correlations greater than .30 between the variables involved in the analysis***. After that, the sampling adequacy of individual variables was explored to confirm the appropriateness of the factor analysis, with *Principal component analyses* entailing the ***Kaiser-Meyer-Olkin Measure of Sampling Adequacy to be greater than .50*** for each individual variable as well as the set of variables. Then, the result of the Bartlett's Test of Sphericity was inspected to make sure about the appropriateness of the factor analysis, with *Principal component analyses* demanding ***the probability associated with the Bartlett's Test of Sphericity to be less than the level of significance***. Finally, communalities were evaluated to determine if there is a need to remove any variable. The factor solution should explain at least half of each original variable's variance. Thereupon, ***the communality value for each variable should be .50 or higher***.

3.9.2. Test of scales reliability

To measure the internal consistency reliability among a group of items combined to form a single scale, the Cronbach's coefficient alpha – a valuation of the degree to which the scale items are homogenous and reflect the same underlying constructs - was used (Cooper & Schindler, 2011).

More precisely, to test the reliability of a given scale composed of *n* items, and in order to determine the final item composition of the scale, three types of indicators were studied (De Vaus, 2002):

[1] The overall Cronbach's alpha which provides the extent of the internal consistency among the *n* items;

[2] The corrected item-total correlation, related to each item, which assesses the item's score, with the composite scores from all other items that remain. ***If this correlation is weak (<.30), then that item should be removed*** and not used to form a composite score for the considered scale; and

[3] The Cronbach's alpha, if an item is deleted, gives the value of the overall Cronbach's alpha.

It is worth noting that ***a Cronbach's alpha of .60 or higher is the minimum acceptable level***. Preferably, a Cronbach's alpha should be .70 or higher (Nunnally and Bernstein, 1994; George and Mallery's, 2003).

3.10. Conclusion of the research methodology

To complete the study, a quantitative research approach was conducted. The research design consisted of a non-experimental cross-sectional survey. The evaluated population comprised all farmers owning a total land area of less than 2ha in the Analamanga region in Madagascar. The minimum sample size required consisted of 385 smallholder farmers interviewed in a randomly selected northern, eastern, southern, and western rural areas of the region. A structured questionnaire inspired by those that have been successfully tested by Allen and Meyer (1990), Chen et al. (2001), Nauta and Kokali (2001), Conroy (2003), Kanyua et al. (2015) and Kuckertz et al. (2017) served as the instrument. Finally, data were collected by a team of five people supervised by the researcher, before being analysed and interpreted through the digital assistance of the IBM SPSS v.25 software.

CHAPTER 4: RESEARCH RESULTS

4.1. Introduction

This chapter presents the findings observed during the research. At first, a broad description of the sample is exhibited. It is followed by a thorough elucidation of the outcomes of: test of scales validity, test of scales reliability, and test of the hypotheses.

4.2. Sample completeness

As per the results of the calculation exhibited in Chapter 3, section 3.4.2, based on Kreicie and Morgan's (1970) formula to compute a minimum sample size, a minimum sample size of 385 smallholder farmers was required. Correspondingly, with a final sample size of 411 adult individuals, the response rate recorded during the data collection was very good, at 106.8 percent (Table 6).

Table 6: Smallholder farmers' response rate during the data collection process

Municipality samples location	Population size	Minimum sample size required	Response rate	Response rate percentage
North	3017	69	70	101.4%
East	3206	73	82	102.3%
South	7190	165	169	102.4%
West	3387	78	90	115.4%
Overall	**16800**	**385**	**411**	**106.8%**

4.3. Characteristic of the sample

Table 7: Demographics of studied population

Demographics	Number	Frequency
Gender		
Female	240	58.4%
Male	171	41.6%
Age		
Less than 20	30	7.3%
Between 20 – 39	195	47.4%
Between 40 – 59	172	41.8%
60 and above	14	3.4%
Level of education		
Without education	26	6.3%
Primary	159	38.7%
Secondary and above	226	55.0%
Overall sample	411	100.0%

The studied sample is composed of 58.4 percent of female and 41.6 percent of male. With regards to the age, if 47.4 percent of them have an age ranged between 20 and 39, 41.8 percent belong to the category ‘Between 40 – 59’ years old. On the other hand, 55 percent of the studied sample mentioned a level of education belonging to the category “Secondary and above” versus 38.7 percent for those who declared having a level of education of primary school (Table 7).

4.5. Test of scales validity

4.5.1. Entrepreneurial competence (E.Cp) scales

Perceived capability (PC)

Table 8: Descriptive statistics related to PC scale

Items	Mean	Std. Deviation	Analysis N	Number of variables	Ratio of case to variables
PC1	5.06	1.41	411	8	51.38 to 1
PC2	5.18	1.38	411		
PC3	5.13	1.41	411		
PC4	5.26	1.27	411		
PC5	5.19	1.34	411		
PC6	5.28	1.26	411		
PC7	5.14	1.37	411		
PC8	5.32	1.30	411		

For the perceived capability scale, the ratio of cases to variables was far higher than the minimum requirement of 5 to 1 – as per Taherdoost's (2016) suggestions, detailed in Chapter 3, section 3.9.1 - as it was 51.38 to 1 (Table 8).

Table 9: Correlation matrix related to PC scale

	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8
PC1	1.00	.80	.74	.73	.69	.75	.63	.68
PC2	.80	1.00	.85	.83	.77	.82	.74	.76
PC3	.74	.85	1.00	.83	.73	.77	.72	.70
PC4	.73	.83	.83	1.00	.83	.85	.73	.78
PC5	.69	.77	.73	.83	1.00	.85	.62	.84
PC6	.75	.82	.77	.85	.85	1.00	.73	.83
PC7	.63	.74	.72	.73	.62	.73	1.00	.68
PC8	.68	.76	.70	.78	.84	.83	.68	1.00

For the perceived capability scale, each variable correlated with another one, with a coefficient greater than .30 (Table 9). It complies with Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Table 10: KMO and Barlett's test related to PC scale

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.94
Bartlett's Test of Sphericity	Approx. Chi-Square	3719.55
	df	28
	Sig.	.00

For the perceived capability scale, the overall measure of sampling adequacy was .94 (Table 10). It is higher than the minimum requirement of .50 (Taherdoost, 2016). The probability associated with the Barlett's test was less than .001 (Table 10). It complies with Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Table 11: Anti-image matrix related to PC scale

		PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8
Anti-image Correlation	PC1	.96[a]	-.35	-.13	-.01	.01	-.14	.04	-.06
	PC2	-.35	.93[a]	-.35	-.11	-.08	-.12	-.19	-.03
	PC3	-.13	-.35	.93[a]	-.33	-.04	.04	-.16	.05
	PC4	-.01	-.11	-.33	.94[a]	-.25	-.25	-.12	-.02
	PC5	.01	-.08	-.04	-.25	.91[a]	-.29	.22	-.44
	PC6	-.14	-.12	.04	-.25	-.29	.94[a]	-.19	-.23
	PC7	.04	-.19	-.16	-.12	.22	-.19	.94[a]	-.19
	PC8	-.06	-.03	.05	-.02	-.42	-.23	-.19	.93[a]

a. Measures of Sampling Adequacy(MSA)

The value of the measure of sampling adequacy for each PC's item was more than the minimum required value of .50 (Table 11). This suggests that there was no need to remove any of them from the composition of the scale - as per Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Table 12: Communalities related to PC scale

Items	Initial	Extraction
PC1	1.00	.71
PC2	1.00	.86
PC3	1.00	.79
PC4	1.00	.86
PC5	1.00	.80
PC6	1.00	.86
PC7	1.00	.67
PC8	1.00	.78

The value of the communalities for each PC's item was more than the minimum requirement of .50 (Table 12). This suggests that there was no need to remove any of them from the composition of the scale - as per Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Perceived opportunity (PO)

Table 13: Descriptive statistics related to PO scale

Items	Mean	Std. Deviation	Analysis N	Number of variables	Ratio of case to variables
PO1	5.10	1.53	411		
PO2	4.15	1.84	411		
PO3	5.17	1.52	411		
PO4	3.75	1.93	411		
PO5	5.15	1.57	411	9	45.67 to 1
PO6	4.62	1.80	411		
PO7	3.55	1.77	411		
PO8	3.08	1.86	411		
PO9	1.41	1.06	411		

For the perceived opportunity scale, the ratio of cases to variables was far higher than the minimum required of 5 to 1 - as per Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1 - as it was 51.38 to 1 (Table 13).

Table 14: Correlation matrix related to PO scale

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
PO1	1.00	.44	.80	.32	.41	.55	.39	.12	.09
PO2	.44	1.00	.53	.27	.37	.47	.75	.20	.16
PO3	.80	.53	1.00	.28	.50	.64	.45	.13	.08
PO4	.32	.27	.28	1.00	.33	.32	.25	.08	.03
PO5	.41	.37	.50	.33	1.00	.46	.28	.20	.18
PO6	.55	.47	.64	.32	.46	1.00	.45	.03	.16
PO7	.39	.75	.45	.25	.28	.45	1.00	.32	.14
PO8	.12	.20	.13	.08	.20	.03	.32	1.00	.14
PO9	.09	.16	.08	.03	.18	.16	.14	.14	1.00

For the perceived opportunity scale, the number of variables with a correlation coefficient greater than .30 was 18 (Table 14). It complies with Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Table 15: KMO and Barlett's test related to PO scale

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		**.77**
Bartlett's Test of Sphericity	Approx. Chi-Square	1446.33
	df	36
	Sig.	.000

For the perceived opportunity scale, the overall measure of sampling adequacy was .77 (Table 15). It is higher than the minimum requirement of .50 (Taherdoost's, 2016). The probability associated with the Barlett's test was less than .001 (Table 15). It complies with Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Table 16: Anti-image matrix related to PO scale

		PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**
Anti-image Correlation	PO1	**.77[a]**	.03	-.67	-.16	.02	-.03	-.03	-.01	-.04
	PO2	.03	**.76[a]**	-.18	-.04	-.11	-.01	-.64	.08	-.08
	PO3	-.67	-.18	**.75[a]**	.11	-.20	-.31	.02	-.02	.10
	PO4	-.16	-.04	.11	**.85[a]**	-.20	-.13	-.04	-.01	.07
	PO5	.02	-.11	-.20	-.20	**.86[a]**	-.17	.11	-.17	-.11
	PO6	-.03	-.01	-.31	-.13	-.18	**.87[a]**	-.18	.20	-.11
	PO7	-.03	-.64	.02	-.04	.11	-.19	**.71[a]**	-.30	.01
	PO8	-.01	.08	-.02	-.01	-.17	.20	-.30	**.59[a]**	-.10
	PO9	-.04	-.08	.10	.07	-.11	-.11	.01	-.10	**.70[a]**

a. Measures of Sampling Adequacy(MSA)

The value of the measure of sampling adequacy for each PO's item was more than the minimum required value of .50 (Table 16) - as per Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Table 17: Communalities related to PO scale

Items	Initial	Extraction
PO1	1.00	.69
PO2	1.00	.64
PO3	1.00	.78
PO4	**1.00**	**.27**
PO5	**1.00**	**.43**
PO6	1.00	.65
PO7	1.00	.66
PO8	1.00	.60
PO9	**1.00**	**.28**

The value of the communalities for each item was more than the minimum requirement of .50 except for the items PO4 (.27), PO5 (.43) and PO9 (.28) (Table 17), suggesting the need for their removal from the composition of the perceived opportunity scale - as per Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Repeating the factor analysis for Perceived Opportunity scale (without PO4, PO5 and PO9)

Table 18: Correlation matrix related to PO revised scale (without PO4, PO5 and PO9)

	PO1	PO2	PO3	PO6	PO7	PO8
PO1	1.00	.44	.80	.55	.39	.12
PO2	.44	1.00	.53	.47	.75	.20
PO3	.80	.53	1.00	.64	.45	.13
PO6	.55	.47	.64	1.00	.45	.03
PO7	.39	.75	.45	.45	1.00	.32
PO8	.12	.20	.13	.03	.32	1.00

For the perceived opportunity revised scale, the number of variables with a correlation coefficient greater than .30 was 11 (Table 18). It complies with Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Table 19: KMO and Barlett's test related to PO revised scale (without PO4, PO5 and PO9)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		**.74**
Bartlett's Test of Sphericity	Approx. Chi-Square	1185.68
	df	15
	Sig.	.00

For the Perceived Opportunity revised scale, the overall measure of sampling adequacy was .74 (Table 19). It is higher than the minimum requirement of .50 (Taherdoost, 2016). The probability associated with the Barlett's test was less than .001 (Table 19). It complies with Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Table 20: Anti-image matrix related to PO revised scale (without PO4, PO5 and PO9)

		PO1	PO2	PO3	PO6	PO7	PO8
Anti-image Correlation	PO1	.74[a]	.02	-.67	-.06	-.04	-.02
	PO2	.02	.74[a]	-.20	-.06	-.64	.05
	PO3	-.67	-.20	.72[a]	-.34	.04	-.05
	PO4	-.064	-.06	-.34	.87[a]	-.17	.15
	PO5	-.04	-.64	.04	-.17	.70[a]	-.28
	PO6	-.02	.05	-.05	.15	-.28	.62[a]
	PO7	.74[a]	.02	-.67	-.06	-.04	-.02
	PO8	.02	.74[a]	-.20	-.06	-.64	.05
	PO9	-.67	-.20	.72[a]	-.34	.04	-.05

The value of the measure of sampling adequacy for each revised PO's item was more than the minimum required value of .50 (Table 20) - as per Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Table 21: Communalities related to PO revised scale (without PO4, PO5 and PO9)

Items	Initial	Extraction
PO1	1.00	.73
PO2	1.00	.69
PO3	1.00	.81
PO6	1.00	.67
PO7	1.00	.75
PO8	1.00	.71

The value of the communalities for each revised PO's item was more than the minimum requirement of .50 (Table 21) - as per Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Less fear of failure (LFF)

Table 22: Descriptive statistics related to LFF scale

Items	Mean	Std. Deviation	Analysis N	Number of variables	Ratio of case to variables
LFF1	5.66	1.24	411		
LFF2	5.90	1.13	411		
LFF3	5.31	1.36	411	5	82.2 to 1
LFF4	5.68	1.25	411		
LFF5	5.58	1.37	411		

For the less fear of failure scale, the ratio of cases to variables was far higher than the minimum requirement of 5 to 1 - as per Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1 - as it was 82.2 to 1 (Table 22).

