Creating Frugal Innovations in India

Challenges for Western MNCs in Frugal Innovation process

Irem Soydan
Acknowledgements

I owe thanks to many people who have contributed to this research. First and foremost, I would like to thank my supervisors Shuan SadreGhazi and Rick Middel for giving me extensive support and feedback on my work and encouraging me during a long process.

I am also grateful for the financial support from Sten A Olssons foundation that has financed the travel expenses to India for the data collection for this thesis. The empirical research would not have been possible without it.

Finally, Figen and Ahmet, thank you for your life-long support. I cannot express in words how much I love you!
Abstract

It has been long since companies started to adapt their products to the budget and preferences of emerging-market consumers. Yet today, the rapidly growing economy and market with billions of consumers in emerging markets invite companies to develop new products and create innovations special to these markets, more than just adapting their existing products to the local needs. Taking the needs of consumers in emerging economies as a starting point; using minimal resources to create affordable and functional products is called frugal innovation. However, the traditional approaches of multinational companies (MNCs) to create innovations do not work in the same way in emerging markets. India is one of these markets where MNCs face barriers creating frugal innovations due to some social, economic and organizational factors. This thesis conducts an exploratory research on innovation process in India. It draws on a literature review and additional interviews with people from diverse areas from the industry and academia in India. It aims to contribute to academia by providing insight to the frugal innovation process and by verifying its challenges for MNCs.

Keywords: Frugal Innovation, Emerging Markets, India, Frugal Engineering, MNCs
Table of Contents
Acknowledgements ........................................................................................................... 3
Abstract .............................................................................................................................. 4
1. Introduction ...................................................................................................................... 7
  1.1. Background ............................................................................................................... 7
  1.2 Purpose ...................................................................................................................... 9
  1.3. Research Question ................................................................................................. 9
  1.4 Scope ......................................................................................................................... 10
  1.5 Contribution ............................................................................................................. 10
  1.6. Outline of the thesis ............................................................................................. 10
2. Methodology .................................................................................................................. 11
  2.1. Research Approach ............................................................................................... 11
  2.2 Data Collection ...................................................................................................... 12
  2.3. Methodological Limitations .................................................................................. 12
3. Literature Review .......................................................................................................... 13
  3.1. Emerging Markets ................................................................................................. 13
      3.1.1. MNCs in Emerging Markets ........................................................................... 14
  3.2. Emerging Market Consumers ............................................................................... 15
      3.2.1. Bottom of the Pyramid ............................................................................... 16
      3.2.2. Middle Class Consumers ............................................................................ 17
  3.3. Indian Market ......................................................................................................... 17
      3.3.1 MNCs in India ............................................................................................... 19
      3.3.2. Indian Consumers ....................................................................................... 19
  3.4 Frugality and Innovation ......................................................................................... 20
      3.4.1 Frugal Engineering ....................................................................................... 20
      3.4.2 Frugal Innovation, Jugaad, Reverse Innovation .............................................. 24
      3.4.3. Frugal Innovation and Its Characteristics ..................................................... 25
      3.4.4. Barriers/Challenges to Frugal Innovation ..................................................... 27
  3.5. Theoretical Framework ......................................................................................... 31
      3.5.1. Summary of received literature .................................................................... 31
      3.5.2 Identifying challenges to Frugal Innovation .................................................. 33
4. Empirical Results and Reflections ................................................................................ 36
  4.1 Indian attraction and MNC innovation ................................................................. 36
  4.1.1. Reflections ....................................................................................................... 36
4.2. Indian Market and Consumers .................................................................................................................. 37
  4.2.1. Reflections ........................................................................................................................................... 38
4.3. Frugal Innovation ........................................................................................................................................ 38
  4.3.1. Corporate Practices of Frugal Innovation in India ................................................................................. 39
  4.3.2. Frugal Innovation Aspects and Definition .......................................................................................... 42
  4.3.3. Controversial Ideas on Frugal Innovation .......................................................................................... 43
  4.3.4 Reflections ............................................................................................................................................ 44
4.4. Challenges to Frugal Innovation .................................................................................................................. 45
  4.4.1. Structural Challenges ......................................................................................................................... 46
  4.4.2. Challenges of a Western Mindset ....................................................................................................... 47
  4.4.3. Operational Challenges ...................................................................................................................... 49
  4.4.4. Economical Challenges ...................................................................................................................... 52
  4.4.5. Social Challenges ............................................................................................................................... 54
5. Conclusion ...................................................................................................................................................... 57
  Indian Market ................................................................................................................................................ 58
  Indian Consumers ............................................................................................................................................ 58
  Frugal Innovation ......................................................................................................................................... 59
  Challenges of Frugal Innovation for MNCs ................................................................................................... 59
6. References ....................................................................................................................................................... 61
7. Appendices ...................................................................................................................................................... 63
  7.1 Interview list ............................................................................................................................................. 63
  7.2 Interview questions ................................................................................................................................... 63
1. Introduction

1.1. Background

Products and services of many global countries have been available in all parts of the world for many years. These global products could however only reach limited number of customers in certain parts of the world. In other words, the products of multinational companies (MNCs) have long remained global and served only high-income, global customers. Yet today, international companies have started to put more emphasis on the emerging markets.

Emerging markets are defined as countries that are in process of rapid growth and industrialization. These countries are in process of restructuring their economies, while at the same time offering wide opportunities of trade, technology transfers and foreign investment. The biggest emerging markets are the so-called BRIC countries; Brazil, Russia, India and China. They are expected to play important role in the global politics, future growth of world trade and global financial stability (Li, n.d.). Special report of The Economist (2011) suggests that about 70% of the world’s growth is expected to come from emerging markets over the next few years. Only the growth in India and China is expected to comprise 40% of the world’s growth. Big populations, stabilizing economic and political environment and the increasing market attractiveness of these countries justify the growth expectations.

According to Li (n.d.) emerging markets have four distinct characteristics. First is that they are regional economic powerhouses with large populations. Any economic success or failure in these countries would also affect neighboring countries. Second, many economic and political reforms are being undertaken in emerging markets and the societies are under transition. Third, they are the fastest growing economies in the world; consumers in these countries are expected to become more significant buyers of goods and services than developed countries. Lastly, they seek more power in international political, economic and social affairs. Continuous reforms are aiming to improve the weak political institutions and poor physical infrastructures in these countries, yet these under-progress conditions of emerging markets could lead to challenges for MNCs.

The notion of addressing billions of consumers in the emerging market countries has become very popular in recent decades. Many MNCs were astonished by the fact that the aggregated purchasing power of the consumers in the emerging markets represented a size of a market nearly as large as a developed market (Sehgal et al. 2010). Prahalad (2009) claimed that firms have to understand the dynamics of emerging markets as effectively participating in these markets is essential to growth in most sectors.

Getting more aware of the possibilities in the emerging markets in the recent decades, multinational companies have started to adapt their products according to the needs and requirements of the consumers in these countries. Prahalad (2009) suggested that new products and business models can be created for these markets, utilizing the constraints as sources of innovation. Given that the 70% of the world’s growth over the next few years is expected to come from emerging markets, the emerging world will undoubtedly make an increasing contribution to radical innovations (The Economist 2011). Many multinational companies are seeking future opportunities in emerging markets and shifting their focus to these countries. The number of R&D centers in emerging markets

---

1 (n.d.) refers to no date. See reference
is constantly increasing. These changes would have a significant impact on the innovation contribution of the emerging markets.

Figure 1: Growing importance of Emerging Markets, Source: Köse & Prasad (2010)

The potential in emerging markets may seem tempting, yet responding to the unique needs of the emerging markets imposes many challenges to multinational firms as innovation in such environments require them to leave the traditional practices and invest in building new resources and capabilities. Frugal innovation, sometimes referred to “reverse innovation” or “constraint based innovation”, takes place in emerging markets, addressing the needs of the value-conscious consumers with limited income by providing affordable and functional products. Frugal innovation requires more than just cutting costs or adapting existing products, but also changing business model and organizational structures (The Economist 2011).

India has been attracting multinational companies with its opportunities for frugal innovation. It already hosts 750 R&D subsidiaries of multinational companies employing over 400,000 professionals and thus becoming a serious player in the innovation space (Kumar & Puranam 2012:6). India’s rapid transition and growth holds significant promises that multinational firms cannot avoid (Iyer et al. 2006). In a country with such potential, the “frugal” type of innovation becomes more important to achieve for many multinational companies.

Frugal innovation has become very important for multinational companies in order to be successful in emerging markets. However, it is quite challenging to create frugal innovations for MNCs due to some special characteristics of emerging markets. Ray and Ray (2011) claim that the poor infrastructure, institutional weaknesses and lack of support services and skills in emerging markets may lead to unforeseen challenges and costs. Due to the sticking western perspectives, understanding the needs and requirements of the emerging market consumers and providing innovative goods and services accordingly is a challenge for international companies. Furthermore, the above mentioned weaknesses of emerging markets also create barriers for innovation in these
countries. Frugal use of resources, new combination of existing technologies and organizational practices enables companies meeting the challenge of innovation.

In the following sections of this thesis, more detailed understanding of emerging markets and consumers with a special focus on India will be presented. Frugal innovation concept will be introduced and its characteristics will be explored. Finally, the challenges of frugal innovation in India will be identified and presented.

1.2 Purpose
The purpose of this research is to define and investigate the frugal innovation process in India and observe, identify and verify the challenges for western multinational companies to create frugal products and services in India.

Having the world’s second biggest population, the projected GDP growth rate of India is at least double of developed countries. As the gap between rich and emerging economies is closing, the opportunities for long-established multinational corporations are shifting to the emerging world. Many studies (Deloitte Touche Tohmatsu 2006), (C.K. Prahalad and Hrishi Bhattacharyya 2011) have claimed that the emerging world has promising opportunities and many multinational companies are seeking growth in these economies.

Many studies (Eyring et al. 2011), (Govindarajan et al. 2012) were conducted on the characteristics of emerging markets and how to do business there. Several authors (Govindarajan & Ramamurti 2011), (Khanna et al. 2005) have stressed upon the growing importance of innovation in emerging markets. It has been presented (C.K Prahalad & Mashelkar 2010) that India has a great potential of innovation and opportunities. Studies on Indian companies and India’s innovation capabilities were conducted. However, the literature lacks research on the innovation potential of MNCs in India and the challenges of innovation they face. This scantiness of research on frugal innovation process and its challenges from a multinational company perspective deprives many companies a roadmap showing their possible challenges. Therefore, this thesis aims to satisfy the lack of research on this area by conducting an exploratory research in India. The study is conducted by many interviews with academia and multinational company managers in India who have lived through and observed the challenges of innovation. Under the light of the previous studies and the interviews, this study aims to explore and identify the challenges of frugal innovations in India from a multinational company perspective and contribute to the academia by filling this gap.

