



SEEK WISDOM, ELEVATE YOUR INTELLECT AND SERVE HUMANITY !



## **College of Business and Economics**

### **Department of Management**

**Determinants of Frugal Innovation Success of the Subsistence's  
Entrepreneurships in Ethiopia: Evidence from Addis Ababa**

**By: Mikealay Desta**

[4betterlife2006@gmail.com](mailto:4betterlife2006@gmail.com)

**November, 2019**

**Addis Ababa – Ethiopia**

**Addis Ababa University**  
**College of Business and Economics**  
**Department of Management**

**The Determinants of Frugal Innovation Success of the Subsistence's  
Entrepreneurships in Ethiopia: Evidence from Addis Ababa**

**BY: MIKEALAY DESTA**

**A Thesis Submitted to the Department of Management of Addis Ababa  
University in Partial Fulfillment of the Requirements for the Degree of Masters  
Science in Management (Specialized in Innovation Management &  
Entrepreneurship)**

**ADVISOR: WORKNEH KASSA (PhD)**

**November, 2019**  
**Addis Ababa, Ethiopia**

**Addis Ababa University**  
**College of Business and Economics**  
**Department of Management**

This is to certify that the thesis prepared by Mikealay Desta entitled “**The Determinants of Frugal Innovation Success of the Subsistence’s Entrepreneurships in Ethiopia: Evidence from Addis Ababa**”, which is submitted in partial fulfilment of the requirements for the Degree of Masters Science in Management (Specialized in Innovation Management & Entrepreneurship), complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

**Approved by Board of Examiners:**

\_\_\_\_\_ Signature\_\_\_\_\_ Date\_\_\_\_\_

Advisor

\_\_\_\_\_ Signature\_\_\_\_\_ Date\_\_\_\_\_

Internal Examiner

\_\_\_\_\_ Signature\_\_\_\_\_ Date\_\_\_\_\_

External Examiner

\_\_\_\_\_ Signature\_\_\_\_\_ Date\_\_\_\_\_

Chair of Department or Graduate Programs Coordinator

## DECLARATION

I, the undersigned, declare that this thesis is my original work and has not been presented for a degree in any other university and that all sources of materials used for the thesis have been duly acknowledged.

**Declared by:**

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

**Confirmed by Advisor:**

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## **Abstract**

*More recently, studies show that entrepreneurship and innovation are a means to reach the unmet needs of the poor majority at the bottom of the pyramid. However, addressing the problem of the poor in the developing nations or making up the base of the pyramid, especially the informal sector as an engine for growth is not easy. This is also an existing fact in Ethiopia. Hence, this thesis is initiated to investigate the determinants of subsistence's entrepreneurs from using and selling out of frugal innovations as well as to look into its relative influence on the entrepreneurial performance success of the subsistence's operators. The study aims to widen the knowledge about the situation of frugal innovation at the base of the pyramid (BOP) in the country. While, policy makers and academicians may also use the findings of the research to influence policy debates and to use them as a reference for further study. The objective of this study is to assess the determinants of subsistence entrepreneurship in using and selling out of frugal innovation in Addis Ababa, Ethiopia. The study used a survey method using a questionnaire to collect data from a sample of 385 subsistence's operators. The study used the descriptive, correlation and regression analysis techniques to analyse the data. The finding shows that all factors are significant determinants except firm size. Whereas, the institutional voids and firm age are found with a negative effect for using and selling out of frugal innovations. As per the finding of this study the entrepreneurial capability, enabling environmental actors and the social weak ties were found as most important determinants of subsistence's entrepreneurs for using and selling out of frugal innovations in Addis Ababa. More specifically, the entrepreneurial capability was found as a most important determinant of frugal innovations with that on average a one percent increase in the overall capability of the entrepreneur leads to an increase in applying and selling out of frugal innovations by 37 percent. Besides, it has found that frugal innovation not only positively but also highly drives the entrepreneurial performance success of the subsistence's entrepreneurs in Addis Ababa. The findings of this study can be inputs to the policy makers that target to enhance the capacity and sustainability of micro-and small enterprises which focus on innovation.*

*Keywords: Base of the pyramid, entrepreneurship, frugal innovation, subsistence economy.*

## ACKNOWLEDGEMENTS

*This thesis would not have been completed without the valuable contribution of my advisor, colleagues, friends and family. I would like to express my gratitude and appreciation, for the support and contribution of everyone who assisted me during this project.*

*I owe my deepest gratitude to my advisor, Dr. Workneh Kassa, for his encouragement and assistance during the course of my research. I would also like to thank my friends and colleagues: Zelalem Abera and Karrote Kanzile for their valuable input to the research. I am particularly indebted to my lovely family for their continuous moral support from beginning to the end.*

*Furthermore, I would like to express my deepest gratitude and respect to my beloved wife Medhanit Adhana and brother Hagos Tadesse for their moral support during my study years. Many blessing to all whose names are not mentioned, but who assisted me during my study. Without their prop up, my study would not have been achievable.*

*Besides, I would like to forward a sincere thank you to the respondents who willingly gave their time to participate in this research work. I would also like to express my warm thanks to officials and employees of National Bank of Ethiopia who rendered their unreserved support. I honestly say that the contribution from every one of you was valuable and without it this study would not have been possible.*

*Last but not least, my gratitude goes to the Addis Ababa University (Ethiopia), Copper belt University (Kitwe, Zambia), Moi University (Eldoret, Kenya) and the University of Hohenheim (Stuttgart, Germany) offer me a joint three-week multidisciplinary program entitled Investing in the knowledge for tomorrow: A summer school on subsistence entrepreneurship and frugal innovations in sub Saharan Africa. I honestly say that, this research title would not be known for me, if had I never got this golden offer.*

*I thank you all!!!*

*Mikealay Desta (September, 2019)*

## **DEDICATION**

**To My  
Lovely Country  
Ethiopia!**

## Table of Contents

Abstract.....	i
ACKNOWLEDGEMENTS .....	ii
DEDICATION .....	iii
List of Figures .....	viii
List of Tables .....	ix
LIST OF ACRONYMS .....	x
CHAPTER ONE .....	1
1. Introduction.....	1
1.1 Background to the Study .....	1
1.2 Statement of the Problem .....	3
1.3 Research Questions .....	6
1.4 Objectives of the Study .....	6
1.4.1 General Objective: - .....	6
1.4.2 Specific Objectives.....	6
1.5 Significance of the Study .....	7
1.6 Scope and Limitation of the study .....	7
CHAPTER TWO .....	8
2. Review of Related Literature .....	8
2.1 Introduction .....	8
2.1.1 Overview of Innovation and Frugality .....	10
2.1.2 Core competence of frugal innovation .....	11
2.1.3 Getting hold of the frugal innovation concept .....	12
2.1.4 Overlapping Innovation Concepts.....	15
2.2 Theoretical Background .....	16
2.2.1 The Resource Dependency Theory .....	17
2.2.2 Institutional Theory .....	18
2.3 Determinants of frugal innovations in emerging markets .....	21
2.3.1 Empirical studies and their relationships .....	22
2.4 Conceptual Framework .....	25
2.4.1 Business Factors/Characteristics .....	25
2.4.1.1 Firm Size and Firm Age.....	26
2.4.2 Entrepreneurial Capability/Personal Competencies .....	26

2.4.2.1 Motive for present activity (Opportunity Driven Motivation) .....	26
2.4.2.2 Competency (Entrepreneurial Education/Training and Experience) .....	26
2.4.2.3 Personality traits .....	26
2.4.3 Institutional Environment and Actors .....	27
2.4.3.1 Institutional voids .....	28
2.4.3.2 Environmental Actors .....	28
2.4.4 Local community or Social Embeddedness .....	28
2.4.4.1 Social ties .....	29
2.4.5 Concentration on Core Functionalities and performance (CCFP) .....	30
2.4.6 Substantial Cost Reduction (SCR) .....	30
2.4.7 Create localization (CL) .....	30
2.4.8 Entrepreneurial Performance (EP) Success .....	31
CHAPTER THREE .....	32
3. Research Methodology .....	32
3.1 Research Design .....	32
3.2 Research Strategy and Techniques .....	32
3.3 Sample Design .....	33
3.3.1 Target population .....	33
3.3.2 Sample size .....	34
3.3.3 Sampling Method and Contingency for non-response .....	35
3.3.4 Questionnaire Distribution .....	36
3.4 Description of Variables and Measurement of constructs .....	36
3.4.1 Reliability and Validity of Instruments .....	37
3.5 Data Analysis Methods .....	38
3.5.1 Regression Model Specification .....	38
CHAPTER FOUR .....	40
4. DATA PRESENTATION AND ANALYSIS .....	40
4.1 Introduction .....	40
4.2 Demographic and Socioeconomic Characteristics of Respondents .....	40
4.2.1 Age and sex of respondents .....	41
4.2.2 Education of respondents .....	42
4.2.3 Sector/activity of the enterprise .....	42
4.3 Business Factors/Characteristics .....	43

4.3.1 Firm Size and Age.....	44
4.4 Entrepreneurial Capability/Personal Competencies.....	45
4.4.1 Motive for present activity ( Opportunity Driven Motivation) .....	45
4.4.2 Competency (Entrepreneurial Education/Training and Experience).....	46
4.4.3 Personality traits.....	46
4.5 Institutional environment and actors.....	47
4.5.1 Institutional voids.....	48
4.5.2 Environmental Actors.....	49
4.6 Local community or Social Embeddedness.....	50
4.6.1 Social ties.....	50
4.7 Frugal Innovations (FI) .....	51
4.7.1 Concentration on Core Functionalities and performance (CCFP), Substantial Cost Reduction (SCR) & Create localization (CL) .....	51
4.8 Entrepreneurial Performance (EP) Success .....	52
4.9 Correlation and regression analysis .....	54
4.9.1 Correlation analysis.....	54
4.9.1.1 Correlation between frugal innovation and business factors .....	55
4.9.1.2 Correlation between frugal innovation and entrepreneurial capability .....	56
4.9.1.3 Correlation between frugal innovation and institutional environment & Actors .....	56
4.9.1.3.1 Correlation between frugal innovation and institutional voids.....	56
4.9.1.3.2 Correlation between frugal innovation and environmental Actors .....	56
4.9.1.4 Correlation between frugal innovation and social embeddedness.....	57
4.9.1.5 Correlation between EPS and frugal innovation elements .....	57
4.9.1.5.1 Correlation between EPS and CCFP.....	58
4.9.1.5.2 Correlation between EPS and SCR.....	58
4.9.1.5.3 Correlation between EPS and CL .....	59
4.9.2 Regression analysis .....	60
4.9.2.1 Linearity.....	60
4.9.2.2 Normality Test .....	60
4.9.2.3 Multicollinearity.....	61
4.9.2.4 Homoscedasticity .....	61
4.9.2.5 Autocorrelation .....	62
4.9.2.6 Fitness of the model; for frugal innovations .....	63

4.9.2.7 Model Specification; for entrepreneurial performance success .....	66
4.9.2.8 Fitness of the model; for entrepreneurial performance success .....	66
CHAPTER FIVE.....	69
5. Summery, Conclusion & Implication of the Findings .....	69
5.1 Summary .....	69
5.2 Conclusion.....	71
5.3 Recommendataions and Implications for Future Researches .....	73
5.3.1 Recommendations .....	73
5.3.2 Implications for Future Researches .....	74
REFERENCES.....	76
APPENDIX.....	76

## List of Figures

Figure 1:Frugal Innovation Determinant Factors .....	29
Figure 2:The influence of frugal innovation on entrepreneurial performance .....	31
Figure 4.1. Shows the normality test.....	60
Figure 4.2. Shows homoscedasticity test.....	62

## List of Tables

Table 1 Sample Size Determination.....	35
Table 2 Reliability Statistics.....	38
Table 3: Respondent age, sex and Education Category .....	41
Table 4:Sector/activity of the enterprise .....	43
Table 5: Firm Size and Age Category.....	43
Table 6: Opportunity Driven Motivation and Competence.....	45
Table 7: Personality traits category.....	47
Table 8: Institutional voids category.....	48
Table 9: Environmental Actors category.....	49
Table 10: Weak Social ties category.....	50
Table 11: Frugal Innovation Characteristics category .....	51
Table 12: Had you ever heard of frugal innovation .....	52
Table 13: Entrepreneurial Performance Success Indicators .....	53
Table 14: Correlation between predictor variables of Frugal Innovation (1 <sup>st</sup> model) .....	55
Table 15: Correlation between predictor variables of Entrepreneurial Performance (2 <sup>nd</sup> model) ....	58
Table 16: Multicollinearity: Frugal innovation and Entrepreneurial performance success .....	61
Table 17: Autocorrelations: Frugal innovation and Entrepreneurial performance success .....	63
Table 18: Model Summary; Frugal innovation .....	63
Table 19: ANOVA; Frugal innovation.....	64
Table 20: Coefficients; Frugal innovation.....	64
Table 21: Model Summary; Entrepreneurial performance success .....	67
Table 22: ANOVA; Entrepreneurial performance success .....	67
Table 23: Coefficients; Entrepreneurial performance success .....	68

## LIST OF ACRONYMS

<b>BoP</b>	Base of the primed
<b>CCFP</b>	Concentration on Core Functionalities and performance
<b>CL</b>	Create localization
<b>CSA</b>	Central Statistical Authority
<b>EC</b>	Entrepreneurial Capability
<b>EPS</b>	Entrepreneurial Performance Success
<b>FI</b>	Frugal Innovation
<b>GDP</b>	Gross Domestic Product
<b>ILC</b>	Internal Locus of Control
<b>ILO</b>	International Labour Organization
<b>MSEs</b>	Micro and Small Enterprises
<b>NA</b>	Need for Achievement
<b>NGOs</b>	Non-Governmental Organizations
<b>RTP</b>	Risk Taking Propensity
<b>SE</b>	Self-Efficacy
<b>SCR</b>	Substantial Cost Reduction

# CHAPTER ONE

## 1. Introduction

### 1.1 Background to the Study

The phenomenon of globalization has brought various opportunities & pressures. This is where, the rapidly growing economy and market with billions of consumers in emerging markets are facing with (Gorodnichenko, Svejnar, & Terrell, K., 2009). As evidence of the visible pressures, over one billion people in the world are living at the foot base of the pyramid (BOP) in the statues of absolute poverty (Hahn and Rüdiger, 2009). According to Pansera and Sarkar (2016), entrepreneurship and innovation are the means to reach the unmet needs of the 4 billion people worldwide living at the base of the pyramid (BOP). However, addressing the problem of the poor in the developing nations or making the base of the pyramid, especially the informal sector as an engine for growth is not easy (Garoma, 2012). Because, the approach for BOP demands cooperation in utilizing the substantial resources by using an entrepreneurial process, for winning the vast market represented by the millions of economically poor people around the world (Prahalad 2006).

Thus, studies have argued that an entrepreneurial process passes along the: entrepreneurial alertness, opportunity recognition, opportunity exploitation, and growth decision stages, while entrepreneurs are mandated to discover opportunities that arise out of competitive imperfections (Kirzner, 1973). However, this discussion, unlike subsistence entrepreneurship, focuses on an individual's perspective with sufficient resources and having an active choice to start a new enterprise (Acs, 2006). Hence, this may not work for the studies of subsistence entrepreneurship since they often operate in an environment which is characterized by the absence of formal institutions and scarce resources (Viswanathan, Echambadi, Venugopal, & Sridharan, 2014). They experience entrepreneurship out of necessity (Reynolds et al. 2005) and exploit the “informal” economy, characterized by uncertain institutional contexts and “institutional voids,” (Mair and Marti 2006). Thus, a *Subsistence Entrepreneurship* is defined as “entrepreneurial actions undertaken by individuals living in poverty” (Viswanathan et al., 2014) or Creating and running businesses with the aim of survival. Notably and despite the challenges, subsistence entrepreneurs

are important agents in the fight against poverty and crucial drivers of economic development (Naude, 2011; Baumol et al., 2007) and hence they are the drivers of innovation practices for the transformation of society and its value systems (Viswanathan et al., 2014).

Above all, the developing countries initiation towards the promotion of endogenous innovation practices is too embryonic even though, it is widely acknowledged that innovation is a crucial driving force of economic development. The progress of turning knowledge creation and use into a driving force for local, economic development are particular problems stark in Africa. That is what makes their society poor and inevitably dependent on developed countries innovated products, which are also imported by hard currency. This is typically lefts true for countries like Ethiopia. This is so far called according to the world economic forum's global competitiveness index (GCI), Ethiopia ranks 109<sup>th</sup> out of 140 countries with a score of 3.5 out of 7 in the 2015 -16 report. Therefore, Ethiopia's innovation practices still lag behind in the global benchmarking. Looking-back, this benchmarking has been done with the exclusive focus on wealth creation and competitive advantage reflects an entrepreneurial perspective of individuals with sufficient resources and environmental conditions to start a new enterprise. However, the case in subsistence settings, entrepreneurship is basically about survival (Viswanathan, Rosa & Ruth, 2010) with lacked practice in deploying cognitive skills to discern, evaluate and exploit growth-oriented opportunities (Viswanathan, Seth, Gau & Chaturvedi, 2007).

This research focuses on the determinants of subsistence's entrepreneurships from using and selling out of frugal innovations, which could form a potential basis for economic growth and poverty reduction in developing countries'. According, to the World Bank (2004) millions of poor people in developing countries are living as micro-entrepreneurs as farmers, street vendors, home workers, and in a range of other occupations, which is mostly informal economy. Many scholars and policymakers have recognized that the informal economy is the center of hope for the poor majority (Garoma, 2012). In other hands, this shows much of the pressures facing by developing countries are raised out directly or indirectly from the informal economy while an approach of serving the poor in developing markets has not yet been equaled exploited (Garoma, 2012).

Yet today, emerging markets are becoming more established for frugal innovation, that is, a settlement of large population groups under the poverty line, which makes them favorable

customers for frugal innovation (Prahalad, 2005). As evidence of this, the concept of frugal innovation calls back to changes linked to population and economic growth in emerging countries such as China and India. Thus, frugal innovation is defined as *a resource-scarce solution (i.e., product, service, process, or business model) that is designed and implemented despite financial, technological, material or other resource constraints, whereby the final outcome is good enough to meet the basic needs of the neglected customers* (Hossain, 2016). Therefore, frugal innovations are good enough, affordable, easy to use products, and adjusted to the particular resource constrained customers (Zeschky, Widenmayer & Gassman, 2011). Summing up all together, *the innovation of accurate, simpler, and locally made products that are functional and easy to use with regard to resources on hand creates the base of frugal innovation*. Hence, they are particularly wrathful for the subsistence's entrepreneurs as a means to overcome the aforementioned hurdles. For instance, the mobile payment 'M-Pesa' in Kenya or 'M-Birr' in Ethiopia (though it is in its early market) is a good example of successful frugal innovations an African context. M- Pesa has lifted 2% of Kenyan households out of poverty and has expanded the opportunities for entrepreneurs by giving them greater access to credit (Zeschky et. Al., 2011). Thus, frugal innovations can help subsistence entrepreneurs to participate in the global market by scaling up their operating capacity. Furthermore, developing their own frugal innovations helps them to connect with their customers and contribute to national development. Consequently, this study provides a base on the current application state of frugal innovation by the subsistence's entrepreneurships and what determining them from using & selling out of frugal innovations; the case of Ethiopia.

## **1.2 Statement of the Problem**

More recently, studies of entrepreneurship and innovation as a means to reach the unmet needs of 4 billion people worldwide living in poverty have been widely discussed (Pansera and Sarkar, 2016). In this respect, literature has been dealing with the application of frugal innovations in large companies or private-public alliance bodies and small-medium enterprises to address the need of consumers at the base of the pyramid (Hossain, 2018). Comparably, little is studied about those subsistence's level innovators that are characterized by little or no formal preparation, and living under a penurious environment, though rich in traditional know-how's (Pansera & Sarkar, 2016). Thus far, it is strongly believed that subsistence's entrepreneurships and their innovation/frugal results rose out of the base of the primed could birth the solutions for the unmet needs. Not only this

but also could have brought sustainable impact through enhanced business performance of the poor living in emerging countries. This is, because subsistence's entrepreneurs create value for their customers more effectively than outside entities as their customers living in poverty with being poor themselves and co-locating in the same community (Viswanathan, Echambadi, & Sridharan, 2014). Therefore, in general terms, subsistence's entrepreneurs could bring the innovation of accurate, simpler, and locally available solutions that are functional and easy to use in spite of the resources on hand which also creates the base of frugal innovation.

Thus, of the fragmented studies existed on the subsistence's entrepreneurs perspective, there is little distinction between the entrepreneurial and innovative success factors in which seen listed in most literature. For instance, Bradley, McMullen, Artz, & Simiyu, (2012) look at the social, business, and individual backgrounds, and their effects, on both innovation and firm performance of micro-credits of the developing country. Besides, little is tested empirically regarding frugal innovations success factors. The nearest this, Hossain (2017) has explored the role of open innovation in three frugal innovation cases from India and found that small firms that develop frugal innovations at the grassroots level require extensive engagement in networking, collaboration with different partners, and third-party assistance. Generally, some researchers categorized the innovation success determinants into three major categories though multi-factors are accounted for it: (a) the founder characteristics, (b) the firm characteristics and (c) the market conditions or external environment in which the enterprise operate (Khattab et al., 2017). On the other hand, some researchers chose to investigate failure determinants that hinder the development of innovation. Pachouri and Sharma (2016), found the unstable institutional policies are key barriers which impede the innovation potential of SMEs in India. Besides, Garoma (2012) on his part indicated that both internal and external factors (individual, business and environmental dimensions all together with the entrepreneurial orientations) would better explain the success or failure of microenterprises in the informal sector.

Although, there have been significant contributions from the above studies, there is a gap in exploring the micro firm environment and frugal innovation phenomenon. Because, most of the empirical studies are conducted on the small and medium-sized firms, which in a sense differs from the nature of micro firm environments. The is different from that of small and medium-sized firms, being it is characterized by the entrepreneur's dominance, lifestyle motivation, market proximity,

embeddedness, simple structure, informal communication and decision making based on intuition (Kearney et al., 2013). While, also there is a gap in exploring determinants of frugal innovation success factors and lacked a scientifically tested impact of frugal innovations, not only in Ethiopian perspective.