Table 23: Correlation matrix related to LFF scale

	LFF1	LFF2	LFF3	LFF4	LFF5
LFF1	1.00	.52	.37	.36	.34
LFF2	.52	1.00	.27	.33	.26
LFF3	.37	.27	1.00	.62	.64
LFF4	.36	.33	.62	1.00	.56
LFF5	.34	.26	.64	.56	1.00

For the less fear of failure scale, the number of variables with a correlation coefficient greater than .30 was 8 (Table 23). It complies with Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Table 24: KMO and Barlett's test related to LFF scale

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.76
Bartlett's Test of Sphericity	Approx. Chi-Square	659.53
	df	10
	Sig.	.00

For the less fear of failure scale, the overall measure of sampling adequacy was .76 (Table 24). It is higher than the minimum requirement of .50 (Taherdoost, 2016). The probability associated with the Barlett's test was less than .001 (Table 24). It complies with Taherdoost's (2016) recommendations detailed in Chapter 3, section 3.9.1.

Table 25: Anti-image matrix related to LFF scale

		LFF1	LFF2	LFF3	LFF4	LFF5
Anti-image Correlation	LFF1	**.74[a]**	-.45	-.12	-.06	-.09
	LFF2	-.45	**.70[a]**	.01	-.14	-.02
	LFF3	-.12	.01	**.75[a]**	-.38	-.42
	LFF4	-.06	-.14	-.38	**.80[a]**	-.25
	LFF5	-.09	-.02	-.42	-.25	**.78[a]**

a. Measures of Sampling Adequacy(MSA)

The value of the measure of sampling adequacy for each LFF's item was more than the minimum required value of .50 (Table 25) - as per Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Table 26: Communalities related to LFF scale

Items	Initial	Extraction
LFF1	1.00	.73
LFF2	1.00	.80
LFF3	1.00	.78
LFF4	1.00	.70
LFF5	1.00	.73

The value of the communalities for each LFF's item was more than the minimum requirement of .50 (Table 26) - as per Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Role models (RM)

Table 27: Descriptive statistics related to RM scale

Items	Mean	Std. Deviation	Analysis N	Number of variables	Ratio of case to variables
RM1	3.85	1.71	411		
RM2	3.84	1.67	411		
RM3	3.96	1.65	411		
RM4	3.97	1.70	411		
RM5	5.02	1.59	411	9	45.67 to 1
RM6	5.20	1.50	411		
RM7	5.25	1.39	411		
RM8	4.35	1.74	411		
RM9	5.18	1.41	411		

For the role models scale, the ratio of cases to variables was far higher than the minimum requirement of 5 to 1 - as per Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1 - as it was 45.67 to 1 (Table 27).

Table 28: Correlation matrix related to RM scale

	RM1	RM2	RM3	RM4	RM5	RM6	RM7	RM8	RM9
RM1	1.00	.85	.72	.61	.49	.47	.45	.47	.36
RM2	.85	1.00	.85	.73	.50	.48	.43	.51	.39
RM3	.72	.85	1.00	.88	.44	.43	.39	.54	.33
RM4	.61	.73	.88	1.00	.42	.41	.38	.57	.35
RM5	.49	.50	.44	.42	1.00	.91	.77	.47	.68
RM6	.47	.48	.44	.41	.91	1.00	.77	.46	.68
RM7	.45	.43	.39	.38	.77	.77	1.00	.55	.75
RM8	.47	.51	.54	.57	.47	.46	.55	1.00	.50
RM9	.36	.39	.33	.35	.68	.68	.75	.50	1.00

For the role models scale, the number of variables with a correlation coefficient greater than .30 was 36 (Table 28). It complies with Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Table 29: KMO and Barlett's test related to RM scale

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.85
Bartlett's Test of Sphericity	Approx. Chi-Square	3516.45
	df	36
	Sig.	.00

For the role models scale, the overall measure of sampling adequacy was .85 (Table 29). It is higher than the minimum requirement of .50 (Taherdoost, 2016). The probability associated with the Barlett's test was less than .001 (Table 29). It complies with Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Table 30: Anti-image matrix related to RM scale

		RM1	RM2	RM3	RM4	RM5	RM6	RM7	RM8	RM9
Anti-image Correlation	RM1	.86[a]	-.62	-.03	.07	-.03	-.00	-.11	-.04	.07
	RM2	-.62	.82[a]	-.48	.04	-.07	.02	.06	-.00	-.09
	RM3	-.03	-.48	.80[a]	-.69	.03	-.06	.01	-.04	.11
	RM4	.07	.04	-.70	.83[a]	-.01	.00	.03	-.20	-.07
	RM5	-.03	-.07	.03	-.01	.83[a]	-.75	-.14	-.01	-.10
	RM6	-.00	.02	-.06	.00	-.75	.82[a]	-.23	.07	-.08
	RM7	-.11	.06	.01	.03	-.14	-.23	.90[a]	-.22	-.40
	RM8	-.04	-.00	-.04	-.20	-.01	.07	-.22	.94[a]	-.15
	RM9	.07	-.09	.11	-.07	-.010	-.08	-.40	-.15	.91[a]

a. Measures of Sampling Adequacy(MSA)

The value of the measure of sampling adequacy for each RM's item was more than the minimum required value of .50 (Table 30). It complies with Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Table 31: Communalities related to RM scale

Items	Initial	Extraction
RM1	1.00	.73
RM2	1.00	.87
RM3	1.00	.90
RM4	1.00	.79
RM5	1.00	.85
RM6	1.00	.84
RM7	1.00	.83
RM8	1.00	.52
RM9	1.00	.7

The value of the communalities for each RM's item was more than the minimum requirement of .50 (Table 31) - as per Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

4.5.2. Entrepreneurial commitment (E.Cm) scales

Normative commitment (NC)

Table 32: Descriptive statistics related to NC scale

Items	Mean	Std. Deviation	Analysis N	Number of variables	Ratio of case to variables
NC1	5.76	1.20	411		
NC2	5.41	1.59	411		
NC3	5.57	1.29	411	5	82.2 to 1
NC4	5.54	1.35	411		
NC5	5.38	1.47	411		

For the normative commitment scale, the ratio of cases to variables was far higher than the minimum requirement of 5 to 1 - as per Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1 - as it was 82.2 to 1 (Table 32).

Table 33: Correlation matrix related to NC scale

	NC1	NC2	NC3	NC4	NC5
NC1	1.00	.75	.72	.69	.61
NC2	.75	1.00	.67	.74	.75
NC3	.72	.67	1.00	.72	.59
NC4	.69	.74	.72	1.00	.81
NC5	.61	.75	.59	.81	1.00

For the normative commitment scale, the number of variables with a correlation coefficient greater than .30 was 10 (Table 33). It complies with Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Table 34: KMO and Barlett's test related to NC scale

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.84
Bartlett's Test of Sphericity	Approx. Chi-Square	1611.45
	df	10
	Sig.	.000

For the normative commitment scale, the overall measure of sampling adequacy was .84 (Table 34). It is higher than the minimum requirement of .50 (Taherdoost, 2016). The probability associated with the Barlett's test was less than .001 (Table 34). It complies with Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Table 35: Anti-image matrix related to NC scale

		NC1	NC2	NC3	NC4	NC5
Anti-image Correlation	NC1	.86[a]	-.42	-.35	-.15	.06
	NC2	-.42	.86[a]	-.13	-.07	-.38
	NC3	-.35	-.13	.87[a]	-.35	.09
	NC4	-.15	-.07	-.35	.82[a]	-.57
	NC5	.06	-.38	.09	-.57	.80[a]

a. Measures of Sampling Adequacy(MSA)

The value of the measure of sampling adequacy for each NC's item was more than the minimum required value of .50 (Table 35). It complies with Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Table 36: Communalities related to NC scale

Items	Initial	Extraction
NC1	1.00	.74
NC2	1.00	.80
NC3	1.00	.71
NC4	1.00	.83
NC5	1.00	.74

The value of the communalities for each NC's item was more than the minimum requirement of .50 (Table 36) – as per Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Affective commitment (AC)

Table 37: Descriptive statistics related to AC scale

Items	Mean	Std. Deviation	Analysis N	Number of variables	Ratio of case to variables
AC1	5.80	1.19	411		
AC2	5.81	1.07	411		
AC3	5.33	1.56	411		
AC4	5.34	1.55	411	7	58.71 to 1
AC5	6.05	1.08	411		
AC6	6.12	1.03	411		
AC7	6.19	1.03	411		

For the affective commitment scale, the ratio of cases to variables was far higher than the minimum requirement of 5 to 1 - as per Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1 - as it was 58.71 to 1 (Table 37).

Table 38: Correlation matrix related to AC scale

	AC1	AC2	AC3	AC4	AC5	AC6	AC7
AC1	1.00	.65	.66	.67	.67	.66	.66
AC2	.65	1.00	.55	.54	.69	.66	.68
AC3	.66	.55	1.00	.69	.57	.53	.54
AC4	.63	.54	.69	1.00	.63	.60	.53
AC5	.67	.69	.57	.63	1.00	.88	.84
AC6	.66	.66	.53	.60	.88	1.00	.89
AC7	.66	.68	.54	.53	.84	.89	1.00

For the affective commitment scale, the number of variables with a correlation coefficient greater than .30 was 21 (Table 38). It complies with Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Table 39: KMO and Barlett's test related to AC scale

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.89
Bartlett's Test of Sphericity	Approx. Chi-Square	2524.43
	df	21
	Sig.	.00

For the affective commitment scale, the overall measure of sampling adequacy was .89 (Table 39). It is higher than the minimum requirement of .50 (Taherdoost, 2016). The probability associated with the Barlett's test was less than .001 (Table 39). It complies with Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Table 40: Anti-image matrix related to AC scale

		AC1	AC2	AC3	AC4	AC5	AC6	AC7
Anti-image Correlation	AC1	.93[a]	-.22	-.25	-.24	-.03	-.03	-.13
	AC2	-.22	.96[a]	-.09	-.03	-.18	.00	-.14
	AC3	-.25	-.09	.88[a]	-.42	-.05	.13	-.13
	AC4	-.24	-.03	-.42	.87[a]	-.15	-.17	.21
	AC5	-.03	-.18	-.05	-.15	.91[a]	-.48	-.18
	AC6	-.03	.00	.13	-.17	-.48	.83[a]	-.57
	AC7	-.13	-.14	-.13	.21	-.18	-.57	.86[a]

a. Measures of Sampling Adequacy(MSA)

The value of the measure of sampling adequacy for each AC's item was more than the minimum required value of .50 (Table 40) - as per Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Table 41: Communalities related to AC scale

Items	Initial	Extraction
AC1	1.00	.71
AC2	1.00	.66
AC3	1.00	.58
AC4	1.00	.62
AC5	1.00	.82
AC6	1.00	.80
AC7	1.00	.78

The value of the communalities for each AC's item was more than the minimum requirement of .50 (Table 41) - as per Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Continuance commitment (CC)

Table 42: Descriptive statistics related to CC scale

Items	Mean	Std. Deviation	Analysis N	Number of variables	Ratio of case to variables
CC1	5.74	1.38	411	8	51.38 to 1
CC2	5.87	1.26	411		
CC3	5.85	1.26	411		
CC4	5.89	1.24	411		
CC5	5.91	1.26	411		
CC6	5.35	1.36	411		
CC7	5.69	1.36	411		
CC8	5.69	1.32	411		

For the continuance commitment scale, the ratio of cases to variables was far higher than the minimum requirement of 5 to 1 - as per Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1 - as it was 51.38 to 1 (Table 42).