1.3. Research Question
The following research question is answered in this study in order to shed light on the possible challenges that might arise for MNCs that aim developing frugal innovations in India;

What are the challenges of Western multinationals for developing frugal innovations in India?

In order to answer the research question, three main areas are explored. First of all, a description of the characteristics of India and Indian consumers is presented. Further, the definition of frugal innovation, its aspects and the process of frugal innovation is investigated. Lastly, the challenges raised for MNCs are identified and categorized. All of these together are used to answer the main research question.
The analysis is done through a literature review and an empirical study. In order to identify the frugal innovation process and aspects, frugal engineering process and characteristics are reviewed. The benefits of frugal innovation both from MNCs and Indian society are discussed. The special characteristics of the market and consumers were also evaluated in order to understand the differences from the developed countries. Finally the challenges identified through the literature are used to compile challenges to frugal innovation for MNCs in India. The identified challenges were then grouped into five categories compared to the empirical findings and validated. Reflections are made to compare and analyze for all categories of challenges identified. The findings are then presented under conclusions.

1.4 Scope
The thesis contains findings from a field work that was supported by a travel grant from Sten A Olssons Foundation. Therefore it was partly carried out in India, in cooperation with professors at Indian Institute of Management in Bangalore (IIMB) and managers from western multinationals in Bangalore. Thus, the scope of this master thesis is limited with India and excludes the frugal innovation processes that take place in other emerging markets.

The multinational companies that are originated in India and other emerging markets, sometimes also referred as the "emerging giants" are also excluded from the analysis, due to the fact that they are familiar to the emerging market characteristics and conditions. They would not share the same challenges with western MNCs.

1.5 Contribution
This thesis aims to identify the innovation process in India and other emerging markets with similar characteristics. It gathers data to present the characteristics of the market, situation of the multinational companies in Indian market, the needs and requirements of the consumers and the specific need for frugal innovation. These pieces of information will later be used in the identification and analysis of the challenges of the frugal innovation process.

There is previous research on emerging markets, India and challenges for multinationals entering and operating in those countries, but there are very few empirical studies on frugal innovation. For example, Nirmalya Kumar and Phanish Puranam (2012) of London Business School presents their work on the innovation challenge in India and authors Vijay Govindarajan and Chris Trimble (2012) of Tuck School of Business at Dartmouth explain where, when and why frugal innovation is on the rise, however there are not many studies analyzing the barriers or challenges to frugal innovation in India from MNCs perspective. Under the light of previous studies conducted on India and Innovation, this thesis contributes to the academia by observing and verifying the challenges of frugal innovation through empirical findings. This empirical study on the frugal innovation process in India defines and presents the challenges of frugal innovation for multinational companies operating in India.

1.6. Outline of the thesis
Following the first chapter with introduction to the thesis, the second chapter describes the methodology of the exploratory research of this thesis. It describes the reasons for conducting an empirical research, the interview method and transcription and finally the development of the theoretical framework.
The second chapter describes the structure of the study and explains the methods used in the analysis. It gives an insight to the research design, data collection from the literature and the empirical study, development of the framework and how the data is used to generate results. Finally the limitations, reliability and validity of the research are discussed.

The third chapter follows by a thorough literature review of the previous research. The literature on the structure of emerging markets, MNCs in emerging markets and emerging market consumers is reviewed and further detailed for India and Indian consumers. Moreover, the literature on frugal engineering and innovation is explored and several views of frugal innovation are gathered and compared. Then the challenges of frugal innovation presented in previous studies were identified. Finally, the identified challenges are grouped in five categories in a theoretical framework and this framework is used in the rest of the thesis.

The fourth chapter consists of the presentation of empirical results followed by discussions at the end of every sub-topic. Results are presented and discussed in the same pattern with the theoretical framework; Indian market and consumers are presented, frugal innovation and processes are described and challenges of frugal innovation is identified and presented under 5-category structure. Views of different interviewees are presented in comparisons, conflicting views and consensus with literature is highlighted and discussed. The author’s own reflections are presented at the end of each sub-section.

Finally the fifth chapter contains the discussion of results and presentation of conclusions. A brief summary of the findings are made and the answer to the research question is presented.

2. Methodology

This chapter aims to present the structure of the thesis by explaining the characteristics of the study, the methods used in data collection, empirical study and the analysis. The work process is presented in detail on literature studies, interviews and the observations that are used reach the results. The methodological limitations and challenges are presented and further validity and reliability of the study are discussed.

2.1. Research Approach

This study adopted an exploratory approach due to scarcity of previous studies on frugal innovation and lack consensus on its definitions and processes. The exploratory characteristic of the research fits the purpose of this thesis; therefore a method of a desktop research followed by an empirical study is applied. In order to identify the challenges of frugal innovation from western multinationals perspective, a broad understanding of the frugal innovation concept and its processes together with special characteristics of Indian market and consumers is needed. The methodology is inductive(Bryman & Bell 2007); a theoretical framework is developed from the data collected from desktop research which then was sought in the empirical data and compared to draw conclusions.

The method used for this thesis has a qualitative strategy; which defined as putting emphasis on words instead of numbers in collection and analysis of data. It is an inductive and exploratory approach to analyze the relationship between theory and research where the theory is generated within the research (Bryman & Bell 2007). This type of research is suggested to be the best choice when identification of new theoretical statements is required, under the circumstance the researcher...
is not entirely knowledgeable about the subject (Lee 1998:38). Qualitative analysis has been most appropriate when the study is formulated to validate the theory developed from desktop research with the understanding and experience of the interviewees in the empirical study.

2.2 Data Collection

Data collection of this thesis was based on primary and secondary sources. Primary sources of information were gathered from the empirical study in India from interviews and secondary data was collected by literature studies. Information on Indian market and consumers, frugal innovation and engineering and challenges of frugal innovation process were sought during literature studies and empirical study.

In order to provide a background to the concepts previous literature on emerging markets, the target consumer group of frugal innovation; low and middle income class consumers were reviewed and presented in the initial literature review. Afterwards, literature on Indian market and consumers, frugal innovation and challenges of frugal innovation were reviewed. Data collection through literature studies were conducted though books, articles and websites. The materials used were accessed through library catalogues, academic databases, journals and internet search. Data collection through literature reviews was conducted in a period of two months. This review was used to develop a theoretical framework and initial results. The initial collection of data on the Indian market and consumers, definition and process of frugal innovation was presented. Identified challenges were then grouped into five challenge topics and presented.

An empirical study in India was also conducted to increase the reliability of the study. The empirical study took place in Bangalore, India in April-May 2012 with 3-weeks duration. The field work provided a broad observation possibility on the Indian market, consumers and culture. Furthermore, the interviewees’ experiences and views have added very valuable input for the primary data collection. The empirical study consisted of 10 interviews in person and the length of interviews had been approximately one hour per interview. 6 of the interviews were with executives and representatives of MNCs in Bangalore and 4 were academics at Indian Institute of Management Bangalore (IIMB). The variation of the occupation and positions of the interviewees provided different perspectives and provided inputs for triangulation.

Interviews were semi-structured; aimed to maximize the input while covering all the important aspects of the study. Pre-defined questions per interviewee according to the position and knowledge were prepared and sent to the interviewee in advance. Semi-structured characteristic of the interviews allowed the respondents to present subjects that were more important in their perceptions which could lead to additional questions and consequently broader aspects were covered. The interviews were recorded by a voice-recorder and transcription was conducted right after. Indian market and culture, definition of frugal innovation and its challenges were sought in the interviews and the results were compared to validate the framework proposed. Interviewees are numbered and referred as I1, I2, I3 throughout the thesis. A full list of interviewees and interview questions could be found in the appendices.

2.3. Methodological Limitations

Qualitative research has some limitations as it is dependent on views of individuals. Personal observations and evaluations of the researcher therefore play an important role for the outcome of
the study. Since the study was constructed in two parts; desktop research and empirical study, the scarcity of previous empirical studies and lack of consensus on the definitions in the literature has been limitations of the methods applied.

The triangulation on different data sources increased the reliability of the study, where different sources of data have shown repeatability and consistency. However the limited number of interviews had a negative effect on the reliability. Validity is the most important criterion of research. It evaluates whether or not an indicator that is devised to gauge a concept, really measures that concept (Bryman & Bell 2007). The sources of data, interviewees, were all very knowledgeable and experienced on the subject and they were comfortable sharing their views in their regular environments, which increases the internal validity of the study. On the other hand, the voice recording or concerns on company image may have biased some answers which may have had a negative effect on the external validity.

3. Literature Review

The theoretical study is conducted through an extensive literature review. The literature review section starts with a broader view on emerging markets and then continues with presentation of the special characteristics for Indian market, Indian consumers and MNCs in India. This sequence aims to provide an understanding of the conditions that create the need for frugal innovation. The introduction to frugal innovation therefore comes in the following sections within the literature review. In order to describe the difference between frugal engineering and frugal innovation, the definition of frugal engineering is first presented, as it plays a significant role as an input for frugal innovation. A comparison of several definitions for frugal innovation in the literature is made, in order to create a common base for the term used in the thesis. Finally, the challenges of frugal innovation for MNCs identified through the literature are presented.

All information collected through the literature review is then used to build a theoretical framework. This framework groups the challenges identified in the literature in five categories. This framework is also used in the empirical study and in the representation, comparison and validation of the empirical results in order to develop conclusions.

3.1. Emerging Markets

In recent decades, emerging world has been hosting a great growth and development in history. The emerging market countries started to become the core of new innovations with new products and services which are dramatically cheaper than their equivalents in the west. Many believe that the reinvention of business models and systems of production and distribution takes place in emerging markets which result in rapid growth of the economies (The Economist 2011), (Eyring et al. 2011).

Innovations are claimed to lead increased productivity, launch of new industries and thus also economic growth in emerging markets (Ahlstrom 2010). Rapid growth occurs even today in emerging markets, especially in China, India and Brazil. According to the Economist (2010), an unprecedented number of people have left poverty and entered the middle class in the recent years only in India and China.