To the best of my knowledge no one has analyzed factors influencing the innovation of subsistence's entrepreneurs from the eye of frugal innovation and its effect in Ethiopia. A lot (for example, Ageba and Amha (2006), Gebreyesus (2009), & Garoma (2012)) has also studied the determinants of micro firm success factors, yet didn't consider the influence of frugal innovations. While, also the financial perspective has been used to measure the entrepreneurial success of the enterprises. So far, the growth in revenue was used as the indicator of firm performance. It is believed all entrepreneurs share the goal of driving economic growth though this is not real in practice. Indeed, subsistence's entrepreneurs are not proactive in setting goals & strategies (Ruach & Frese 2000); rather they are motivated to run the business forced by lifestyle and personal factors (Walker & Brown, 2004). Thus, subjective / non-financial goal measurements could indicate the success of the micro-enterprises (Sutter, Bruton & Chen, 2019). Therefore, other factors, such as family welfare, the level of competitiveness & customer development and personal well-being could be also important factors indicating the performance of micro and small-scale enterprises.

In this regard, assessing the determinants of frugal innovation success of subsistence's entrepreneurs is new direction in the field of innovation studies in Ethiopia. This study is also presumed to indicate new direction towards the influence of frugal innovations on the entrepreneurial performance success of the subsistence operators. Moreover, the study tried to indicate application state assessment of the frugal innovation, particularly; identifying the determining factors of frugal innovations success in Ethiopia. Thus, the study investigates the determinants of frugal innovation success based on the empirical foundations and the research theories which are Institutional and Resource Dependency theories.

This is, therefore, initiated being the concept of frugal innovation is pioneering in nature and the need to study at the individual micro level, not discovered in the existing researches ( Bruton, Ahlstrom, & Si, 2015; McCloskey, 2010).

### **1.3 Research Questions**

Based on the study gaps stated above, the following research questions are addressed. The main question is, what are the determinants of frugal innovation success of subsistence's entrepreneurs while looking its relative influence. For a more comprehensive understanding of the phenomenon under study and to provide a sufficient justification, the following questions will be addressed. These are:

- Does the entrepreneurial capability have a significant impact on the frugal innovation success of the subsistence's entrepreneurs in Addis Ababa?
- Do the business factors have a significant impact on the frugal innovation success of the subsistence's entrepreneurs in Addis Ababa?
- How and to what extent the institutional environment & actors determine the frugal innovation success of the subsistence's entrepreneurs in Addis Ababa?
- Does the social capital of the local community influence the frugal innovation success of the subsistence's entrepreneurs in Addis Ababa?
- How does frugal innovation influence the entrepreneurial/business performance of the subsistence's entrepreneurs in Addis Ababa?

### **1.4 Objectives of the Study**

**1.4.1 General Objective:** - To assess the determinants of frugal innovation success of subsistence's entrepreneurs in Ethiopia.

#### **1.4.2 Specific Objectives**

- To assess the impact of entrepreneurial capability on the frugal innovation success of the subsistence's entrepreneurs in Addis Ababa.
- To examine the effect of business factors on the frugal innovation success of the subsistence's entrepreneurs in Addis Ababa.
- To investigate how and to what extent the institutional environment & actors determine the frugal innovation success of the subsistence's entrepreneurs in Addis Ababa.
- To assess the impact of the social capital of the local community on the frugal innovation success of the subsistence's entrepreneurs in Addis Ababa.
- To assess the influence of frugal innovation on the business performance of the subsistence's entrepreneurs in Addis Ababa

## **1.5 Significance of the Study**

The research may use as an input for further extension of the concept to other contexts to give additional insights and adds to the knowledge about the concept for frugal innovations empowerment by identifying the intercedes behind subsistence's entrepreneurship and how to respond to and manage things in the way which contribute for innovation practice enhancement. Furthermore, it may also widen the knowledge about the situation of frugal innovation at the base of the primed (BOP) in the country. Policy makers and academicians may also use the findings of the research to influence policy debates and answer some academic questions and/or to use them as a reference for further study.

## **1.6 Scope and Limitation of the study**

The study examined the determinants of frugal innovation success. Here, the study focuses only on determinants of frugal innovation success particularly to micro firms. The Study doesn't include the large, MSEs and other multinational companies. Geographically, the study focused in Addis Ababa, even does not include all directions of the megacity. This is, because, due to the scattered nature of the respondents.

Where as, the limitations of the research can be listed as follows.

- The output of this study may be limited because of that, the sample size for this study may not be large enough to study the issue.
- Since the data is collected at one time base from the selected target population to describe some larger population at that time, it may not allow analysis continuity and changes over time.
- The findings of the study may not have all the countryside full representation since the study is focussed on the small scale firms located in Addis Ababa, which may differ also from the regional state endearments of the subsistence's entrepreneurships.

## CHAPTER TWO

### 2. Review of Related Literature

#### 2.1 Introduction

Emerging market countries like Ethiopia has become a resident of substances entrepreneurship, thereby contributing as a source of employment and economic drivers. According to the CSA (2003) report, for example, the 50.6% of Ethiopia's total urban labor force is employed in this gate, yet it is from the informal sector. Besides, approximately 72 percent of the GDP in North and Sub-Saharan Africa has its roots in the informal economy, according to International Labour Organization study (2002). So, subsistence entrepreneurships are microenterprises mostly run informal businesses. This is to mean economic activities that occur outside of formal institutional boundaries (i.e. Illegal) yet fall within informal institutional boundaries (i.e. Legitimate)" (Webb et al., 2014). Yet, different empirical studies defined informality differently. For example, Gebreyesus (2009), Mead and Liedholm (1998), and McPherson & Liedholm (1996) defined the informal sector depending on employing the size of the enterprise. However, De Soto (1989) defines informality based on compliance with rules and regulations.

Therefore, to position the ambiguity this study defines informality based on the size of the manpower employment given to micro-enterprises. Hence, subsistence entrepreneurs are considered as those micro-entrepreneurs who are self-employed or up to 10 employees including (World Bank, 2007). Accordingly, microenterprises employed fewer than or equal to 10 employees are used at the heart of this study. Whereas, the term "substances entrepreneurship" uses to refer as "entrepreneurial actions undertaken by individuals living in poverty" (Viswanathan et al., 2014) or Creating and running businesses with the aim of survival. Subsistence entrepreneurs typically operate in micro and small-sized enterprises, which tend to be undercapitalized, unstructured, poorly managed and informal. They often operate in an environment which is characterized by the absence of formal institutions and scarce resources (Vishwanathan et al., 2014). Many scholars and policymakers have recognized that the informal economy is the center of hope for the poor majority (Garoma, 2012). In other hands, this shows much of the pressures facing by developing countries are raised out directly or indirectly from the informal economy while an approach of serving the

poor for the substances entrepreneurs remains not easy yet (Vishwanathan et al., 2014). “However, in comparison to formal business operations, a high degree of innovation is the key for micro-enterprises to make profits in severely competitive markets (Chiayu et al., 2014)”. And this is why developing frugal innovations for these BOP markets offers wonderful chances for the subsistence’s entrepreneurships to grow out and feet in the emerging market contexts. On the other hand, the innovation of accurate, simpler, and locally available solutions that are functional and easy to use given to resources on hand creates the base of frugal innovation. Hence, they are particularly wrathful for the subsistence entrepreneurs as a means to overcome the aforementioned hurdles. An interesting topic is, unlikely what determines them from using such a frugal result. This remains central, because, they have an opportunity to yield out and bring the creative ideas of entrepreneurship & develop frugal innovations from the original market. To this point, subsistence entrepreneurs are greed as important agents in the fight against poverty and crucial drivers of economic development (Baumol et al 2007).

Given, the aim of enterprise growth for poverty alleviation, most literature argues that the GDP contribution of the sector, mainly make up of microenterprises, is the significant one. Thus, the developing countries economic growth and poverty reduction greatly depends on how well small businesses perform (Garoma, 2012) and innovations would promote. Thus, policies for shaping frugal innovations and entrepreneurial success in the substance level are very important in various ways. In the main gate, it means alignment of the poor majority with the sources of frugal innovations to fight against poverty. It means the government invests on the systems of innovation policies, and then inclusive economic growth would emerge. At a policy level, it also includes, building endogenous knowledge and frugality. Thus, subsistence’s entrepreneurships frugal innovators could be able to solve commercial or social problems for the resource-constrained customers. Hence, developing policies for shaping frugal innovations and entrepreneurial success at micro-level would result in achieving inclusive economic growth and fair play discipline. This is, therefore, frugal innovations could be the most desired means to address the unmet needs of the mass population with a limited paying capacity. Collecting all, the understanding of what determines subsistence’s entrepreneurships from using frugal innovations (which is the theme of this study) would, therefore, mean great relevance to policy influence or to the society.

There are wide and diverse investigative works of literature focused on determinants of micro and small business success, though little has been said for frugal innovations. For this review, how the new concept of frugal innovation works well with the initial theory needed to include at the micro level: depends on the effective extraction of and in the presence of specific constructs framed from the innovation-related multi-theories and a synthesized result of the subsistence level work of others. Consequently, this review of theoretical and empirical studies focuses on the frugal innovation determinants, the business, the institutional environment & actors, the local community (social embedding's) and the capabilities and its influence on the entrepreneurial success. Before discussing about the determinants, attention must go to the basic issues related to frugal innovations and entrepreneurship including the definition. This study of literature review is divided into subsequent sections amid to consolidate in to framework. This, starts from a relatively leading perspective of the entrepreneurship as foundation for innovation with different views on innovation and frugality, then narrowing it down to the novel concept of frugal innovation and related ones. Then, the succeeding sections deals with the theoretical and empirical research of the determining factors as well as windup with the construction of the conceptual frameworks.

### **2.1.1 Overview of Innovation and Frugality**

As literatures are worrying the word innovation are interpreted in different manners. For instance, academics, usually interpret innovation stressing scientific novelty, unlike entrepreneurs may interpreted innovation as is anything that makes money (Massa and Testa, 2008 cited in Talegeta, 2014). Likewise, since innovation has continued to be area of interest by scholars of different disciplines, it has hence viewed as a multidimensional concept. Investing on the meaning the term stands from the Latin word 'innovare' which is to mean a change or something is about to change (Tidd & Bessant, 2014). As one of the early definition, innovation was understood as any shift in the production function. Later on, Schumpeter defined as meaning for engaging crucial factors for economic growth and new product development (Imhof and Mahr, 2017). Additionally, it has viewed as tool of entrepreneurs, which used as a way of exploiting change driven opportunity (Drucker, 1985). Similarly, Tidd & Bessant (2014) defined innovation as the process of creating value from ideas. Whereas, Baregheh et al.,(2009) define "Innovation is the multi-stage process whereby organizations transform ideas into new/improved products, service or processes, in order to advance, compete and differentiate themselves successfully in their marketplace".

The nature of innovation being technological and non-technological was among the other measurements for defining innovation. Given the definitions of many scholars and organizations, innovation is the offspring of the combination of social activities and science & technological creativity. However, it is not limited to technologically oriented creativity, as developed and developing gaps in technological and economic – development shapes the nations innovation initiatives, even though, the understanding of innovation varies from place to place. The fact is that innovation generates more productivity, new job, and better material safety to serve specific communities (Edquist, 1999). As this gives the focus for frugal innovation the second concept is frugality which leads to the approach to relate frugality to innovation. The concept of frugality is not a new phenomenon, but originated on the mid-sixteenth century from Latin word ‘frugalis’ (frūgālis) to mean “thrifty and modest, clearly addressing the sufficient product quality, suitability and handiness under resource-constraints” as recalled by (Imhof and Mahr, 2017). According to the Oxford Dictionaries of (2017) frugal is defined as “simple & plain, costing little and sparing or economical”. Therefore, generation of products in more frugal ways, satisfying actual needs of potential consumers, mostly based in emerging countries is defined as frugality (Horn & Brem, 2013). Furthermore, frugality is not focused with material resources only, but optimizes demand through improvements in quality, price and life of frugal products (Le Bas, 2016).

### **2.1.2 Core competence of frugal innovation**

Frugal Innovation is a new innovative method in which appropriate, adaptable, affordable, and accessible services and products are developed putting in mind the requirements and context of developing market citizens/customers (Le Bas, 2016). Frugal innovation has blossomed to target these underserved populations, encouraging entrepreneurship and sustainable growth for all participants. Besides, the following 10 core competencies of frugal innovation were developed by the Frugal Innovation Lab at Santa Clara University.

**Ruggedization:** designed for harsh physical environments (e.g., heat, moisture, pests)

**Lightweight:** portable for varying transportation options

**Mobile Enabled Solutions:** connectivity anytime, anywhere

**Human Centric Design:** easy-to-use, intuitive designs that require little to no prior knowledge or training to utilize

**Simplification:** minimalist features and functional requirements

**New Distribution Models:** non-conventional channels and access.

**Adaptation:** leveraging existing products, inputs and services

**Use of Local Resources:** sourcing without importing equipment or materials

**Green Technologies:** powered by renewable resources

**Affordability:** low input and operation costs

### **2.1.3 Getting hold of the frugal innovation concept**

It is thus, the Economist (2010) for the first time introduced the term frugal innovations putting as a new innovation phenomenon which is more to frugal engineering of simply cutting costs. Within mind, that frugal innovation is not just about redesigning products; it involves rethinking entire production processes and business models while products need to be good enough and easy to use. So far, this research argues that frugal innovation is not as narrow as to product innovations, but instead moves towards the more integrative way by looking at the innovation of process, product (goods & Service) and business model.

Besides unfolding the facts related to frugal innovation, some authors have defined frugal innovation itself with a focus on one aspect of frugal innovation. For example, Bhatti (2012) and Zeschky et al., (2014) defined it as cost-saving or resource scarcity innovation. Even as, defined frugal innovation is a new or considerably improved product, processes, or business model that seek to use less for more value with the intention of cost minimization (Tiwari et al., 2014). Nevertheless, Tiwari & Herstatt (2012) stated that list cost leads to an affordable price which is a necessary but not sufficient for the success of frugal innovation. Agarwal & Brem (2012) define frugal innovation is redesigning & developing both products and processes at list cost to address the local market needs. According to them, frugal products developed out of the scarcity are cheaper and much simpler with some degree of features. Indeed, most of the time, frugal innovations are driven by scarcity of capital, resources, knowledge, and else, but some say frugal innovations are friendly/ simple – either it is not being owned basic functionalities or using only effortless technology. Save-for this, development of highly advanced functionality products out of basic and cheaper materials have been resulted from frugal innovation. Example, M-Pesa is a

mobile financial service which uses mobile phone technology to innovatively overcome the barriers of banking access, screening that the limited functionality of frugal products is not always the case and are often very superior (Zeschky et al., 2014). Thus, M-Pesa as a frugal innovation is not good-enough only. In its place, it has offered a distractive way to existing processes, goods /services, and systems. Thus, existing definitions of frugal innovation have been focused on its single characteristics either on minimum cost, ease of use, functionality, wisely use or reuse of resources on hand (Bhatti, 2012). Yet it need to consider broader definitions since the phenomenon of frugal innovation couldn't fully described by a single characteristic.

Here in linking to the center of this study, so far, the most systematic definition of frugal innovation has been done by Bhatti (2012) and Hossain (2016). For Bhatti (2012) frugal innovation is re-innovating business models, value chains and products to use resources innovatively and serving the poor majority by providing inclusive innovation results affordably and often in a scalable & consistent way. Whereas for Hossain (2016), frugal innovation is a resource-scarce solution (either it can be product, service, process, or business model innovation) that is designed and implemented in spite of financial, technological, material or other resource constraints, whereby the final outcome is good enough to meet the basic needs of neglected customers (Hossain, 2016). Therefore, frugal innovations are good enough, affordable, easy to use products, and adjusted to the particular resource constrained customers (Zeschky et al., 2011). Frugal innovations are "cheap, robust in harsh environments, easy to use and repair, and made of used and local materials"(Douglas, 2013). Before defining the term it is perhaps important to understand the characteristics and attributes of frugal innovations and technologies arising from the references just discussed (for example, Bhatti (2012); Hossain (2016); Zeschky et al.,( 2011) and Douglas (2013)). Some of the attributes include

1. *Functional* is to mean– reducing complexity by due care on core functions
2. *Robust* - good enough quality
3. *User-friendly* – simplicity or manageable features of the product
4. *Growing* – Scalable performance on the durability and accuracy
5. *Affordable* – Substantial Cost Reduction to save the material and financial resources
6. *Local* – use of endogenous knowledge's / local elements to create a frugal ecosystem

Thus, all in one so gives us **FRUGAL**. *Summing up altogether, the working definition of frugal innovation proposed here is: the innovation of Robust, User-friendly/simpler, and Localized solutions that are Functional and Affordable with a Growing/scalable performance given the resources on hand creates the base of frugal innovation.* Hence, without going into the semantics of what characteristics and attributes are formed; the attributes listed above deduce with confidence that frugal innovations are about the three central elements i.e., concentration on core functionalities and performance, substantial cost reduction (Rossetto, Borini, Carlos Bernardes, & Frankwick, 2017) and create localization (Douglas, 2013).

1. **Concentration on Core Functionalities and performance:** - Frugal innovations concentrate on functionality. Functionality refers to the essential functions and reduced complexity. Thus in frugal innovations, entrepreneurs are emphasizing on core functions of a product with the highest benefits to the customers. It involves stripping down a product to its barest essentials. In the process of stripping down a product to its essentials, there is a save on material and financial resources (Rossetto et al., 2017). The product becomes at the same time very user-friendly or easy to use. The moral here is to concentrate on core functionalities. In most of sub-Saharan Africa, the majority of people do not require sophisticated products (Zeschky et al., 2011). Regarding cell phones, for example, the majority only uses it for text messages, calls and maybe the calculator (Zeschky et al., 2011). But most cell phones have more than these functions. **Optimized Performance:** This refers to the levels of performance and quality required. This means that even when costs are reduced substantially and the product covers the necessary functionalities, quality and level of performance should not be compromised. Quality and level of performance refers to speed, power, durability, and accuracy (Rossetto et al., 2017). These business characteristics must be retained.
2. **Substantial Cost Reduction:** This implies that frugal innovations are characterized by lower costs and subsequently less pricey than competitive offerings (if available) and which meets the needs of those customers who otherwise remain un-served ( Simula et al., 2015). Thus, the lower cost must also be from the perspective of the customer. Thus cost reduction from the producer's perspective alone is insufficient for classifying innovation as frugal if it is not passed on to the customers (Rossetto et al., 2017).
3. **Create localization;** - According to Douglas (2013), besides to the above elements, frugal innovations are made of used and local materials or built based on the entrepreneur's effort in their

partnerships to create frugal ecosystem, bring efficient and effective solutions to local customers' with its use of endogenous knowledge / local elements.

Hence, in connection to all this definition proposes broader characteristics in defining frugal innovation rather than Deeping in a single element such as creating low-cost items.

#### **2.1.4 Overlapping Innovation Concepts**

Studies imply that usage of the term frugal innovation is new, however, the concept is not so with the phenomenon. Thus far, frugal innovation concept is not new by its footing, *yet overlaps with various other concepts*, and several studies have defined various concepts that overlap with the frugal innovation concept (Hossain, 2018). Up on which, some of the concepts are specific to certain countries and some are implanted in developing countries. Off which, the Gandhian and Jugaad innovation, Jiejian Chuangxin, Gambiarra and Jeitinho, and Kanju and Jua Kali are the country-specific innovation concepts centered in India, China, Brazil, and in Africa respectively (Nair et al., 2015; Prabhu and Jain, 2015). Whereas, the indigenous, resource-constrained, value, cost, BoP, good-enough, and inclusive innovations are some of which embedded in developing countries (Rosca et al., 2017). While, the related Frugal Innovation concepts such as disruptive, grassroots, blowback, reverse, and trickle-up innovations are existed in between developing and developed countries as a linkage (Hossain et al., 2016; Rosca et al., 2017). The blowback innovation, reverse innovation, and trickle-up innovation concepts underline the surge of developing countries innovation to developed ones. Thus far, BoP innovation is among the various overlapping concepts which is close to frugal innovation, however, it targets the poor customers with daily earning of not more than \$ 4.00 (Hart and Christensen, 2002). On the contrary, frugal innovation targets both the low and emerging middle-income customers of developing countries (Hossain et al., 2016). Indeed, Frugal Innovation is broader than that of BoP innovation. A similar concept, frugal engineering was also used by the CEO of Nissan-Renault, Carlos Ghosn in 2006 aimed at maximizing value for the customers while minimizing non-essential cost. Thus, frugal innovation is sometimes called as a broader description of the phenomenon being it shares most characteristics of the other overlapping concepts (Hossain, 2018). The next section addresses theoretical motives to the phenomenon of frugal innovations and identifies the determinants of frugal innovations at the subsistence level.

## 2.2 Theoretical Background

According to Soni, & Krishnan (2014), it is this challenge that there are insufficient explanations of the conditions which help the demand for frugal innovations in the earlier literature of frugal innovation. Thus, looking at various theoretical foundations that best fit for the basing of frugal innovations helps to understand the phenomenon and offer its predictability while conceptualizing on how frugal innovations can be influenced for the subsistence-level entrepreneurs/grassroots innovators. Studies show that the theoretical discussions in the frugal innovation literature is in its infancy stage and also sparse with different theories are cited in different literature discussed without any precise examination yet stated as broad statements. Researchers have proposed a number of theoretical foundations that may provide assistance in analyzing strategic and innovation management at both structures and firm stage in the emerging economies context. Among which the theories of resource dependency, diffusion, disruptive innovation, institutional, network, organizational, international product life cycle, and transaction are main theories employed in the frugal innovation literature with some studies see it through the eye of sustainability and open innovation (Hossain, 2018). In configuring the driving forces that lead to the failure of infrastructural, capabilities, and institutional innovation gurus, some studies proposed as the discussion must fall under the theories of new institutional economics, and the resource-based view of the firm. Whereas, George et al. (2012) proposed the theories of resource dependency, social and organizational networks, governance and agency, transaction cost and organizational economics, competition and strategy, stakeholder engagement and property rights, and adoption of innovation as founding theories in exploring the phenomenon of inclusive innovation. However, the discussion of these theories in the literature is very limited since any of the quantitative analysis of these cited theories is not useful being the studies are mostly fall in the business and management category with an overlap on the Multinational Company and Macro – level of industries (Hossain, 2018). And this made many of the theories are unsuitable for explaining frugal innovation at Micro-level given their current forms (Hossain, 2018). Thus, using a more frugal approach in taking the theoretical views for this purpose, this research minimized the theories to the following Two: {i.e. the resource dependency theory (including capabilities) and the institutional theory (counting social and organizational networks)}. Here, is how and what the researcher thinks that these theoretical

views provide with insights for explaining the phenomenon of frugal innovations and later on to be used in analyzing the results of the study.