Table 43: Correlation matrix related to CC scale

	CC1	CC2	CC3	CC4	CC5	CC6	CC7	CC8
CC1	1.00	.71	.60	.63	.58	.47	.50	.45
CC2	.71	1.00	.83	.86	.85	.48	.48	.69
CC3	.60	.83	1.00	.93	.86	.43	.52	.67
CC4	.63	.86	.93	1.00	.91	.46	.56	.70
CC5	.58	.85	.86	.91	1.00	.41	.49	.75
CC6	.47	.48	.43	.46	.41	1.00	.69	.49
CC7	.50	.48	.52	.56	.49	.69	1.00	.57
CC8	.45	.69	.67	.70	.75	.49	.57	1.00

For the continuance commitment scale, the number of variables with a correlation coefficient greater than .30 was 28 (Table 43). It complies with Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Table 44: KMO and Barlett's test related to CC scale

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.88
Bartlett's Test of Sphericity	Approx. Chi-Square	3317.19
	df	28
	Sig.	.00

For the continuance commitment scale, the overall measure of sampling adequacy was .88 (Table 44). It is higher than the minimum requirement of .50 (Taherdoost, 2016). The probability associated with the Barlett's test was less than .001 (Table 44). It complies with Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Table 45: Anti-image matrix related to CC scale

		CC1	CC2	CC3	CC4	CC5	CC6	CC7	CC8
Anti-image Correlation	CC1	.89[a]	-.45	-.00	-.02	.04	-.09	-.20	.17
	CC2	-.45	.90[a]	-.13	-.17	-.24	-.15	.22	-.18
	CC3	-.00	-.13	.90[a]	-.63	-.02	.02	-.00	-.03
	CC4	-.02	-.17	-.63	.84[a]	-.48	.03	-.20	.09
	CC5	.04	-.24	-.02	-.48	.89[a]	.08	.08	-.36
	CC6	-.09	-.15	.02	.03	.08	.84[a]	-.53	-.11
	CC7	-.20	.22	-.00	-.20	.08	-.53	.81[a]	-.26
	CC8	.17	-.18	-.03	.09	-.36	-.11	-.26	.91[a]

a. Measures of Sampling Adequacy(MSA)

The value of the measure of sampling adequacy for each CC's item was more than the minimum required value of .50 (Table 45) - as per Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Table 46: Communalities related to CC scale

Items	Initial	Extraction
CC1	1.00	.56
CC2	1.00	.87
CC3	1.00	.88
CC4	1.00	.92
CC5	1.00	.90
CC6	1.00	.85
CC7	1.00	.82
CC8	1.00	.66

The value of the communalities for each CC's item was more than the minimum requirement of .50 (Table 46) - as per Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

4.5.3. Profitability (PFT) scale

Table 47: Descriptive statistics related to PFT scale

Items	Mean	Std. Deviation	Analysis N	Number of variables	Ratio of case to variables
PFT1	5.32	1.33	411	6	68.5 to 1
PFT2	3.73	1.73	411		
PFT3	3.44	1.97	411		
PFT4	1.78	1.30	411		
PFT5	3.50	1.80	411		
PFT6	3.45	1.91	411		

For the profitability scale, the ratio of cases to variables was far higher than the minimum requirement of 5 to 1 - as per Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1 - as it was 68.5 to 1 (Table 47).

Table 48: Correlation matrix related to PFT scale

	PFT1	PFT2	PFT3	PFT4	PFT5	PFT6
PFT1	1.00	.45	.54	.20	.31	.41
PFT2	.45	1.00	.67	.19	.30	.74
PFT3	.54	.67	1.00	.27	.35	.71
PFT4	.20	.19	.27	1.00	.19	.20
PFT5	.31	.30	.35	.19	1.00	.43
PFT6	.41	.74	.71	.20	.43	1.00

For the profitability scale, the number of variables with a correlation coefficient greater than .30 was 8 (Table 48). It complies with Taherdoost's recommendations, detailed in Chapter 3, section 3.9.1.

Table 49: KMO and Barlett's test related to PFT scale

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.80
Bartlett's Test of Sphericity	Approx. Chi-Square	934.09
	df	15
	Sig.	.00

For the profitability scale, the overall measure of sampling adequacy was .80 (Table 49). It is higher than the minimum requirement of .50 (Taherdoost, 2016). The probability associated with the Barlett's test was less than .001 (Table 49). It complies with Taherdoost's recommendations, detailed in Chapter 3, section 3.9.1.

Table 50: Anti-image matrix related to PFT scale

		PFT1	PFT2	PFT3	PFT4	PFT5	PFT6
Anti-image Correlation	PFT1	.84[a]	-.14	-.32	-.05	-.14	.06
	PFT2	-.14	.79[a]	-.25	-.00	.08	-.51
	PFT3	-.32	-.25	.82[a]	-.13	-.02	-.37
	PFT4	-.05	-.00	-.13	.89[a]	-.09	.09
	PFT5	-.14	.08	-.02	-.09	.82[a]	-.28
	PFT6	.06	-.51	-.37	.01	-.28	.75[a]

a. Measures of Sampling Adequacy(MSA)

The value of the measure of sampling adequacy for each PFT's item was more than the minimum required value of .50 (Table 50) - as per Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Table 51: Communalities related to PFT scale

Items	Initial	Extraction
PFT1	**1.00**	**.46**
PFT2	1.00	.70
PFT3	1.00	.75
PFT4	**1.00**	**.15**
PFT5	**1.00**	**.32**
PFT6	1.00	.75

The value of the communalities for each PFT's item was more than the minimum requirement of .50 except for the items PFT1 (.464), PFT4 (.15) and PFT5 (.32) (Table 51). It suggests the need for the removal of these respective items from the composition of the Profitability scale - as per Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Repeating the factor analysis for the PFT revised scale (without PFT1, PFT4 and PFT5)

Table 52: Correlation matrix related to PFT revised scale (without PFT1, PFT4 and PFT5)

	PFT2	PFT3	PFT6
PFT2	1.00	.67	.74
PFT3	.67	1.00	.71
PFT6	.74	.71	1.00

For the profitability revised scale, the number of variables with a correlation coefficient greater than .30 was 3 (Table 52). It complies with Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Table 53: KMO and Barlett's test related to PFT revised scale (without PFT1, PFT4 and PFT5)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.74
Bartlett's Test of Sphericity	Approx. Chi-Square	654.51
	df	3
	Sig.	.00

For the profitability revised scale, the overall measure of sampling adequacy was .74 (Table 53). It is higher than the minimum requirement of .50 (Taherdoost, 2016). The probability associated with the Barlett's test was less than .001 (Table 53). It complies with Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Table 54: Anti-image matrix related to PFT revised scale (without PFT1, PFT4 and PFT5)

		PFT2	PFT3	PFT6
Anti-image Correlation	PFT2	.73[a]	-.31	-.51
	PFT3	-.31	.78[a]	-.41
	PFT6	-.51	-.41	.71[a]

The value of the measure of sampling adequacy for each PFT's revised item was more than the minimum required value of .50 (Table 54) - as per Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

Table 55: Communalities related to PO revised scale (without PFT1, PFT4 and PFT5)

Items	Initial	Extraction
PFT2	1.00	.81
PFT3	1.00	.78
PFT6	1.00	.83

The value of the communalities for each PFT's revised item was more than the minimum required of .50 (Table 55) - as per Taherdoost's (2016) recommendations, detailed in Chapter 3, section 3.9.1.

4.6. Test of scales reliability

4.6.1. Entrepreneurial competence (E.Cp) scales

Perceived capability (PC)

Table 56: Reliability and item-total statistics related to PC scale

Reliability Statistics	
Cronbach's Alpha	**Number of Items**
.96	8

Item-Total Statistics				
Items	**Scale Mean if Item Deleted**	**Scale Variance if Item Deleted**	**Corrected Item-Total Correlation**	**Cronbach's Alpha if Item Deleted**
PC1	36.50	70.02	.80	.96
PC2	36.39	68.23	.90	.95
PC3	36.43	68.68	.86	.96
PC4	36.30	70.00	.90	.95
PC5	36.37	69.92	.85	.96
PC6	36.28	70.21	.90	.95
PC7	36.42	71.19	.77	.96
PC8	36.25	70.74	.84	.96

The perceived capability scale was excellent with eight items (α = .96*)* (Table 56). This figure is higher than the minimum requirement of .60 – in accordance with Nunnally and Bernstein 's (1994) and George and Mallery's (2003) suggestions, detailed in Chapter 3, section 3.9.2. The corrected item-total correlation related to each item was very strong (>.30) (Table 56) – consistent with De Vaus' (2002) recommendations, detailed in Chapter 3, section 3.9.2.

Perceived opportunity (PO)

Table 57: Reliability and item-total statistics related to PO scale

Reliability Statistics				
Cronbach's Alpha			Number of Items	
.80			6	
Item-Total Statistics				
Items	**Scale Mean if Item Deleted**	**Scale Variance if Item Deleted**	**Corrected Item-Total Correlation**	**Cronbach's Alpha if Item Deleted**
PO1	20.58	39.80	.62	.76
PO2	21.53	35.95	.67	.74
PO3	20.51	38.49	.71	.74
PO6	21.06	38.19	.57	.77
PO7	22.13	36.72	.67	.75
PO8	**22.61**	**45.63**	**.20**	**.85**

The perceived opportunity scale was excellent with six items (⍺ = .80*)* (Table 57). This is higher than the minimum requirement of .60 – in accordance with Nunnally and Bernstein's (1994) and George and Mallery's (2003) suggestions, detailed in Chapter 3, section 3.9.2. The corrected item-total correlation related to each item was strong (>.30), apart from PO8 item which showed a weak Corrected Item-Total Correlation of .20 (Table 57). This suggests the need for the removal of PO8 item from the scale – following De Vaus' (2002) recommendations, detailed in Chapter 3, section 3.9.2.

Table 58: Reliability and item-total statistics related to PO adjusted scale

Reliability Statistics				
Cronbach's Alpha			Number of Items	
.85			5	
Item-Total Statistics				
Items	**Scale Mean if Item Deleted**	**Scale Variance if Item Deleted**	**Corrected Item-Total Correlation**	**Cronbach's Alpha if Item Deleted**
PO1	17.50	31.90	.66	.83
PO2	18.45	28.75	.68	.82
PO3	17.43	30.64	.75	.81
PO6	17.98	29.79	.64	.83
PO7	19.05	30.26	.63	.83

The perceived opportunity adjusted scale was excellent with five items (ɾ = .85*)* (Table 58). This figure is higher than the minimum requirement of .60 – in accordance with Nunnally and Bernstein's (1994) and George and Mallery's (2003) suggestions, detailed in Chapter 3, section 3.9.2. The corrected item-total correlation related to each item was very strong (>.30) (Table 58) – consistent with De Vaus' (2002) recommendations, detailed in Chapter 3, section 3.9.2.

Less fear of failure (LFF)

Table 59: Reliability and item-total statistics related to LFF scale

Reliability Statistics				
Cronbach's Alpha			Number of Items	
.79			5	
Item-Total Statistics				
Items	**Scale Mean if Item Deleted**	**Scale Variance if Item Deleted**	**Corrected Item-Total Correlation**	**Cronbach's Alpha if Item Deleted**
LFF1	22.48	15.60	.51	.77
LFF2	22.24	16.78	.43	.79
LFF3	22.83	13.69	.65	.72
LFF4	22.46	14.46	.64	.73
LFF5	22.56	13.93	.61	.74

The less fear of failure scale was excellent with five items (ɾ = .79*)* (Table 59). This figure is higher than the minimum requirement of .60 – in accordance with Nunnally and Bernstein's (1994) and George and Mallery's (2003) suggestions, detailed in Chapter 3, section 3.9.2. The corrected item-total correlation related to each item was very strong (>.30) (Table 59) – consistent with De Vaus' (2002) recommendations, detailed in Chapter 3, section 3.9.2.

Role models (RM)

Table 60: Reliability and item-total statistics related to RM scale

Reliability Statistics				
Cronbach's Alpha			**Number of Items**	
.92			9	
Item-Total Statistics				
Items	**Scale Mean if Item Deleted**	**Scale Variance if Item Deleted**	**Corrected Item-Total Correlation**	**Cronbach's Alpha if Item Deleted**
RM1	36.76	97.91	.71	.91
RM2	36.77	96.79	.78	.90
RM3	36.65	97.78	.75	.90
RM4	36.64	98.34	.71	.91
RM5	35.59	99.23	.74	.91
RM6	35.41	100.99	.72	.91
RM7	35.36	103.23	.70	.91
RM8	36.27	99.64	.65	.91
RM9	35.43	105.03	.63	.91

The role models scale was excellent with nine items (ϒ = .92*)* (Table 60). This figure is higher than the minimum requirement of .60 – in accordance with Nunnally and Bernstein's (1994) and George and Mallery's (2003) suggestions, as detailed in Chapter 3, section 3.9.2. The corrected item-total correlation relating to each item was very strong (>.30) (Table 60) – consistent with De Vaus' (2002) recommendations, detailed in Chapter 3, section 3.9.2.