Enjoying the greatest growth in history, the share of global GDP of emerging world has increased from 36% to 45% in 20 years time and it is projected to grow to 51% by 2014. Emerging market
consumers outspent the consumption by Americans and their share of global consumption continues to rise. Moreover, the expected growth of emerging markets is expected to be faster than the rich world for at least the next five years (The Economist 2011).

Emerging markets still represent the special characteristics of developing countries but, following their rapid growth and transition, their business environment is expected to be very similar to the developed countries in the next several years. Together with increasing purchasing power, expanding market size and other developing aspects, emerging markets hold significant promises that multinational firms cannot afford to ignore (Iyer et al. 2006).

Given these circumstances, some western MNCs are investing big hopes in emerging markets. Both the economic growth and the availability of high quality brain-power in these countries create high hopes on these companies. According to the Economist (2011), about 70% of the world’s growth is expected to come from emerging markets, out of 40% will be only from India and China over the next few years.

As several billion people in the emerging markets earn less than $1,500 per year, more possibilities for multinational firms exist in the lower tiers of the world’s markets. These consumers with limited income are starting to demand goods and services that were only available to wealthier people before. However, the multinational companies should not disregard the fact that the emerging markets are far more varied, complex and volatile than mature ones and they require specific adaptations for specific needs (Ahlstrom 2010).

According to Ray and Ray (2011), many cases of failures were caused by the little consideration of the different characteristics of the emerging market environments and appropriateness of product offerings. The product and service offerings for these markets should be a substitute of an existing product which is more accessible in terms of price, convenience and simplicity. Cultural differences, lack of brand loyalty, recruiting and retaining workers are some of the challenges that multinational firms that have entered these markets have faced.

To summarize, there is a huge and increasing potential in emerging markets where millions of people who shifted to middle class are now starting to demand for goods that were not available to them before. It is highly likely to succeed in these markets by offering simpler, cheaper and convenient products and services. Furthermore, this would provide not only just profits to the companies but also economic growth and employment through the innovative products they supply. Nevertheless, rapid growth and high staff turnover in the emerging markets also make them far more volatile than the mature ones, and the peripheral complexities create specific challenges in these markets to operate.

3.1.1. MNCs in Emerging Markets

Globalization has led many MNCs to take their products and services to other ends of the world. In case of emerging markets, with more value seeking consumers, globalization forced western MNCs to provide more value for money. The Economist (2012) claimed that the globalization will provide western firms more ideas to cut costs and more tools to innovate (The Economist 2012). In spite of some challenges of emerging countries, the huge potential of the market creates extraordinary opportunities. Given that millions of people are entering the middle class in the coming decades, the incentives for multinationals to innovate in emerging markets is increasing. In fact, The Economist
(2011) claimed that the combination of challenges and opportunities will result in creativity and the emerging world will make a growing contribution to breakthrough innovations.

Despite increasing globalization, differences between countries still remain and the distance matters. According to Ghemawat (2003), firms are strategically challenged to determine how much to standardize and how much to localize. Govindarajan and Ramamurti (2011) also view the global strategy of MNCs as creatively balancing economies of global scale and the advantages of local adaptation. Ghemawat (2001) claimed that most of the costs and risks of globalization result from distance barriers. He defines cultural, administrative, geographical and economic barriers as a sort of distance and argues them as challenges for MNCs.

There is no doubt that MNCs will face at least some of these distances mentioned by Ghemawat (2001) in emerging markets. Specifically, given the characteristics of Indian market and consumers, geographical, economical and administrative distances are inevitable for MNCs. As a country with a lot of variation even within its regions, India is a challenging market for MNCs.

Emerging countries have indeed many differences from developed countries. The institutional inefficiencies, poor physical infrastructure, cultural differences and many other dimensions of emerging markets create barriers to operate for MNCs. The managers of MNCs are ill-equipped to deal with such barriers, and they usually can only perform only at the market’s global tier for this reason (Palepu & Khanna 2006). The emerging markets today however, require multinationals to go down to reach more volume with low-income customers. Tse et al. (2011) suggested that the opportunities in global middle market below the top tiers worth the effort, and the executives of MNCs should change their conventional business mindsets to focus on volume and efficiency over customization. According to them; new thinking, more autonomy, financial resources and talent will bring MNCs success in emerging markets.

3.2. Emerging Market Consumers

In spite of a growing number of middle class consumers, a vast majority of people in emerging countries will still be left somewhat behind due to the historical patterns and the uneven development (Govindarajan & Trimble 2009). The growth and development in these markets will produce a set of consumers in the middle class who are eager for new products; however there will be an even larger set of consumers with lower incomes who can only afford lower cost alternatives. Even at the same time, the rising income in the middle class does not promise better demand for foreign products and demands as they may still be looking for value rather than best quality (Iyer et al 2006).

Khanna and Palepu (2006) have made an analysis of the market structure of developing countries for finished goods and raw materials. In this four-tiered pyramid structure of markets; four distinct components of a market pyramid has been identified; global, glocal, local and bottom of the pyramid.

The global tier is identified at the apex of the market pyramid. In the product market, this section is presented to contain consumers who want offerings to have the same attributes and quality of products in the developed markets. These consumers are also willing to pay the global prices for them. This global tier in the talent market also consists of top quality graduates from the best
universities in India who also demand salaries at global level. According to Palepu & Khanna (2006), MNCs in emerging markets compete for consumers and talent only in the global tier.

The second top tier in the market pyramid of emerging markets is called the Glocal Tier. This tier consists of consumers who demand customized products at global quality standards, but at less than global prices. In the talent market, this tier also contain high-quality managers who works for the local companies at a little less salary than it would be in multinational companies (Palepu & Khanna 2006).

The third tier from the top consists of consumers who are happy with local products with local features, quality and prices. The managers and employees in this tier would generally have less than world-class working conditions and they are usually paid average or higher average salaries. Consumers in this segment are considered as the lower parts of the middle class. They have limited purchasing power, but they are demanding the best quality and value products that are available to them (Palepu & Khanna 2006).

The last tier of the market pyramid, “The bottom of the pyramid” (BOP) consists of people who can afford only the least expensive products (Palepu & Khanna 2006). The consumers in this segment consist of over four billion people in the world. Some of them live on less than two dollars per day. Estimated purchasing power of the BOP markets are about five trillion dollars (C. K. Prahalad 2009). Prahalad (2009) also claimed that this is a large, untapped market, which can be the new source of breakthrough innovations if it can be converted to an organized, private sector market.

![Figure 2: Four-Tiered Structure of Markets, Source: Papepu & Khanna (2006)](image)

The main idea behind introducing these market tiers is to have a better understanding of the target consumers of frugal innovation. Frugal innovation aims to deliver products and services that are in the last two layers of the pyramid, which together would create the base of the pyramid. In the next sections below, a detailed presentation of these consumer groups will be presented.

### 3.2.1. Bottom of the Pyramid

The bottom of the pyramid corresponds to the largest but poorest consumer group in the world (C. K. Prahalad 2005). From a business point of view, it is defined as the creation of new profit-seeking
market opportunities to low-income consumers in the emerging world by aiming to contribute to the resolution of significant societal problems in these countries (Olsen & Boxenbaum 2009).

It has been suggested that there is a large, untapped market at the bottom of the pyramid where multinational firms can no longer ignore and must reconsider their offerings and change the way they do business in emerging markets. With nearly $5 trillion global purchasing power, the BOP markets to become the fundamental drivers of innovation for products and business systems (C. K. Prahalad 2009).

Prahalad & Mashelkar (2010) underline the importance of developing innovative products and services for the consumers at the bottom of the pyramid. According to them, these innovations should be developed using fewer resources and should be cheap in order to ensure accessibility for greater number of people. They name this kind of innovation “Gandhian Innovation” which will be explained and discussed as frugal innovation in the following sections.

3.2.2. Middle Class Consumers
The middle class consumers are defined as “people who are above median poverty line of their own countries”. Even though these people can be considered as poor for the western standards, they still have enough purchasing power to buy manufactured goods and services. The global middle class is consisted of consumers from countries such as; China, India, Indonesia, Mexico, Vietnam and Nigeria which have large working populations and rapid economic growth (Tse et al. 2011).

Middle class market is very complex with various buying power and demands of the middle classes in different nations. For example, consumers in developing nations seek products that have the same quality and features as in developed nations, but in lower prices. MNCs are now trying to change their business mindsets and effectively align their strategies to the needs and requirements of the consumers in emerging markets (Tse et al. 2011). Products and services developed with a frugal innovation mindset delivers only what is required from the customers and not more. This meets the value and affordability requirements of both BOP and middle class consumers in emerging markets. Examples of frugal innovation for these markets will be presented in the following sections.

3.3. Indian Market
Guillermo Wille, managing director at General Electric in India says; “The beauty of the Indian market is that it pushes you in a corner ... it demands everything in the world, but cheaper and smaller”. (Kumar & Puranam 2012:106)

Khanna et al. (2005) maps a framework of five contexts of the fastest growing emerging markets. These five contexts are; Political and social systems, openness, product markets, labor Markets and capital markets. The application of the framework for India’s political and social system is presented as a vibrant democracy in the political structure where the government is highly bureaucratic. Corruption is mentioned as an obstacle in state and local governments. The civil society in India is introduced with a dynamic press and vigilant NGOs act as checks on politicians and companies. In terms of openness of the market and the modes of entry, restrictions on investments and the necessity of acquisitions and joint ventures in some sectors is mentioned. Red tape was claimed to hinder companies in sectors where the government allow foreign investment.
The product market context was explored under three parts: the product development and intellectual property rights (IPR), supplier base and logistics, and brand perceptions and management. Some local design capability is available in India regarding product development, but IPR problems with the United States exist in some industries. There are regulatory bodies monitoring product quality and fraud. Local suppliers in India are available but their quality and dependability varies greatly. Quality of transportation is considered to be low as the roads are in poor condition and ports and airports are underdeveloped. About the brand perceptions and management of Indian consumers; it has been presented as they buy both local and global brands. Global ad agencies are also present, but not as successful as the local ad agencies (Khanna et al. 2005).

The labor and capital markets of India are also analyzed in the five contexts. The labor market in India contains a high number of English-speaking management talents from the technical and business schools. Local hires are preferred over foreign managers. The trade union movements are becoming less important in India, however it is still active and volatile; and they have strong political connections. The analysis of the capital markets in India has shown that the local banking system is well developed and they can be relied on by multinationals for their local needs. Equity is available to local and foreign entities. Venture capital is also available in some cities and from the Indian Diaspora. Accounting standards are high in India; the financial reporting is based on a common-law system and it functions well. Finally, existence of inefficient bankruptcy processes in India has been claimed as the promoters find it difficult to sell or shut down the sick enterprises (Khanna et al. 2005).