### **2.2.1 The Resource Dependency Theory**

This theory as consistent with the resource-based view of firms states that a firm's aggressive benefit stands out of ownership and utilization of characteristic resources and capabilities (Barney, 1991). Thus, the major principle of resource dependency theory is a limited resource, where large-Medium – Small and Macro to Micro firms compete for common sets of scarce resources (Hessels and Terjesen, 2010). So to gain aggressive benefit, a firm has to either have been gifted of resources and capabilities or be able to collect these from the environment (Sirmon et al., 2007). Thus, according to this theory, firms are dependent upon other actors in the immediate "work environment" to obtain resources, such as customers and suppliers (Pfeffer and Salancik 1978). As stated earlier, emerging economies of subsistence entrepreneurs typically operate in micro and small-sized enterprises, which characterized by environments that lack resources and scarce in nature. Given that, one of the most important capabilities for competitive advantage is to come up with predictable and sustainable innovations (Teece, 2007). Yet, matters on what types of innovation to adopt by a firm which situated in resource-scarce environments. This study proposes a frugal approach to innovation for such resource-scarce environment especially in the micro level that individuals will act to reduce or increase its level of dependence on the environmental actors, through actions such as networking or social engagement (Hossain, 2018). Hence, resource dependency theory can also be applied to consider a firm's need to obtain resources required for using and selling out of frugal innovations (Hossain, 2018). This is the fact that individuals become entrepreneurs to challenge and take opportunities, and in turn, configure existing capabilities or create newer ones when faced with constraints (Teece, 2007). So this approach could call for "frugal mindset", which results in the creation of new routines Teece, 2007). Such a frugal mindset approach when situated in a resource-scarce environment, its end result might not be a world-class solution, but good enough for addressing a problem and this is often referred to as bricolage or jugaad (Krishnan, 2010). From an entrepreneurial perspective, in this approach the innovator or entrepreneur manages the contingencies with the available resources on hand with no aim to predict the future is called as effectuation (Sarasvathy, 2001). Besides, in a firm that "lacks idiosyncratic resources or has resource-parity" with the competition, the manager mobilizes scarce resources and

develops new innovative ways to yield distinctive possibilities. And this makes the role of entrepreneurial capability vital (Sirmon et al., 2007).

Surfacing on resource dependency theory, the researcher expects that subsistence's entrepreneurs are dependent upon the immediate environmental actors to obtain resources needed for innovation and may benefit when enabling business environments are existed with valued resources. It is believed unlike to the large multinationals, micro level firms have limited firm resources particularly; they may be reliant on the resources perceived to be available in the immediate business environment. So far, how firms based in national markets enjoy certain competitive advantages according to Porter (1998) is due to the presence of (customers and suppliers) and convinced factors (capital, knowledge, technology, resources availability and transferability with the quality of government regulation for business operations). Accordingly, the researcher believes that the condition of environmental actors can determine the subsistence's entrepreneurs abilities to use and sell out frugal innovations. For example, according to Sirmon et al., (2007) subsistence entrepreneurs' often depend on their immediate environments for obtaining the finance, advice, business ideas, technology and other resources needed for starting their businesses, and the subsistence entrepreneurs' will be benefited when these resources are perceived to be diversely available for pursuing their new innovation outcomes. To this end, as per to Pfeffer and Salancik (1978), resource dependency theory centers on a firm's value to access resources from other actors in the environment and describes how resource scarcity derive firms/capacity to pursue new innovations as a source of alternatives..

### **2.2.2 Institutional Theory**

According to Scott (2005), Institutional theory is about the description of the considerably acceptable and legitimate practices within its organizational field and how an organization adopts it at all. Thus, this theory like the resource dependency theory describes how firms face operating pressures and “*may depend on or be impacted by*” other actors in the surroundings. However, resource dependency theory is differed by that the explanation offered as to why firms may be impacted by being dependent on other actors is related to need for resources, while institutional theory argues that firms are disposed to imitate the behavioral norms of other actors in the business field (Scott, 2005).

Thus, in reference to institutional theory, institutions operate within a social framework of norms, principles, and assumptions of which acceptable behaviors (Oliver, 1997). It is Scott (2005), who cleared institutions as social structures that conquered a greater degree of flexibility that is composed of cultural values, norms, and regulative elements with the associated activities and resources which can give an embedded social Safety Net. Thus, institutions can be defined as the humanly resulting constraints that structure how humans interact. According to North (1990) institutional constraints can be formal such as formal rules, laws, and constitutions, or informal like norms of behavior, conventions, and codes of conduct. *The institutional theory put forward that individuals and firms get embedded into an institution because the building blocks are [considered suitable, sufficient, balanced, and essential] while modeling their internal structures can enable firms to avoid the cost of illegitimacy and/or mitigate the Institutional Void (Bhatti and Ventresca, 2013).* Following the definition of North (1990), institutional voids are stated as the shortage of institutional conveniences, norm, and desirable regulations for a well-growing economy. Among which the absence of agency contracting, financial credit availability, legal protection for property rights, being there poor enforcement of commercial laws, Non-transparent judicial & lawsuit systems, weak enabling markets, and the inefficient market peacekeeping troops are examples of institutional voids (Bhatti and Ventresca, 2013).

The greater for the formal institutions, but the informal institutions could also have an impact on the nature of innovations practiced by individuals and firms. As subsistence-level frugal innovations are embedded in ‘tight social ties’ and for this reason, their behavior is formed mainly by the communal norms (Coleman, 1988). Thus, it is the strong social consent if to break-away as such an approach does not radically disturb the social equilibrium and invite sanctions from the dominant value systems (Coleman, 1988). As an example to this, the Indians culture is distinguished by collectivism, and a high tolerance for ambiguity while due attention is given to incline towards improvisation, which is opposite to a systematic approach to problem-solving as a result of poor solidarity ( Krishnan, 2010). And hence collectivist culture offers greater resistance to a radically new idea, while tolerance for ambiguity indicates people’s comfort with a good-enough solution but is more permissible to an improvisational approach and instead of a world-class solution respectively. Further, the terracotta-based refrigerator is the example of applying a frugal mindset to solving a personal problem. that's why, at the subsistence-level, social norms support a frugal

mindset establishment for solving personal problems, yet its diffusion is not on a business level that can enable disturb the social equilibrium or can enable them to use and sell out in the market.

One more important dimension of the institutions is the position of an individual or a firm in a social network (Bhatti and Ventresca, 2013). In regarding to Coleman(1988) social networks have three key economic outcomes :-“*{i.e. 1) affect the flow and quality of information 2) form an important source of rewards and punishments by formation of norms, and 3) create trust in the face of impending opportunism through obligations and expectations}*”. At the same time Coleman (1988) focuses upon the importance of robust ties, and the resulting social capital, it has also argued that sparse networks assist innovation by being wealthy in new statistics and ideas (Granovetter, 2005). While it comes to frugal innovations, the area of an innovator inside the social fabric performs a completely important function.

So far, access to networks that offer “non-redundant information and resources” would enable subsistence-level entrepreneurs to use and sell out frugal innovations rather work on a frugal mindset being embedded in strong social ties (Bhatti and Ventresca, 2013). This is one reason that the diffusion of frugal innovations by such innovators is able to gather be unsuccessful to scale up or give way better results. Yet, subsistence entrepreneurs could transform the frugal mindset even gather new frugal approach into commercialization of such results, if they are able to soak up new & updated information, and is able to utilize ideas and other resources from different parties (Bhatti and Ventresca, 2013). As an example, the idea of the terracotta-primarily based refrigerator-Mitticool was conceived to solve personal problems during the Nineteen Eighties, however, best in recent years; the product noticed a real demand in the marketplace (Vijay, 2012). This was in many ways due to the fact the innovator did no longer have to get admission to convert a frugal mindset into viable final results. Institutional help, which includes the countrywide Innovation foundation and Honey Bee Networks, act as catalysts for changing frugal mindsets into frugal process and effects that are impactful and scalable. According to Vijay (2012), in absence of such means, the position of the innovator in the community is critical in getting the character get admission to more recent ideas and sources.

Not only this but also frugal innovation requires linking with and gaining acceptance from the immediate business actors: - the organizations and individuals with significant influence on frugal

innovations market. Example, government bodies frequently have a vested interest in improving existence for good –enough and affordable innovations (Cholez et al., 2012), Non-Governmental corporations (NGOs) can offer know-how, sources and legitimacy to grassroots innovators (Webb et al., 2010) and regulators may additionally even significantly influence innovation diffusion (Ansari and Krop, 2012). Connecting with fashionable stakeholders, along with local communities and their influential, may in addition increase innovation reputation (Angeli and Jaiswal, 2016). Therefore, having a network with various stakeholders are vital, over and above creating sharing abilities, to provide get admission to diffuse frugal innovations to BOP markets (Hossain, 2018).

### **2.3 Determinants of frugal innovations in emerging markets**

As it has stated earlier, in the theoretical and introduction parts it has some sort of inputs to the frugal innovation determining factors, such as the firm's internal capabilities, environmental actors, institutional voids and the local community base. This is also in line with the standard reference to Schumpeter was perhaps less worried about the real determinants of innovation directly, yet more concerned with the consequence of rivalry on innovation and in turn on long-run economic growth (Cohen, 2010). *Thus, the success and/or impeding factors to the frugal innovation process are considered in this thesis as the determinants of frugal innovation.* Although developing countries being resource-constrained environments have provided a fruitful position for frugal innovations to grow (Zeschky et al., 2011), predicting success for frugal innovations is difficult and more challenging (Manceau and Morand, 2014). So the concerned actors need to be aware of frugal innovations and know-how they can manipulate the rules and regulations in resource-constrained and unpredictable environments. Jha and Krishnan (2013) therefore argue that Research & Development centers need to move to build up in their efforts friendly business environment rather than simply working on existing technical capabilities. Consequently, a local frugal innovation can diffuse to countrywide and so a considerable change in mindset and capability is necessary for many cases (Hossain et al., 2016). Since, Frugal Innovations are encouraged to resolve local challenges, the industrial and local market knowledge transfer is also essential for frugal innovation approach (Altmann and Engberg 2016).

According to Altmann and Engberg (2016), the success of frugal innovation is highly linked to the institutional regulation to decline unfortunate projects and hunt for new shows potential approaches. Thus far, the speedy and winning use of external partners is essential (Horn and Brem, 2013).

Enabling business environment is supportive to turn innovative ideas into successful marketable products yet it is generally perceived as very poor in the case for developing countries (Sood and Szyf, 2011). Being reinforcing the role of universities for society (Manceau and Morand, 2014), and committing to endogenous knowledge (Rosca et al., 2017), as well as constructing relations with governments and other public & private bodies (Hossain et al., 2016) is vital for frugal innovators to develop and meet the Bop customers need. The Non-Government Organizations, social and other private enterprises, serve Bop customers under financial, technical, and knowledge challenges (Hossain, 2016). Furthermore, evidence shows that frugal innovations are industrialized under a range of constraints, so various impeding factors are coupled with these innovations. Frugal innovations largely come out in an environment with institutional voids and full of unjusts (Zeschky et al. 2014). Therefore, in the place of such market failure and with no support, diffusion is also a key challenge for frugal innovations (Hossain, 2016). Besides, Hang et al., (2015) stated an alternative diffusion theory to Rogers' (2010), that owns some different elements in its communication channels, the innovation itself, time and the social context is required to understand frugal innovation. This is so far, called the Rogers' (2010) diffusion theory, and is about innovations flow from the privileged class to the masses as resulted with the decrease in the cost of production and in the end becoming affordable for BOP customers. Whereas frugal innovation takes the reverse corridor, from the masses to the privileged in diffusion (Hossain et al., 2016). At this time, winning frugal innovations which need an insightful understanding of underserved consumers is more challenging especially for developing countries (Hossain, 2016).. This is because of deficiencies in a resource, finance, infrastructure and its accessibility (Ahuja and Chan, 2014). Hence, the presence of inadequate education, infrastructure, and uneven allocation systems drastically hamper the diffusion of frugal innovations (Kahle et al., 2013). Therefore, Rogers' diffusion theory is not suitable to apply in the developing countries, and as such, some researchers have criticized its applicability (Hossain et al., 2016).

### **2.3.1 Empirical studies and their relationships**

It is this challenge that, there is little distinction between the entrepreneurial and innovative success factors in which seen listed in most literature and little is tested empirically regarding frugal innovations success factors. So far, in order to investigate this properly, in this study the factors that could influence the entrepreneurial success can also interchangeably affect the success of the frugal

innovation. This is being the entrepreneurship is believed as prosecutor/central trait of innovation while operating innovatively can be the only means to achieve entrepreneurial success (Carland et al., 1984). For instance, Bradley et al., (2012) look at the social, business, and individual backgrounds, and their effects, on both innovation and firm performance of micro-credits of the developing country. In line to the business, and individual backgrounds, they found knowledge level and expertise of the entrepreneur as well as family business experience is positive indicators of innovation and performance. Yet, the family business background was unlikely related to the novelty based innovations rather differentiation-related innovations. Not only was this opportunity based entrepreneurship also measured as they have the intention of business growth and opportunity exploitation than that of the necessity-driven entrepreneurship. In regard to social capital, diverse networks are positively integrated into the performance serving as a source of business growth. They also found that weak ties (depend on buyers and suppliers information) had a more significant effect on novel innovations, unlike strong ties (includes family and close friends) which show a negative relationship with innovation. This is in line with the social network theory that family and close friends have a higher emotional intensity and greater intimacy to create strong ties result in redundant information flows. Whereas, the limited interpersonal connection for information acquaintance with buyers and suppliers and other partners are weak ties characterized least density networks and could serve as novel sources of information that might not be easily accessible to the entrepreneur (Bradley et al., 2012).

Generally some researchers categorized determinants of entrepreneurs' success into three major categories though multi-factors are accounted for it: (a) the founder characteristics [i.e. psychological elements and personality traits of the entrepreneurs], (b) the firm characteristics [including the managerial skills and training of the entrepreneurs] and (c) the market conditions or external environment in which the enterprise operate [ i.e. the cooperation, network & support by/with stakeholders] (Khattab et al., 2017). Alam (2011), in his study of relating the personality factors and firm innovation capability in Malaysia, had found the personality traits of an entrepreneur such as the need for achievement, independent, opportunity alertness, confidence, innovativeness, risk-taking, and openness to experience had significant impact on the firm innovation capability. Wan et al., (2005), summarized the determinants that lead to innovation success using data from 71 companies in Singapore. The results indicate that the significant and positive impact of the presence of organizational resources, decentralized structure, believe that

innovation is important, willingness to exchange ideas as well as the willingness to take risks on firm's innovation. Others found the importance of combining different founder and firm characteristics such as university education, entrepreneurial & technical as well as commercial training, prior experience, and level of motivation to realize own innovative ideas increases the innovativeness of firms (Spyros and Tobias, 2012). The third determinants are environmental factors which include government support, availability and access to finance and the support of family and friends (Khattab et al., 2017). Besides, Hossain (2017) explores the role of open innovation in three frugal innovation cases from India and find that small firms that develop frugal innovations at the grassroots level as such require extensive engagement in networking, collaboration with different partners, and third-party assistance. He also argued as frugal innovations need more support in the development stage than in the commercialization stage for inclusive development. Ashebre et al. (2013), studied the internal and external factors of innovation success determinant of electromechanical of SMEs, located in Mekelle using the here enlisted seven factors. However, the result shows the investment in research and development, the involvement of skilled employees, and collaboration with technology support centers was found to be more impact full on the innovativeness of the sampled firms. Whereas, the manager's skill, the age of the firm, and support from suppliers, customers, and competitor shows no effect while the contribution of the business size on the innovation practices of SMEs is found as a small negative impact.

On the other hand, some researchers chose to investigate failure determinants that hinder the development of innovation. Pachouri and Sharma (2016), found the unstable public policy [i.e. the hassle economic and political environment, compound taxation, and corruption] lack of funding, lack of skilled research and development (R&D) personnel and weak institutional linkages are key barriers which impede the innovation potential of SMEs in India. Additionally, Talegeta (2014) found that most of the challenges the Small and Medium Enterprises in Ethiopia, particularly Addis Ababa, face by, in his study of technological innovation barriers are lack of (government policy and regulation, technological and market information, skilled personnel, finance), inadequate research and development, high cost of innovation, organizational culture, and size of enterprise, have major impact except the absence of cooperation which results to statistically insignificant. Trusting on this review, the above theoretical and empirical studies provide the ground for this thesis, it materializes that there is a need to investigate subsistence's' entrepreneurship status quo in Ethiopia

and identify factors that determine the subsistence's entrepreneurships from using & selling out of frugal innovation particularly in Addis Ababa.

## **2.4 Conceptual Framework**

The conceptual framework for this study is drawn from the theoretical and empirical literature as well as situation analysis of the study area. In general terms, the theoretical and empirical literature discussed so far reveal that determinants of innovation success and/or entrepreneurs' success are categorized into three major categories such as the founder characteristics, the firm characteristics and the market conditions or external environment. However, most of the empirical studies are conducted on the small and medium-sized firms, which in a sense differs from the nature of micro firm environments. The subsistence' entrepreneurship/micro firm environment is different from that of small and medium-sized firms, being it is characterized by the entrepreneur's dominance, lifestyle motivation, market proximity, embeddedness, simple structure, informal communication and decision making based on intuition (Kearney et al., 2013). Thus far, keeping the characteristics of the micro-firm environment and the presence of arguments that innovation is embedded in the contextual surroundings of its immediate environmental actors & local community (Kearney et al., 2013), this study categorizes the determining factors in to four major groups namely; *the 1) Business factor, Entrepreneurial Capability, Institutional environment & Actors, and Local community or Social Embeddedness.*

### **2.4.1 Business Factors/Characteristics**

As has been discussed in the previous parts, subsistence's entrepreneurship determinants have been analyzed from four angles: factors related to the business, factors related to the entrepreneur's capability, factors related to institutional environment & Actors and factors linked to Local Community/Social Embeddedness. Besides, the conceptual framework for this study has included the effect of frugal innovations on the entrepreneurial success of the subsistence's operators in separate model. Hence, this section discusses characteristics of the business such as, the firm size, and firm age.

### **2.4.1.1 Firm Size and Firm Age**

These are the two important factors of the enterprise. These are firm attributes which are mostly discussed dimensions of a business. A large body of literature on firm studies emphasizes testing if the firm age & firm size have a separate effect on the innovation outputs (for example, Ashebre et al. (2013)). Thus, size and age of the firm are investigated as a major business factors and both are expected to have an effect on the frugal innovations of the subsistence's operators.

## **2.4.2 Entrepreneurial Capability/Personal Competencies**

As has been discussed in the theoretical framework, entrepreneurial capability is a personal competency of the entrepreneurs. In this regard, entrepreneurial capability can be explained as a distinct set of individual capabilities and skills as well as core personalities that could enable them to explore and exploit untapped business opportunities in which it *consists the motives, Skill /Knowledge's and the personal traits*. This could raise the issue of if entrepreneurs start their businesses by first getting equipped with the necessary knowledge and skill needed to do the task.

### **2.4.2.1 Motive for present activity (Opportunity Driven Motivation)**

Inline to the individual backgrounds, other than the knowledge level and expertise of the entrepreneur they found opportunity based entrepreneurship was also measured as they have the intention of business growth and opportunity exploitation than that of the necessity-driven entrepreneurship so taken as one of the factors determining frugality.

### **2.4.2.2 Competency (Entrepreneurial Education/Training and Experience)**

As has been explained above, entrepreneurial education/trainings and experience are an important input for entrepreneurs in that it not only familiarizes entrepreneurs with process and organizational functions it also helps entrepreneurs to establish networks with suppliers and buyers (Garoma, 2012).

### **2.4.2.3 Personality traits**

In reference to the theoretical framework, personality traits are more psychological factors of the entrepreneur which need to be assessed and included in the function of subsistence's

entrepreneurship entrepreneurial success factors. Although, psychological factors are generally ignored in the small enterprise success studies for developing countries (Nichter and Goldmark, 2009), these factors could make a difference on subsistence's entrepreneurs success. Hence, this study considers the importance of these factors for success of frugal innovation results. Yet, out of all emphasis here is given to need for achievement, locus of control, risk taking propensity and self-efficacy.

***Need for achievement (NA):*** The role of need for achievement on the entrepreneurial success (as has noted by Garoma, 2012), is advocated through its effect on determination for growth, which drives efforts and energy of the entrepreneur towards the business ultimately leading to success. Besides, this is believed to measure the level of needs mastery, work orientation and interpersonal competitiveness of the entrepreneurs (Garoma, 2012).

***Risk-taking propensity (RTP):*** According to Bigsten et al., (2003), the importance of risk taking is much more a critical factor in Africa because there are many business uncertainties resulting from institutional and structural problems. Risk taking is an investment on assets which leads to entrepreneurial success (Casser, 2007). Therefore risk taking could make a big difference between subsistence's entrepreneurs in less developed countries like Ethiopia.

***Locus of control (ILC):*** A view that business outcomes are a function of external factors would lead to failure (Shane, 2003). According him, individuals with internal locus of control perceive that their business outcomes solely rely on their own efforts and talents. Hence, creativity in this case depends on how one perceives of the impact of own effort on business outcomes.

***Self-efficacy (SE):*** Self-efficacy is a robust predictor of an individual's performance for a specific task (Shane, 2003). It measures "task specific self-confidence, reflects the mastery of operators over their businesses". Bandura, (1997) noted that the ability of entrepreneurs to pull resources, skill and their competence to achieve their goal is reflected through self-efficacy.

### **2.4.3 Institutional Environment and Actors**

The previous parts of the study focuses on internal determinants of subsistence's entrepreneurs from using and selling out of frugal innovations. Whereas, this and the succeeding part analyzes determinants from the external institutional and social environments. In this case emphasis is given

to institutional voids and the environmental actors while social ties/local community value is stated subsequently. The institutional environment and actor factors considered for the purpose of this study are the institutional voids and environmental actors assuming these are the most relevant institutional issues for grass root innovators in the context of Ethiopia.

#### **2.4.3.1 Institutional voids**

According, to North (1990), institutional voids are stated as the shortage of institutional conveniences, norm, and desirable regulations for a well-growing economy. Among which the, Heavy government tax, Lack of up to date business information, Lack of infrastructure, Lack of property rights, Corruption and weak institutional linkages are the most discussed parts in in the theoretical frameworks and hence used as source of the determinant factors.

#### **2.4.3.2 Environmental Actors**

Actors are business enablers that provide support services used by entrepreneurs to help them establish & grow their businesses with aim of contributing to economic growth and poverty alleviation. Driving on resource dependency theory, the researcher expects that subsistence's entrepreneurs are dependent upon their immediate environmental actors to obtain resources needed for innovation and may benefit when enabling business environments are existed with valued resources. Among all, the Local and National Governments, Government Organizations and Non-government institutions are considered as main Actors that could have support for subsistence's entrepreneurs in this study. For example, government bodies frequently have a vested interest in improving existence for good –enough and affordable innovations (Cholez et al., 2012), Non-Governmental corporations (NGOs) can offer know-how, sources and legitimacy to grassroots innovators (Webb et al., 2010) and regulators may additionally even significantly influence innovation diffusion (Ansari and Krop, 2012).