4.6.2. Entrepreneurial commitment (E.Cm) scales

Normative commitment (NC)

Table 61: Reliability and item-total statistics related to NC scale

Reliability Statistics				
Cronbach's Alpha			**Number of Items**	
.92			5	
Item-Total Statistics				
Items	**Scale Mean if Item Deleted**	**Scale Variance if Item Deleted**	**Corrected Item-Total Correlation**	**Cronbach's Alpha if Item Deleted**
NC1	21.90	25.61	.78	.91
NC2	22.25	21.71	.83	.90
NC3	22.09	25.19	.75	.91
NC4	22.12	23.60	.85	.89
NC5	22.28	23.27	.79	.91

The normative commitment scale was excellent with five items (ϒ = .92*)* (Table 61). This figure is higher than the minimum requirement of .60 – in accordance with Nunnally and Bernstein's (1994) and George and Mallery's (2003) suggestions, detailed in Chapter 3, section 3.9.2.

The corrected item-total correlation related to each item was very strong (>.30) (Table 61) – consistent with De Vaus' (2002) recommendations, detailed in Chapter 3, section 3.9.2.

Affective commitment (AC)

Table 62: Reliability and item-total statistics related to AC scale

Reliability Statistics				
Cronbach's Alpha			Number of Items	
.92			7	
Item-Total Statistics				
Items	**Scale Mean if Item Deleted**	**Scale Variance if Item Deleted**	**Corrected Item-Total Correlation**	**Cronbach's Alpha if Item Deleted**
AC1	34.84	37.74	.79	.90
AC2	34.83	39.69	.73	.91
AC3	35.31	35.22	.70	.92
AC4	35.30	34.89	.73	.91
AC5	34.59	38.31	.84	.90
AC6	34.52	39.04	.82	.90
AC7	34.45	39.23	.80	.90

The affective commitment scale was excellent with seven items (α = .92*)* (Table 62). This figure is higher than the minimum requirement of .60 – in accordance with Nunnally and Bernstein's (1994) and George and Mallery's (2003) suggestions, detailed in Chapter 3, section 3.9.2. The corrected item-total correlation related to each item was very strong (>.30) (Table 62) – consistent with De Vaus' (2002) recommendations, detailed in Chapter 3, section 3.9.2.

Continuance commitment (CC)

Table 63: Reliability and item-total statistics related to CC scale

Reliability Statistics				
Cronbach's Alpha			Number of Items	
.93			8	
Item-Total Statistics				
Items	**Scale Mean if Item Deleted**	**Scale Variance if Item Deleted**	**Corrected Item-Total Correlation**	**Cronbach's Alpha if Item Deleted**
CC1	40.25	57.01	.67	.93
CC2	40.12	55.24	.86	.91
CC3	40.14	55.44	.84	.91
CC4	40.10	55.08	.88	.91
CC5	40.08	55.35	.85	.91
CC6	40.64	58.88	.58	.93
CC7	40.30	57.57	.65	.93
CC8	40.30	56.44	.74	.92

The continuance commitment scale was excellent with eight items (ɾ = .93*)* (Table 63). This figure is higher than the minimum requirement of .60 – in accordance with Nunnally and Bernstein's (1994) and George and Mallery's (2003) suggestions, detailed in Chapter 3, section 3.9.2. The corrected item-total correlation related to each item was very strong (>.30) (Table 63) – consistent with De Vaus' (2002) recommendations, detailed in Chapter 3, section 3.9.2.

4.6.3. Profitability (PFT) scale

Table 64: Reliability and item-total statistics related to PFT scale

Reliability Statistics				
Cronbach's Alpha			Number of Items	
.88			3	
Item-Total Statistics				
Items	**Scale Mean if Item Deleted**	**Scale Variance if Item Deleted**	**Corrected Item-Total Correlation**	**Cronbach's Alpha if Item Deleted**
PFT2	6.89	12.81	.77	.83
PFT3	7.18	11.55	.74	.85
PFT6	7.18	11.48	.79	.80

The profitability scale was excellent with three items (ɾ = .88*)* (Table 64). This figure is higher than the minimum requirement of .60 – in accordance with Nunnally and Bernstein's (1994) and George and Mallery's (2003) suggestions, detailed in Chapter 3, section 3.9.2. The corrected item-total correlation related to each item was very strong (>.30) (Table 64) – consistent with De Vaus' (2002) recommendations, detailed in Chapter 3, section 3.9.2.

Appendix B displays the items composition for the studied scales.

4.7. Test of hypotheses

As the three hypotheses were about seeking if each independent variable – entrepreneurial competence (perceived capability, perceived opportunity, less fear of failure, role models), entrepreneurial commitment (normative commitment, affective commitment, continuance commitment) or entrepreneurial capital – is significantly correlated to profitability – the dependent variable, the use of a regression mechanism known as the classic Baron and

Kenny (1986) is commended (Saunders and Blume, 2018). In that perspective, the regression to be used is either a multiple or a simple linear regression in line with the following the generic form:

For hypothesis 1

Hypothesis 1: There is a significant relationship between entrepreneurial competence (perceived capability, perceived opportunity, less fear of failure, role models) and the profitability of smallholder farmers in Analamanga's rural areas, where demographics (gender, age and level of education) play a role.

$$\mathbf{PFT} = b_0 + \beta_1 \mathbf{PC} + \beta_2 \mathbf{PO} + \beta_3 \mathbf{LFF} + \beta_4 \mathbf{RM} + \varepsilon_i$$

Where:

b_0 = the intercept or constant

β_1 = the regression weight of perceived capability, predictor of profitability.

β_2 = the regression weight of perceived opportunity, predictor of profitability.

β_3 = the regression weight of less fear for failure, predictor of profitability.

β_4= the regression weight of role models, predictor of profitability.

For hypothesis 2

Hypothesis 2: There is a significant relationship between entrepreneurial commitment (normative commitment, affective commitment, continuance commitment) and the profitability of smallholder farmers in Analamanga's rural areas, where demographics (gender, age and level of education) play a role.

$$\mathbf{PFT} = b_0 + \beta_1 \mathbf{NC} + \beta_2 \mathbf{AC} + \beta_3 \mathbf{CC} + \varepsilon_i$$

Where:

b_0 = the intercept or constant

β_1= the regression weight of normative commitment, predictor of profitability.

β_2= the regression weight of affective commitment, predictor of profitability.

β_3= the regression weight of continuance commitment, predictor of profitability.

For hypothesis 3

Hypothesis 3: There is a significant relationship amongst the multiplicative interaction between the entrepreneurial competence and entrepreneurial commitment constructs – engendering the entrepreneurial capital paradigm - and the profitability of smallholder farmers in Analamanga's rural areas, where demographics (gender, age and level of education) play a role.

PFT = $b_0 + \beta_1 EC + \varepsilon_i$

Where:

b_0 = the intercept or constant

β_1= the regression weight of entrepreneurial capital, predictor of profitability.

The relationship does exist if the linear regression model is significant ($p<.05$). Moreover, the R squared (R^2) gives information about the effect size (f^2) – the quantitative measure of the strength of a phenomenon (Kelley and Preacher, 2012). It should be highlighted that (Nandy, 2012):

- If f^2 is equal to 0.02, the effect is considered to be of a small magnitude;
- If f^2 is equal to 0.15, the effect is considered to be of a medium magnitude; and
- If f^2 is equal to .35, the effect is considered to be of a large magnitude.

4.7.1. Test of hypothesis 1

Hypothesis 1: There is a significant relationship between entrepreneurial competence (perceived capability, perceived opportunities, less fear of failure and role models) and the profitability of smallholder farmers in Analamanga's rural areas, where demographics (gender, age and level of education) play a role.

Table 65: Relationship between entrepreneurial competence and profitability

Demographics	Change Statistics				Main effect										Effect size			% of variance explained
					b values					p values								
	F	df1	df2	Sig.	b0 (Intercept)	PC	PO	LFF	RM	Intercept	PC	PO	LFF	RM	R^2_{AB}	R^2_A	f^2	
Gender																		
Female	30.13	4	235	<.001	-1.26	.44	.40	.01	.13	.05	<.001	<.001	**.89**	**.08**	.34	0	.52	33.9%
Male	31.52	4	166	<.001	-1.22	.46	.46	-.04	.13	.11	<.001	<.001	**.73**	**.15**	.43	0	.75	43.2%
Age																		
Between 20 and 39	33.36	4	190	<.001	-1.14	.51	.38	-.03	.10	.11	<.001	<.001	**.76**	**.23**	.41	0	.69	41.3%
Between 40 and 59	26.77	4	167	<.001	-1.58	.35	.51	.00	.23	.03	.001	<.001	**.99**	.02	.39	0	.64	39.1%
Level of education																		
Primary	29.18	4	154	<.001	-1.93	.50	.50	.05	.10	.02	<.001	<.001	**.64**	**.27**	.43	0	.75	43.1%
Secondary and above	27.44	4	221	<.001	-1.03	.38	.37	-.00	.16	.11	<.001	<.001	**.97**	.05	.33	0		33.2%
Overall Sample	62.90	4	406	<.001	-1.28	.45	.43	-.02	.14	.01	<.001	<.001	**.84**	.02	.38	0	.61	38.3%

The results of the test conclude the following:

- The entrepreneurial competence construct comprises four dimensions: perceived capability, perceived opportunity, less fear of failure and role models. With regard to the overall sample, it was proven that the overall construct as well as the perceived capability, perceived opportunity and role models dimensions do have a significant correlation with profitability, while less fear of failure doesn't (Table 65). That means, three of the four dimensions making up the construct are considerably correlated to the dependent variable while one isn't. Consequently, it can be advanced that the entrepreneurial competence construct in its entirety has a partially significant relationship with the profitability of smallholder farmers ($F(4,406) = 62.90$, $p<.001$; b_0=-1.28, $p=.01$; $в_1=.45$, $p<.001$; $в_2=.43$, $p<.001$; $в_3$=-.02, $p=.84$, $в_4=.14$, $p=.02$) (Table 65).

- Considering the breakdown by demographics, it was observed that neither for the female group ($F(4,235) = 30.13$, $p<.001$; b_0=-1.26, $p=.05$; $в_1=.44$, $p<.001$; $в_2=.40$, $p<.001$; $в_3$=-.01, $p=.89$, $в_4=.13$, $p=.08$) nor for the male group ($F(4,166) = 31.52$, $p<.001$; b_0=-1.22, $p=.11$; $в_1=.46$, $p<.001$; $в_2=.46$, $p<.001$; $в_3$=-.04, $p=.73$, $в_4=.13$, $p=.15$), did the less fear of failure and role model dimensions have a significant relationship with profitability (Table 65).

  The same observation is valid for the 'between 20 and 39' group ($F(4,190) = 33.36$, $p<.001$; b_0=-1.14, $p=.11$; $в_1=.51$, $p<.001$; $в_2=.38$, $p<.001$; $в_3$=-.03, $p=.76$, $в_4=.10$, $p=.23$) and the 'primary' group ($F(4,154) = 29.18$, $p<.001$; b_0=-1.93, $p=.02$; $в_1=.50$, $p<.001$; $в_2=.50$, $p<.001$; $в_3$=-.05, $p=.64$, $в_4=.10$, $p=.27$) (Table 65).

  For the 'between 40 and 59' ($F(4,167) = 26.77$, $p<.001$; b_0=-1.58, $p=.03$; $в_1=.35$, $p<.001$; $в_2=.51$, $p<.001$; $в_3$=-.00, $p=.99$, $в_4=.23$, $p=.02$) and the 'secondary and above' group ($F(4,221) = 27.44$, $p<.001$; b_0=-1.03, $p=.11$; $в_1=.38$, $p<.001$; $в_2=.37$, $p<.001$; $в_3$=-.00, $p=.97$, $в_4=.16$, $p=.05$), it could be remarked that only the correlation between the less fear of failure dimension and profitability was found to be non-significant (Table 65).

4.7.2. Test of hypothesis 2

Hypothesis 2: There is a significant relationship between entrepreneurial commitment (normative commitment, affective commitment and continuance commitment) and the profitability of smallholder farmers in Analamanga's rural areas, where demographics (gender, age and level of education) play a role.

Table 66: Relationship between entrepreneurial commitment and profitability

Demographics	Change Statistics				Main effect								Effect size			% of variance explained
					b values				p values							
	F	df1	df2	Sig.	b0 (Intercept)	NC	AC	CC	Intercept	NC	AC	CC	R^2_{AB}	R^2_A	f^2	
Gender																
Female	33.25	3	236	<.001	-1.62	.16	.65	.07	.004	**.11**	<.001	**.46**	.30	0	.43	29.7%
Male	12.00	3	167	<.001	.84	.17	.76	-.44	.32	**.23**	<.001	.001	.18	0	.22	17.7%
Age																
Between 20 and 39	17.35	3	191	<.001	-.09	.13	.63	-.14	.89	.25	<.001	.21	.21	0	.27	21.4%
Between 40 and 59	19.72	3	168	<.001	-1.10	.28	.74	-.21	.16	.04	<.001	**.10**	.26	0	.35	26%
Level of education																
Primary	18.98	3	155	<.001	-1.85	.31	.81	-.16	.05	.02	<.001	**.27**	.27	0	.37	26;9%
Secondary and above	16.40	3	222	<.001	.29	.14	.56	-.16	.63	**.25**	<.001	**.10**	.18	0	.22	18.1%
Overall Sample	39.91	3	407	<.001	0	.16	.71	-.14	.18	**.06**	<.001	**.08**	.29	0	.41	28.6%

The results of the test conclude the following:

- The entrepreneurial commitment construct comprises three dimensions: normative, affective and continuance commitment. With respect to the overall sample, it was proven that the overall construct as well as the affective commitment dimension do have a significant correlation with profitability, while normative and continuance commitment don't (Table 66). That means, one of the three dimensions making up the construct is considerably correlated to the dependent variable while two aren't. Therefore, it can be advanced that the entrepreneurial commitment construct in its entirety has a partially significant relationship with the profitability of smallholder farmers ($F(3,407) = 39.91$, $p<.001$; $b_0=-.48$, $p=.17$; $\beta_1=.08$, $p=.06$; $\beta_2=.10$, $p<.001$; $\beta_3=-.08$, $p=.08$) (Table 66).