Kumar and Puranam (2012:6) analyzes the Indian market and business structure in their book “Inside India”. In their book, they present a recent study that has shown that there are 750 R&D subsidiaries of MNCs employing over 400,000 employees in India, which promises India as a new destination for innovation. The remarkable number of R&D subsidiaries of many MNCs in India also demonstrates the faith that these MNCs have in India.

According to Kumar and Puranam (2012), understanding the business and social life of India is crucial for multinationals, especially in a country that contains enormous range of constraints. In their book, they stress on the limited income levels in India. They claim that a large segment of India’s population is both demanding and budget constrained. They present the Indian consumer as the most value conscious consumer group in the world than anywhere else. According to them, the Indian consumer is more value conscious than cost. They ask “How this product will change my life?” Therefore, Kumar and Puranam (2012: 106) suggest the companies to think hard in terms of what is the value added, together with the differentiation they are bringing to the Indian marketplace.

It has been suggested that the large number of limited income consumers have allowed the emergence of new capabilities for certain kinds of innovation in India. Moreover, meeting the needs of these customers may lead to some new products and services that might eventually diffuse to the west. Finally, three main issues that India has as roadblocks to innovation and success in India were defined: the real talent pool, IP protection and venture financing (Kumar & Puranam 2012:15).

The literature on Indian market clearly points out that India is not an easy market to enter and operate for western MNCs. The country has a very different infrastructure, politics, customers and many other characteristics that don’t resemble anywhere else in the world. Some roadblocks
identified in the literature were presented in this section. The next section will focus on MNCs' perspective on emerging markets.

3.3.1 MNCs in India
Kumar & Puranam (2012:6) claimed that 750 R&D subsidiaries of MNCs employ over 400,000 employees in India. This proves that India is an attractive emerging country for trading and investor interests. Pacek and Thorniley (2004:171) claim that India's IT enclaves are excellent and India is very attractive for outsourcing activities such as shared services facilities and call centers. It also possesses excellent human resources to operate these services.

India is a difficult market for MNCs. Studies stated that many multinationals complain of strong local competition, corruption, differences between the north and the south India, low purchasing power of consumers, and strong cultural and social resistance to western brands. They name seven burdens of doing business in India: red tape, expensive and inefficient transport, inflexible labor markets, cost of borrowing, heavy sales and local taxes, corruption and cost of power and utilities (Pacek & Thorniley 2004:170).

In spite of significant challenges, India continues to be an attractive country and promises many opportunities for multinationals in the next decades. As some researchers (C. K. Prahalad 2009) have also concluded, the incentives to go down the market tiers, increasing the consumer volume and innovation is gradually increasing in India. The following sections will explore the frugal products and frugal innovation process in India developed for consumers with limited income. Given the characteristics of the market and the target consumers, the challenges for frugal innovation will be explored in more detail.

3.3.2. Indian Consumers
The majority of consumers in rural areas in India are in the BOP segment and consumers in urban areas are in lower middle class. Despite the continuous growth and developments in India, many of the consumers will continue to be in the low-income segments. The most conspicuous characteristics of Indian consumers are “budget-constrained” and “value seeking” (Kumar & Puranam 2012:106).

Managing director of AstraZeneca India, Anandh Balasundaram describes the Indian consumers; “Indian consumers are a lot more value conscious than anywhere I have seen. I think we always viewed it as being cost conscious, but I see it as value.” Indian consumers ask “How will this product change my life?”, “Do I really need it?” before spending even a little amount of money. Therefore according to him, it is very important for MNCs to add value as well as bringing differentiation to the marketplace (Kumar & Puranam 2012:106).

Krishnan (2010) presents some interesting aspects of Indian people. According to him, Indians are notoriously bad team players and they have difficulties in achieving shared goals. He also argues that Indians are sensitive to criticism and this is a challenge for them to work together. Together with these characteristics and the high levels of hierarchy and control, he argues that India has challenges to become an innovation player.

The value consciousness and budget-constraints of Indian consumers refer to the two important aspects of frugal innovation; affordability and value creation. It shows the clear need for frugal innovation in India. The following section will explore the Indian market and support this need
further. The definition of frugal innovation and its aspects from different academic sources will be presented and discussed in the latter sections.

3.4 Frugality and Innovation

The middle and BOP class consumers in India and other developing countries are the fastest-growing consumer segments in the world. It has been suggested that serving these budget-constrained consumers can lead to successful frugal engineering and innovation examples (Kumar & Puranam 2012:13).

MNCs can benefit from frugal engineering and innovation in the following way: Innovations resulting from frugal products and services can be offered in India and other emerging markets to meet the needs of customers in different segments. Moreover, same products could also be offered to the budget-constrained niche markets in developed markets and lastly these innovations can be used to simplify and improve existing products (Kumar & Puranam 2012:123).

Many (I1, I3, 2012) suggest that the incentive to innovate in emerging markets has increased, but many companies are still struggling in the process. Following sections will explore the process of frugal innovations developed for emerging market consumers in terms of the drivers, inputs and the capacity and identify the barriers for multinational companies.

3.4.1 Frugal Engineering

Development of new products has been viewed as the bloodline for growth for many companies. Innovation through product development allows companies to gain competitive advantage, attract and retain customers and strengthen ties with distribution networks. Through well-developed product development processes, companies strive to launch successful new products to satisfy specific consumer needs (Chandra & Neelankavil 2008).

When entering emerging markets, MNCs have been introducing variations of their products that proved success in developed countries. Due to the high prices and low incomes in these countries, even some of the commonly used household products have not been easily accessible to the emerging market consumers. Studies have shown that most MNCs entered foreign markets with their existing products with minor local adjustments. According to Chandra and Neelankavil (2008) the reason for MNCs to devote less attention to develop products specifically for these markets is the low marginal potential in these countries. They argue that the high cost of developing new products together with limited profit opportunities results in less time devotion for developing new products for these companies.

A study by Deloitte Touche Tohmatsu (2006) argued that the emerging markets are becoming the catalyst for new product development and innovation. It claims the long-term success of MNCs in these countries depends on developing new, targeted innovative products and not just minor local adjustments to local products. The study concludes that; understanding customer needs, product design and innovation strategies should be adapted to these markets in order to take advantage of the talent and growth potential of these rising markets.

In their book India Inside, Kumar and Puranam (2012:13) introduce a new class of innovative products that they define to be built on meta-process innovation- frugal engineering. Their definition of frugal engineering is developing products for the budget-constrained consumers in emerging
countries. A large segment of the population in these countries is both demanding and budget constrained. According to the authors (Kumar & Puranam, 2012), meeting the needs of this segment today is the key to success in these countries.

Sehgal, Dehoff and Panneer (2010) also state that frugal engineering is a “powerful and ultimately essential approach to developing products and services in emerging markets.” They claim that removing features from existing products to be able to sell products for cheaper prices in emerging markets is a losing game. In their article, they stress on the unique needs of emerging market consumers and the importance of developing new products addressing their needs. They argue that, the process of frugal engineering is more than simply cutting costs while developing products for these markets, but seeking to avoid unnecessary costs by a “clean sheet” approach to product development (Sehgal et al. 2010).

The budget constrained consumers in emerging markets could lead to emergence of new capabilities for new product development and innovation. The resulting innovation by the development of specific products and services for emerging markets is called frugal innovation; and it will be explored more in detail in the following section. A prime example of frugal engineering and innovation is given: world’s cheapest car, Tata Nano which is sold for less than 100,000 rupees (about $2500). The product was developed to meet a real domestic need in India; breaking the norm of two-wheelers carrying four passengers. The idea was to rebuild a car around a scooter; producing something carlike but revolutionary for India (Kumar & Puranam 2012:107).

The first challenge for the Nano Car was to reduce the production costs; in order to reach a minimum cost level; every element of the car was questioned and the performance of the car was radically reduced but still meeting the requirements of Indian drivers. The product later was accompanied with an innovative distribution model that further lowered the costs. The car was sold in kits to dealer-entrepreneurs and they assembled them for the buyers. According to Kumar and Puranam (2012:108), Tata Motors has proved with Nano Car that great opportunities exist to design and develop products for low-income markets. They claim that, Tata Nano is beyond innovating a new product and a new sales method, but it also adding value to the customer by offering cheap and safe transportation to millions of people who thought safe transportation was beyond their reach.

Sehgal et al. (2010) recognizes that emerging market consumers can be more demanding on products to spend their money as they don’t have much to spend. Therefore they argue that these consumers require different set of features and functions of products and consequently they claim that the ultimate goal of frugal engineering is to understand the customer and providing the essential functions they need. Thus, they stress that efforts to lowering costs should also be accompanied by customer value maximization.

Kumar and Puranam (2012:116) suggest that frugal engineering can be a distinctive paradigm of new product development and they outline a set of dimensions and capabilities as pillars of frugal engineering on which the success is measured;

Robustness: They explain robustness in product design as “the stability in the face of variations in the operating environment.” The phenomenon is explained by the huge variances in India’s operating environment. The extreme climate conditions, frequent power cuts and peak-load ratios in India create challenges for companies to achieve quality and consistency. Tetra Pak’s design for its milk
and juice-packaging machines, Nokia’s dust-proof keypad and face and Tata Nano’s ability to navigate Indian roads are crucial examples of robust product designs in India (Kumar & Puranam 2012:116).

**Portability:** Kumar and Puranam (2012:116) highlight the importance of portability in India due to poor transportation and space constraints. They believe that the products and services should be taken to the people in rural areas rather than expecting them to travel to urban centers. They claim that size and light-weighted products are becoming more desirable in India. GE’s portable ECG and ultrasound machines are great examples of miniaturization and portability. It was claimed (Govindarajan & Trimble 2009) that the ultrasound machine was a hit in rural clinics in India and China where doctors were expected to visit patients in villages and used it for simple applications. The product also pioneered the usage of product in other applications in the world where portability was critical such as emergency rooms or accident sites.