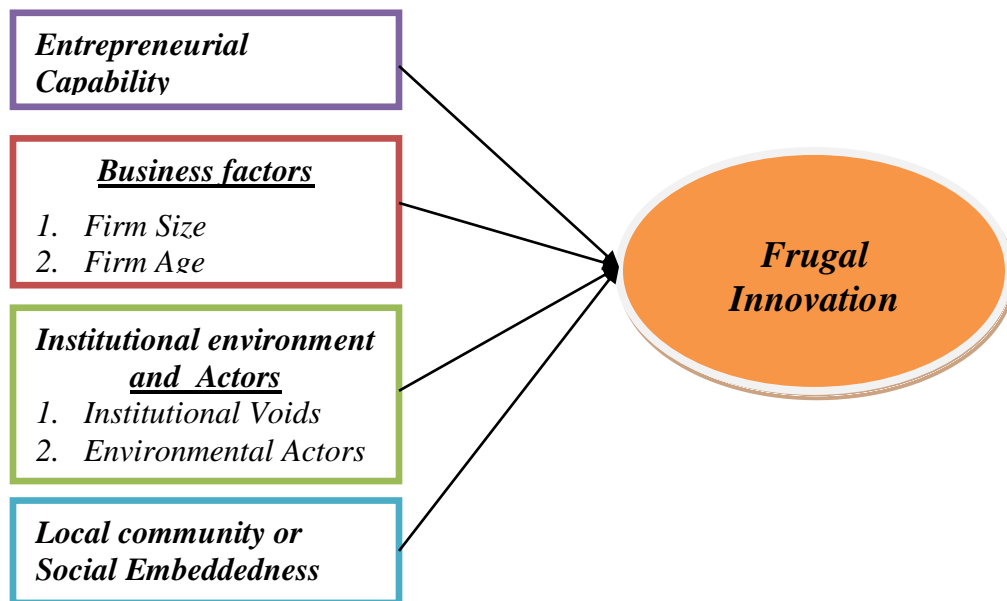
#### **2.4.4 Local community or Social Embeddedness**

As it has elaborated in the theoretical framework, the local community is the social networks which provide entrepreneurs with resources serving either as an information/adevice. Thus, according to Granovetter (1973), the social network approach is viewed as being embedded in social context.

Hence, the important dimension of the institutions is the position of an individual or a firm in a social network (Bhatti and Ventresca, 2013), which is the focus of this factor.

#### 2.4.4.1 Social ties

In regard to social capital, diverse networks are positively integrated into the performance serving as a source of business growth. They also found that weak ties (depend on local entrepreneurs, buyers and suppliers information) had a more significant effect on innovations, unlike strong ties (includes family and close friends) which show a negative relationship with innovation. This is in line with the social network theory that, the limited interpersonal connection for information acquaintance with buyers and suppliers and other partners are weak ties characterized least density networks and could serve as novel sources of information that might not be easily accessible to the entrepreneur (Steven et al., 2012). When it comes to frugal innovations, the area of an innovator inside the social fabric performs a completely important function. Thus, the focus of this section is the value of the weak social ties, such as the information fabricated from Customers, Suppliers, Other Business partners and local entrepreneurs. Hence, based on the above literature perspectives, an integrated conceptual model is developed below to support the study.



**Figure 1: Detrminants of frugal innovation success of subsistance’s entrepreneurships**

( Source, Emperical and theorethical Review results)

Besides, this study considers the influence of frugal innovations on the entrepreneurial performances success of the subsistence's entrepreneurs as a one-dimensional separate concept. The *innovation of Robust, User-friendly/simpler, and Localized solutions that are Functional and Affordable with a Growing/scalable performance in spite of the scares-resources on hand could create the base of frugal innovation*. In reference to Rossetto et al., 2017, the central issues that are believed to measure the frugal innovation characteristics are the following Two with addition the third element/s from (Douglas, 2013). On the other hand, the influence of each of these elements on the entrepreneurial performances success of the operators is seen separately.

#### **2.4.5 Concentration on Core Functionalities and performance (CCFP)**

In this regard, the derived items show the role of concentration on core functionalities and performance on the entrepreneurial process is advocated here through its effect on entrepreneurial performances to bring frugal innovations at the bottom of the primed. Accordingly, these items are believed to measure the level of entrepreneurial focus on the core functionality of the product/service rather than additional functionality (Functionality), ease of use of the product/service (User-friendly) and on the durability of the product / service (does not spoil easy/robustness).

#### **2.4.6 Substantial Cost Reduction (SCR)**

This brings also together the items that seek to measure the effort to reduce the use of material, financial & other resources so will give low ownership costs to transfer to the final consumer (Affordability). This is because frugal innovation is the application of solutions that offer "good and cheap" products/services or the systematic and significant cost reduction in the operational process so will result to the significant reduction of the final price of the product/service.

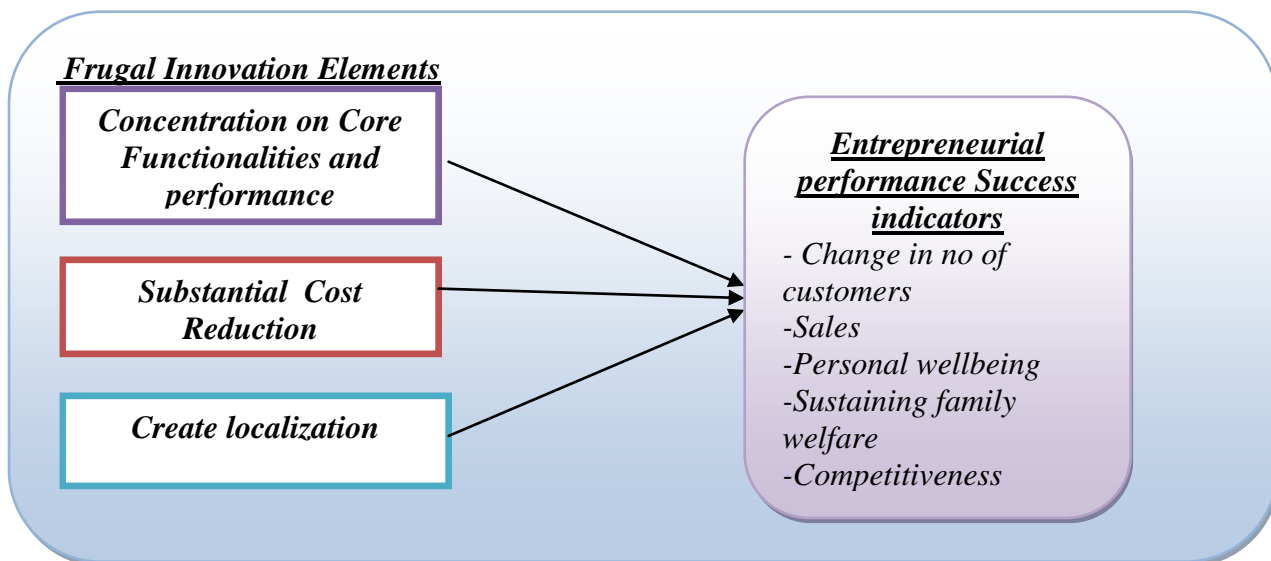
#### **2.4.7 Create localization (CL)**

As described in the theoretical framework, frugal innovation is unlike to reverses innovation otherwise, it brings the entrepreneurial efforts which are based on and designed for local ecosystem. Hence, this part measures result of the entrepreneurs effort invested in creating frugal innovation cooperation's/ecosystem. Therefore, this dimension brings together the items that seek to measure the entrepreneur's effort in their partnerships with local companies during their operational process,

efficient and effective solutions to customers' social/environmental needs while using endogenous knowledge / local elements to create a frugal system.

#### 2.4.8 Entrepreneurial Performance (EP) Success

As has stated by many studies the concept of enterprise success has been widely studied and the most adopted success indicator is that of organizational performance were largely looking at economic and financial ratios such as return on investment, profitability, sales and employment (Venkatraman and Ramanujam, 1986). Yet, non-economic aspects that particularly focus on the personal perceptions of the entrepreneur could be of best indicators particularly, for subsistence's entrepreneurships success (Venkatraman and Ramanujam, 1986). This is because, subsistence's or micro entrepreneurships lack and do not follow appropriate recording of financial data's that could bring comparable results across all (Jennings and Brush, 2013). In this regard, researcher believes subjective / non-financial goal measurements could indicate the success of the subsistence's entrepreneurships. Therefore, in this study the more emphasis was given to the perception of the entrepreneurs on how they rate the changes on their number of customers, sales, family welfare, personal well-being and level of competitiveness apart from a year ago. Thus far, the framework which supports to see if frugal innovation affects the performance of subsistence's entrepreneurships is depicted separately as follows.



**Figure 2: The influence of frugal innovation on entrepreneurial performance**

(Adopted from, Rossetto et al., 2017 and Douglas, 2013).

## **CHAPTER THREE**

### **3. Research Methodology**

This chapter is concerned with the research method used to accomplish the objectives of this study. It especially describes the methodological approaches employed to find the research values. Besides, it focuses on the demonstration of the research design and strategy which are then accompanied by the respective techniques.

#### **3.1 Research Design**

A research design is a general plan of how to address the unknown/the research question. Generally, research design can be of quantitative, qualitative and mixed-methods and hence the selection from either of these methods must be in line to the nature of the research (Moorhead and Griffin, 1990). As stated earlier, the nature of this research is attempting to describe and explain while providing additional information about the topic. Accordingly, to achieve these objectives an explanatory type of research design with a quantitative approach was employed in analyzing the collected data. The explanatory research deals with the explanations of observed behaviors in attempt to “connect the dots” in research, by identifying causal factors and outcomes of the target phenomenon (Moorhead and Griffin, 1990). So, this method is found to be appropriate because of its suitability for describing and analyzing existing situations in the selected study area.

#### **3.2 Research Strategy and Techniques**

In this regard the source and type of data to be used may concerned with that, the study had employee both primary and secondary data type and sources in order to produce a richer and more complete result. Moorhead and Griffin (1990) state that the primary sources of data provide a direct description of the study to the researcher who actually observes and witnesses the occurrence of events. Thus far, primary data is original information obtained through questionnaires and observations. While, secondary data involves the use of and further analysis of data collected for another purpose and found by means of desk research, thus secondary data is one that is already in existence and might have been collected for other purposes by other researchers (Haralambos and Holborn, 2004). So long, a survey method is used as main strategy of this research study. Hence, a

survey that consists of questions with Likert scale with 5 rating values had conducted with the selected subsistence's entrepreneurs.

### **3.3 Sample Design**

#### **3.3.1 Target population**

The full set of cases from which a sample is taken is called the population. Population is a collection of a specified group of human beings or non-human entities such as institutions or organizations, countries, states, industries, etc. that have one or more characteristics in common that are of interest to the investigator. The population for this study is drawn from the subsistence's entrepreneurs operating in micro-level enterprises located in Addis Ababa. So, subsistence entrepreneurships are microenterprises mostly run informal businesses. This is to mean economic activities that occur outside of formal institutional boundaries (i.e. Illegal) yet fall within informal institutional boundaries (i.e. Legitimate)" (Webb et al., 2014). Subsistence entrepreneurs typically operate in micro and small-sized enterprises, which tend to be undercapitalized, unstructured, poorly managed and informal. They often operate in an environment which is characterized by the absence of formal institutions and scarce resources (Vishwanathan et al., 2014). Hence, subsistence entrepreneurs are considered as those micro-entrepreneurs who are self-employed or up to 10 employees including (World Bank, 2007). Accordingly, microenterprises employed fewer than or equal to 10 employees are used at the heart of this study.

As expressed earlier, to include the full response of the situation, different sectors of microenterprises located on the commercial streets (bazaar exhibition), residential markets (shopping's) and the center for entrepreneurial training & incubations are the targets where the samples was taken (purposively sampled destination of the subsistances entrepreneurships in Addis Ababa). As a result, quantitative data are gathered from a sample of individuals who are the founders/owners.

Nevertheless, neither the Addis Ababa city administration micro & small enterprises development bureau nor the Federal micro & small enterprise development agency had an indicating record on the number of this ideal targeted population. Thus, to take a sample from this ideal population that is large, the Cochran (1963) equation yields a representative sample as follows. But, the paper in its

limitation may not also incorporate the responses of subsistence's entrepreneurs who are out of ease.

### 3.3.2 Sample size

In this regard, to decide on a suitable sample size is ambiguous, yet could be addressed using Cochran's Sample Size Formula. The Cochran formula allows the determination of an ideal sample size given a desired level of precision, desired confidence level, and the estimated proportion of the attribute present in the population. Suppose this is intended on doing a study on the inhabitants of a large town, and want to find the number of subsistances entrepreneurs, yet don't have much information on the subject to begin with. Thus, it applies a  $\pm 5$  percent **Level of Precision-** *sometimes called sampling error or range* in which the true value of the population is estimated to be selected at 95% **Confidence Level** that samples have the true population value within the range of precision with a 50% maximum degree of variability. This is because a proportion of 0.5 indicates the maximum variability in a population, it is often used in determining a more conservative sample size, and that is, the sample size may be larger than if the true variability of the

population attribute were used. Hence:

$$n_0 = \frac{Z^2 pq}{e^2}$$

Where: -  $n_0$  is the sample size

$Z$  is the abscissa of the normal curve that cuts off an area  $\alpha$  at the tails; is found in a Z table

$P$  is the estimated proportion of an attribute that is present in the population and  $q$  is  $1-p$ .

To this end,  $n_0 = ((1.96)^2 (0.5) (0.5)) / (0.05)^2 = 385$  entrepreneurs.

So a purposively sample of 385 substances entrepreneurs in the target population should be enough to give the needed confidence levels. As supporting to this a published table was also used. There were various published sample tables, which were developed by various authors and institutions. Though tables are expected to be different among various authors, the differences are insignificant and not ambiguous. For the purpose of this study, the Krejcie & Morgan (1970) sample size table was referred.

Table 1 - Sample Size Determination

Population Size	Required Sample Size			
	Confidence = 95%			
	Margin of Error			
	5.0%	3.5%	2.5%	1.0%
10	10	10	10	10
20	19	20	20	20
30	28	29	29	30
50	44	47	48	50
75	63	69	72	74
100	80	89	94	99
150	108	126	137	148
200	132	160	177	196
250	152	190	215	244
300	169	217	251	291
400	196	265	318	384
500	217	306	377	475
600	234	340	432	565
700	248	370	481	653
800	260	396	526	739
1,000	278	440	606	906
1,200	291	474	674	1067
1,500	306	515	759	1297
2,000	322	563	869	1655
2,500	333	597	952	1984
3,500	346	641	1068	2565
5,000	357	678	1176	3288
7,500	365	710	1275	4211
10,000	370	727	1332	4899
25,000	378	760	1448	6939
50,000	381	772	1491	8056
75,000	382	776	1506	8514
100,000	383	778	1513	8762
250,000	384	782	1527	9248
500,000	384	783	1532	9423
1,000,000	384	783	1534	9512
2,500,000	384	784	1536	9567
10,000,000	384	784	1536	9594
100,000,000	384	784	1537	9603
300,000,000	384	784	1537	9603

Source: Krejcie & Morgan (1970)

It could be confidently estimated that at least 100,000 subsistence's entrepreneurs were there in Addis Ababa from whole population. Similar to the Cochran formula the above table of Krejcie & Morgan gave 384 sample sizes greater than 100,000 populations. So, this could assure that taking a sample of 385 substances entrepreneurs for this study is adequate.

### 3.3.3 Sampling Method and Contingency for non-response

Sampling methods can be of probability or non-probability sampling techniques. For probability samples, the probability of selecting a sample from the total population is likely the same and known with which requires to make statistical inferences about the characteristics of the population unlike to the non-probability sampling. Thus, following to Magnani (1997, p.18), an allowance of 10 percent was kept in addition to the randomly selected sample of 385 substances entrepreneurs to compensate the non-response. This is because in this study non-response was expected due to

various reasons especially respondents may not be willing to fill questionnaires in fear of inadequate time to fill questionnaires due to their busy schedule. To this end, the study was used a purposive sampling method and distributed a total of 424 questionnaires, so the non-response problem had solved.

### **3.3.4 Questionnaire Distribution**

An effort was made to make the sample more representative. In doing so, the selected areas were used to choose the targets are believed to be gathered upon which the commercial streets (bazaar exhibition), residential markets (shopping's) and the center for entrepreneurial training & incubations are the most ones. Though studding across the border of the city could give a more precise result, it would be unmanageable in terms of connivance. Hence, the success and failure of geographical inclusion is seized by the researcher's convenience in relation to the respondents. But, the paper in its limitation does not incorporate the responses of subsistence's entrepreneurs who were out of ease.

### **3.4 Description of Variables and Measurement of constructs**

This section discusses the procedures employed in constructing the items used in the survey instruments. In this study, the items chosen for most of the constructs are taken from review of related literature. For example, the construct for each of the personality trite is adopted from Garoma (2012), who uses them in his study of the microenterprises success determinants. According to this approach, three sub-scales namely: motivation, competency and the personal traits are used to measure the construct entrepreneurial capability. These sub-scales are translated into multiple questions/items as attached in the appendix part. Likert-type question, employing five scales (5 for strongly agree and 1 for strongly disagree), was used to quantify and compute an index for the entrepreneurial capability construct. Since there were total of twelve items, a respondent may score a maximum of 60 (most favorable capability) and a minimum of 12 (with least favorable one) for the 'entrepreneurial capability factors. Thus, the average of the 12 item scores were used to measure the value of constructs (entrepreneurial capability). The same technique applies to all other constructs with a Likert-scale and seen in the regression models. And demographic questions were also similar to these studies while self-administered questionnaire was also designed in a fashion,

which was believed to address the research questions appropriately. See chapter 4 for the goodness of measures for each construct

### **3.4.1 Reliability and Validity of Instruments**

Reliability and validity are important concepts in research. Reliability is the degree to which the measure of a research instrument is consistent, while validity refers the quality in which the questionnaire enable the researcher to measure what intended to measure. Hence, in order to get validity on the instrument, pilot sample was undertaken consisted of 10 respondents located around the Ethiopian post office head quarter in order to know how suitable and clear the instrument is. Since, the population of the study comprises people from various levels of literacy; the questionnaire was converted in to local language which in Amharic version. So that it makes the findings are dependable and credible being clear for all. Moreover, my co-coworker was invited to comment on the appropriateness of the questionnaire besides to the respondents. Hence, necessary corrections were made on the questionnaire by incorporating the comments observed from respondents and friends. To this end, Chronbach Alpha was deployed to assess the scales reliability and stability. According to Sekaran (2005) a Chronbach Alpha with a value of less than 0.70 should be eliminated. Thus, this standard is used to produce a reliable scale and all exceeds 0.70 as shown in the below.

**Table 2; Reliability Statistics**

**Crombach’s alpha score for predictor and predicted variables of the 1<sup>st</sup> (Frugal Innovation) & 2<sup>nd</sup> (Entrepreneurial Performance Success) models**

1 <sup>st</sup> model				2 <sup>nd</sup> model			
No.	Variable	Alpha value	No of Items	No.	Variable	Alpha value	No of Items
1	Firm Size	Non	1	1	CCFP	0.839	3
2	Firm Age	Non	1	2	SCR	0.808	3
3	Entrepreneurial Capability	0.76	12	3	CL	0.872	3
4	Institutional Voids	0.754	6	Entrepreneurial Performance Success (EPS)		0.869	5
5	Environmental Actors	0.858	4	Where :-			
6	Social Embedddnes	0.804	3	CCFP- Concentration on Core Functionalities and performance			
Frugal Innovation		0.854	9	SCR - Substantial Cost Reduction			
				CL - Create localization			

Source: Own survey 2019

### 3.5 Data Analysis Methods

Data analysis involves reducing the collected data in to manageable size, by developing summaries, through the utilization of data analysis techniques. Thus, the study has used descriptive statistics such as frequencies, percentages and tabulations in order to analyze the collected data. Tables were extensively used in the descriptive analysis. Along with it, the study has also used an empirical analysis whereby econometric methods are employed. To understand the relationship between predictor variables and predicted variables, Correlation analysis was undertaken using Pearson’s correlation coefficient. Similarly, the cause and effect relation between the predictor and predicted variable was assessed using multiple linear regressions. This method has been used to strengthen the descriptive analysis part of the study. For all analysis the SPSS (SPSS version 20) software package was used to process the numeric value of the quantified data.

#### 3.5.1 Regression Model Specification

The study also emphasizes on the direct determinants of frugal innovations from the previously described four dimensions while looking the influence of frugal innovations on the entrepreneurial performances success in parallel. The general form of the models is:

Model One; -  $\mathbf{FI} = \alpha + \beta_1 \text{Business factors} + \beta_2 \text{Entrepreneurial Capability} + \beta_3 \text{Institutional Environment and Actors} + \beta_4 \text{Social Embeddness} + e$

Where: **FI** represents for frugal Innovations

**Business factor** includes firm attributes (firm size and firm age)

**Entrepreneurial Capability** deals with the individual dimensions such as motivation, competence and personality traits of the entrepreneur.

**Institutional Environment and Actors** represents the institutional voids and environmental Actors.

**Social Embeddness** also gives the value of social networks especially the weak ties. While, **e** is the stochastic error term .

However, not only sum of means of this linear relationship but also some variables with independent positive and negative signs analyzed in this study. The regression model applied here therefore took account of this linearity as well. As such, the model used in this study takes the following specific form:

$\mathbf{FI} = \alpha + \beta_1 \text{Firm Size} + \beta_2 \text{Firm Age} + \beta_3 \text{Entrepreneurial Capability} + \beta_4 \text{Institutional Voids} + \beta_5 \text{Environmental Actors} + \beta_6 \text{Social Embeddness} + e$

Where, the coefficients  $\beta_1$  to  $\beta_6$  represents estimated values of the firm size to social embedding's effect on frugal innovations.

## **CHAPTER FOUR**

### **4. DATA PRESENTATION AND ANALYSIS**

#### **4.1 Introduction**

This chapter analyzes the factors determining the subsistence's entrepreneurships from using and selling out of frugal innovations and the influence of the frugal innovations on the entrepreneurial performance success of the subsistence's entrepreneurships in Addis Ababa. Two separate conceptual frameworks that were used for the design and analysis of data have been explained in chapter 2.