- Considering the breakdown by demographics, it was observed that for the female group ($F(3,236) = 33.25$, $p<.001$; $b_0=-1.62$, $p=.004$; $\beta_1=.16$, $p=.11$; $\beta_2=.65$, $p<.001$; $\beta_3=-.07$, $p=.46$), neither the normative commitment dimension nor the continuance commitment had a significant relationship with profitability (Table 66).
  The same observation is valid for both the 'secondary and above' ($F(3,222) = 16.40$, $p<.001$; $b_0=.29$, $p=.63$; $\beta_1=.14$, $p=.25$; $\beta_2=.56$, $p<.001$; $\beta_3=-.16$, $p=.10$) and the 'between 20 and 39' group ($F(3,191) = 17.35$, $p<.001$; $b_0=-.09$, $p=.89$; $\beta_1=.13$, $p=.25$; $\beta_2=.63$, $p<.001$; $\beta_3=-.14$, $p=.21$) (Table 66).
  For the male group ($F(3,167) = 12.00$, $p<.001$; $b_0=.84$, $p=.32$; $\beta_1=.17$, $p=.23$; $\beta_2=.76$, $p<.001$; $\beta_3=-.44$, $p=.001$), the normative commitment dimension did not have a significant correlation with profitability. The relationship between affective commitment and profitability was significantly positive ($\beta_2=.76$, $p<.001$). The relationship between continuance commitment and profitability, however, was remarkably negative ($\beta_3=-.44$, $p=.001$) (Table 66).
  For both the 'between 40 and 59' group ($F(3,168) = 19.72$, $p<.001$; $b_0=-1.10$, $p=.16$; $\beta_1=.28$, $p=.04$; $\beta_2=.74$, $p<.001$; $\beta_3=-.21$, $p=.10$) and the 'primary' group '($F(3,155) = 18.98$, $p<.001$; $b_0=-1.85$, $p=.05$; $\beta_1=.31$, $p=.02$; $\beta_2=.81$, $p<.001$; $\beta_3=-.16$, $p=.27$), it could be remarked that only the relationship between continuance commitment and profitability was non-significant (Table 66).

4.7.3. Test of hypothesis 3

Hypothesis 3: There is a significant relationship amongst the multiplicative interaction between entrepreneurial competence and entrepreneurial commitment - engendering entrepreneurial capital - and the profitability of smallholder farmers in Analamanga's rural areas, where demographics (gender, age and level of education) play a role.

Table 67: Relationship between entrepreneurial capital and profitability

Demographics	Change Statistics				Main effect				Effect size			% of variance explained
					b values		p values					
	F	df1	df2	Sig.	b0 (Intercept)	EC	Intercept	EC	R^2_{AB}	R^2_A	f^2	
Gender												
Female	133.62	1	238	<.001	-.14	.01	.66	<.001	.36	0	.56	36%
Male	56.42	1	169	<.001	.39	.01	.39	<.001	.25	0	.33	25%
Age												
Between 20 and 39	84.47	1	193	<.001	.21	.01	.57	<.001	.30	0	.43	30.4%
Between 40 and 59	88.37	1	170	<.001	-.09	.01	.82	<.001	.34	0	.52	34.2%
Level of education												
Primary	91.97	1	157	<.001	-.57	.01	.24	<.001	.37	0	.59	36.9%
Secondary and above	78.92	1	224	<.001	.51	.01	.12	<.001	.26	0	.35	26.1%
Overall Sample	188.20	1	409	<.001	.05	.01	.86	<.001	.32	0	.47	31.5%

The results of the test conclude the following:

- For the overall sample, the multiplicative interaction between entrepreneurial competence and entrepreneurial commitment has a significant relationship with the profitability of smallholder farmers ($F(1,409) = 91.97$, $p<.001$; $b_0=-.05$, $p=.86$; $\beta_1=.01$, $p<.001$) (Table 67).

- Considering the breakdown by demographics, the same result was observed for both the female ($F(1,238) = 133.62$, $p<.001$; $b_0=-.14$, $p=.66$; $\beta_1=.01$, $p<.001$) and the male group ($F(1,169) = 56.42$, $p<.001$; $b_0=.39$, $p=.39$; $\beta_1=.01$, $p<.001$), as well as for the 'between 20 and 39' group ($F(1,193) = 84.47$, $p<.001$; $b_0=.21$, $p=.57$; $\beta_1=.01$, $p<.001$), the 'between 40 and 59' group ($F(1,170) = 88.37$, $p<.001$; $b_0=-.09$, $p=.82$; $\beta_1=.01$, $p<.001$), the 'primary' group ($F(1,157) = 91.97$, $p<.001$; $b_0=-.57$, $p=.24$; $\beta_1=.01$, $p<.001$) and the 'secondary and above' group ($F(1,224) = 78.92$, $p<.001$; $b_0=.51$, $p=.12$; $\beta_1=.01$, $p<.001$) (Table 67).

4.8. Summary

With a sample size of 411 adult smallholder farmers (240 female and 171 male), and diverse sub-samples – including male, female, less than 20 years old, between 20 and 39 years old, between 40 and 59 years old, above 60 years old, without education, primary school education, secondary school and above education group - the response rate was sensational (106.8 percent).The overall sample is characterised by a transcendent proportion of women (58.4 percent) and smallholder farmers who have acquired a secondary school and above level of education (55 percent). Regarding the testing of the hypotheses, making up the core platform of the study, the subsequent observations have been made:

- There is a partially significant relationship between entrepreneurial competence - perceived capability, perceived opportunities, less fear of failure, role models - and the profitability of smallholder farmers in Analamanga's rural areas.

- There is a partially significant relationship between entrepreneurial commitment - normative commitment, affective commitment, continuance commitment - and the profitability of smallholder farmers in Analamanga's rural areas.

- The is a significant relationship amongst the multiplicative interaction between the entrepreneurial competence and entrepreneurial commitment constructs - engendering the entrepreneurial capital paradigm - and the profitability of smallholder farmers in Analamanga's rural areas.

Table 68 presents a synoptic representation of the results.

Table 68: Results summary

Hypothesis	Test performed	Main findings
H1: There is a significant relationship between entrepreneurial competence and the profitability of smallholder farmers in Analamanga's rural areas where demographics (gender, age, level of education) play a role.	Multiple linear regression	***Perceived capability dimension*** Among all the sub-samples studied, there is a significantly positive relationship between perceived capability and the profitability of smallholder farmers in Analamanga's rural areas (Table 65).
		Perceived opportunities dimension Among all the sub-samples studied, there is a significantly positive relationship between perceived opportunities and the profitability of smallholder farmers in Analamanga's rural areas (Table 65).
		Less fear of failure dimension Among all the sub-samples studied, there is no significant relationship between less fear of failure and the profitability of smallholder farmers in Analamanga's rural areas (Table 65).
		Role models dimension Among the female, male, between 20 and 39 and primary groups, there is no significant relationship between role models and the profitability of smallholder farmers in Analamanga's rural areas (Table 65). Among the between 40 and 59, secondary and above, and overall groups, there is a significantly positive relationship between role models and the profitability of smallholder farmers in Analamanga's rural areas (Table 65).

Hypothesis	Test performed	Main findings
H2: There is a significant relationship between entrepreneurial commitment and the profitability of smallholder farmers in Analamanga's rural areas where demographics (gender, age, level of education) play a role.	Multiple linear regression	***Normative commitment dimension*** Among the female, male, between 20 and 39, secondary and above, and overall groups, there is no significant relationship between normative commitment and the profitability of smallholder farmers in Analamanga's rural areas (Table 66). Among the between 40 and 59, and primary groups, there is a significantly positive relationship between normative commitment and the profitability of smallholder farmers in Analamanga's rural areas (Table 66). ***Affective commitment dimension*** Among all the sub-samples studied, there is a significantly positive relationship between affective commitment and the profitability of smallholder farmers in Analamanga's rural areas (Table 66). ***Continuance commitment dimension*** Among the female, between 20 and 39, between 40 and 59, primary, secondary and above, and overall groups, there is no significant relationship between continuance commitment and the profitability of smallholder farmers in Analamanga's rural areas (Table 66). Among the male group, there is a significantly negative relationship between continuance commitment and the profitability of smallholder farmers in Analamanga's rural areas (Table 66).
H3: There is a significant relationship amongst the multiplicative interaction between entrepreneurial competence and entrepreneurial commitment – engendering entrepreneurial capital - and the profitability of smallholder farmers in Analamanga's rural areas where demographics (gender, age, level of education) play a role	Simple linear regression	Among all the sub-samples studied, there is a significantly positive relationship amongst the multiplicative interaction between entrepreneurial competence and entrepreneurial commitment – engendering entrepreneurial capital – and the profitability of smallholder farmers in Analamanga's rural areas (Table 67).

Source: Author

CHAPTER 5: RESULTS DISCUSSION

5.1. Introduction

This chapter discusses the findings from the research. At first, a discussion pertaining to hypothesis 1 is unfolded. It is followed by a thorough exploration of the results obtained from the testing of hypothesis 2 and hypothesis 3.

5.2. Discussion pertaining to hypothesis 1

Hypothesis 1: There is a significant relationship between entrepreneurial competence (perceived capacity, perceived opportunities, less fear of failure and role models) and the profitability of smallholder farmers in Analamanga's rural areas, where demographics (gender, age and level of education) play a role.

Conforming to the findings, the profitability of samllholder farmers in Analamanga's rural areas is partially correlated to the construct of entrepreneurial competence, consisting of the following dimensions: perceived capability, perceived opportunities, less fear of failure and role models (Barazandeh et al., 2015). To a greater extent, the results denote the following.

Firstly, among the male and female groups, the perceived capability and perceived opportunity dimensions are positively correlated to the profitability of smallholder farmers in Analamanga's rural areas (Table 65).

Secondly, among the between 20 and 39 year old group, both the perceived capability and perceived opportunity dimensions are positively correlated to the profitability of smallholder farmers in Analamanga's rural areas. Whereas, among the between 40 and 59 year old group, the same dimensions, along with the role models dimension, similarly, are positively correlated to the profitability of the smallholder farmers (Table 65).

Additionally, among the primary school level educated group, the perceived capability and perceived opportunity dimensions are positively correlated to the profitability of smallholder farmers in Analamanga's rural areas. While among the secondary school and above level

educated group, the same variables, along with the role models dimension, similarly, are positively correlated to the profitability of smallholder farmers (Table 65).

Finally, among the overall group, the perceived capability, perceived opportunity and role models dimensions are positively correlated to the profitability of smallholder farmers in Analamanga's rural areas (Table 65). While no such significant relationship was observed between less fear of failure and profitability.

Now, regarding the results obtained among the overall sample, the insignificant correlation between the less fear of failure dimension and the profitability of smallholder farmers (p=.84, β_3=-.02) is surprising as it contradicts Cacciotti, Hayton, Mitchell and Giatzitoglu's (2016) assertion that fear of failure affects the behaviour of an entrepreneur, which in turn, as attested by Binz, Ferguson, Pieper, and Astrachan (2017), is substantially correlated to profitability.

Actually, Cacciotti et al. (2016) defend that fear of failure can have both an inhibiting and a motivating effect on entrepreneurial behaviour. Some entrepreneurs react to fear of failure with a behavioural response that the scholars label as *'Inhibition'* (Cacciotti et al., 2016). It consists of promoting inaction with the aim to delay performing all operations that frighten them. It could also be expressed through the promotion of extreme cautions as a means to prevent losses while running a certain entrepreneurial endeavour (Cacciotti et al., 2016). Other than that, there is a further behavioural response to fear of failure, characterised as *'Motivation'*. It involves a persistent pursuit of a certain venture as a reaction to fear in order to avoid failure through achieving success (Cacciotti et al., 2016). The scholars (Cacciotti et al., 2016) suggest that the inhibition response impedes entrepreneurial behaviour, while motivation fuels it (Cacciotti et al., 2016).

At this point, Cacciotti et al. (2016) advocate a third behavioural response to fear of failure, titled as *'Repression'*. It embraces a wilful ignorance of the situations or activities that frighten the entrepreneur, enabling them to suppress all the negative derivatives that could result from their fear (Cacciotti et al., 2016). As the entrepreneur disregards whatever it is that intimidates

them, they are not tempted to take any course of action towards or against it as their judgement of how things stand remains impartial (Cacciotti et al., 2016).