**Defeaturing:** In their book, Kumar and Puranam (2012:117) quotes the CEO of Siemens about his view on India; “These products require a different kind of innovation. What counts here is simplicity, not sophistication.” They suggest that firms should refocus features and avoid any extra features that don’t enhance the actual product very much. In this aspect, the development team of Tata Nano decided to exclude a radio in the car, not just to cut costs but also to provide more value to the customer by providing extra storage space (Sehgal et al. 2010). Godrej’s small refrigerator is a great example of robustness, defeaturing and portability. The product was developed and tested in a co-creation event with more than 600 women in India in order to fully understand the needs and create value for the targeted customers. The little refrigerator has capacity of 43 liters and weighs only 7.8 kilograms. It consists of only 20 parts without any compressor, cooling tubes or refrigerant. It uses less than half the energy of a conventional refrigerator and it can even run on a battery during the frequent electricity cuts. The product is a great size for its purpose, easy to move, reliable in power cuts and affordable (Eyring et al. 2011).

**Leapfrog Technology:** The infrastructure gaps in emerging markets could lead to creative and innovative product developments in emerging markets. Kumar and Puranam (2012) argues that products like a battery-powered, low cost refrigerator or a flour mill powered by a scooter are not to be developed by people in the west with constant access to electricity. Limited fixed-line phone infrastructure has led mobile phone industry to leapfrog over infrastructural constraints in India and has become very widespread. As a result, authors suggests that the poor infrastructure in emerging markets can lead to innovative usage of existing technologies to develop frugal products for these markets (Kumar & Puranam 2012:118).

**Megascale production:** According to Kumar and Puranam (2012:119) megascale production is another pillar of frugal engineering. The massive population of India and the other global middle class consumers can be the driver of cutting costs for companies by producing and selling in massive volumes. They give the examples for component manufacturing for the Nano Car and the mobile handsets in India to reflect the possible production scale for these products.

**Service Ecosystems:** The final pillar of frugal engineering introduced by Kumar and Puranam (2012) is efficient service ecosystems. In their book, they argue on the dilemma of reaching cost targets while selling in large volumes. Co-existence of these creates a dilemma since low cost targets require low
variability or one-size fits all mentality and selling in large volumes require products that are able to appeal to multiple segments with slightly different needs. Authors suggest that an innovative approach to use efficient service ecosystems can resolve this dilemma. According to them, these ecosystems can broaden product’s appeal by achieving low costs while highlighting product features. The case of Cummins Engine Company is given as an example for this occasion in India. The company developed a modular, low-horsepower diesel engine that could target both hospitals and farmers at the same time (Kumar & Puranam 2012:121).

In addition to the above introduced pillars of frugal engineering, Sehgal et al. (2010) also argues that frugal engineering requires organizational capabilities and innovation. They draw upon three key areas that are particularly important;

Cross-functional teams: Chances of finding new ways to lower the costs is maximized with cross-functional teams. They suggest that this has been the advantage of Tata Nano’s development team. Another successful cross-functional teamwork frugal engineering is Godrej’s refrigerator. The development team represented such radical moves that were beyond standard operating procedures in the refrigerator industry. Idea of replacing the compressor with a computer chip combined with a procurement team that found a low-cost component supplier and a manufacturing team who could handle the assembly line with chips instead of compressors in the refrigerator has together developed the outcome (Sehgal et al. 2010).

A mature, western multinational company might face difficulties with organizational agility. Mature organizations have more rigid functional silos without much coordination between functions. Moreover, these organizations tend to be optimized for their main customers, therefore a different organizational approach for emerging markets sometimes create barriers to frugal practices (Sehgal et al. 2010).

A nontraditional supply chain: According to Sehgal et al. (2010) reducing costs for frugal innovation takes more than getting better prices from suppliers, but instead treats the suppliers as an extension of the firm within a lean production approach. Frugal engineering demands high levels of cost transparency and involving the suppliers in the core product development teams. They argue that frugal engineering target costs are so tight that they are unlikely to meet the conventional requirements. Thus, they suggest that companies and suppliers to team up and work together to optimize entire cost systems.

Top-down support: Another important factor for frugal engineering is commitment from the top, together with the supplier commitment. Authors claim that the best examples of frugal engineering were pioneered by company founders. Both examples of Ratan Tata, the chairman of Tata and Anand Mahindra of Mahindra & Mahindra have proved the importance of top management commitment (Sehgal et al. 2010).

Global companies have the opportunity to develop innovative low-cost products in order to meet the needs of emerging market consumers. These products may require new ideas and capabilities, and their development can be shaped by the specific characteristics, needs or even by the gaps in the infrastructure of these countries. By understanding the customer needs, market structure and going beyond the traditional western practices, companies can achieve substantial market share and profitable growth in emerging markets (Deloitte Touche Tohmatsu 2006).
3.4.2 Frugal Innovation, Jugaad, Reverse Innovation

Recently, many articles and books on frugal innovation have started to flourish and there is no doubt that the Frugal Innovation phenomenon is becoming more important every day. The Economist (2012) confirms the important emergence of frugal innovation and presents that it will change the world in the next decades. However it also recognizes the fact that the guru’s of the subject failed on a term to describe it (The Economist 2012).

In a special report of The Economist in 2011, Frugal Innovation is simply defined as “taking the needs of poor consumers as a starting point and working backwards; creating frugal products and services that are both cheap, easy to use and serving the needs.” This article also present that this phenomenon is called as “reverse innovation”, “frugal innovation” or “constraint-based innovation” (The Economist 2011). Some other authors (C.K Prahalad & Mashelkar 2010) have even defined it as “Jugaad innovation” or “Gandhian innovation” in their own books and articles.

Before getting into details of frugal innovations, this section will explore the confusion between these terms by different people. First of all, “jugaad” is a Hindi word meaning: clever improvisation. In their article, “Innovation’s Holy Grail” Prahalad and Mashelkar (2010) challenge others who view frugal innovation phenomenon as an extension of Jugaad. According to them, jugaad is developing alternatives and improvisations to deal with scarce resources and solve complex problems. Moreover, they argue that jugaad is associated with compromising on quality. In their own definition, they prefer to name this phenomenon as “Gandhian Innovation” (C.K Prahalad & Mashelkar 2010).

Similarly, Kumar and Puranam (2012:114) argue that frugal engineering is not mere jugaad. They agree that jugaads are very creative and inventive in making fixes and finding work-arounds to overcome constraints. However, according to them; frugal engineering can achieve more with fewer resources in a systematic approach and make those constraints irrelevant or less important. In fact, they argue that the jugaad mindset should be transferred to a disciplined, frugal engineering.

Definition of “reverse innovation” by Govindarajan et al. (2012) agrees with others' views by acknowledging the importance of huge opportunities in the developing world, recognizing their difference than the developed world and stressing on the importance of their innovation needs. Differently, he argues that reverse innovations can have global impact by migrating from poor countries to rich ones (Govindarajan et al. 2012:20). In fact, reverse innovation is defined as “The case where an innovation is adopted first in poor (emerging) economies before ‘trickling up’ to rich countries” (Govindarajan & Ramamurti 2011).

After all, definitions from different authors imply the same; developing world contains lots of opportunities that companies cannot ignore, they have different needs and they need innovation. The products and services developed for the limited income consumers in these countries serve for their needs and strive to deliver more value for less. This process requires new ways of thinking, creativity and development. These product and services may lead to innovations in these countries and this overall phenomenon defined under different names, will be referred as “frugal innovation” in the rest of this thesis. The term reverse innovation will be viewed as a next step of frugal innovation, where these innovations actually trickle up from these countries to developed countries.
3.4.3. Frugal Innovation and Its Characteristics

Specific needs of emerging market consumers require specific innovations. Views of different authors on emerging market strategies have concluded that traditional strategies from developed countries do not work in the emerging markets. Many views on how to develop successful innovations in emerging markets are presented in this section.

For the companies who strive to create frugal innovations, Prahalad (2006) suggested four success factors;

1) World-class quality: The innovation must create a world-quality product or service. The idea behind is that even the consumers are budget-limited; they demand the most quality products and services they can have.

2) New price-performance levels: The innovation must achieve significant cost reduction – 90% less than the price of the product or services in the West. In order to reach the consumers with lower income levels, the prices of the products/services provided should be significantly reduced, while the performance should be kept in order to create value.

3) Scalability: It should have scalability component that is could be produced, marketed and used in different environments. Companies should ensure scalability to expand their products into similar geographies.

4) Universal Access: The product/service by the innovation should be affordable by low-income consumers in every society. The affordability aspect of frugal innovation is provided by several other authors [Ray & Kanta Ray 2011] as well.

In addition to those above, (Govindarajan et al. 2012:20) summarized the facts and trends of emerging markets as; developing world consists of huge opportunities, these countries and their needs are very different and finally; innovators win, exporters lose. Furthermore, they argue that frugal innovation begins not with inventing, but with forgetting. Western companies should let go of the conventional approaches that worked well in the developed countries. Companies should use today’s science and technology in a creative way to address the needs of developing world (Govindarajan et al. 2012:14).

In the article “First break all the rules”, The Economist shares similar views on frugal innovation. The article claims that frugal innovation is more than redesigning products but rethinking the entire business models and production processes. It argues that companies should cut costs in order to reach more customers and they should accept smaller profit margins to gain volume. The article suggests three ways to reduce costs; first is to outsource more activities; second is to use existing technologies in creative ways and the third is to apply mass production techniques (The Economist 2011).

Sehgal et al. (2010) has further views on the characteristics of frugal innovation. According to them, the ultimate goal of frugal engineering is to understand the customer and to provide the essential functions the customers need. Authors also claim that companies should thrive to follow unconventional approaches to create bottom-up innovation. In order to achieve this, it has been argued that organizational agility is necessary and there are three important areas; cross functional teams, non-traditional supply chain and top-down support.

Kumar & Puranam (2012:116) defined another set of factors for successful frugal innovation which is called “The pillars of frugal engineering” where authors claim the success on frugal products depend on eight fundamental characteristics; Robustness, portability, defeaturing, leapfrog technology,
megascale production, service ecosystems and cross-functional systems. These were presented in the frugal engineering section above (3.4.1). In their analysis, Kumar and Puranam have the most detailed approach to examine the necessary characteristics of frugal innovation, most of which are congruent with ideas of other authors. As there might be differences how different authors present the characteristics of frugal innovation, their perspectives align with each other.

Prahalad and Mashelkar (2010) believe that companies should start developing new products with fewer resources to make it accessible by more number of consumers. They define three different ways to practice frugal innovations. According to them, frugal innovations could be developed by disruption of business models, modification of organizational capabilities or creation or sourcing of new capabilities.