Accordingly, the study analyzes frugal innovation determinants from four major angles: the business attributes, the entrepreneurial capabilities, institutional environments & Actors [Institutional Voids & Environmental Actors] and the local community/social embeddedness. The survey strived to capture business factors by determining the Age and Size of the firm. While asking questions related to individual motives, competences and personality traits such as the need for achievement, risk taking propensity, internal locus of control and self-efficacy were used to explain the entrepreneurial capability of the entrepreneurs. Multiple item questions were developed to measure these factors using a Likert-scale method. Institutional voids and the environmental Actors also appear in the questionnaire and included for analysis separately as a main factors of the institutional environment & Actors dimension. As a determinant of frugal innovations the value of social network has also been included in the questionnaire under the local community/social embeddedness factors. Besides the survey questionnaire includes also a single general know-how item devoted to know if the respondents had heard of about frugal innovation. Whereas, the influence of frugal innovations on the entrepreneurial performance success of the subsistence's entrepreneurships is analyzed using the three elements (CCFP, SCR & CL) of frugal innovation.

#### **4.2 Demographic and Socioeconomic Characteristics of Respondents**

This section discusses general characteristics related to age, sex, and education. Though, these personal background characteristics are expected to have a direct or in direct impact on grass root

innovators success, in this study they are used only to describe the population composition. The following section discusses these factors.

#### 4.2.1 Age and sex of respondents

Age and Gender of an entrepreneur are important factors that have something to do with entrepreneurial success through its effect on creativity, determination and willingness to test abilities (Welter, 2001). The data reveals that from the total sample, majority of the respondents (54.5%) were found to be male while, female's respondents account 45.5% of the total respondents. With regard to their age, productive respondents (aged from 18-29 years) took the majority (47.0%). Yet, about 83.4 % of the operators are aged less than 39 years. Thus far about 90.2% of the operators are in the productive age ranging from 18-less or equal to 50 years old. This was a good representation because productive entrepreneurs took majority of the population on the middle. A few (7.5%) of respondents found to be below 18 years old while 2.3% of the remaining are above 50 years which are assumed to be less productive according to the United Nations human development report criteria as seen in Table 3.

**Table 3: Respondent age, sex and Education Category**

Demography Factors	Category	Frequency	Percentile
Gender	Male	210	54.5%
	Female	175	45.5%
	Total	385	100.0%
Age	Below 18	29	7.5%
	18-29	181	47.0%
	30-39	111	28.8%
	40-49	55	14.3%
	50 & above	9	2.3%
	Total	385	100.0%
Educational Background	No formal Education	2	0.5%
	Primary Education (Grades 1-8)	58	15.1%
	Secondary Education (Grades 9-12)	150	39.0%
	Non-tertiary education (vocational/diploma)	128	33.2%
	Bachelor	46	11.9%
	Master & above	1	0.3%
	Total	385	100.0%

Source: Own survey result 2019

#### 4.2.2 Education of respondents

As stated by Garoma (2012), the effectiveness on making good business judgments, exposure to new technology, well exploitation of opportunities and thereby contributing to business success is highly dependent on the education level. Thus, the role of education for entrepreneurial success is driven via its effect on exposure and processing to new information, which has an ultimate positive impact on production and/or innovation results.

As the above (Table 3) reveals, majority of the subsistence's entrepreneurs located in Addis Ababa are not illiterate. Only 2(0.5%) of the operators are illiterate according to the data. However, about 54.1% of the respondents are less literate since they have completed grade 12 and less. The percentage of entrepreneurs education fall under vocational training/diploma holders category is counted 33.2 %, while the remaining accounts for highly educated entrepreneurs of which 11.9 % are BA/BSc graduates with only 1(0.3%) having a masters and Above education level. In contrast to the World Bank Report 2007, that educated people are showing good tendency to become entrepreneurs in Ethiopia. Hence, this shows educated peoples are forced to become entrepreneurs. This is could be a positive indicator for the exploitation of frugal innovations and success full business performance by the subsistence's entrepreneurs.

#### 4.2.3 Sector/activity of the enterprise

The sectorial breakdown employed for this study is based on the definitions used by researchers such Garoma (2012) and according to the naming given by the Ethiopian Federal Governments Micro and small enterprises development Agency. Thus far, the sectors in this study were defined broadly as in for example the definition employed by Garoma (2012) . Accordingly, each sector is defined as follows for the purpose of this study:

**Textile & Garment:** Which include Sinjer, waving and any other Textile productions.

**Leather production:** Manufacture of any leather and leather products including shoo, and closes productions

**Food & Beverages:** Process of any food products and beverages

**Metal & Engineering:** Any type of metal works including Garage

**Wood work:** All wood works including Furniture and Bamboo works

**Souvenirs:** souvenir items include the production and selling of different postcards, traditional tools, mugs, plates, hand crafts, etc.

**Service delivery:** Designing, Maintenance, Restaurant, hotel, shoe shining, car wash, etc.

**Electronics & Software Development:** combines all together the IT software development and electrical works. Accordingly, as it has delivered in the below Table 4 the souvenir sector entrepreneurs were found to show a little bit highest representation with a rate of about 26.5% respondents followed by the Textile & Garment enterprises (21.6%), leather production (14.5%), and wood work sector operators (12.5) which have shown more than 10 % representations among all. While, the Food & Beverages sector is found to be 9.9% which is relatively highest from the remaining either from Metal & Engineering, Service delivery and Electronics & Software Development sector operators which accounts 6.8%, 5.7% and with a least 2.6% respectively.

**Table 4:Sector/activity of the enterprise**

Sector	Textile & Garment	leather production	Food & Beverages	Metal & Engineering	wood work	souvenir	Service delivery	Electronics & Software Development	Total
Frequency	83	56	38	26	48	102	22	10	385
Percent	21.6	14.5	9.9	6.8	12.5	26.5	5.7	2.6	100.0
Cumulative Percent	21.6	36.1	46.0	52.7	65.2	91.7	97.4	100.0	

Source: Own survey result 2019

### 4.3 Business Factors/Characteristics

**Table 5: Firm Size and Age Category**

Part 1: Firm Size											
No of Employees	1 employee	2	3	4	5	6	7	8	9	10 employees	Total
Frequency	87	91	47	38	35	18	16	23	13	17	385
Percent	22.6	23.6	12.2	9.9	9.1	4.7	4.2	6.0	3.4	4.4	100.0
Cumulative Percent	22.6	46.2	58.4	68.3	77.4	82.1	86.2	92.2	95.6	100.0	
Part 2: Firm Age											
Age of the Firm	Below 1 year	1-5 years	6-10 years	11-15 years	16-20 years	21-25 years	above 25 years	Total			
Frequency	28	169	96	42	31	9	10	385			
Percent	7.3	43.9	24.9	10.9	8.1	2.3	2.6	100.0			
Cumulative Percent	7.3	51.2	76.1	87.0	95.1	97.4	100.0				

Source: Own survey result 2019

As has been discussed in the previous chapters, the determinants have been analyzed from four angles: factors related to the business, factors related to the entrepreneur's capability, factors related to institutional environment & Actors and factors linked to local community/social embeddedness. Besides, the conceptual framework for this study has included the effect of frugal innovations on the entrepreneurial success of the subsistence's operators in separate model. Hence, this section discusses characteristics of the business such as, the firm size and age.

### **4.3.1 Firm Size and Age**

These are the two important factors of the enterprise. These are firm attributes which are mostly discussed dimensions of a business. A large body of literature on firm studies emphasizes testing if the firm age & firm size have a separate effect on the innovation outputs. Thus, size and age of the firm are investigated as a major business factors and both are expected to be inversely related to frugal innovations.

As the above table 5 part 1 indicates, from the total sample majority of the firms (77.4%) were found recruited up to or less than 5 employees including the owners. Of which, 22.6%, 23.6%, 12.2%, 9.9% and 9.1% of the subsistence's entrepreneurs are the sole workers (1), have 2, 3, 4, & 5 employees in their business including themselves respectively. Whereas, the fewer amounts (32.6%) of the enterprises have 6-10 employees with the composition of 4.7% which have 6 employees, 4.2% have 7 employees, 6.0% have 8 employees, 3.4% have 9 employees and the last 4.4% haired 10 employees. Hence, this was a good representation because the less the firm size could bring the more effort in frugality.

When it came to the firm age as it has depicted in Table 5 part 2: 51.2% of the enterprises have been operating for 5 and less years out of which the only 7.3% of them were under a year old. While the 24.9%, 10.9%, 8.1%, 2.3% and 2.6% of the firms are respectively 6-10, 11-15, 16-20, 21-25 and above 25 years old. This is, therefore, a nice to see most firms operating at less age for driving frugal innovations. In this regard, pieces of evidence show that entry is innovative when the likelihood of survival is lower which increases the higher the risk is, and the growth subsequent to successful innovation is higher the higher barriers to survival are (Elena and Jordi, 2002).

## 4.4 Entrepreneurial Capability/Personal Competencies

As has been discussed in the theoretical framework, entrepreneurial capability is personal competencies of the entrepreneurs. In this regard, entrepreneurial capability *consists the motives, skill /knowledge's and the personal traits*. This could raise the issue of if entrepreneurs start their businesses by first getting equipped with the necessary knowledge and skill needed to do the task. Consequently, 12 items based on five-scale Likert method were used to measure the entrepreneurial capability as one dependent variable.

### 4.4.1 Motive for present activity ( Opportunity Driven Motivation)

From the survey (table 6) respondents show a higher tendency for that a voluntary choice dominates reasons for joining in the subsistence's entrepreneurship of these sectors. Hence, about 72% of the total respondents strongly agreed or agreed with that they started their business because to exploit the opportunity. In the other hand, if it is considered for the remaining that the business is their involuntary choice as composed of no employment opportunities, no other alternatives and else, this accounts for about 28% of the total respondents. Hence, this is expected as it is good for exploring and exploiting the untapped business opportunities like frugal innovations since the data shows the majority of them are opportunity driven motivated entrepreneurs.

**Table 6 : Opportunity Driven Motivation and Competence categories**

Responses	OD		Competency1		Competency2	
	f	%	f	%	F	%
<b>1=Strongly Disagree</b>	39	10.1	63	16.4	76	19.7
<b>2</b>	32	8.3	31	8.1	41	10.6
<b>3</b>	37	9.6	77	20.0	75	19.5
<b>4</b>	75	19.5	87	22.6	87	22.6
<b>5=Strongly agree</b>	202	52.5	127	33.0	106	27.5
<b>Total</b>	385	100.0	385	100.0	385	100.0
<b>Mean</b>	3.96		3.48		3.28	
<b>Std. Deviation</b>	1.367		1.434		1.467	
<i>Source: Own survey result 2019</i>						

Note that strongly disagree =1, Disagree= 2, Neutral=3, Agree=4, strongly agree =5.

OD= I started this business because I like the activity

Competency1 = I receive help full entrepreneurial education/training

Competency2 = I had enough entrepreneurial experience before I started this business

#### **4.4.2 Competency (Entrepreneurial Education/Training and Experience)**

Thus far, the above table 6 reveals that more than half of the respondents agreed that they have help full entrepreneurial education/training and had enough entrepreneurial experience to operate their business effectively. About 55.6 % of the respondents either agree or strongly agree with that they have help full entrepreneurial education/training (Competency1) while about 50.1% of the respondents either agree or strongly agree with that they had enough entrepreneurial experience before starting their current business. Hence, as has explained earlier these are positive predictors of frugal innovation and performance.

#### **4.4.3 Personality traits**

Out of all emphasis here is given to need for achievement, locus of control, risk taking propensity and self-efficiency.

##### **4.4.3.1 Need for achievement (NA), Risk-taking propensity (RTP), Locus of control (ILC) and Self-efficiency (SE)**

Three items based on five-scale Likert method were used to measure need for achievement & Self-efficiency of the operators. But a two item for Risk-taking propensity and a single item for Locus of control. Thus, the following table (Table 7) provides results of the survey on need for achievement and the other below listed traits based on respondents' perceptions. The result shown in the below represented table (Table 7) reveals respondents show a higher tendency for achievement motivation. About 80% of the respondents either agree or strongly agree with the need for achievement item number one (NA1) and about 77% of them either agree or strongly agree with the need for achievement item number two (NA2) while about 68.3% of the respondents either agree or strongly agree with possessing interpersonal competitiveness, item 3 (NA3). In general, these shows there are positive signs of personality traits that could drive operators towards innovativeness. Only about 4.2%,8.1% and 18.7% of the operators perceive that they do not have achievement motivation or are neutral on the three need achievement items respectively.

**Table7: Personality traits category**

Respo nses	NA1		NA2		NA3		RTP1		RTP2		ILC		SE1		SE2		SE3	
	F	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	F	%
1= SDA	3	.8	13	3.4	30	7.8	9	2.3	36	9.4	22	5.7	28	7.3	7	1.8	19	4.9
2	13	3.4	18	4.7	42	10.9	26	6.8	33	8.6	6	1.6	12	3.1	6	1.6	16	4.2
3	61	15.8	55	14.3	50	13.0	43	11.2	74	19.2	30	7.8	38	9.9	37	9.6	76	19.7
4	86	22.3	89	23.1	100	26.0	96	24.9	114	29.6	117	30.4	128	33.2	121	31.4	117	30.4
5=SA	222	57.7	210	54.5	163	42.3	211	54.8	128	33.2	210	54.5	179	46.5	214	55.6	157	40.8
<b>Total</b>	385	100	385	100	385	100	385	100	385	100	385	100	385	100	385	100	385	100
<b>Mean</b>	4.33		4.21		3.84		4.23		3.69		4.26		4.09		4.37		3.98	
<b>Std. Deviation</b>	0.914		1.067		1.292		1.044		1.271		1.064		1.157		0.860		1.104	

Source: Own survey result 2019

Note that strongly disagree(SDA) =1, Disagree= 2, Neutral=3, Agree=4, strongly agree (SA) =5

Following to Garoma (2012) a two item and five scale Likert question has been used and respondents were asked to tell their perception on each items of the risk-taking propensity.

Consequently, the data (in Table 7) reveals that in general risk taking propensity is good among subsistence’s entrepreneurs in Addis Ababa. About 79.7% of agreed or strongly agreed with risk taking propensity one (RTP1), and about 62.8% of agreed or strongly agreed with risk taking propensity item two (RTP2) indicating that the great majority of respondents tends to take risks in their business.

Internal locus of control is measured by an item; “result of my business is strongly dependent on my own effort” and around 85% of the respondents’ perception that they think they can influence their enterprises is very strong. Only 7.3 % of the total respondents perceive that their business outcomes is determined by external factors with the exception the remaining 7.7% of are neutral.

Similarly, the data in (Table 7) reflects that self-efficiency (SE) of respondents is stronger as other traits such as internal locus of control. On the average about 79.3% of the respondents agreed or strongly agreed to all positively stated items indicating that most respondents perceive that they possess mastery and self-confidence over their businesses.

#### **4.5 Institutional environment and actors**

In this case emphasis is given to institutional voids and the environmental actors as seen below separately.

#### 4.5.1 Institutional voids

Institutional voids are stated as the shortage of institutional conveniences which includes, Heavy government tax, Lack of up to date business information, Lack of infrastructure, Lack of property rights, Corruption and weak institutional linkages.

**Table 8: Institutional voids category**

Responses	heavy government tax		Lack of business Information		shortage of Infrastructure		lack Property rights		Corruption		weak institutional Linkages	
	F	%	f	%	f	%	f	%	f	%	f	%
<b>1=Very Low</b>	20	5.19	29	7.53	30	7.79	36	9.35	117	30.4	100	26
<b>2</b>	49	12.7	57	14.8	74	19.2	84	21.8	78	20.3	53	13.8
<b>3</b>	141	36.6	126	32.7	102	26.5	122	31.7	73	19	79	20.5
<b>4</b>	87	22.6	84	21.8	101	26.2	80	20.8	61	15.8	76	19.7
<b>5=Very High</b>	88	22.9	89	23.1	78	20.3	63	16.4	56	14.5	77	20
<b>Total</b>	385	100.0	385	100.0	385	100.0	385	100.0	385	100.0	385	100.0
<b>Mean</b>	3.45		3.38		3.32		3.13		2.64		2.94	
<b>Std. Deviation</b>	1.13		1.20		1.22		1.20		1.43		1.48	

Source: Own survey result 2019

In this part respondents were asked to rate on a scale of 1-5 the sever problems they faced during operation with the existence of the above institutional voids category in table 8. Where;- 5= Very High, 4= High, 3= Neutral, 2= Low, 1= Very Low . Consequently the data reviles that about 45% of the operators have rated either high or very high with the effects of the presence of heavy government tax, lack of up to date business information, lack of infrastructure and 35% of have also rated as either high or very high for the weak institutional linkages and existence of corruption while about 30.3% of the total operators have rated either high or very high for the sever problems they faced during operation with the lack of property rights. Thus, significant number of operators have rated that the sever problems they faced during operation with the existence of institutional voids as it is high with the least for the effect of lack of property rights. Hence, this could affect the operators not to use and sell out frugal innovations severely.

## 4.5.2 Environmental Actors

**Table 9: Environmental Actors category**

Responses	Actor 1		Actor 2		Actor 3		Actor 4	
	f	%	f	%	F	%	f	%
<b>1= Strongly Disagree</b>	2	0.52	2	0.52	2	0.52	7	1.82
<b>2</b>	8	2.08	17	4.42	24	6.23	50	13
<b>3</b>	146	37.9	143	37.1	141	36.6	249	64.7
<b>4</b>	122	31.7	145	37.7	105	27.3	51	13.2
<b>5=Strongly agree</b>	107	27.8	78	20.3	113	29.4	28	7.27
<b>Total</b>	385	100.0	385	100.0	385	100.0	385	100.0
<b>Mean</b>	3.84		3.73		3.79		3.11	
<b>Std. Deviation</b>	0.87		0.85		0.96		0.78	

Source: Own survey result 2019

Note that strongly disagree =1, Disagree= 2, Neutral=3, Agree=4, strongly agree =5

Actor 1, Actor 2, Actor 3, Actor 4= item 1, 2, 3 & 4

Among all, the Local and National Governments, Government and Non-government Organizations are considered as main Actors that could have support for subsistence's entrepreneurs in this study. Consequently, 4 items based on five-scale Likert method were used to measure support provided by the Actors. Given the table above, the result shows that a significant number of operators are less satisfied with the actors support that they provide for individuals/subsistence's entrepreneurs to establish & grow their own businesses.

In the safe side about 59.5% of the respondents either agree or strongly agree with that government organizations assist individuals in starting their own business ventures (Actor 1). While, about 58% and 56.7% of them either agree or strongly agree with the statements that the local & national governments have support for individuals starting a business venture (Actor 2) and Non-Government organizations helps to develop new business ventures (Actor 3). Yet, in the hardest way the only 20.47% of the subsistence's operators have also either agree or strongly agree with that even after failing government assists entrepreneurs starting again (Actor 4). This suggests that although environmental actors/enablers have vested interest in improving existence for good – enough and affordable innovations by grass root entrepreneurs as advocated by researchers, lack of it might have hampered the diffusion & productivity of frugal innovations in this case.

## 4.6 Local community or Social Embeddedness

As it has elaborated in the theoretical framework, the local community is the social networks which provide entrepreneurs with resources serving either as an information/a device. Thus, according to Granovetter, the social network approach is viewed as being embedded in social context (Granovetter, 1973). Hence, the important dimension of the institutions is the position of an individual or a firm in a social network (Bhatti and Ventresca, 2013).

### 4.6.1 Social ties

For frugal innovations, the area of an innovator inside the social fabric performs a completely important function. Thus, the focus of this section is the value of the weak social ties, such as the information fabricated from Customers, Suppliers, Other Business partners and local entrepreneurs and their result is shown in Table 10.

**Table 10: Weak Social ties category**

Responses	W_tie1		W_tie2		W_tie3	
	f	%	f	%	f	%
1=Strongly Disagree	5	1.3	4	1.04	2	0.52
2	10	2.6	19	4.94	30	7.79
3	86	22.3	82	21.3	90	23.4
4	122	31.7	114	29.6	121	31.4
5=Strongly agree	162	42.1	166	43.1	142	36.9
<b>Total</b>	385	100.0	385	100.0	385	100.0
<b>Mean</b>	4.11		4.09		3.96	
<b>Std. Deviation</b>	0.93		0.96		0.98	

Source: Own survey result 2019

Note that strongly disagree =1, Disagree= 2, Neutral=3, Agree=4, strongly agree =5

The data in (Table 10) reflects that the social capital of respondents is high that the value of the local community they are embedded in it is worthy for their business growth and innovativeness being using the networks that could serve as novel sources of information that might not be easily accessible to them. On the average about 71.5% of the respondents agreed or strongly agreed to all positively stated items indicating that most respondents perceive that the information fabricated from customers, suppliers, and other business partners or local entrepreneurs is worthy for their business growth and innovativeness.

## 4.7 Frugal Innovations (FI)

In spite of the working definition given in chapter two, the central issues that are believed to measure the frugal innovations are the following three elements. These, could raise the level of mastery of the frugal innovation practices by the subsistence’s entrepreneurships. Consequently, a total of 9 items based on five-scale Likert method which goes 3 per each of the below stated frugal innovation elements were used to measure the applicability of frugal innovations being as a dependent variable to be controlled and also as independent variable which show its effect on entrepreneurial performance success of the subsistence’s entrepreneurs in a separate model.

### 4.7.1 Concentration on Core Functionalities and performance (CCFP), Substantial Cost Reduction (SCR) & Create localization (CL)

Regarding to the measurement of frugality respondents were asked to state their agreement in scale of 1-5 (Where; - 5= Strongly Agree, to 1= Strongly Disagree ) with the level of importance they do to the frugal innovation components/elements in developing/selling out of their products/services as shown in the below table 11.