This could provide a good explanation as to why the less fear of failure dimension is not correlated with the profitability of smallholder farmers in Analamanga's rural areas. Culturally, Malagasy people regard fear as a sign of weakness that should be silenced, for if exhibited, it attests an individual's incapacity to survive alone in a visible and an invisible world, perceived as belligerent (Rahajarizafy, 2011). This is corroborated by old adages, like *'Mitaintaina toy ny saobakaka ambodirihana'*, which describes *how shameful it is to be fearful like a frog about to fall, against the edge of a balcony* (Rahajarizafy, 2011). Being compared to 'a frog' is not viewed as flattery in Madagascar. When considering ancient dicta, the population traditionally perceives the amphibians as witless and grisly (Rahajarizafy, 2011). Correspondingly, smallholder farmers would tend to repress their fear of failure in such a way that they would not have to act on it, hence its insignificant relationship with profitability.

Another quite fascinating observation is the diversified outcomes obtained regarding the nature of the relationship between role models and the profitability of smallholder farmers in Analamanga's rural areas. Apparently, this relationship is inconsequential among the male, female, between 20 and 39 and primary groups, while a significantly positive correlation is evident among the between 40 and 59 and secondary and above groups.

At first, concerning the insignificant correlation observed between the role models dimension and the profitability of smallholder farmers among male, female, between 20 and 39, and primary groups, these findings contradict with Leroy, Anseel, Gardner and Sels' (2015) stipulation that the interaction between an individual in a leadership position - such as a role model - and their subordinates have a significant relationship with the latters' work performance - often measured through profitability (Binz et al., 2017). As a matter of fact, Leroy et al. (2015) argue that followers' work performance is enhanced when they have a leader who satisfies their basic needs by allowing enough room for them to be autonomous. In other words, basic needs satisfaction mediates the relationship between role models and profitability.

Referring to the cultural context in Madagascar, it could be posited that the rationale of why this anticipated relationship is insignificant among the aforementioned groups might be the fact that the mediation effect of basic needs satisfaction could be inexistent. The malagasy

society follows a rigid hierarchical order, whereby subordinates have an immense respect towards their superiors (Rahajarizafy, 2011). Subsequently, as the farmers view their role models as their superiors, they would never imagine themselves benefitting from a similar level of autonomy as the latters do, like a popular dictum says: *'Aza manao tehina mialoha andriana'*, which in English connotes that *as a subordinate [or a mentee], you should never attempt to measure yourself up against your leader [or your role model]* (Rahajarizafy, 2011). Therefore, since basic needs satisfaction is dependent upon mentees enjoying a sufficient level of autonomy (Leroy et al., 2015), its mediation effect would be absent and the correlation, unimportant.

To continue, regarding the positive correlation observed between the same variables but this time among the between 40 and 59, and secondary and above groups, it conforms with Leroy et al.'s (2015) findings. Even though, it is intriguing to notice dissimilarities in the results obtained between the two different age groups and the two distinct education levels.

About the discordant outcomes generated from the two different age groups, it is evident that as opposed to the profitability of their younger peers, the net profits of farmers between 40 and 59 years of age exhibit a positive relationship with the magnitude of their role models dimension. The more constructive the imprint of their role models is, the more profits they procure from their farming business. This could be explained with Minola, Criaco and Obschonka's (2015) assertion that entrepreneurs between the age of 40 and 59 have a much lower self-employment motivation than those between 20 and 39. As such, considering the positive correlation between entrepreneurial motivation and profitability, their earnings could also be much smaller (Machmud and Sidharta, 2016), unless if they benefit from a constructive influence from role models, which would allow them to resuscitate a juvenile motivation that would transmute into a more considerable net profit (Rajaei, Jalili, Abadi and Azizkhani, 2015).

Regarding the positive relationship between role models and profitability, noticed among smallholder farmers with a higher level of education than their peers, it could be justified with Moogan's (2018) contention that as an individual gets more educated, they tend to further rely on proven facts, experience and advice from people they look up to - like a counsellor, parents or friends - to make a decision. That is to say, the more educated an entrepreneur is, the more they require some form of a role model figure to steer their decision-making

processes, which in turn carry a major influence on their return on investment and affect their profitability (Smyth and Lecoeuvre, 2015).

5.3. Discussion pertaining to hypothesis 2

Hypothesis 2: There is a significant relationship between entrepreneurial commitment (normative commitment, affective commitment and continuance commitment) and the profitability of smallholder farmers in Analamanga's rural areas, where demographics (gender, age and level of education) play a role.

According to the findings, the profitability of samllholder farmers in Analamanga's rural areas is partially correlated to the construct of entrepreneurial commitment, consisting of the following dimensions: normative, affective and continuance commitment (Tasnim and Singh, 2016). More exhaustively, the results denote the following.

First of all, among the female group, the affective commitment dimension is positively correlated to the profitability of smallholder farmers in Analamanga's rural areas. Whereas, among the male group, the same dimension, similarly, is positively correlated with profitability, and the relationship between continuance commitment and the dependent variable (i.e. profitability) is significantly negative (Table 66).

Secondarily, among the between 20 and 39 year old group, the affective commitment dimension is positively correlated to the profitability of smallholder farmers in Analamanga's rural areas. Whereas, among the between 40 and 59 year old group, both the same dimension and the normative commitment one are positively correlated to the outcome variable i.e. profitability (Table 66).

Next, among the secondary school and above level educated group, the affective commitment dimension is positively correlated to the profitability of smallholder farmers in Analamanga's rural areas. Whereas, among the primary school level educated group, both the same dimension and the normative commitment dimension are positively correlated to profitability (Table 66).

Also, among the overall group, the affective commitment dimension is positively correlated to the profitability of smallholder farmers in Analamanga's rural areas (Table 66).

One intriguing aspect of these results is affective commitment being recorded to display a significant relationship with profitability among the overall sample, while neither normative, nor continuance commitment presented any such meaningful correlation with the dependent variable i.e. profitability.

This is in line with Machmud and Sidharta's (2016) contention that an entrepreneur's motivation can enhance their small business' profitability. As a matter of fact, the scholars (Machmud and Sidharta, 2016) performed a study in the SUCI Clothing Centre, in Bandung, Indonesia. It demonstrated that entrepreneurial motivation has a significantly positive influence over SMEs' profitability (Machmund and Sidharta, 2016). Henceforth, as affective commitment is potentially much more firmly correlated to motivation than the other organisational commitment dimensions (Yousef, 2017), only the former would present a significantly positive relationship with profitability, through a mediation effect of the motivative parameter.

When further zooming in the findings obtained regarding the correlation between normative commitment and profitability, it can be advanced that despite the negligible outcomes generated among the overall sample, the nature of this correlation is significantly positive among smallholder farmers between 40 and 59 years of age, as well as those who have received only a primary school level of education.

These results conform with Zefeiti and Mohamad's (2017) findings on the positive influence of normative commitment - representing an individual's obligation to keep running their company - over profitability. As a matter of fact, Malagasy culture promotes the values of duties and obligations - termed 'adidy' - as witnessed by a famous quote from one of the country's former presidents: *"Tsy hiamboho adidy aho, Mon General"* - which, in English refers to *his intention to honourably fulfil the obligations, transferred to him, by his predecessor, towards the Malagasy people* (Raison-Jourde and Roy, 2010).

Nonetheless, the younger generation and those who received a higher level of education, quickly adapted to the newly standardised worldwide culture, introduced by globalisation

(Petrus, 2017), as opposed to their older and less educated peers (Fokkema and de Haas, 2011). As a result, among the 40 to 59 years old smallholder farmers and their equivalents who only received a primary school level of education, the relationship between normative commitment and profitability is positive. Whereas, among their younger and more academic peers, the same relationship is negligible.

Another interesting facet of these findings is the significantly negative relationship between continuance commitment and profitability, noticed among male smallholder farmers, while the same correlation is insignificant among their female counterparts. The rationale for this could be found in the high status attributed to men in the Malagasy society (Hardaker and McGlashan, 2016). Subsequently, when downgraded to a lower social status such as that of a necessity entrepreneur - expressed through continuance commitment (Yousef, 2017) and representing probable economic challenges (Miller and Le Breton-Miller, 2016) - not only does their level of self-worth decrease (Ali, Bahar, Gopalan, Lukasiewicz, Parker, McKay and Walker, 2018), but they also become subject to a vicious cycle of social exclusion which hampers their business' potential earnings (Mood and Jonsson, 2016 ; Kibler, Wainwright, Kautonen and Blackburn, 2015).

5.4. Discussion pertaining to hypothesis 3

Hypothesis 3: There is a significant relationship amongst the interaction between the entrepreneurial competence and entrepreneurial commitment constructs - engendering the entrepreneurial capital paradigm - and the profitability of smallholder farmers in Analamanga's rural areas, where demographics (gender, age and level of education) play a role.

According to the outcomes, the multiplicative interaction between the entrepreneurial competence and entrepreneurial commitment constructs - producing the entrepreneurial capital paradigm - has a significantly positive relationship with the profitability of smallholder farmers in Analamanga's rural areas. In more details, the results suggest the following.

First up, among both the male and female groups, entrepreneurial capital is positively correlated to the profitability of smallholder farmers in Analamanga's rural areas (Table 67).

Besides, among both the between 20 and 39 and the between 40 and 59 year old groups, entrepreneurial capital is positively correlated to the profitability of smallholder farmers in Analamanga's rural areas (Table 67).

Thirdly, among both the primary school and the secondary school and above educated groups, entrepreneurial capital is positively correlated to the profitability of smallholder farmers in Analamanga's rural areas (Table 67).

Moreover, among the overall group, entrepreneurial capital is positively correlated to the profitability of smallholder farmers in Analamanga's rural areas (Table 67).

These findings validate Audretsch and Keilbach's (2004) assertion that entrepreneurial capital positively influences an enterprise's profitability by shaping their output and productivity. Essentially, the researchers (Audretsch and Keilbach, 2004) looked at the effects of an entrepreneurial capital investment on the profitability of several companies from different sectors in Germany. This similarity observed in the results could give a hint on the universality of entrepreneurial capital theories provided that uniform outcomes could be obtained from two different enquiries run in two different countries, which are geographically, culturally and demographically stupendously far-off from each other (Gendron, Crivelli and Barrett, 2018).

Additionally, a proven positive relationship between entrepreneurial capital and profitability complements Hjortso and Chea's (2017) formula by adding up instillation of entrepreneurial capital dimensions (perceived capability, perceived opportunity, role models and affective commitment) to their key characteristics of a successful agribusiness incubation programme. The scholars (Hiortso and Chea, 2017) advocated that to triumph, an agri-food company growth supporting seminar should feature: (i) a promotion of the participants' services, (ii) network development and (iii) fundraising.

Furthermore, an emphasis should be put on role models for small agri entrepreneurs between 40 and 59 years of age, and those who have acquired a secondary school and higher level of education. Normative commitment - a sense of obligatoriness to pursue farming venture -

should be particularly ingrained in 40 to 59 year old farmers and those with only a primary school level of education.

Finally, teaching continuance commitment – the promotion of a feel of need to pursue a business venture - should be avoided, especially among male smallholder farmers. A necessity mindset could force them into a vicious cycle of social exclusion, which would impede their business' financial achievements (Mood and Jonsson, 2016 ; Kibler et al., 2015).

5.5. Conclusion

Taking into consideration the findings of the research, with particular emphasis on the nature of the relationship, within the framework of the testing of the hypotheses 1, 2, and 3 between the predictor variables consisting of the constructs of entrepreneurial competence, entrepreneurial commitment and their subsequent multiplicative interaction, and the outcome variable amounting to the paradigm of profitability, it can be concluded that the related alternative hypotheses could be accepted if slightly modified as follow:

- Ha of H1: There is a partially significant relationship between entrepreneurial competence and the profitability of smallholder farmers in Analamanga's rural areas, where demographics play a role.

- Ha of H2: There is a partially significant relationship between entrepreneurial commitment and the profitability of smallholder farmers in Analamanga's rural areas, where demographics play a role.

- Ha of H3: There is a significant relationship amongst the multiplicative interaction between entrepreneurial competence and entrepreneurial commitment – engendering entrepreneurial capital – and the profitability of smallholder farmers in Analamanga's rural areas, where demographics play a role.

Concerning the distribution of the sample into various demographic groups, it was quite alluring to observe a difference between the results obtained from male and female smallholder farmers regarding the nature of the relationship between continuance commitment and profitability. Among male farmers, there is a significantly negative

relationship between continuance commitment and profitability. Whereas, among their female counterparts, this correlation does not exist.

About the two main age groups studied, quite a few discrepancies were observed. Primarily, it was proven that there is a positive relationship between role models and profitability, among 40 to 59 year old farmers. While their younger peers do not necessarily need a constructive influence from role models to improve their financial performance. Secondarily, 20 to 39 year old sharecroppers exposed an insignificant relationship between normative commitment and profitability. Whereas, among their older peers, this correlation is positive.