Prahalad (2006) suggests that companies should radically rethink their entire business models to create innovations in emerging markets. According to him, the technology choices, distribution, pricing, scale, workflow and organizational structures must be re-created. Additionally, some companies have become globally successful by new, altered business models (C.K Prahalad & Mashelkar 2010). Govindarajan et al. (2012) also agrees with this view as they claim most frugal innovations should be business-model innovations. They suggest that frugal innovations may require new processes, new partnerships or even reinvention of value chains. In their book, they present the case of Bharti Airtel Limited. The company focused on its core capabilities which were branding and accurately diagnosing customer needs. It outsourced the other necessary activities such as network installation, maintenance and service to other companies. As a result of Bharti’s innovative business model, the company dramatically lowered its costs and became capable to offer world’s lowest telecom rates (Govindarajan et al. 2012:40).

Creating and acquiring new capabilities is also another approach to create frugal innovations. According to Prahalad and Mashelkar (2010) companies can create new capabilities by technology development or collaborative approaches. A third approach to creating frugal innovations is to modify the organizational capabilities. Authors suggest that some companies have brought different technologies together, altering their capabilities in design skills and deployment of resources which resulted in innovative products and services.

Frugal innovation can also include business model innovation. Eyring et al. (2011) view business model innovation as the key to success in emerging markets. They claim; “Targeting the middle market can be lucrative, but companies won’t be able to deliver unless they start from scratch”(Eyring et al. 2011). According to them, companies cannot succeed in emerging markets by lowering prices, selling smaller sizes or using low-cost labor, materials or resources. All approaches would fail as long as their fundamental profit formulas and operating models remain unchanged. Authors claim that companies can exploit emerging markets by identifying important unsatisfied needs and devising their business models fundamentally so that they can meet these needs and requirements profitably and affordably.

The proposed path to success by Eyring et al. (2011) illustrates important aspects of frugal innovation. These can be summarized as first; identifying specific and unmet needs of the emerging markets. Second; start designing and developing products and services from scratch to meet these needs, and third; do all of these with an open mindset with a new business model created for the
market. These views on starting from scratch and addressing needs affordably are added in the theoretical framework section (3.5) as the main aspects of frugal innovation.

To summarize, frugal innovation has been defined under several names and characteristics in different studies. At the end, it can be concluded that all authors agree on the following definition; frugal products and services must serve the needs of the consumers in the emerging world in an affordable, easy to use and functional way. Some of the ideas on frugal innovation that has been presented in this section points out the methods to create frugal innovation such as creating new organizational capabilities or new business models. Some ideas on the other hand describe the aspects of frugal innovation. The significant aspects of frugal innovation identified through this section are; affordability, value creation, simplicity, starting from scratch and use of fewer resources. Not all examples of frugal innovation however contain all these aspects. These will be discussed in the empirical results and reflections section (4.3).

Despite the proposed views of methods and characteristics of frugal innovation, many companies are struggling to create frugal innovations. The next chapter will explore the literature on the barriers along the way to create successful frugal innovations from MNCs perspective.

3.4.4. Barriers/Challenges to Frugal Innovation

While stressing the growing importance and opportunities of emerging markets, many authors (Govindarajan et al. 2012:19), (Kumar & Puranam 2012:15) underline that these special markets has their own challenges to business and innovations. Although many international companies may recognize the importance of emerging markets and frugal innovations, many fail due to emerging market barriers to innovation. Several authors (C.K Prahalad 2006),(Krishnan 2010:138) have mentioned different types of barriers for local and multinational companies to innovate in emerging countries. This section is dedicated to reflect these barriers of emerging markets that are presented by the authors.

Frugal innovations do not begin with inventing, but instead with forgetting. It is claimed that traditional methods used in developed countries face tremendous challenge in emerging markets and therefore they should be left behind (Govindarajan et al. 2012:14). Glocalization is defined as the previous strategies of multinationals in emerging markets and it has been successful until now. However, glocalization strategies are not sufficient enough to serve the base of the pyramid consumers. Moreover, the structures and capabilities that served well for glocalization strategies might actually challenge the frugal innovation process. Three kinds of traps that multinationals face while striving to seize opportunities of frugal innovation in emerging markets are proposed (Govindarajan & Ramamurti 2011).

**Familiarity trap:** The trend is given that organizations favor what is familiar to them and it is a challenge for MNCs to disrupt their existing structures and to understand the needs of emerging markets. Govindarajan and Ramamurti (2011) underline that emerging market managers do not get the power and voice to develop strategies for emerging markets, therefore it becomes harder for them to understand the unique features of these markets. They claim that it is therefore very difficult for international units to identify opportunities for innovations in highly different markets.

**Competency trap:** Existing competencies in companies may become barriers to building new ones. Companies tend to exploit their existing capabilities instead of building new ones. For emerging
markets which require brand new approaches and competencies, previous competencies are therefore defined as traps. Needs of emerging markets include low-cost, good enough quality, functional and value products. This definition conflicts with previous premium product offerings and capabilities of some multinational companies. The authors also stress the issue that value products developed for emerging markets could also cannibalize the sale of premium products and brand image in their home countries (Govindarajan & Ramamurti 2011).

Complacency trap: Value products for emerging markets and premium products in developed markets require inconsistent business models. One focuses on low margin, high volume and the other focuses on high margin low volume. Given that the value products have uncertain future potential and revenues, Govindarajan and Ramamurti (2011) suggest that multinational companies may choose to invest on their scarce resources on premium products which formerly have proved to bring success.

Chandra and Neenkavil (2008) believe that multinational companies devote less attention to emerging markets due to low marginal potentials. They claim that developing new products from scratch is costly and opportunities for profit are uncertain. Given that the product development process is complex, time consuming, expensive and risky; creating new and innovative products for these markets might raise challenging issues. Authors suggest four major areas that create barriers for multinational companies in developing new products and services for emerging markets. These four areas are; price income levels, technology development issues, capital constraints and creativity.

Price-income levels: Despite the growing middle class consumers, majority of consumers in emerging markets have low-income levels and most developed country product prices are too high for them. At the same time, this situation makes it difficult multinational companies to generate profits by serving customers with low incomes. It is claimed that multinational companies have fewer incentives to create innovative products in emerging markets due to low price-income levels (Chandra & Neenkavil 2008). Same issue is also discussed by Govindarajan et al. (2012:40) where they claim that this concern of MNCs does not match with experience. Moreover, they suggest that despite the low gross margin percentages, fixed costs in emerging countries are much lower than developed countries and potential volumes are much bigger. However this issue remains as a concern in minds of the MNC managers, creating barriers to frugal innovation in emerging markets.

If the technology is the root of innovation, lack of sound technology and trained scientists in emerging markets would create a barrier to innovation in these countries. Multinational companies hesitate investing in human and financial capital to develop new technologies for new products and services in these countries. Chandra and Neenkavil (2008) also discuss capital constraints in emerging markets. Financial capital in these countries is scarce for development of products and services. MNCs usually set limited budgets for R&D due to high costs of product development and lack of capital.

In India Inside, Kumar and Puranam (2012:127) focus on three major problems in the innovation system of India. They claim that the intellectual property regime (IP), talent pipeline and the venture capital sector to be the most critical barriers to innovation in India among many other problems. According to the authors, if these pillars of innovation in India are strengthened, India shows great promises to be a globally important source of innovation in the future.
Talent Pipeline: India Inside presents that one-third of the world’s low-cost labor is supplied by India. Furthermore, India has the youngest population in the world. Although India has an abundant amount of labor, only a very small section consists of the skilled talent necessary for innovation. The authors claim that even the best educational institutions in India are understaffed and they operate at one-third level of their strength. According to them, Indian university system fails to train and furthermore they lack the capability of creating new knowledge and innovation (Kumar & Puranam 2012:127).

Lack of skilled talent affects the capability of multinational companies creating innovations in India. Authors of India Inside present an example of Astra Zeneca as head of the Indian R&D lab of Astra Zeneca, Tanjore Balganesh complains that in a brainstorming session for drug discovery, no single chemist exist among seventy-five contributors in the meeting. Even though it’s the chemists who make a drug, biologists are trying to make a drug on their own since there are not enough medicinal chemists in India (Kumar & Puranam 2012:128).

Final issue in the talent pipeline according to the authors is the lack of quality among the labor pool in India. R&D managers of many MNC subsidiaries in India have reported that only a small proportion of the graduates in their disciplines are actually employable. Therefore, the quality of skilled labor is an additional problem to the quantity shortfall, and they both affect the innovation capability of India and the multinational companies in India (Kumar & Puranam 2012:132).

Krishnan (2010) also mentions problems about the talent pool in India as barriers to innovation. He presents that Indians are sensitive to criticism and thus not very efficient in teamwork and problem-solving. Moreover, he claims that contemporary innovation and knowledge requires knowledge-based authority not the position in the hierarchy, however Indian society and organizations yet remained hierarchical. This structure of the Indian society also forced multinational companies operating in India to introduce more levels into their organizations on the contrary to their global flat-organizations. Therefore, he claims that the Indian society and culture affects the talent pool by poor teamwork, hierarchical progression, low tolerance to failure and therefore lack of confidence in innovation capabilities (Krishnan 2010:140).

Intellectual Property and Pirates: Indian intellectual property regime has denied composition of patents in many industries. This approach was taken at the when the foreign companies held most of the patents. It was feared that foreign patents would prevent domestic competition with imported items and Indian consumers would not be able to access goods at cheaper prices. This restrictive legislation has resulted in a lack of importance of Intellectual Property (IP) and its protection. The poor IP infrastructure in India creates challenges for MNCs to protect their information which results in fewer incentives to innovate in India (Kumar & Puranam 2012:139).

Kumar and Puranam (2012:139) quotes the CEO of Novartis in their book; “In principle you can discover in India, you can do research. There has been some progress on the protection of intellectual property but it’s not up to the standard that I would expect to make an investment into discovery-led research.” The authors argue that multinational companies operating in India cannot wait for improved legislation or let their secret information stolen. Therefore many multinationals in India had to develop internal IP regimes to protect their information or segment their innovative projects in a way to minimize the risk of any potential leakage.
The Economist (2011) also mentions this challenge as piracy, where multinational companies face competition by rivals that they never heard of. They also claim that branding is also challenged due to cheaper pirate products. Therefore multinationals in India still have legitimate concerns to protect their IP rights. According to Kumar and Puranam (2012) developing their own internal IP regimes leads to additional costs and may deter some multinational companies from leveraging innovation capabilities (Kumar & Puranam 2012:16).