**Table 11: Frugal Innovation Characteristics category**

Respo nses	CCFP1		CCFP2		CCFP3		SCR1		SCR2		SCR3		CL1		CL2		CL3	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
1= SDA	22	5.7	19	4.9	21	5.5	20	5.2	16	4.2	15	3.9	27	7.0	46	11.9	23	6.0
2	27	7.0	17	4.4	10	2.6	27	7.0	33	8.6	44	11.4	22	5.7	52	13.5	25	6.5
3	70	18.2	71	18.4	82	21.3	85	22.1	97	25.2	91	23.6	79	20.5	82	21.3	79	20.5
4	112	29.1	145	37.7	101	26.2	121	31.4	84	21.8	115	29.9	99	25.7	105	27.3	112	29.1
5=SA	154	40.0	133	34.5	171	44.4	132	34.3	155	40.3	120	31.2	158	41.0	100	26.0	146	37.9
<b>Total</b>	385	100	385	100	385	100	385	100	385	100	385	100	385	100	385	100	385	100
<b>Mean</b>	3.91		3.92		4.02		3.83		3.85		3.73		3.88		3.42		3.86	
<b>Std. Deviation</b>	1.171		1.071		1.120		1.133		1.164		1.134		1.210		1.325		1.169	

Source: Own survey result 2019

Note that strongly disagree(SDA) =1, Disagree= 2, Neutral=3, Agree=4, strongly agree(SA) =5

Thus, the result shown in the above table reveals entrepreneurs give a great importance to the listed components of frugal innovations while developing/selling out of their products and/ services. Averagely, about 70.6 % of the subsistence’s entrepreneurs either agree or strongly agree with that

they concentrate on core functionalities and performance (CCFP) and about 62.9% of them either agree or strongly agree that they do focus for substantial cost reduction (SCR) while about 62.3% of the respondents either agree or strongly agree with that they invest their efforts in producing & selling of their values by creating localization. To sum up, about 65.3% of the subsistence’s entrepreneurships in Addis Ababa are seen practicing frugal innovations. Hence, this implies that the current application states of frugal innovations by the subsistence’s entrepreneurships are good, yet the term frugal innovation is not known by them at all. This is because of that all most all (97.1%) of the subsistence’s entrepreneurs responded that they never heard of what frugal innovation is as you see it in below table 12. However, the term frugal innovation is new for them conceptually they are practicing it.

**Table 12: Had you ever heard of frugal innovation**

Responses	Frequency	Percent
<b>Valid</b> Yes	11	2.9
No	374	97.1
Total	385	100.0

Source: Own survey result 2019

This study has asked respondents if they may heard of about frugal innovation (Table 12). Thus, the only 11 (2.9%) of the subsistence’s entrepreneurs said “yes” for that they were familiar with the term frugal innovation. Therefore, this indicates that the term is not actively promoted or diffused to our society. So, this could be seen as a gap for future researches to be done on the diffusion of frugal innovations.

#### **4.8 Entrepreneurial Performance (EP) Success**

In this regard, researcher believes subjective / non-financial goal measurements could indicate the success of the subsistence’s entrepreneurships. Consequently, 5 items based on five-scale Likert method were used to measure the entrepreneurial performance success of the subsistence’s entrepreneurships as seen below.

**Table 13: Entrepreneurial Performance Success Indicators**

Responses	EP1		EP2		EP3		EP4		EP5	
	f	%	f	%	f	%	f	%	f	%
<b>Decreased Strongly</b>	47	12.2	51	13.2	42	10.9	35	9.1	31	8.1
<b>2</b>	41	10.6	61	15.8	40	10.4	39	10.1	40	10.4
<b>3</b>	70	18.2	78	20.3	95	24.7	112	29.1	111	28.8
<b>4</b>	125	32.5	130	33.8	132	34.3	105	27.3	94	24.4
<b>Increased Strongly</b>	102	26.5	65	16.9	76	19.7	94	24.4	109	28.3
<b>Total</b>	385	100.0	385	100.0	385	100.0	385	100.0	385	100.0
<b>Mean</b>	3.50		3.25		3.42		3.48		3.55	
<b>Std. Deviation</b>	1.315		1.281		1.226		1.221		1.228	

Source: Own survey result 2019

Thus, respondents were asked to rate on a scale of 1-5 on how they perceive the changes on the subjective indicators have had happen comparing to a year ago. Where;- 5= Increased Strongly, 4= Increased Slightly, 3= Stayed the same, 2= Decreased Slightly, 1= Decreased Strongly . Consequently the data reveals that about 59%, 50.6%, 54%, 51.7% and 52.7% of the operators have perceived their customers (EP1), sales volume (EP2), personal well-being (EP3), family well-being (EP4) and level of competitiveness have either increased slightly or strongly in a respective way. Thus, majority (about 53.6%) of the operators have perceived as they are succeeding well while 24.2% of them seen as there is constant growth in their performance on average base. Hence, the entrepreneurial performance of the subsistence’s entrepreneurships in Addis Ababa is generally perceived as good.

In conclusion this part has discussed the frugal innovation determinants and its influence on the entrepreneurial performance success based on the sample of 385 surveyed subsistence’s entrepreneurships in Addis Ababa. In the previous part, the result of the items has been analyzed based on the framework set for the study using a descriptive method. However, this descriptive analysis needs to be supported by an empirical analysis whereby all the hypothesized determinants are taken together to strengthen the findings of the analysis. Thus, both correlation and regression analysis’s are used to analyze determinants of frugal innovation and its influence on the entrepreneurial performance. This is discussed in the next part.

## 4.9 Correlation and regression analysis

Kothari (2004) suggests that there are two methods to determine the relation between variables; namely correlation and regression. Correlation answers whether two or more variables have any relationship and to what degree are they related (Kothari, 2004). Regression, multiple regressions in this case, answers the cause and effect relation between two or more variables and to what degree (Kothari, 2004).

### 4.9.1 Correlation analysis

To understand the relationship between independent and dependent variables a correlation analysis was conducted. Karl Pearson's coefficient of correlation ( $r$ ) was used to measure the strength and direction of relations among linear variables with a continuous data. Pearson's correlation coefficient is the most widely used technique to measure correlation under the following assumption (Kothari, 2004 p. 139):

1. "that there is linear relationship between the two variables";
2. "that the two variables are casually related which means that one of the variables is independent and the other one is dependent"; and
3. "A large number of independent causes are operating in both variables so as to produce a normal distribution".

Where as, a Spearman rank correlation is used to measure the degree of association between frugal innovation and the two business variables appeared with a categorical data. The Spearman rank correlation test does not carry any assumptions about the distribution of the data and is the appropriate correlation analysis when the variables are measured on a scale that is at least ordinal.

To understand and gauge the direction of relationships among variables, the guide set by Cohen (1988) was used. According to Cohen (1988)  $r$  value of .10 has a small effect size, .30 has a medium effect size and .50 has a large effect size. Inferring from the table below and Cohen's (1988) analysis guide, the relationship between predictor variables with Frugal Innovation and Entrepreneurial Performance (EP) Success is presented below.

**Table 14: Correlation between predictor variables of Frugal Innovation (1<sup>st</sup> model)**

		FI	FS	FA	EC	IV	EA	ST
Frugal Innovation (FI)	Pearson Correlation	1						
	Sig. (2-tailed)							
	N	385						
Firm size (FS)	<b>Spearman's rho</b>	-.034	1					
	Sig. (2-tailed)	.506						
	N	385	385					
Firm Age (FA)	<b>Spearman's rho</b>	-.092*	-0.002	1				
	Sig. (2-tailed)	.040	0.969					
	N	385	385	385				
Entrepreneurial Capability (EC)	Pearson Correlation	.566**	0.021	-0.079	1			
	Sig. (2-tailed)	.000	0.681	0.122				
	N	385	385	385	385			
Institutional Voids (IV)	Pearson Correlation	-.186**	-0.022	-0.069	-.153**	1		
	Sig. (2-tailed)	.000	0.673	0.175	0.003			
	N	385	385	385	385	385		
Environmental Actors (EA)	Pearson Correlation	.543**	0.045	-0.047	.364**	-0.023	1	
	Sig. (2-tailed)	.000	0.381	0.359	0	0.649		
	N	385	385	385	385	385	385	
Social ties (ST)	Pearson Correlation	.508**	-.110*	-0.007	.331**	-0.055	.324**	1
	Sig. (2-tailed)	.000	0.031	0.896	0	0.278	0	
	N	385	385	385	385	385	385	385
**. Correlation is significant at the 0.01 level (2-tailed).								
*. Correlation is significant at the 0.05 level (2-tailed).								

Source: own survey 2019

#### 4.9.1.1 Correlation between frugal innovation and business factors

In this section the frugal innovation is analyzed against the business factors. The firm size and firm age are important factors discussed under this section. In reference to the above (1<sup>st</sup> model), frugal innovation and business factors (firm size and age) have a negative relationship. However, the effect of firm size was not statistically significant under the regression analysis since its significance level/P\_value (.506) is greater than .05. Yet, for firm age it has been found that keeping other factors constant, being an averagely getting older in operation is associated with decreasing in applying frugal innovations though its magnitude is weak.

#### **4.9.1.2 Correlation between frugal innovation and entrepreneurial capability**

These are core personal qualities of the entrepreneurs that could enable them more systematic in solving social and environmental problems of their customers. Hence, this part measures the subsistence's entrepreneurs driving motives, skill/knowledge's and the personal traits. So this could help to see if these entrepreneurs were equipped with the necessary knowledge and skill needed to enable them to use and sale out frugal innovations and how this personal quality would influence their application of frugal innovations. Consequently, as presented in the above table frugal innovation and entrepreneurial capability have positive relationship with a strong magnitude i.e.  $r = .566$ . In other words, when entrepreneur's overall capability increase the effort for using and selling out of frugal innovations increase as well. It is also statistically significant at  $P < 0.01$ .

#### **4.9.1.3 Correlation between frugal innovation and institutional environment & Actors**

Institutional environment and Actors are hypothesized if to influence the frugal innovations of the subsistence's entrepreneurs in this context. Institutional voids and the environmental actors are among the mostly discussed factors from this dimension. The institutional voids are those external pressure which affects the innovative solutions of the subsistence's entrepreneurs while environmental actors are enablers/facilitators.

##### **4.9.1.3.1 Correlation between frugal innovation and institutional voids**

Inferring from the table presented above (1<sup>st</sup> model), similar to frugal innovation and firm age, frugal innovation and institutional voids have a negative relationship. In other words, when the pressure of the institutional voids increases the subsistence's entrepreneurs exploitation of frugal innovations moves in opposite. The magnitude or strength of this relationship, is weak i.e.  $r = .186$  and it has statistically significant correlation at 0.01 level ( $p < 0.01$ ).

##### **4.9.1.3.2 Correlation between frugal innovation and environmental Actors**

In reference to above table (1<sup>st</sup> model), frugal innovation and environmental Actors have a positive relationship. In other words, the higher the environmental support from actors will increase the application and usage of frugal innovations by the subsistence's entrepreneurs. Unlike to the relationship existed in between frugal innovation and institutional voids, frugal innovation had a

positive and stronger relationship with environmental actors. Furthermore, frugal innovation and environmental Actors have a statistically significant correlation at 0.01 level ( $p < 0.01$ ); meaning, a change in environmental actors support (increase/decrease) significantly affects the application of frugal innovations by the subsistence's entrepreneurs.

#### **4.9.1.4 Correlation between frugal innovation and social embeddedness**

The fourth important analyzed factor was the impact of social ties on the frugal innovations. Social network/tie is named under the dimension influencing frugal innovation of the subsistence's entrepreneurs. Thus, the focus of this section is the value of the weak social ties, such as the information fabricated from customers, suppliers, other business partners and local entrepreneurs.

Accordingly the coloration between frugal innovation and social ties is positive and statistically significant at  $P < 0.01$  as presented in the above table (1<sup>st</sup> model). Thus, the social capital of weak ties is positively correlated into the application and usage of frugal innovations. Besides, the magnitude of their relationship, is strong i.e.  $r = .508$  and have statistically significant correlation at 0.01 level ( $p < 0.01$ ). Therefore, Entrepreneurs positioned within the social fabric of weak ties perform a higher degree in using & selling of frugal innovations. Meaning, a change in the social capital of weak ties (increase/decrease) significantly affects the application of frugal innovations by the subsistence's entrepreneurs.

#### **4.9.1.5 Correlation between entrepreneurial performance success (EPS) and frugal innovation elements**

In the first model frugal innovation was measured using the Garand mean of the following three elements, which consists 3 items per each of the elements. Besides the mean of the three elements of frugal innovation are taken here also to see the relative influence of the frugal innovation on the entrepreneurial performance success of the subsistence's entrepreneurs in a separate model. Thus, the correlation of predictor variables (CCFP, SCR & CL) of the entrepreneurial performance success is presented next.

**Table 15: Correlation between predictor variables of Entrepreneurial Performance (2<sup>nd</sup> model)**

		EPS	CCFP	SCR	CL
Entrepreneurial Performance Success (EPS)	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	385			
Concentration on Core Functionalities and performance (CCFP)	Pearson Correlation	.328**	1		
	Sig. (2-tailed)	.000			
	N	385	385		
Substantial Cost Reduction (SCR)	Pearson Correlation	.246**	.343**	1	
	Sig. (2-tailed)	.000	.000		
	N	385	385	385	
Create localization (CL)	Pearson Correlation	.452**	.355**	.529**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	385	385	385	385

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

Source: own survey 2019

#### **4.9.1.5.1 Correlation between entrepreneurial performance success (EPS) and concentration on core functionalities and performance (CCFP)**

In reference to the above table 2<sup>nd</sup> model entrepreneurial performance and concentration on core functionalities and performance have a positive relationship. This is an indication that when subsistence’s entrepreneurships concentrate on the core functionalities and performance of their products in using and selling out of them they will easily successful. This means, the more they use and sell out a functionally appropriate , User-friendly and durable/robust innovations the more they will become successful in their business performance. The magnitude or strength of this relation, is medium i.e.  $r = .328$ . Furthermore, entrepreneurial performance success and CCFP have a statistically significant correlation at 0.01 level ( $p < 0.01$ ), meaning, a change in CCFP (increase/decrease) significantly affects entrepreneurial performance success.

#### **4.9.1.5.2 Correlation between entrepreneurial performance success (EPS) and substantial cost reduction (SCR)**

Substantial cost reduction is the reduction of the use of material, financial & other resources so as to use and sellout affordable innovations. This is because frugal innovation is the application of solutions that offer "good and cheap" products/services or the systematic and significant cost

reduction in the operational process so will result to the significant reduction of the final price of the product/service.

According to the above table (2<sup>nd</sup> model), entrepreneurial performance and substantial cost reduction have a positive relationship. This is an indication that when subsistence's entrepreneurs come with affordable innovations that are resulted by use of less material, financial & other resources so that will easily connect with their customers and increase their business performance. The magnitude or strength of this relation, is a little bit weak i.e.  $r = .246$ . Furthermore, entrepreneurial performance success and SCR have a statistically significant correlation at 0.01 level ( $p < 0.01$ ), meaning, the more they give more importance for substantial cost reduction in producing and selling out of their innovations significantly increases their entrepreneurial performance success.

#### **4.9.1.5.3 Correlation between entrepreneurial performance success (EPS) and create localization (CL)**

This part measures result of the entrepreneurs effort invested in creating frugal innovation cooperation's/ecosystem that can affect their entrepreneurial performance success. Therefore, as presented in the above table (2<sup>nd</sup> model), similar to CCFP and SCR, entrepreneurial performance has a positive relationship with create localization. This means, when entrepreneurs effort invested in creating frugal innovation cooperation's/ecosystem increases their entrepreneurial performance success will get increased as well. The magnitude or strength of this relation, is moderate relation i.e.,  $r = .45$  which is less than  $.50$ . Hence, CL has a statistically significant correlation with entrepreneurial performance like the rest of the elements i.e. CCFP and SCR which is 0.01 level ( $p < 0.01$ ), indicating that a change in CL (increase/decrease) significantly affects entrepreneurial performance success of the operators. To summarize the correlation analysis;

- All correlation combinations, except institutional voids, firm size and age with frugal innovation, have a positive relationship
- All the correlations in the 1<sup>st</sup> model except the correlation between frugal innovation and institutional voids, firm size and age have strong correlation coefficients.
- All the correlations in the 2<sup>nd</sup> model except the correlation between entrepreneurial performance success and SCR have moderate correlation coefficients

- All correlations are statistically significant at 0.01/0.01 level ( $p < 0.01/0.05$ ), but firm size.

## 4.9.2 Regression analysis

The findings of the regression analysis are presented after the results of classical linear regression model (CLRM) tests; Linearity, homoscedasticity, autocorrelation, multicollinearity and normality results are presented. Findings of a regression model can be generalized when underlying Classical Linear Regression Model (CLRM) assumptions are met and cross-validation is undertaken.

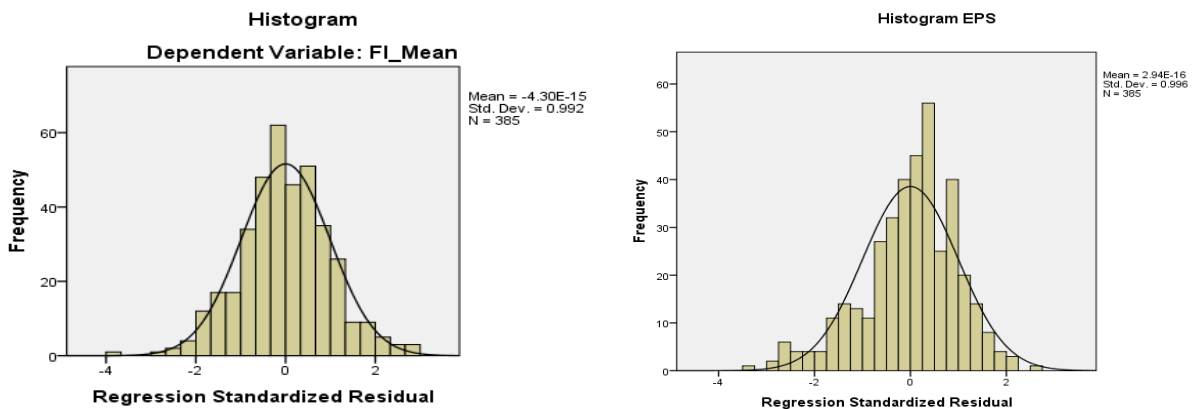
### 4.9.2.1 Linearity

According to Brooks (2014) as long as a constant term is included in a regression equation the assumption of linearity will never be violated. Inferring from the two models proposed above there exist an intercept in the models 0.712 for frugal innovation/FI and 1.069 for EPS. Therefore, it can be concluded that assumption of linearity is not violated.

### 4.9.2.2 Normality Test

One of the assumptions in leaner regression analysis is whether variables in the model are obtained from normally distributed population or not. The deviation from the normal curve and the distribution across the mean served as a testing tool on either to utilize leaner regression for the analysis of the data or not. Thus, as attached below the study employed the relevant normality tests for both of the above models. Hence, the disturbances looks normal {distributed from -2 to 2} with majority which allows exact inference about the estimate as seen below in Figure 4.1.

**Figure 4.1. Shows the normality test**



### 4.9.2.3 Multicollinearity

Multicollinearity is the other assumption that affects the multiple regression analysis results and so needs to be addressed. It makes the coefficient estimates unreliable if a correlation exists between explanatory variables. Therefore, as noted by Wooldridge, (2000) in a regression model Variance inflation factor (VIF) and tolerance are two important measures that can guide to identify multicollinearity. The higher VIF or the lower tolerance index means that severe multicollinearity effects are present and there is a greater chance to have insignificant coefficients.

**Table 16: Multicollinearity: Frugal innovation and Entrepreneurial performance success**

Model	Collinearity Statistics		
	Tolerance	VIF	
	(Constant)		
1	Firm_size	.979	1.022
	Firm_Age	.986	1.014
	Enter_Capa	.793	1.261
	Ins_Void	.968	1.033
	Ens_Actor	.815	1.227
	Social_tie	.826	1.210
Dependent Variable: Frugal innovations			

Model	Collinearity Statistics		
	Tolerance	VIF	
(Constant)			
1	CCFP	.840	1.190
	SCR	.693	1.444
	CL	.686	1.457
Dependent Variable: EPS			

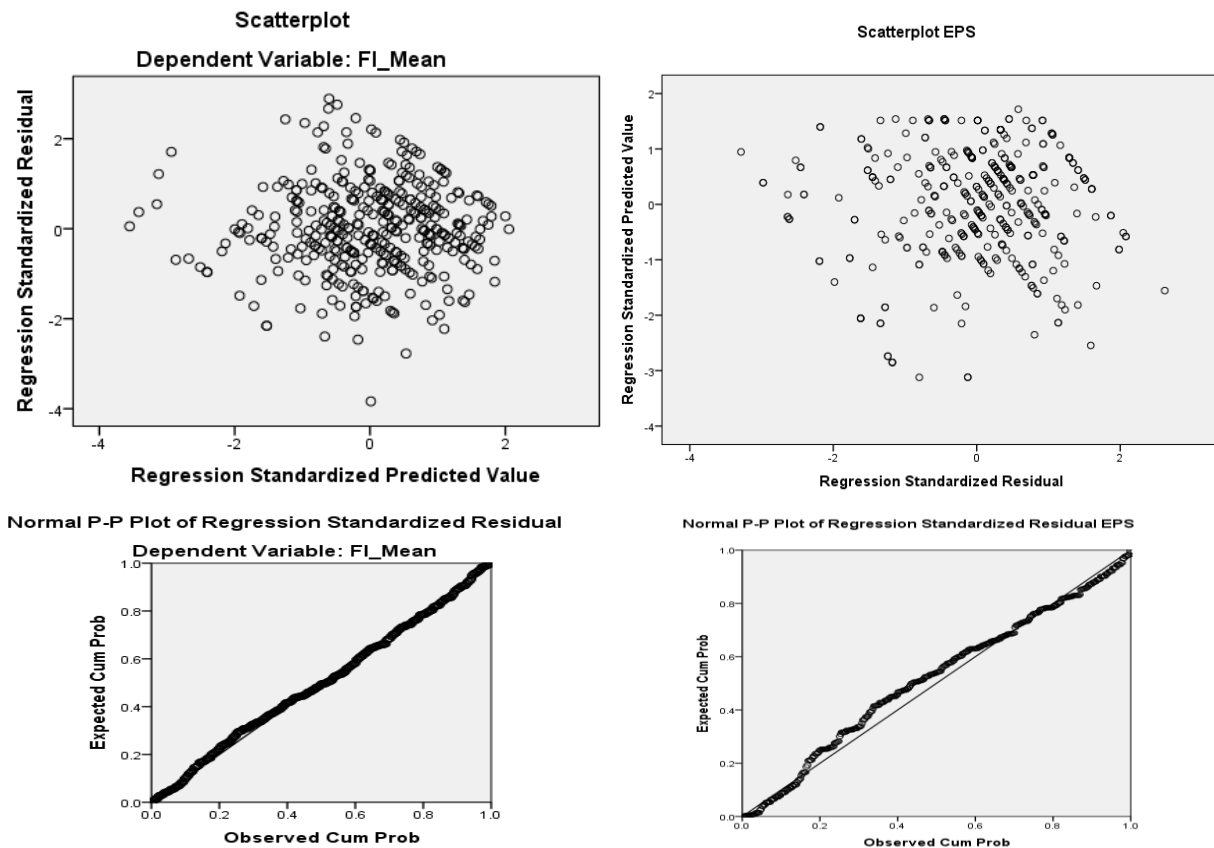
Thus as rule of thumb, VIF value of 10 {maximum} or tolerance index of 0.20 {minimum} has been used as a critical point to indicate excessive or serious multicollinearity. To make sure there are no multicollinearity problems in between the independent variables, after running the co linearity diagnosis in the SPSS the result shows for all the tolerance result is above 0.20 and VIF is under 3. Hence, all the variables passed the criteria and retained for regression analysis. See above.