Lastly, with respect to education level, it was ascertained that smallholder farmers who have not been to secondary school manifest an unimportant relationship between role models and profitability. While their more academic peers definitely require a constructive influence from role models to increase their earnings. Also, an observation was made that, with reference to normative commitment, a high obligation inspired devotion enables primary school level educated farmers to raise profitability. Whilst the same variable is in no way correlated with the economic success of their better-read fellows.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion of the research

The study sought to examine the nature of the relationship between entrepreneurial capital (entrepreneurial competence x entrepreneurial commitment) and the profitability of smallholder farmers - an impoverished group of people making up 49.7 percent of the Malagasy population - in Analamanga's rural areas.

Analamanga is the central region of Madagascar, the fifth biggest island in the world, facing such a dire magnitude of rural poverty, mounted by recurrent political and economic crises, combined with an accustomed occurrence of natural disasters - mainly cyclones - ravaging hectares of agricultural land. This context exacerbates the pocketbook issues, already endured by smallholder farmers, which could be resolved through the promotion of a profitability focused business education backed up with solid empirical studies like this research: a valid and reliable exploration of the entrepreneurial capital epitome and its demonstrated correlation with economic realisation.

A non-experimental cross-sectional survey was used to run the research. A sample of 411 smallholder farmers were interrogated by trained interviewers, on the basis of a structured questionnaire. Different sub-samples comprising 240 women, 171 men, 30 adults below 20 years old, 195 individuals between 20 and 39 years old, 172 between 40 and 59 years old, 14 people above 60 years old, 26 farmers who haven't been to school, 159 who have achieved a primary school education level and 226 who have received a secondary school and above level of education were randomly selected. The selection of participants followed a cluster sampling with a quota approach. Rural municipality samples were haphazardly handpicked from randomly selected district samples in the northern, southern, eastern and western parts of Analamanga.

For analysis and interpretation purposes, data were initially entered into Microsoft Excel. Once input, it was imported to IBM SPSS v.25 for scrutiny. Then, descriptive statistics were generated to allow the sample's demographics to be examined prior to running the test of

scales validity and test of scales reliability. Finally, multiple and simple linear regression were performed to test hypotheses 1, 2 and 3.

Rather fascinating observations were drawn from the data analysis and interpretation mechanism. Firstly, it was proven that there is a significant relationship between entrepreneurial competence and the profitability of smallholder farmers in Analamanga's rural areas but this correlation is expressed only in a partial manner through dimensions such as perceived capability, perceived opportunities and role models (sub-problem 1). Similar results were generated regarding the relationship between entrepreneurial commitment and the profitability of smallholder farmers but this time, the singular dimension at stake was affective commitment (sub-problem 2). Also, a significant relationship was noticed amongst the multiplicative interaction between entrepreneurial competence and entrepreneurial commitment - engendering entrepreneurial capital - and the profitability of smallholder farmers in Analamanga's rural areas (sub-problem 3).

Certain aspects of the findings are somewhat intriguing, considering that they contradict with Cacciotti et al's (2016) attestation of the noteworthy correlation between fear of failure and the financial performance of an entrepreneur. They also challenge Leroy et al.'s (2015) corroboration of the significant relationship between role models and the economic success of a white-collar worker. These unforeseen results were particularly observed among the male, female, between 20 and 39 year old and primary school education level groups.

Nonetheless, looking at a widerspread perspective, the core of the results is intelligible, provided that they conform to the Malagasy cultural tendency to repress fear and display a steadfast respect to hierarchy (Rahajariafy, 2011). Some of the findings also verify Minola et al.'s (2015), Machmud and Sidharta's (2016) and Rajaei et al.'s (2015) observations that older entrepreneurs have a lower level of motivation, ultimately affecting their business' financial performance, unless if they benefit from a constructive influence from role models. Additionally, the results are in line with Moogan's (2018), and Smyth and Lecoeuvre's (2015) stipulations that the more educated an entrepreneur is, the more they require some form of a role model figure to assist them in decision-making as a means to further their profitability. Moreover, Machmud and Sidharta's (2016) and Yousef's (2017) findings about the positive correlations between entrepreneurial motivation and economic success, affective commitment and motivation, and motivation and profitability are complied with. Finally, the

outcomes adhere to Audretsch and Keilbach's (2004) validation of the positive relationship between the entrepreneurial capital and the profitability of business owners.

Considering the research outcomes, summarised in Table 68, the subsequent diagramme (Figure 7) represents the profile of the most profitable smallholder farmers in Analamanga's rural areas.

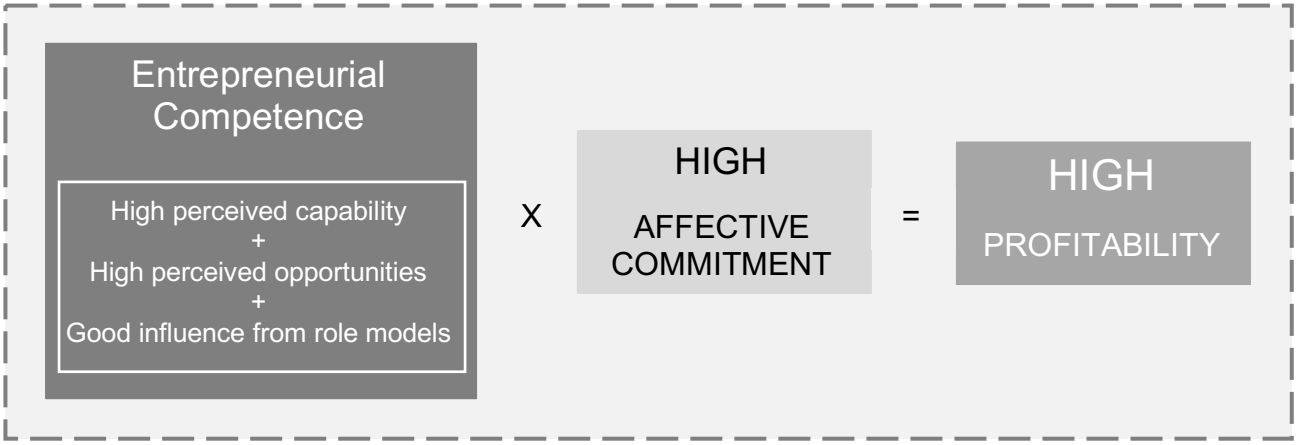


Figure 7: Profile of the most profitable smallholder farmers in Analamanga (Author)

In bulk, a profitable smallholder farming business in Analamanga's rural areas is run by an entrepreneur who strongly believes in their ability to suitably create and propitiously manage a company (Shapero and Sokol, 1982). Economically successful smallholder farmers are completely aware of the different opportunities present in the market and are resourceful enough to properly explore and exploit them (Renko et al., 2012). They enjoy a salutary liaison with individuals who inspire them with their work and behaviour (Minola et al., 2015 ; Machmud and Sidharta, 2016 ; Rajaei et al., 2015 ; Yousef, 2017) and are dynamically devoted to their business because they are passionate about what they do (Yousef, 2017).

To put it another way, considering Venter and Urban's (2015) entrepreneurial capital formula - expressed through a multiplicative interaction between entrepreneurial competence and entrepreneurial commitment - it can be deduced that smallholder farmers in Analamanga's rural areas are:

- less likely to be profitable if the magnitude of their perceived capability, perceived opportunities, role models and affective commitment dimensions are low

- more likely to be profitable if the magnitude of their perceived capability, perceived opportunities, role models and affective commitment dimensions are high.

In the end, two major limitations were identified to be connected with the research. Firstly, as a non-experimental cross-sectional survey, the interview was run only once, without any follow up afterwards to monitor whether the participants' situations had changed over time. Also, the circumstances of those who consented to participate in the survey could differ from that of those who didn't, creating a non-response bias that could result in a sample, which is not representative of the population.

6.2 Recommendations

Being a pioneer in its kind in the context of Madagascar, this research drew attention to ground-breaking findings, which demystify the concepts of entrepreneurship and profitability among smallholder farmers in the central region of the island, and advocated empirically authenticated recommendations that could be invigorated both at strategic and operational levels. Overcoming rural poverty is such a bone of contention among Malagasy decision makers and socio-economic development actors. As such, a long-term sustenance of farmers or country dwellers' entrepreneurial capital appears to be a germane solution.

Therefore, in the light of the profile of the most profitable smallholder farmers in Analamanga's rural areas laid out in Figure 7:

- At strategic level, Malagasy decision makers should re-evaluate the strategies developed with regards to the promotion of flourishing farming businesses in the central region of the island. It is in fact circumspect to suggest that the various dimensions submitted in Figure 7 be thoughtfully reviewed as potential starting points to stimulate the generation of a unique strategic plan, specifically tailored to fit in the typical day-to-day contexts of the smallholder farmers in the Analamanga region. The competent authorities may possibly enable an opulent environment, sumptuously adorned with the opportunity for prosperity, whereby any distraction is obliterated and the essential qualities required by country dwellers, initiated, to empower them to thrive in their respective businesses.

- At operational level, in lieu of keeping up with the conventionally fruitless practice of stiffly imposing duplicated trends from overseas into the local environment, the actors of socio-economic development at the bottom of the pyramid, such as business incubators and microfinance institutions, are advised to provide research-based trainings and services that unequivocally respond to their clientele's needs as a means to eradicate rural poverty in Madagascar. On account of that, a particular attention should be paid to the development of smallholder farmers' perceived capability, perceived opportunities, role model environment and affective commitment.

6.3 Suggestion for further research

As a logical perpetuation of the chain of knowledge established from this study, it would be so enthralling to:

- conduct an investigation into the influence of intrinsic entrepreneurship enabling personality dimensions like need for achievement and counterfactual thinking (Frese and Gielnik, 2014) on the relationship amongst the multiplicative interaction between entrepreneurial competence and entrepreneurial commitment - engendering entrepreneurial capital - and the profitability of smallholder farmers in Analamanga's rural areas, for the purpose of grasping a further apprehension of the predictive function of psychological factors on the business success of smallholder farmers at individual level,

- and replicate the theme of the research to the other regions of Madagascar with the aim to rigorously explore the wealth of prospects for economic success and development available in the country and thoroughly compare and contrast the differentiating elements among the various profiles of profitable smallholder farmers in each region.

This research has, without a doubt, contributed towards the establishment of the concept of profitability as a much more enigmatic subject than simply a figure recorded on a company's financial statement to represent the deduction of their total costs from their total revenues.

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APPENDIX A: INFORMATION SHEET AND CONSENT FORM

Examination of the relationship between the entrepreneurial capital and the profitability of smallholder farmers in Analamanga's rural municipalities

Who I am

Hello, I am Radomalala Ratsimanetrimanana (Student Number: 909603). I am conducting research for the purpose of completing my MM in Entrepreneurship and New Venture Creation at Wits Business School.

What I am doing

I am conducting a quantitative study to understand the nature of the relationship between the entrepreneurial capital and the profitability of smallholder farmers in Analamanga's rural municipalities.

Your participation

I am asking you whether you will allow me to conduct one interview with you. If you agree, I will ask you to participate in one interview for approximately 30 minutes. Please understand that your participation is voluntary and you are not being forced to take part in this study. The choice of whether to participate or not, is yours alone. If you choose not to take part, you will not be affected in any way whatsoever. If you agree to participate, you may stop participating in the research at any time and tell me that you don't want to continue. If you do this there will also be no penalties and you will NOT be prejudiced in ANY way.

Confidentiality

Any study records that identify you will be kept confidential to the extent possible by law. The records from your participation may be reviewed by people responsible for making sure that research is done properly, including my academic supervisor/s. (All of these people are required to keep your identity confidential.) All study records will be destroyed after the completion and marking of my research assignment. I will refer to you by a code number or pseudonym (another name) in the research assignment.

Risks/discomforts

At the present time, I do not see any risks in your participation. The risks associated with participation in this study are no greater than those encountered in daily life.

Benefits

There are no immediate benefits to you from participating in this study. However, this study will be extremely helpful to us in understanding how your level of competence and commitment to your business help to boost your profitability.

Who to contact if you have been harmed or have any concerns

This research has been approved by the Wits Business School. If you have any complaints about ethical aspects of the research or feel that you have been harmed in any way by participating in this study, please contact the Research Office Manager at the Wits Business School, Mmabatho Leeuw. Mmabatho.leeuw@wits.ac.za. If you have concerns or questions about the research you may call my academic research supervisor Dr McEdward Murimbika on +27 83 613 6530 or Email: murimbikam@ftt580.com.

CONSENT

I hereby agree to participate in the research on the examination of the relationship between the entrepreneurial capital and the profitability of smallholder farmers in Analamanga's rural municipalities. I understand that I am participating freely and without being forced in any way to do so. I also understand that I can stop participating at any point should I not want to continue and that this decision will not in any way affect me negatively. I understand that this is a research project whose purpose is not necessarily to benefit me personally in the immediate or short term. I understand that my participation will remain confidential.

……..

Signature of participant Date: ……..