**Venture Capital:** New entrepreneurial venture support in India is immature. Despite the emergence of new networks of investors and venture funds in the recent years, global financial community still argues that there is a big gap between the available venture capital and existing opportunities in India. Some individuals and companies try to overcome this challenge in creative ways, but it still creates an important barrier to innovation (Kumar & Puranam 2012:142).

It is also claimed the scarcity of capital in emerging countries as a barrier to innovation. Chandra & Neelankavil (2008) argue that multinational companies cannot justify investing in research and innovation in countries with difficult access to capital. Due to the high costs and scarcity of capital, MNCs in developing countries keep their budgets very limited for R&D in these countries. This situation creates a barrier to firms and entrepreneurs who aim to design new products and innovate in India.

**Western Fears:** In their book Reverse Innovation, Govindarajan et al. (2012) mention several fears that western MNCs have while considering creating reverse innovations. First of them is having too low margins to make profits. According to the authors, this concern is invalidated by experience as the fixed costs in these countries are relatively low and volumes are much higher. Moreover, they claim that reverse innovation requires redesign of the product and its cost structure which makes it comparable or better to invest in innovation in developing countries. Eyring et al (2011) supports the argument that these fears are unjust; they claim that MNCs can adapt and overcome these challenges by changing the cost structure and profit formulas and by renewing their business models. However, this fear remains as an important barrier to frugal innovation in developing countries and makes MNCs hesitate to get going (Govindarajan et al. 2012:40).

Another fear mentioned by the authors is putting existing brands at risk and cannibalize the sales of premium offerings. While admitting these risks are real, it is suggested that having multiple price points is necessary to be competitive internationally. The authors argue that the risk of being passive against other companies could cause more damage than the risk of cannibalization. In this case, another company can do the cannibalizing instead. Yet the authors have a point, fear of cannibalization still stands as a barrier to frugal innovation in emerging markets (Govindarajan et al. 2012:41).

The final fear of multinationals presented is the incompatibility of technology leadership and ultra low-cost. Some technology-driven companies fear that they cannot develop ultra-cheap products for the needs of developing countries while keeping their technology-leader positions. Therefore they refrain themselves to create frugal innovations (Govindarajan et al. 2012:41).

**Differences from the Western World:** Every characteristic in emerging markets show great variety and differences from the West. Markets are varied and volatile. Infrastructure, geography, language, religion and government have their own distinct conditions. Culture is complex and tastes are very
Kumar and Puranam (2012) mentioned Indian consumers as the world’s most value-conscious consumers. Creating the most value for the best price, especially in a country with high variation is a challenge for MNCs. The Economist (2011) presents another difference from the western world and calls the distribution system in India “dreadful”. Finding reliable suppliers is difficult. Recruiting and retaining talented labor is a big challenge. All these differences and complex characteristics of developing countries create barriers for multinational companies to develop frugal innovations.

On the other hand, these differences might lead to new ways and approaches to do business. Traditional supply chains and cost structures may be required to be reversed. In order to cope with these differences and adapting to varied needs, MNCs should start with abandoning their traditional practices. Govindarajan et al. (2012:14) claim that frugal innovation begins not with inventing, but with forgetting. Complete new approaches require open minds and this might be the biggest challenge for MNCs creating innovations in developing countries.

Several challenges for MNCs to develop frugal innovations in India were presented in the literature. These challenges will be categorized under five groups under a theoretical framework in the next section.

3.5. Theoretical Framework

The theoretical framework brings together the data collected from the literature review and proposes a model for the analysis. First section of the theoretical framework will provide a short summary of the findings from the literature review. The findings on the market and consumer characteristics of emerging markets and also the factors creating the need for frugal innovation are discussed. A visual model is then presented to explain the relationship between the market and consumer needs and frugal innovation.

Second section presents framework consisting of challenges of frugal innovation divided into 5 categories. The challenges identified in the literature review are grouped under five categories in order to make a systematic analysis based on this framework in the next chapters. The theoretical framework model of five different challenges is also presented visually on the table below.

3.5.1. Summary of received literature

A literature survey on growing middle class consumers in the emerging countries, the emergence of the need for frugal innovation, the characteristics and challenges of frugal innovation have been conducted in the previous section. Provided with a broad illustration of the structure, conditions and needs, the characteristics and challenges of frugal innovation identified by different authors were presented. This section will provide an overview of the theories presented, then develop a theoretical framework to group and assess the realized barriers to frugal innovation.

The growing potential of emerging markets and increasing importance of these markets for international companies have been stressed in different books and articles by many authors (e.g. Ahlstrom (2010), Iyer et al. (2006), Tse et al. (2011), Eyring et al. (2011) and Prahalad (2006)). Given that these markets are expected to grow even faster in the next years, the promising opportunities found in these countries cannot be ignored. Growth in their economies shifted billions of middle consumers in these countries to the middle class. These consumers have recently started to demand goods and services that they could not afford before. The middle class consumer segment in emerging markets is presented to be very complex with various buying power and customization.
needs. It has also been stressed in the literature that whether multinational companies decide to serve to the needs of these consumers or not, some other companies will.

Huge potential in the emerging markets together with globalization has attracted multinational companies to invest in developing countries. Millions of people entering the middle class have created incentives for multinational companies to innovate according to the needs. Yet operating in emerging countries comes with difficulties arising from differences between geographies, infrastructures, norms and needs. As an emerging country in this segment, India itself is defined as a difficult market for multinational companies. It has social, economic and technological constraints, infrastructural problems and highly value and cost conscious consumers. Even though India poses significant challenges for multinationals to operate and innovate, yet it continues to be an attractive and promising country for many opportunities in the next decades.

The upper-middle class consumers in India are the fastest growing consumer segment. Many authors e.g. Govindarajan et al. (2012), Kumar & Puranam (2012:13) claim that several opportunities for creativity and innovation arise from the constrained budgets and specific needs of these consumers. Social, economic and technological constraints in India, at the same time create a variety of goods or services to be offered. Many researchers e.g. Krishnan (2010), Kumar & Puranam (2012) suggest that incentives to create innovations in developing countries have increased. The MNCs can create value for themselves with budget-friendly, innovative products by spreading their products to other emerging countries, improving and simplifying existing products and targeting niche segments in the developed markets. Creating frugal innovation is one way to create value for both companies and consumers in emerging markets. The figure below shows the relationship between frugal innovation and factors creating the need for it.

![Figure 3: Factors creating the base for Frugal Innovation. Source: Author](image)

The cost-effective, functional and creative products and services that are designed and produced for emerging market consumers are defined as frugal products and services through frugal engineering. Frugal innovation is created through the creative and different ways of production, redesigned cost structures and supply chains in the business process. Successful commercialization of these frugal products and of its effect on the consumers differ frugal innovation from just frugal engineering. Govindarajan et al. (2012:14) stresses that frugal innovation starts with re-thinking of every aspect in
the business from scratch. Furthermore, addressing needs with affordable prices is considered as one of the key aspects of frugal innovation by many authors e.g. Kumar & Puranam (2012), Govindarajan et al. (2012). They also agree that frugal products and services share some common characteristics as affordability, ease-of-use, robustness and portability. It has been argued (Sehgal et al. 2010) that top-down support, untraditional supply chains and cross-functional teams are important inputs to companies while creating frugal innovations. Another aspect of frugal innovation is developing more products and services with fewer resources (C.K Prahalad & Mashelkar 2010). Finally, all these efforts to create simple, affordable products from scratch in India and other emerging markets aim to create value for customers and companies. The aspects constituting frugal innovation gathered from the literature review are shown in the figure below;

![Frugal innovation aspects presented in the literature. Source: Author](image)

Even though many international companies recognize the importance and the potential of emerging markets, a lot of them still struggle in the process of creating and managing innovations for these markets. Most business models and approaches that brought success previously in developed countries did not work in India and other emerging markets, and therefore brand new ideas and approaches were needed. Besides the perception of multinational companies, there were additional challenges that have risen from the structure and characteristics of these countries. Several ideas and views on challenges and barriers preventing MNCs creating innovations have been presented in the literature review section (3.4.4.). The following section will develop a framework to categorize and group the challenges presented in the literature. This framework is also used in the next sections to evaluate the empirical results and present conclusions.

### 3.5.2 Identifying challenges to Frugal Innovation

The previous chapter presented some challenges that have been identified in previous research. This section is dedicated to present and classify the challenges of frugal innovation presented in the academic literature. The barriers presented in the literature were grouped into five main categories. The theoretical framework consists of following five categories; Structural Challenges, Challenges of Western Mindset, Operational Challenges, Economical Challenges and Social Challenges. The first category, Structural challenges covers the challenges raised due to the Indian country characteristics and structure. Challenges of Western mindset focus on the challenges raised by the western perspective of multinational companies. Operational challenges evaluate the challenges raised in the supply chain and the operating process. Economical challenges cover the barriers related to financial
issues. Finally the Social Challenges focuses on the barriers that raise due to Indian consumers and their behaviors.

<table>
<thead>
<tr>
<th>Structural Challenges</th>
<th>Western Mindset Challenges</th>
<th>Operational Challenges</th>
<th>Economical Challenges</th>
<th>Social Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor infrastructure</td>
<td>Understanding hidden needs</td>
<td>Complacency trap</td>
<td>Venture capital</td>
<td>Nuanced consumer needs</td>
</tr>
<tr>
<td>Tax system</td>
<td>Western norms</td>
<td>Human capital</td>
<td>Cutting costs</td>
<td>Hierarchical progression of society</td>
</tr>
<tr>
<td>Unreliable policymaking</td>
<td>Local adaptation</td>
<td>Unreliable local partners</td>
<td>Price sensitive consumers</td>
<td>Value-oriented consumers</td>
</tr>
<tr>
<td>Weak IP protection</td>
<td>Concerns on brand image</td>
<td>Lack of proficient suppliers</td>
<td>Operation expenses</td>
<td>Variations in society</td>
</tr>
<tr>
<td>Institutional weaknesses</td>
<td>Low margins for profitability</td>
<td>Weak distribution networks</td>
<td></td>
<td>Poor teamwork, scarcity of input for innovation</td>
</tr>
<tr>
<td>Corruption</td>
<td>Familiarity trap</td>
<td>Inefficient transportation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pirates</td>
<td>High tech / low cost incompatibility</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Theoretical framework for frugal innovation challenges. Source: Author

The table above shows the five categories of frugal innovation challenges for MNCs. The data collected on challenges from the literature review is shown in respective columns. All challenges compiled from the literature review are described in detail in the section below.