### 4.9.2.4 Homoscedasticity

In cases where there exists a diverse and heterogeneous group of operators, application of linear regression may lead to biased estimates. This implies, before applying linear regression, it is must to make sure that the data show homoscedasticity which can be seen in the variances of disturbances

along the line of best fit. Therefore, by using a scatter plot and line graph the tested results of both models remains similar and best fit as to move along the line. See Figure

**Figure 4.2. Shows homoscedasticity test**



#### 4.9.2.5 Autocorrelation

The assessment of autocorrelation is tested using Durbin-Watson (DW) (1951) test which ranges between 0 and 4 where 0 is perfect positive autocorrelation and 4 is a perfect negative autocorrelation (Seddighi, 2012). Therefore, a DW ratio near to 2 signifies no autocorrelation (Seddighi, 2012). Inferring from the model summary table stated below the DW ratio for model 1 (frugal innovation) is  $DW = 1.887$  (see table 4.21). Meaning, the model is free from significant autocorrelation. Similarly, the DW ratio for model 2 (EPS) is  $DW = 1.420$  we can say there is no significant autocorrelation in the second model as well (see tables below).

**Table 17: Autocorrelations: Frugal innovation and Entrepreneurial performance success**

<b>Model Summary<sup>b</sup> - Autocorrelation: Frugal innovation</b>					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.740 <sup>a</sup>	.547	.540	.47732	<b>1.887</b>
a. Predictors: (Constant), Social_tie, Firm_Age, Ins_Void, Firm_size, Env_Actor, Enter_Capa					
b. Dependent Variable: FI					

<b>Model Summary<sup>b</sup> - Autocorrelation: EPS</b>					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.487 <sup>a</sup>	.237	.231	.88512	<b>1.420</b>
a. Predictors: (Constant), CL, CCFP, SCR					
b. Dependent Variable: EPS					

Source: own survey 2019

#### 4.9.2.6 Fitness of the model; for frugal innovations

In this regard, the first table of interest is the Model Summary table. This table provides the R, R<sup>2</sup>, adjusted R<sup>2</sup>, and the standard error of the estimate, which can be used to determine how well a regression model fits the data while also includes the Durbin-Watson test result together.

**Table 18: Model Summary; Frugal innovation**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.740 <sup>a</sup>	.547	.540	.47732	<b>1.887</b>
a. Predictors: (Constant), Social_tie, Firm_Age, Ins_Void, Firm_size, Env_Actor, Enter_Capa					
b. Dependent Variable: FI_Mean					

The "R" column represents the value of R, the *multiple correlation coefficients*. R can be considered to be one measure of the quality of the prediction of the dependent variable (frugal innovation in this case). Hence, R with a value of 0.740, in the table of model summary indicates a good level of prediction. Besides, a value of the overall fitness of the model for the regression is tested using R<sup>2</sup> (also called the coefficient of determination). This test tells us the degree to which the model was able to explain the variation in the dependent variable (frugal innovation in this case). You can see from the above table value of R<sup>2</sup> 0.547 close to the **Adjusted R Square** (*adj. R<sup>2</sup>*) of 0.54, which implies that the independent variables (the firm size, firm age, environmental

actors, institutional voids, social ties and entrepreneurial capability) explain 54.7% of the variability of the dependent variable, frugal innovation.

Whereas, the *F*-ratio in the ANOVA table (see below) tests whether the overall regression model is a good fit for the data. The table shows that the independent variables statistically & significantly predict the frugal innovation,  $F(6, 378) = 76.189, p < .0005$  (either indicating the regression model is a good fit of the data).

**Table 19: ANOVA; Frugal innovation**

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	104.149	6	17.358	76.189	.000 <sup>b</sup>
Residual	86.120	378	.228		
Total	190.270	384			

a. Dependent Variable: FI

b. Predictors: (Constant), Firm size, Firm Age, Entrepreneurial Capability, Institutional Voids, Environmental Actors, Social tie

**Table 20: Coefficients; Frugal innovation**

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	.712	.232		3.066	.002
Firm size	-.006	.009	-.022	-.642	.521
Firm age	-.064	.018	-.121	-3.483	.001
Entrepreneurial Capability	.370	.044	.326	8.381	.000
Institutional Voids,	-.102	.030	-.121	-3.447	.001
Environmental Actors	.320	.038	.325	8.468	.000
Social tie/weak tie	.251	.034	.285	7.491	.000

a. Dependent Variable: Frugal Innovation

As seen in the above table, the regression equation established that, if taking all factors to be constant at zero, the applicability of frugal innovation by the subsistence's entrepreneurs will be stick to 0.712. However, measuring the relative influence of each independent variable using the coefficient beta in the above table of coefficient gives the following results.

The above Table 20 shows that firm size and firm age appeared with a negative sign which is in accordance with the theory. However, the effect of firm size was not statistically significant under the regression analysis since its significance level/P\_value (.521) is greater than .05. Yet, for firm

age it has been found that keeping other factors constant, being an average getting older in operation is associated with a 6.4 percent lower in using and selling out of frugal innovations. This is statistically significant at 5% level of significance and 95% level of confidence. *Thus, on average, an increase in firm age is associated with lower in the exploitation of frugal innovations by the subsistence's entrepreneurs.*

Consequently, the overall entrepreneurial capability of the operator was found to be statistically significant determinant of frugal innovations using the linear regression. It was found that controlling for other variables, on the average a one percent increase in the overall capability of the entrepreneur leads to an increase in using and selling out of frugal innovations by 37 percent which is statistically significant at  $P < 0.01$ .

According to the coefficient of regression analysis depicted in Table 16, it was found out that entrepreneurs who faced higher pressure of the institutional voids experienced in lower practicing of frugal innovations. The result shows that taking all other independent variables at zero, on average one percent increase in a pressure of the institutional voids will lead to decrease in the frugal innovation of the subsistence's entrepreneurs' by 10.2 percent. This was significant statistically at  $P < 0.05$ . While, entrepreneurs with a higher environmental support from actors coupled with a better score for frugal innovations. The result were found to show higher (by about 32 percent) in selling and usage of frugal innovations, significant at  $p < 0.01$ . Meaning, on average a one percent increase in the environmental support from actors leads to an average increase the enhancement of frugal innovations by 32 percent.

Finally, the frugal innovation regression result revealed that the interaction effect of social network (weak tie) is significant determinant of frugal innovations. Thus, the social capital of weak ties is positively integrated into the application and usage of frugal innovations. On average, an additional effort of entrepreneurs engagement within the social fabric of weak ties perform about 25.1 percent higher in using & selling out of frugal innovations keeping other things constant in the model. This was significant statistically at  $P < 0.01$  as presented in Table 16.

**Conclusion:** - an independent variable that has a higher value of beta coefficient means it is a more important determinant of the dependent variable. The data findings also shows  $\beta = -.006$  (0.06%),  $\beta =$

-.064 (6.4%),  $\beta = .37$  (37%),  $\beta = -.102$  (10.2%),  $\beta = .32$  (32 %), and  $\beta = .251$  (25.1%) are the coefficient of the independent variable of firm size, firm age, entrepreneurial capability, institutional voids, environmental actors and social ties respectively. From the result, entrepreneurial capability has a higher influence with ( 37 percent) on frugal innovations while the enabling environmental actors and social ties are same as next highest significant determinants of frugal innovations with the coefficient value of 32% & 25.1% respectively, and all are significant at  $p < 0.01$ . Unlikely, both the institutional voids and firm age influence the frugal innovations of subsistence's entrepreneurs by 6.4% & 10.2 % respectively, and both are statistically significant at  $p < 0.05$ . Firm size has a minimum negative effect of 0.06%, yet found statistically insignificant.

#### **4.9.2.7 Model Specification; for entrepreneurial performance success**

This model is designed to assess the relationship between entrepreneurial performance successes towards the application of the three elements of frugal innovation. For this reason, a multiple regression analysis is used to test this model.

$$\text{Model Two; - } \mathbf{EPS} = \alpha + \beta_1 \text{CCFP} + \beta_2 \text{SCR} + \beta_3 \text{CL} + e$$

Where: **EPS** = Entrepreneurial performance success

$\alpha$  = Constant term

CCFP = Concentration on Core Functionalities and performance

SCR = Substantial Cost Reduction

CL = Create localization

$\epsilon$  = error term

In this regard, the changes on the number of customers, sales, family welfare, personal well-being and level of competitiveness were used to measure its results over period of one year.

#### **4.9.2.8 Fitness of the model; for entrepreneurial performance success**

In this regard, the influence of frugal innovation on entrepreneurial performance is considered in the regression analysis in a separate model to see the effect of the three frugal innovation elements. Since fitness of the model is related to variable and model specifications the relevant tests has been done for model indicators and the following sections illustrate these issues.

**Table 21: Model Summary; Entrepreneurial performance success**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.487 <sup>a</sup>	.237	.231	.88512	1.420
a. Predictors: (Constant), CL, CCFP, SCR					
b. Dependent Variable: EPS					

As stated in the above part, the  $R^2$  tells how much of the variance in dependent variable (entrepreneurial performance in this case) is accounted for by the regression model from the total sample of subsistence's entrepreneurships. Whereas, the adjusted value shows how much variance in the dependent variable would be accounted for if the model had been derived from the population from the sample was taken.

Form the above Table 21, the  $R^2$  and adjusted  $R^2$  value are very close to each other which shows .237 and .231 respectively. Hence, this analysis result, 23.7% of variation on entrepreneurial performance of subsistence's entrepreneurships can be explained by the factors of frugal innovations. This is to mean that the remaining 76.3 percent of variation on entrepreneurial performance can be explained by other predictors that are not covered by this research. Besides, as presented on the below Table 22, the elements of frugal innovation statistically significantly predict the entrepreneurial performance of subsistence entrepreneurships with,  $F(1, 381) = 39.485$ ,  $p < .0005$  (either indicating the regression model is a good fit of the data).

**Table 22: ANOVA; Entrepreneurial performance success**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	92.802	3	30.934	39.485	.000 <sup>b</sup>
	Residual	298.488	381	.783		
	Total	391.289	384			
a. Dependent Variable: EPS_Mean						
b. Predictors: (Constant), CL_Mean, CCFP_Mean, SCR_Mean						

**Table 23: Coefficients; Entrepreneurial performance success**

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	1.069	.260		4.115	.000
1 CCFP_Mean	.247	.061	.197	4.045	.000
SCR_Mean	.037	.059	.034	.626	.531
CL_Mean	.414	.056	.400	7.400	.000

a. Dependent Variable: Entrepreneurial performance success

As seen in the above (table 23), the regression equation established that, if taking all factors to be constant at zero, the entrepreneurial performance success of the subsistence’s entrepreneurships will be stick to 1.069. However, measuring the relative influence of CCFP & CL using the unstandardized coefficient beta in the above table of coefficient gives 24.7% and 41.4 % respectively. Both are statistically significant at 1% level of significance and 99% level of confidence interval. Thus, keeping other things constant, an average increase in the application level of frugal innovations (CCFP & CL) leads to increase the entrepreneurial performance successes of the subsistence’s entrepreneurships by about 24.7% and 41.4 % respectively. However, Furthermore, the third element of the frugal innovation (SCR) has appeared with a positive sign, its effect was not statistically significant under the regression analysis since its significance level/P\_value (.531) is greater than .05.

Generally, it can be concluded that frugal innovations not only positively affects but also highly drives the entrepreneurial performance success of the subsistence’s entrepreneurships in Addis Ababa.

## CHAPTER FIVE

### 5. Summery, Conclusion & Implication of the Findings

This chapter is initiated to summarize, draw conclusions and point to some implications from the findings related to research questions and objectives. Thus, the next section posts the summary, conclusion and implications of the findings.

#### 5.1 Summary

This part mainly summarizes the findings of the study while providing quick introduction of the main issues related to this study.

Addressing the problem of the poor in the developing nations or making up the base of the pyramid, especially the informal sector as an engine for growth is not easy. In this view, literature has been dealing with the application of frugal innovations in large companies or private-public alliance bodies and small-medium enterprises to address the need of consumers at the base of the pyramid (Hossain, 2018). Comparably, little is studied about those subsistence's level innovators (in other countries) and devoted by a few recommendations on how to develop the sector or how to make the sector serve as an engine of growth for developing countries. Yet, the reality shows this sector is where competent entrepreneurs emerge owning frugal innovation results. If it is so, what really constrained them from using and selling out of frugal innovations is inevitably a leading inquiry. This thesis is devoted to filling this gap. As has already been mentioned earlier, this study emphasizes on the analysis of factors explaining frugal innovations of the subsistence's entrepreneurships in Ethiopia, the case of Addis Ababa.

The data used for this study was based on a cross-sectional method conducted in a certain time horizon. A structured survey questionnaire method was used to collect the primary data. The general guiding objective was to see if the frugal innovation is determined by the four dimensions: entrepreneurial capability, business factors, institutional environment & actors and social ties. In the conceptual framework, about six (6) cumulated determining factors were derived from these four major dimensions while the influence of frugal innovation on the entrepreneurial performance success of the subsistence's entrepreneurships was also seen in a separate model. A multiple

regression method was used to test the effect of the study by taking the relevant assumptions in to account. Findings from regression analysis were also supported by descriptive methods. In this way, the study has addressed two important issues; analysis of the determinants of frugal innovations and measuring the relative influence of the frugal innovation elements on the entrepreneurial performance of the subsistence's entrepreneurs.

Based on the findings of this study, the entrepreneurial capability (Personality traits, competence and motivation) are the most important internal factors for this study which are measured as attitudes and resources. Thus, it is found good for exploring and exploiting the untapped business opportunities like frugal innovations since the data shows the majority (on average 72 %, 53% & 82%) of them are opportunity driven motivated, with the required competency and personal quality entrepreneurs. And this was also found the most important determinate of frugal innovations with that on average a one percent increase in the overall capability of the entrepreneur leads to an increase in applying and selling out of frugal innovations by 37 percent which is statistically significant at  $P < 0.01$ . Besides, this study analyzed two components of the business factors, i.e., firm size and firm age. Generally, the study finds that the firm size is less implausible determinant for the application of frugal innovations by the microenterprise operators while firm age is detected as influencing negatively though in small value. Hence, as it has been stated in the theory, it is evident that younger firms applies frugal innovations better, but no enough evidence is found on the smaller in size. So, policies that strive to alleviate poverty should target these firms.

While, the impact of institutional voids and environmental actors on frugal innovation was generally found significant for both. However, the result shows a negative influence of the institutional voids with that on average about 45% of the operators are facing higher pressure of the institutional voids which could be a sign of lower practicing of frugal innovations as presented in the descriptive part of this study. The regression analysis result also shows that taking all other independent variables at zero, on average a one percent increase in a pressure of the institutional voids will lead to decrease in the frugal innovation of the subsistence's entrepreneurs by 10.2 percent. In other hand, the regression analysis result of environmental support from actors were found to show a second higher determinant that could bring an increase by about 32 percent in application and usage of frugal innovations, significant at  $p < 0.01$  keeping other things constant. This suggests that although environmental actors/enablers have vested interest in improving

existence for good – enough and affordable innovations by grass root entrepreneurs, lack of it and existence of the pressure from institutional voids might have hampered the diffusion & productivity of frugal innovations in Ethiopia.

Last but not least, on the average about 71.5% of the operators perceive that the information fabricated from the weak social ties is worthy for their business growth and innovativeness. The frugal innovation regression result also revealed that the interaction effect of social network (weak tie) is significant determinant of frugal innovations. Thus, entrepreneurs positioned within the social fabric of weak ties perform about 25.1 percent higher in frugal innovations keeping other things constant. With this, all the above findings are found consistent according to the theories and the findings of the other researchers listed in chapter two.

To this end, measuring the relative influence of the frugal innovation elements using the multiple regression analysis gives coefficient of 24.7% and 41.4 % for CCFP & CL respectively. Implies, on average an overall increase in the application level of frugal innovations (CCFP & CL) leads to increase the entrepreneurial performance success of the subsistence's entrepreneurships by about 24.7% and 41.4 % respectively keeping other things in the model constant. But no enough evidence is obtained on the third element (SCR) with that, its effect is statistically significant under the regression analysis since its significance level/ P-value (.531) is greater than .05.

Generally, it can be concluded that frugal innovations not only positively affects but also highly drives the entrepreneurial performance success of the subsistence entrepreneurship in Addis Ababa.

## **5.2 Conclusion**

- ✓ The study concludes in line to Sirmon et al., (2007), a firm that “lacks idiosyncratic resources or has resource-parity” with the competition, the entrepreneur mobilizes scarce resources and develops new innovative ways to yield distinctive possibilities. Hence, the role of entrepreneurial capability of subsistence's entrepreneurships in Addis Ababa is vital for using and selling out of frugal innovations.
- ✓ This study confirms that, firm age has negative impact on the frugal innovations of the subsistence's entrepreneurships in Addis Ababa. Thus, it is evident that younger firms applies

frugal innovations better, but not enough evidence on the smaller in size. So, policies that strive to alleviate poverty in Ethiopia should target these younger firms.

- ✓ The study also highlights one of the challenges of the subsistence's entrepreneurships which reduce their effort from using and selling out frugal innovations is the higher pressure of the institutional voids poised to them from the institutional environment. Hence, this affects the frugal innovation effort of subsistence's entrepreneurships negatively.
- ✓ In line to the resource dependency theory, this research has also conclude that *favorably perceived access to environmental actors be more able to push the exploitation of frugal innovations. Yet, the support done for subsistence's entrepreneurships by the environmental actors in Addis Ababa is not up to the expected level.* This suggests that although environmental actors/enablers have vested interest in improving existence for good – enough and affordable innovations by grass root entrepreneurs, lack of it might have hampered the diffusion & productivity of frugal innovations in Ethiopia.
- ✓ The study proves also that entrepreneurs positioned within the social fabric of weak ties perform higher in frugal innovations. Hence, the social capital of weak ties is positively integrated into the application and usage of frugal innovations.
- ✓ According to the study majority of the subsistence's entrepreneurships in Addis Ababa are practicing frugal innovations. Hence, this implies that the current application states of frugal innovations by the subsistence's entrepreneurships are good, yet the term frugal innovation is not known by them at all. This is to mean that though the concept frugal innovation is new for them practically they are practicing it. Therefore, this study proved that the concept is not actively promoted or diffused to our society. So, this could be seen as a gap for future researches to be done on the diffusion of frugal innovations.
- ✓ Besides, it can be concluded that frugal innovations not only positively affects but also highly drives the entrepreneurial performance success of the subsistence's entrepreneurship in Addis Ababa.

## **5.3 Recommendation and Implications for Future Researches**

### **5.3.1 Recommendations**

Based on the findings of this study, the following recommendations are forwarded to the different stakeholders.

1. Some of the factors such as institutional voids and environmental actors require policy level advocacy. That means policy makers should take an action to reduce the pressure of institutional voids through; revising the government mandates and external pressures posed to the subsistence's entrepreneurs, (i.e., reducing the government tax and corruptions, improving infrastructures, promoting property rights, initiating the institutional linkages and accessibility of business information's).
2. Medias has to be also play a key role in promoting institutional linkages and accessibility of business information's. For instance, success story advertisings of entrepreneurs via different Medias can be a good lesson for others.
3. For building support issue from the environmental actors, government should work extensively with national & state government institutions and aids by local or foreign NGOs especially those who work on empowering the small and medium sizes enterprises. These are because remained as the life saver for subsistence's entrepreneurs i.e., providing or importing different development packages such as financial and business advise, incubation, training & development programs.
4. In order to use and sale out frugal innovations, entrepreneurs must build a set of entrepreneurial capabilities by taking relevant trainings, learning from experiences, exploiting opportunities and positively influencing their personality traits (such as their risk taking propensity, internal locos of control, self esteem and their need for achievements). Besides, they have to embed within the network of local community, so that they can get novel innovation ideas. Especially, local entrepreneurs or business partners, customers and supplies are found as a source of valuable social capitals for exploiting frugal innovations.
5. Based on the descirptive analysis result, the current application states of frugal innovations by the subsistence's entrepreneurship is found moderate. However, it cannot be said that the frugal innovations practice is as desired, so that this needs to be addressed through an intensive effort

between various stakeholders to reduce the impact of the variables and respond to the beneficiaries for the relief efforts of the operators. Hence, the collaborative effort among and with environmental actors, such as NGOs, policy makers, entrepreneurs and networks of supporting institutions is mandatory to bring the full practice of frugal innovations in Ethiopia.

### **5.3.2 Implications for Future Researches**

This study argues that graduating subsistence's entrepreneurships is difficult but interesting subject that either policy makers or scholars need to base on such knowledge. With the increasing role of the subsistence's entrepreneurships either in employment generation or contribution to the domestic economy, policy makers are currently struggling to incorporate such a significant sector into the mainstream economy. In Ethiopia for example, micro and small enterprise development agencies use various policy strategies for business development support. Such interventions would require also the knowledge of paradigms what worked in other countries is to be introduced/ graduated here for better. And this intervention need to take into account the nature and source of the success factors for subsistence's entrepreneurships which yield them to growth. So, with this view formulating a center for frugal innovations to work not for only small but even for large enterprises development packages is expected intervention. Therefore, policy makers and scholars should be alert of the paradigms what worked in other countries will also work here. However, graduating entrepreneurship factors vary from country to country, even in a given country being differ in terms of social, political and economic structures. In general, importing small enterprises development packages is expected intervention of the policy makers, scholars and practitioners.

This study argues that subsistence's entrepreneurships need to be tolerated because they are signs of the hope for the poor majority. Hence, unless designed a means to incorporate them they could be sign of failure in the other segments of the economy. The sector has growth potential. It has been found out in this study that existing pressures of the institutional voids, but little existing enabling environmental actors would have significant influence on subsistence's entrepreneurships. Thus, this would remained policy makers to revisit the current intervention strategies if weather these interventions have worked. From this side, this study could serve as an input for policy makers to pass informed decisions.