APPENDIX B: ITEMS' COMPOSITION FOR THE STUDIED SCALES

Scale	Items	Cronbach's Alpha	MSA	Communality values
Entrepreneurial Competence				
Perceived Capability	PC1. I will be able to achieve most of the goals that I set for myself	.96	.94	.71
	PC2. When facing difficult tasks, I am certain that I will accomplish them			.86
	PC3. In general, I believe that I can obtain outcomes that are important to me			.79
	PC4. I believe I can succeed to most any endeavor to which I set my mind			.86
	PC5. I will be able to successfully overcome many challenges			.80
	PC6. I am confident that I can perform effectively on many different tasks			.86
	PC7. Compared to other people, I can do most tasks very well			.67
	PC8. Even when things are tough, I can perform quite well			.78
Perceived Opportunity	PO1. I am always alert to business opportunities	.85	.74	.73
	PO2. I research potential markets to identify business opportunities			.69
	PO3. I search systematically for business opportunities			.81
	PO6. I have set up this business to pursue an opportunity I perceived			.67
	PO7. Based on a business opportunity I perceived, I have developed a new market			.75

Scale	Items	Cronbach's Alpha	MSA	Communality values
Entrepreneurial Competence				
Less Fear of Failure	LFF1. When I am failing, I'm not afraid that I might not have enough talent	.79	.76	.73
	LFF2. When I am failing, it does not upset my plan for the future			.79
	LFF3. When I am not succeeding, people are still interested in me			.78
	LFF4. When I am failing, important others are not disappointed			.70
	LFF5. When I am failing, I don't worry about what others think about me			.73
Role Models	RM1. There is someone I can count on if I need support when I make decisions in my farming business	.92	.85	.73
	RM2. There is someone who helps me to weigh the pros and cons of the decisions that I make in my farming business			.87
	RM3. There is someone who shows me how to get where I am going with my farming business			.90
	RM4. There is someone who tells or shows me general strategies to succeed in my farming business			.79
	RM5. There is someone I want to be like when running my farming business			.85
	RM6. There is someone particularly inspirational to me in the farming industry			.84
	RM7. In the farming business that I am pursuing, there is someone that I admire			.83
	RM8. I have a mentor in my farming business			.52
	RM9. I know of someone who has an achievement that I would like to pursue			.74

Scale	Items	Cronbach's Alpha	MSA	Communality values
Entrepreneurial Commitment				
Normative Commitment	NC1. One of the major reasons I continue to work for my own business is that I believe that loyalty is important and therefore a sense of moral obligation to remain	.92	.84	.74
	NC2. If I got another offer for a better job elsewhere, I would not feel it was right to leave my business			.80
	NC3. I was taught to believe in the value of remaining loyal to the business that you started			.71
	NC4. Things were better in the days when smallholder farmers remained in the farming business for most of their careers			.83
	NC5. I do not think that working anywhere else is more appealing			.74
Affective Commitment	AC1. I would be very happy to spend the rest of my career in this business of mine	.92	.89	.71
	AC2. I enjoy discussing about my business with people outside it			.66
	AC3. I really feel that this business' problems are my own			.58
	AC4. I think I could not be easily attached to another organization as I am to this business			.62
	AC5. I feel that my business is part of my family			.82
	AC6. I am feeling emotionally attached to my business			.80
	AC7. This business has a great deal of personal meaning for me			.78
Continuance Commitment	CC1. I am afraid of what might happen if I leave this business without having any other job alternative lined up	.93	.88	.56
	CC2. It would be very hard for me to stop this business right now even if I wanted to			.87
	CC3. Too much in my life would be disrupted if I decided to stop this business			.88
	CC4. It would be too costly for me to stop this business now			.92
	CC5. Right now keeping running this business is a matter of necessity as much as desire			.90
	CC6. I feel that I have too few options to consider stopping this business			.85
	CC7. One of the few serious consequences of stopping this business would be the scarcity of available alternatives			.82
	CC8. One of the reasons why I keep running this business is that closing it would require considerable personal sacrifice – another professional activity may not match the overall benefits I have here			.66
Profitability				
PFT2. I have all the tools required to provide high quality products from my farming activity		.88	.74	.81
PFT3. My farm is large enough to produce the required profit				.78
PFT6. I can and I do feed my crops/animals well for them to be healthy and produce high quality products				.83

Source: Author

APPENDIX C: CONSISTENCY MATRIX

Research Problem: To examine the nature of the relationship between entrepreneurial capital and the profitability of smallholder farmers in Analamanga's rural municipalities.							
Sub-problem	**Literature review**	**Hypotheses**	**Research questions**	**Variables**	**Source of data**	**Type of data**	**Analysis**
Examine the nature of the relationship between entrepreneurial competence and the profitability of smallholder farmers in Analamanga's rural municipalities.	(Feurer and Chaharbaghi, 1994) (Lopa and Bose, 2014) (Barazandeh et al., 2015)	**H1:** There is a significant correlation between entrepreneurial competence and the profitability of smallholder farmers in Analamanga's rural municipalities where demographics play a role.	What is the nature of the correlation between entrepreneurial competence and the profitability of smallholder farmers in Analamanga's rural municipalities?	**IV:** Entrepreneurial competence (consisting of perceived capability, perceived opportunities, less fear of failure and role models) **DV:** Profitability	Sections 3 and 5 – Questions 1 to 31 and 55 to 60 in the questionnaire	Ordinal / Interval (Numerical)	Data entered into Microsoft Excel for the cleaning then, imported to IBM SPSS v.25 for statistical analyses Descriptive statistics used to analyse demographics data Cronbach's Alpha used to test the scale reliability Factor analysis used to test the scale validity
Examine the nature of the relationship between entrepreneurial commitment and the profitability of smallholder farmers in Analamanga's rural municipalities.	(Tasmin et al., 2013) (Simon, Stachel and Covin, 2011)	**H2:** There is a significant correlation between entrepreneurial commitment and the profitability of smallholder farmers in Analamanga's rural municipalities where demographics play a role.	What is the nature of the correlation between entrepreneurial commitment and the profitability of smallholder farmers in Analamanga's rural municipalities?	**IV:** Entrepreneurial commitment (consisting of normative commitment, affective commitment and continuance commitment) **DV:** Profitability	Sections 4 and 5 – Questions 32 to 60 in the questionnaire	Ordinal / Interval (Numerical)	

Examine the nature of the relationship between the multiplicative interaction between entrepreneurial competence and entrepreneurial commitment – engendering entrepreneurial capital -and the profitability of smallholder farmers in Analamanga's rural municipalities.	(Erikson, 2002) (Audretsch and Keilbach, 2010)	**H3:** There is a significant correlation between the multiplicative interaction between entrepreneurial competence and entrepreneurial commitment - engendering entrepreneurial capital -and the profitability of smallholder farmers in Analamanga's rural areas where demographics play a role.	What is the nature of the correlation between the multiplicative interaction between entrepreneurial competence and entrepreneurial commitment – engendering entrepreneurial capital -and the profitability of smallholder farmers in Analamanga's rural municipalities?	**IV:** Entrepreneurial capital (consisting of entrepreneurial competence and entrepreneurial commitment) **DV:** Profitability	Section 3,4 and 5 – Questions 1 and 60 in the questionnaire	Ordinal / Interval (Numerical)	Multiple linear regression used to test H1 and H2 Simple linear regression used to test H3

APPENDIX D: RESEARCH INSTRUMENT

1. GENERAL INFORMATION

Please give some information about the localization of your village.

Region	Analamanga
District	
Municipality	
Village	

2. DEMOGRAPHICS

1. Are you?	Male ☐ Female ☐
2. How old are you?	Less than 20 years ☐ 20 – 29 years ☐ 30 – 39 years ☐ 40 – 49 years ☐ 50 – 59 years ☐ 60 years and more ☐

3. What level of education did you reach?	Without education ☐ Primary ☐ Secondary and more ☐

3. ENTREPRENEURIAL COMPETENCE

Rate the following statement based on the scale provided below.

Never true = 1 Rarely true = 2 Sometimes but infrequently true = 3 Neutral = 4 Sometimes true = 5 Usually true = 6 Always true = 7

3.1. Perceived capability

1 I will be able to achieve most of the goals that I set for myself	1	2	3	4	5	6	7
2 When facing difficult tasks, I am certain that I will accomplish them	1	2	3	4	5	6	7
3 In general, I believe that I can obtain outcomes that are important to me	1	2	3	4	5	6	7
4 I believe I can succeed to most any endeavor to which I set my mind	1	2	3	4	5	6	7
5 I will be able to successfully overcome many challenges	1	2	3	4	5	6	7
6 I am confident that I can perform effectively on many different tasks	1	2	3	4	5	6	7

7 Compared to other people, I can do most tasks very well	1	2	3	4	5	6	7
8 Even when things are tough, I can perform quite well	1	2	3	4	5	6	7

3.2. Perceived opportunities

9 I am always alert to business opportunities	1	2	3	4	5	6	7
10 I research potential markets to identify business opportunities	1	2	3	4	5	6	7
11 I search systematically for business opportunities	1	2	3	4	5	6	7
12 I look for information about new ideas on products or services	1	2	3	4	5	6	7
13 I regularly scan the environment for business opportunities	1	2	3	4	5	6	7
14 I have set up this business to pursue an opportunity I perceived	1	2	3	4	5	6	7
15 Based on a business opportunity I perceived, I have developed a new market	1	2	3	4	5	6	7
16 I have put together an entrepreneurial team to pursue a business opportunity I perceived	1	2	3	4	5	6	7
17 I have approached investors to acquire funding for this business opportunity	1	2	3	4	5	6	7

3.3. Perception failure appraisal inventory

18 When I am failing, I'm not afraid that I might not have enough talent	1	2	3	4	5	6	7
19 When I am failing, it does not upset my plan for the future	1	2	3	4	5	6	7
20 When I am not succeeding, people are still interested in me	1	2	3	4	5	6	7
21 When I am failing, important others are not disappointed	1	2	3	4	5	6	7
22 When I am failing, I don't worry about what others think about me	1	2	3	4	5	6	7

3.4. Role models

23 There is someone I can count on if I need support when I make decisions in my farming business	1	2	3	4	5	6	7
24 There is someone who helps me to weigh the pros and cons of the decisions that I make in my farming business	1	2	3	4	5	6	7
25 There is someone who shows me how to get where I am going with my farming business	1	2	3	4	5	6	7
26 There is someone who tells or shows me general strategies to succeed in my farming business	1	2	3	4	5	6	7
27 There is someone I want to be like when running my farming business	1	2	3	4	5	6	7
28 There is someone particularly inspirational to me in the farming industry	1	2	3	4	5	6	7

29 In the farming business that I am pursuing, there is someone that I admire	1	2	3	4	5	6	7
30 I have a mentor in my farming business	1	2	3	4	5	6	7
31 I know of someone who has an achievement that I would like to pursue	1	2	3	4	5	6	7

4. ENTREPRENEURIAL COMMITMENT

4.1. Normative commitment

32 One of the major reasons I continue to work for my own business is that I believe that loyalty is important and therefore a sense of moral obligation to remain	1	2	3	4	5	6	7
33 If I got another offer for a better job elsewhere, I would not feel it was right to leave my business	1	2	3	4	5	6	7
34 I was taught to believe in the value of remaining loyal to the business that you started	1	2	3	4	5	6	7
35 Things were better in the days when smallholder farmers remained in the farming business for most of their careers	1	2	3	4	5	6	7
36 I do not think that working anywhere else is more appealing	1	2	3	4	5	6	7

4.2. Affective commitment

37 I would be very happy to spend the rest of my career in this business of mine	1	2	3	4	5	6	7
38 I enjoy discussing about my business with people outside it	1	2	3	4	5	6	7
39 I really feel that this business' problems are my own	1	2	3	4	5	6	7
40 I think I could not be easily attached to another organization as I am to this business	1	2	3	4	5	6	7
41 I feel that my business is part of my family	1	2	3	4	5	6	7
42 I am feeling emotionally attached to my business	1	2	3	4	5	6	7
43 This business has a great deal of personal meaning for me	1	2	3	4	5	6	7

4.3. Continuance commitment

44 I am afraid of what might happen if I leave this business without having any other job alternative lined up	1	2	3	4	5	6	7
45 It would be very hard for me to stop this business right now even if I wanted to	1	2	3	4	5	6	7
46 Too much in my life would be disrupted if I decided to stop this business	1	2	3	4	5	6	7
47 It would be too costly for me to stop this business now	1	2	3	4	5	6	7
48 Right now keeping running this business is a matter of necessity as much as desire	1	2	3	4	5	6	7

49 I feel that I have too few options to consider stopping this business	1 2 3 4 5 6 7
50 One of the few serious consequences of stopping this business would be the scarcity of available alternatives	1 2 3 4 5 6 7
51 One of the reasons why I keep running this business is that closing it would require considerable personal sacrifice – another professional activity may not match the overall benefits I have here	1 2 3 4 5 6 7

5. PROFITABILITY

52 I have enough years of farming experience to know exactly how to maximize my profit	1 2 3 4 5 6 7
53 I have all the tools required to provide high quality products from my farming activity	1 2 3 4 5 6 7
54 My farm is large enough to produce the required profit	1 2 3 4 5 6 7
55 I can borrow the financial resources required to leverage my farming activity	1 2 3 4 5 6 7
56 There are competent people working with me to help me to grow and harvest high quality products	1 2 3 4 5 6 7
57 I can and I do feed my crops/animals well for them to be healthy and produce high quality products	1 2 3 4 5 6 7