Finally, it is important to note that frugal innovations largely come out in an environment with institutional voids and full of unjusts. Therefore, according to Hossain et al., (2016) in the place of such market failure and with no support, diffusion is also a key challenge for frugal innovations. At this time, winning frugal innovations which need an insightful understanding of underserved consumers is more challenging especially for developing countries like Ethiopia. But, the application of frugal innovations by the subsistence's entrepreneurs is best understood if a multi-factor analysis, where a number of external and internal factors are taken into consideration. Consequently, this study argues exploitation of the frugal innovations need to consider various actors involved with it. Thus far, , highlighting on these inclusive and pro-poor innovations involves a collaborative effort among and with research & development bodies, industry, universities, NGOs and networks of supporting institutions. Hence, influencing frugal innovation should manifest at an attitude degree, by interventions which include providing schooling applications, sharing high-quality practices, or shaping appropriate behaviors (Soni and Krishnan, 2014). Hence, Universities, Research & Development centers, and/or policy makers need to move to build up in their efforts friendly business environment rather than working on usual routines. So that, a local frugal innovation can diffuse to country wide and so a considerable change in mindset and capability to resolve local challenges will become a culture of the society. Likewise, consideration of the different levels of innovators (subsistence's-level, small & medium-level enterprises, or large domestic companies) would help also to improve the development of appropriate policies and creating enabling business environment so as to diffuse frugal innovations to the desired level.

Besides, this study could serve as a step towards better understanding of the frugal innovations in Ethiopia. In addition, this study needs to be supported by further findings based on different perspectives. For example the study on the diffusion of frugal innovations in Ethiopia could be one perspective. This is done for the subsistence's entrepreneurs. So, this needs also to be checked if this works for small and medium enterprises. This study was also limited only to Addis Ababa. However; other studies are needed to draw conclusions on other cities/parts of the country .

## REFERENCES

- Acs, Z. (2006). How is entrepreneurship good for economic growth?. *Innovations: technology, governance, globalization*, 1(1), 97-107.
- Agarwal, Nivedita & Brem, Alexander. (2012). Frugal and reverse innovation - Literature overview and case study insights from a German MNC in India and China. 2012 18th *International Conference on Engineering, Technology and Innovation, ICE 2012 - Conference Proceedings*. 10.1109/ICE.2012.6297683.
- Ageba, G., & Amha, W. (2006). Micro and Small Enterprises (MSEs) finance in Ethiopia: empirical evidence. *Eastern Africa social science research review*, 22(1), 63-86.
- Ahuja, S., & Chan, Y. (2014). The enabling role of IT in frugal innovation.
- Alam, S. S. (2011). Entrepreneur's traits and firm innovation capability: an empirical study in Malaysia. *Asian Journal of Technology Innovation*, 19(1), 53-66.
- Altmann, P., & Engberg, R. (2016). Frugal Innovation and Knowledge Transferability: Innovation for Emerging Markets Using Home-Based R&D Western firms aiming to develop products for emerging markets may face knowledge transfer barriers that favor a home-based approach to frugal innovation. *Research-Technology Management*, 59(1), 48-55.
- Angeli, F., & Jaiswal, A. K. (2016). Business model innovation for inclusive health care delivery at the bottom of the pyramid. *Organization & Environment*, 29(4), 486-507.
- Ardichvili, A., Cardozo, R., & Ray, S. (2003). A theory of entrepreneurial opportunity identification and development. *Journal of Business venturing*, 18(1), 105-123.
- Arvanitis, S., & Stucki, T. (2012). What determines the innovation capability of firm founders?. *Industrial and Corporate Change*, 21(4), 1049-1084.
- Baregheh, A., Rowley, J., & Sambrook, S. (2009). Towards a multidisciplinary definition of innovation. *Management decision*, 47(8), 1323-1339.
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of management*, 17(1), 99-120.
- Baumol, W. J., & Strom, R. J. (2007). Entrepreneurship and economic growth. *Strategic entrepreneurship journal*, 1(3-4), 233-237.
- Bhatti, Y. A., & Ventresca, M. (2012). The emerging market for frugal innovation: fad, fashion, or fit?. *Fashion or Fit*.

- Bhatti, Y. A., & Ventresca, M. (2013). How can 'frugal innovation' be conceptualized?. Available at SSRN 2203552.
- Bhola, R., Verheul, I. I., Thurik, R. A., & Grilo, I. I. (2006). Explaining engagement levels of opportunity and necessity entrepreneurs.
- Bigsten, A., Collier, P., Dercon, S., Fafchamps, M., Gauthier, B., Gunning, J. W., & Teal, F. (2003). Credit constraints in manufacturing enterprises in Africa. *Journal of African Economies*, 12(1), 104-125.
- Bradley, S. W., McMullen, J. S., Artz, K., & Simiyu, E. M. (2012). Capital is not enough: Innovation in developing economies. *Journal of Management Studies*, 49(4), 684-717.
- Bruton, G. D., Ahlstrom, D., & Si, S. (2015). Entrepreneurship, poverty, and Asia: Moving beyond subsistence entrepreneurship. *Asia Pacific Journal of Management*, 32(1), 1-22.
- Cholez, C., Trompette, P., Vinck, D., & Reverdy, T. (2012). Bridging access to electricity through BOP markets: Between economic equations and political configurations. *Review of Policy Research*, 29(6), 713-732.
- Cohen, W. M. (2010). Fifty years of empirical studies of innovative activity and performance. In *Handbook of the Economics of Innovation* (Vol. 1, pp. 129-213). North-Holland.
- Coleman, J. S. (1988). Social capital in the creation of human capital. *American journal of sociology*, 94, S95-S120.
- CSA - Central Statistics Authority (2003) *Report on Urban Informal Sector Sample Survey (Addis Ababa)*.
- DeSoto, H. (1989). The other path.
- Edquist, C. (1999). *Innovation policy: A systemic approach*. Tema, Univ..
- Ensley, M. D., Carland, J. W., & Carland, J. C. (2000). Investigating the existence of the lead entrepreneur. *Journal of small business management*, 38(4), 59.
- Garoma, B. F. (2012). *Determinants of microenterprise success in the urban informal sector of Addis Ababa: A multidimensional analysis*.
- Gartner, W. B. (1988). "Who is an entrepreneur?" is the wrong question. *American journal of small business*, 12(4), 11-32.
- Gebreeyesus, M. (2009). Inactions and spikes of investment in Ethiopian manufacturing firms: Empirical evidence on irreversibility and non-convexities.
- George, G., McGahan, A. M., & Prabhu, J. (2012). Innovation for inclusive growth: Towards a

- theoretical framework and a research agenda. *Journal of management studies*, 49(4), 661-683.
- Gorodnichenko, Y., Svejnar, J., & Terrell, K. (2009). *Globalization and innovation in emerging markets*. The World Bank.
- Govindarajan, V., & Trimble, C. (2012). Reverse innovation: a global growth strategy that could pre-empt disruption at home. *Strategy & Leadership*, 40(5), 5-11.
- Granovetter, M. (2005). The impact of social structure on economic outcomes. *Journal of economic perspectives*, 19(1), 33-50.
- Hahn, R. (2009). The ethical rationale of business for the poor—integrating the concepts bottom of the pyramid, sustainable development, and corporate citizenship. *Journal of business ethics*, 84(3), 313-324.
- Hessels, J., & Terjesen, S. (2010). Resource dependency and institutional theory perspectives on direct and indirect export choices. *Small business economics*, 34(2), 203-220.
- Horn, C., & Brem, A. (2013). Strategic directions on innovation management—a conceptual framework. *Management research review*, 36(10), 939-954.
- Hossain, M. (2016). Frugal innovation: A systematic literature review. *Available at SSRN 2768254*.
- Hossain, M. (2018). Frugal innovation: a review and research agenda. *Journal of cleaner production*, 182, 926-936.
- Hossain, Mokter. "Mapping the frugal innovation phenomenon." *Technology in Society* 51 (2017): 199-208.
- Jennings, J. E., & Brush, C. G. (2013). Research on women entrepreneurs: challenges to (and from) the broader entrepreneurship literature?. *The Academy of Management Annals*, 7(1), 663-715.
- Jha, S. K., & Krishnan, R. T. (2013). Local innovation: The key to globalisation. *IIMB Management Review*, 25(4), 249-256.
- Karlan, D. S., & Zinman, J. (2012). List randomization for sensitive behavior: An application for measuring use of loan proceeds. *Journal of Development Economics*, 98(1), 71-75.
- Kearney, A. T., & Schneider, F. (2013). The shadow economy in Europe, 2013. *Johannes Kepler Universitat, Linz*.
- Kevane, M., & Wydick, B. (2001). Microenterprise lending to female entrepreneurs: sacrificing economic growth for poverty alleviation?. *World development*, 29(7), 1225-1236.

- Kirzner, Israel M., *Competition and Entrepreneurship* (1973). University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship. [Available at SSRN: https://ssrn.com/abstract=1496174](https://ssrn.com/abstract=1496174)
- Le Bas, C. (2016). Frugal innovation, sustainable innovation, reverse innovation: why do they look alike? Why are they different?. *Journal of Innovation Economics Management*, (3), 9-26.
- Mahr, J., & Imhof, M. (2017). Applying Frugal Innovation to Serve the Bottom of the Pyramid in Germany.
- Mair, J., & Marti, I. (2006). Social entrepreneurship research: A source of explanation, prediction, and delight. *Journal of world business*, 41(1), 36-44.
- Manceau, D., & Morand, P. (2014). A few arguments in favor of a holistic approach to innovation in economics and management. *Journal of Innovation Economics Management*, (3), 101-115.
- McMullen, J. S., Bagby, D. R., & Palich, L. E. (2008). Economic freedom and the motivation to engage in entrepreneurial action. *Entrepreneurship Theory and Practice*, 32(5), 875-895.
- McPherson, M. A., & Liedholm, C. (1996). Determinants of small and micro enterprise registration: Results from surveys in Niger and Swaziland. *World Development*, 24(3), 481-487.
- Mead, D. C., & Liedholm, C. (1998). The dynamics of micro and small enterprises in developing countries. *World development*, 26(1), 61-74.
- Moorhead, G., & Griffin, R. W. (1990). *Organizational Behavior: Managing people and organizations (5th ed.)*. Boston, MA: Houghton Mifflin.
- Nair, A., Jain, S., & Ahlstrom, D. (2015). Introduction to the Special Issue: Towards a theoretical understanding of innovation and entrepreneurship in India.
- Nari Kahle, H., Dubiel, A., Ernst, H., & Prabhu, J. (2013). The democratizing effects of frugal innovation: Implications for inclusive growth and state-building. *Journal of Indian Business Research*, 5(4), 220-234.
- Naudé, W. (2011). Entrepreneurship is not a binding constraint on growth and development in the poorest countries. *World Development*, 39(1), 33-44.
- Nichter, S., & Goldmark, L. (2009). Small firm growth in developing countries. *World development*, 37(9), 1453-1464.
- North, D. C. (1990). A transaction cost theory of politics. *Journal of theoretical politics*, 2(4),

355-367.

- Pachouri, A., & Sharma, S. (2016). Barriers to innovation in Indian small and medium-sized enterprises.
- Pansera, M., & Sarkar, S. (2016). Crafting sustainable development solutions: frugal innovations of grassroots entrepreneurs. *Sustainability*, 8(1), 51.
- Parrish, B. D. (2010). Sustainability-driven entrepreneurship: Principles of organization design. *Journal of Business Venturing*, 25(5), 510-523.
- Perry, G. E., Arias, O., Fajnzylber, P., Maloney, W. F., Mason, A., & Saavedra-Chanduvi, J. (2007). *Informality: Exit and exclusion*. The World Bank.
- Porter, M. E. (1998). *Clusters and the new economics of competition* (Vol. 76, No. 6, pp. 77-90). Boston: Harvard Business Review.
- Prabhu, J., & Jain, S. (2015). Innovation and entrepreneurship in India: Understanding jugaad. *Asia Pacific Journal of Management*, 32(4), 843-868.
- Prahalad, C. K. (2006). The innovation sandbox. *Strategy and Business*, 44, 62.
- Rauch, A., & Frese, M. (2007). Let's put the person back into entrepreneurship research: A meta-analysis on the relationship between business owners' personality traits, business creation, and success. *European Journal of work and organizational psychology*, 16(4), 353-385.
- Rosca, E., Arnold, M., & Bendul, J. C. (2017). Business models for sustainable innovation—an empirical analysis of frugal products and services. *Journal of Cleaner Production*, 162, S133-S145.
- Rossetto, D., Borini, F., Carlos Bernardes, R., & Frankwick, G. (2017). A new scale for measuring Frugal Innovation: The first stage of development of a measurement tool. In *VI Simposio Internacional de Gestão de Projetos, Inovação e Sustentabilidade-SINGEP, At São Paulo, SP, Brazil*.
- Salancik, G. R., & Pfeffer, J. (1978). A social information processing approach to job attitudes and task design. *Administrative science quarterly*, 224-253.
- Sarasvathy, S. D. (2001). Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of management Review*, 26(2), 243-263.
- Scott, W. R. (2005). Institutional theory: Contributing to a theoretical research program. *Great minds in management: The process of theory development*, 37(2005), 460-484.
- Shane, S. A. (2003). *A general theory of entrepreneurship: The individual-opportunity nexus*.

Edward Elgar Publishing.

- Shane, S., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of management review*, 25(1), 217-226.
- Shepherd, D. A., & Patzelt, H. (2011). The new field of sustainable entrepreneurship: Studying entrepreneurial action linking “what is to be sustained” with “what is to be developed”. *Entrepreneurship Theory and Practice*, 35(1), 137-163.
- Sirmon, D. G., Hitt, M. A., & Ireland, R. D. (2007). Managing firm resources in dynamic environments to create value: Looking inside the black box. *Academy of management review*, 32(1), 273-292.
- Soni, P., & T. Krishnan, R. (2014). Frugal innovation: aligning theory, practice, and public policy. *Journal of Indian Business Research*, 6(1), 29-47.
- Sood, A., & Szyf, Y. A. (2011). Productivity and technology for Asia’s growth. *Global Journal of Emerging Market Economies*, 3(3), 313-334.
- Stevens, E. B., Jason, L. A., Light, J. M., & Beers, K. (2012). Dynamic social networks in recovery homes. *American journal of community psychology*, 53(3-4), 324-334.
- Sutter, C., Bruton, G. D., & Chen, J. (2019). Entrepreneurship as a solution to extreme poverty: A review and future research directions. *Journal of Business Venturing*, 34(1), 197-214.
- Talegeta, S. (2014). Innovation and barriers to innovation: small and medium enterprises in Addis Ababa. *Journal of Small Business and Entrepreneurship Development*, 2(1), 83-106.
- Teece, D. J. (2007). Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. *Strategic management journal*, 28(13), 1319-1350.
- Tidd, J., & Bessant, J. (2014). *Strategic innovation management*. John Wiley & Sons.
- Tiwari, R., & Herstatt, C. (2012). Frugal innovations for the 'unserved' customer: An assessment of India's attractiveness as a lead Market for cost-effective products. *Technology and Innovation Management Working Paper*, (69).
- Tiwari, R., Kalogerakis, K., & Herstatt, C. (2014). Frugal innovation and analogies: some propositions for product development in emerging economies.
- Tu, C., Hwang, S. N., & Wong, J. Y. (2014). How does cooperation affect innovation in micro-enterprises?. *Management Decision*, 52(8), 1390-1409.
- Venkataraman, N., & Ramanujam, V. (1986). Measurement of business performance in strategy

- research: A comparison of approaches. *Academy of management review*, 11(4), 801-814.
- Viswanathan, M., Echambadi, R., Venugopal, S., & Sridharan, S. (2014). Subsistence entrepreneurship, value creation, and community exchange systems: A social capital explanation. *Journal of Macromarketing*, 34(2), 213-226.
- Viswanathan, M., Rosa, J. A., & Ruth, J. A. (2010). Exchanges in marketing systems: the case of subsistence consumer–merchants in Chennai, India. *Journal of marketing*, 74(3), 1-17.
- Viswanathan, m., seth, a., gau, r., & chaturvedi, a. (2007, august). Doing well by doing good: pursuing commercial success by internalizing social good in subsistence markets. In *Academy of Management Proceedings* (Vol. 2007, No. 1, pp. 1-6). Briarcliff Manor, NY 10510: Academy of Management.
- Walker, E., & Brown, A. (2004). What success factors are important to small business owners?. *International small business journal*, 22(6), 577-594.
- Wan, D., Ong, C. H., & Lee, F. (2005). Determinants of firm innovation in Singapore. *Technovation*, 25(3), 261-268.
- Webb, J. W., Ireland, R. D., & Ketchen, D. J. (2014). Toward a greater understanding of entrepreneurship and strategy in the informal economy. *Strategic Entrepreneurship Journal*, 8(1), 1-15.
- Welter, F. (2001). The distinctiveness of entrepreneurship in transition economies. *Small business economics*, 16(4), 249-262.
- Wennekers, S., Van Wennekers, A., Thurik, R., & Reynolds, P. (2005). Nascent entrepreneurship and the level of economic development. *Small business economics*, 24(3), 293-309.
- World Bank. 2017. The World Bank annual report 2017: end extreme poverty, boost shared prosperity (Vol. 2): *Management's discussion and analysis and financial statements* (FY2017) (English). Washington, D.C.: World Bank Group.
- Zeschky, M. B., Winterhalter, S., & Gassmann, O. (2014). From cost to frugal and reverse innovation: Mapping the field and implications for global competitiveness. *Research-Technology Management*, 57(4), 20-27.
- Zeschky, M., Widenmayer, B., & Gassmann, O. (2011). Frugal innovation in emerging markets. *Research-Technology Management*, 54(4), 38-45.
- <http://documents.worldbank.org/curated/en/778451507538123771/Managements-discussion-and-analysis-and-financial-statements-FY2017>

**APPENDIX**  
**Addis Ababa University**  
**College of Business and Economics**  
**Department of Management**

**Dear Sir/Madam,**

I am a postgraduate student at Addis Ababa University pursuing a Master's Degree in Management. The aim of the study is to assess the determinants of subsistence's entrepreneurship from using and selling out of frugal innovations in Ethiopia (Addis Ababa). Therefore, I hereby request your kind cooperation in filling the attached questionnaire. Your opinions shall remain confidential and will be used for academic purpose only.

Thank you for your kind cooperation.

SOCIO DEMOGRAPHIC CHARACTERSTICS

Please put a check mark (✓) on the appropriate box or table & give short answer.

1. Gender:- Male  Female
2. Your Age:- below 18  18-29  30-39  40-49  50 and above
3. Highest\_completed level of education  
No Formal Education  Grades 1-8  Grades 9—12  TVETs certificate vocational training/diploma  BA/BSc  Master & Above
4. What is it does you are doing? Textile & Garment  leather production   
Food & Beverages  Metal & Engineering  Wood work  Souvenir   
Service delivery  Electronics & Software Development  other (specify)

NOW, LET US TALK ABOUT YOUR **BUSINESS**

5. How many people work at your business, including yourself? \_\_\_\_\_
6. For how many years have you been running this business? Below 1 year  1-5 years   
6-10 years  11-15 years  16-20 years  21-25 years  above 25 years

<i>Please indicate your agreement in scale of 1-5 with the following statements. Where; -5= Strongly Agree, 4= Agree, 3= Neutral, 2= Disagree, 1= Strongly Disagree</i>		SA	A	N	DA	SDA
		5	4	3	2	1
<b><i>Entrepreneurial Capability Factors</i></b>						
7.	I started this business because I like the activity					
8.	I receive help full entrepreneurial education/training					
9.	I had enough entrepreneurial experience before I started this business					
10.	I do everything in order to reach my goal					
11.	Even if I have achieved success in my business, I want to become better					
12.	I like to compare myself with others					
13.	I am ready to take risk in my business					
14.	I like to invest in business even under risky condition					
15.	Result of my business is strongly dependent on my own effort					
16.	I am goal oriented					
17.	I am open for new and non- traditional ideas					
18.	I usually lead the implementation of new ideas, products/services and processes					
<b><i>Environmental Actors</i></b>						
19.	Government organizations assist individuals in starting their own business ventures.					
20.	Local & national governments have support for individuals starting a business venture					
21.	Non-Government organizations helps to develop new business ventures					
22.	Even after failing government assists entrepreneurs starting again					
<b><i>Social Embededdnes/ Value of Weak ties</i></b>						
23.	The advice from other local entrepreneurs/business partners is Valuable					
24.	The advice from customers is Valuable					
25.	The advice from suppliers is Valuable					
<i>Please, rate on a scale of 1-5 the sever problems you faced during operation with the following. Where;- 5= Very High, 4= High, 3= Neutral, 2= Low, 1= Very Low</i>		VH	H	N	L	VL
		5	4	3	2	1
<b><i>Institutional Voids</i></b>						
26.	Poor enforcement of commercial laws/lack of policy					
27.	Heavy government tax					
28.	Lack of up to date business information					
29.	Lack of infrastructure					
30.	Lack of property rights					
31.	Corruption					
32.	Weak institutional linkages					

<b>Please indicate your agreement in scale of 1-5 (Where; - 5= Strongly Agree, to 1= Strongly Disagree ) with the statement that In Developing/selling out of products/services I give great importance to</b>	<b>SA</b>	<b>A</b>	<b>N</b>	<b>DA</b>	<b>SDA</b>
	5	4	3	2	1

**Frugal Innovations**

33.	The core functionality of the product/service rather than additional features					
34.	Ease of use of the product/service					
35.	Durability of the product / service (that does not spoil easily)					
36.	Solutions that offer "good and cheap" products/services					
37.	Significant cost reduction in the operational process					
38.	The significant reduction of the final price of the product/service					
39.	Locally made products/processes using local knowledge & materials					
40.	Partnerships with local companies in the operational process					
41.	Efficient and effective solutions to customers' social/environmental needs					

**Entrepreneurial Performance Success**

**Please indicate your agreement to the following questions by putting a(✓)mark in the given box.**

42. Comparing your situation now with a year ago, how did the number of customers develop?

Increased Strongly  Increased Slightly  Stayed the same  Decreased Slightly   
Decreased Strongly

43. Comparing your situation now with a year ago, how did your sales develop?

Increased Strongly  Increased Slightly  Stayed the same  Decreased Slightly   
Decreased Strongly

44. To what extent have you been able to sustain your personal well-being from the business, compared to a year ago?

Increased Strongly  Increased Slightly  Stayed the same  Decreased Slightly   
Decreased Strongly

45. To what extent have you been able to sustain your family well-being from the business, compared to a year ago?

Increased Strongly  Increased Slightly  Stayed the same  Decreased Slightly   
Decreased Strongly

46. Compared to your competitors how is your level of competitiveness?

Increased Strongly  Increased Slightly  Stayed the same  Decreased Slightly   
Decreased Strongly

47. Before completing this questionnaire, had you ever heard of frugal innovation? Yes  No