3.5.2.1 Structural Challenges
Poor physical infrastructure, institutional weaknesses, lack of support services and skills have been claimed to cause unforeseen challenges and costs in the literature. Red-tape, weak political institutions, corruption, weak protection of IP rights and piracy were also mentioned to create burdens of doing business in India. Palepu & Khanna (2006) claimed that managers of multinational companies are ill-equipped to deal with these challenges. These structural challenges provided in the previous literature may lead to fewer incentives for multinational companies to innovate in India and become barriers to frugal innovation.

3.5.2.2 Challenges of Western Mindset
Govindarajan et al. (2012:14), argues that frugal innovation and emerging market success requires abandoning of traditional practices. Some western perspectives and norms may create difficulties in understanding hidden needs of Indian consumers. Developed country perspectives of multinational firms may also hinder their adaptation to local cultures and requirements. The familiarity trap, introduced in the previous literature presents that organizations favor practices that are familiar to them, which creates challenge and barriers for multinational companies that want success in the emerging world. Their perceptions may hinder disrupting their existing structures and understand hidden needs. These western perceptions may also create fears that also hinder frugal innovation.
Some of these fears were presented in the literature as; cannibalizing current products, having low margins to make profits, brand image and incompatibility technology leadership.

3.5.2.3. Operational Challenges
Successful frugal innovations require non-traditional supply chains, re-invented business models and organizational structures. More effective supply chains for frugal innovation requires better integration with suppliers and distributors. Most multinational companies face challenges finding high quality and reliable suppliers. Moreover, due to inefficient and expensive transportation companies are required to set up their own distribution systems. Therefore, current structure of the operational infrastructure in India does not offer effective local partnerships, which causes operational challenges to frugal innovation. Furthermore lack of skilled talent and the lack of quality among the labor pool are also mentioned in the literature (Kumar & Puranam 2012:132). It is claimed that the ones that are employable are very hard to retain. The competency and complacency traps mentioned in the literature also create operational barriers as the companies face difficulties developing new capabilities and changing their business models.

3.5.2.4. Economical Challenges
Using fewer resources and cutting costs to deliver quality, functional but cheaper products is the norm of frugal innovation. This however sometimes can be difficult for mature multinational companies whose practices could hardly be changed. Furthermore, low-cost combined with quality is a challenge in this very price-sensitive environment. Given that most of the Indian consumers have very limited incomes and they are very value conscious, price of a functional product play an important role. Cost-cutting within the firms can sometimes create challenges to frugal innovations. The declining cost advantage of India also a negative factor while trying to cut costs (I1, 2012). Lack of venture capital is also mentioned in the literature as an economical challenge to frugal innovation as companies cannot justify investing in research in innovation in India where it is difficult to access capital.

3.5.2.5. Social Challenges
Challenges of frugal innovation caused by the behavioral structure of the Indian society are covered in this category. It has been mentioned that India is varied in culture, religion, language, food and habits. This variations result in nuanced consumer needs and behaviors. The different priority and expectations of products and services at different regions and value seeking behavior of Indian consumers are creating challenges (Kumar & Puranam 2012:118). An interviewee (I1,2012) mentioned a negative attitude towards foreigners and strong social and cultural resistance to western brands. Furthermore, he also mentioned the hierarchical structure of the Indian society which made some multinational companies to introduce more levels in their organizations in India. Adapting to the nuanced needs of consumers and fighting with the prejudice against western products are challenges for multinational companies. Finally, Indian employees were presented as having no tolerance to failure, sensitive to criticism and poor in teamwork, which creates challenges for cross-functional teams which are crucial for frugal innovation (Krishnan 2010:140). These characteristics of Indian consumers therefore create social challenges to frugal innovation.
4. Empirical Results and Reflections

Empirical results collected from the interviews in India are presented in this chapter. Data collected from the interviews are grouped into categories to present the view on emerging markets, frugal innovation and the challenges in parallel to the literature review. During the interviews, the definition of frugal innovation was questioned and the validity of challenges identified in the literature was explored. Based on the views and experiences of the interviewees, the aspects of frugal innovation are validated, some of the identified challenges were verified and some other challenges were added.

4.1 Indian attraction and MNC innovation

The large market size and the growing economy of India makes many multinational companies feel the need to be India and make long term investments here (I8, 2012). They see India as a land of opportunities to address a mass market and they even take their research and development centers to India. Aligned with the authors who have written about India’s potential and opportunities, an Indian professor (I3, 2012) adds; “India is definitely growing much faster than before, but people in India are not satisfied since it could grow even faster... If it were not obstacles in the way then the potential for growth would be even better... In spite of the growth, the potential is much more than that” (I3, 2012).

One should still remember that there are still about 600 million people who consume less than 20 rupees per day in India, which equals to more than half of the population. The hope is that Indian economy will continue to do well in the next five–ten years, so that the inequalities will be reduced. Then these millions of consumers will be able to demand more products and services such as clothes, watches and detergents, and this is a big incentive for multinationals. However none of these will happen in the short term. Any MNC coming to India with short term goals will not succeed. Long term investments are more likely to succeed (I8, 2012).

Some multinationals on the other hand might choose to address and benefit from the current requirements raised due to the weak infrastructures in India. Understanding the needs, developing simple and functional solutions within the affordable price limits would also make short-term profits as well as helping to leverage the current situation in India. However, long-term sustainable success in India requires broad understanding of the market and the consumers and making accurate decisions of the development path of the market. According to one of the interviewees (I3, 2012), MNCs have an advantage of knowledge, experience and enough resources to attract right talent in India. Together with their efficient training systems, they have good potential to succeed.

4.1.1. Reflections

The increasing incentives for MNCs to operate in India have been viewed both in the literature and the empirical study. It has been stated in the literature that there are 20,000 MNCs operating in emerging markets and they expect 70% of their growth there (Eyring et al. 2011). The proposed literature views and the empirical study show that MNCs have both advantages and disadvantages in emerging markets. Prior knowledge and experience, financial resources and strong establishments of MNCs were viewed as crucial advantages of multinationals to invest in and attract talent in emerging markets. At the same time, the unfamiliar conditions and poor infrastructure of these markets might incur some disadvantages.
Despite the stunning potential of India, an interviewee (I1, 2012) reminded that there are millions of poor in India and poverty cannot be escaped. While entering India and aiming high, MNCs should consider the target consumers and evaluate well what they can offer and how they can benefit from it. To be discussed in the following chapters, the ultimate goal of frugal innovation is to create value for both sides. As some interviewees (I1, I3, 2012) argued, MNCs can invest in India and create innovations there which would also help improving the weak infrastructure in India and leverage the country. While targeting the urgent needs with fast solutions may bring short term success and profits, long-term investments in India are likely to bring sustainable success given the future growth projections of India.

4.2. Indian Market and Consumers

More than half of the population in India lives in very limited income conditions which result in very price sensitive consumer behavior. The interviews conducted with managers of MNCs and academicians at Indian universities verify the characteristics of Indian consumers as presented in the literature. In fact, an interviewee from an MNC in India reveals the phenomenon in these words; “Every market is price sensitive, but India is double price sensitive” (I5, 2012). Moreover, Indian consumer would not pay any extra for any additional features. Good enough solution with the best price is always preferred (I5, 2012). Majority of the consumer groups in India are considered as savings oriented, not consumption (I1, 2012).

Most of the consumers in India think twice before spending their money on a product or service. They think how long and how many times they can use the product or the service and how much value it brings to their lives. They are very value conscious; according to one interviewee, if an Indian consumer feels that he is being fooled or if the product does not worth his money, he will never buy that brand again (I3, 2012). They seek the best quality and value at the best price, which makes it hard for MNCs to get the right price-value balance. Another interviewee notes; nothing is wasted in India. Everything is repaired and re-used until it cannot be used anymore (I9, 2012). Therefore, the durability and reliability of products bring value to Indian customer.

An additional aspect of Indian consumers was added during the interviews. According to one interviewee, Indian consumers prefer human interaction in their transactions (I1, 2012). For example; Indian customers are reluctant to book online trips, tickets or make bank transactions and the culture is very paper, stamp and signature oriented. An expatriate manager of an MNC has also observed this aspect of Indian society and culture (I7, 2012). This phenomenon can be considered as unexpected given that India contains world’s largest IT centers and research facilities. The majority of the society yet remains paper oriented and seeks human interaction.

Some interviewees (I3, I9, 2012) from academia argued that frugality may not long last in India. Consumers are becoming more brand-conscious and demanding. Middle class consumers living in big cities do not experience scarcity anymore and they don’t think twice before spending 2000 rupees for a dinner. A product with a foreign tag attached or endorsed by a celebrity makes it a good brand (I3, 2012). This phenomenon is noted by another interviewee (I9, 2012), commenting that there is much higher consumption in India now. However this increased consumption and brand awareness is only happening in urban India where middle and upper class live. The rural areas still face the scarcity of resources.
4.2.1. Reflections
The common conclusion of the literature and the empirical study is that Indian market is very challenging. Kumar & Puranam (2012) quoted Guillermo Wille, the managing director of GE in India, claiming that Indian market demands everything in the world in a cheaper and smaller context and this creates the difficulty of the market (Kumar & Puranam 2012:106). Authors also presented that most Indian consumers are budget constrained and more value-conscious than anywhere else in the world. Both the literature on Indian market and consumers and the empirical data agrees on the different characteristics of Indian consumers than the west in terms of limited income and high value expectations. An interviewee (I5, 2012) also argued that a good enough solution with the best price will always be preferred in India. Even the middle class consumers who can afford more products and services would be more value conscious in India. These two characteristics of Indian consumers make it even more important to address their needs at the right price.

The literature mostly focuses on the limited income conditions and value consciousness of Indian consumers and the variations in the Indian market. The empirical study results agrees and supports the arguments presented in the literature and adds even more dimensions and views about the Indian market and consumers. Views of some interviewees (I3, I9, 2012) have shown that the Indian market is very nuanced between the north and the south; urban and rural. Higher income consumers at the urban centers have started to demand products that are labeled with brands and advertised by celebrities. This consumer group is more open and demanding to western products and services as they can pay for more features and higher quality. The interviewees (I3, I9, 2012) have claimed that the younger population in India are shifting into these characteristics and it is about to spread even more as India continues to grow and develop. Some (I3, 2012) have even claimed that frugality may not be a need in India in the future. Nevertheless, it is clear that there are big differences in consumer needs and characteristics in India due to regions, tastes and incomes. These differences were told to create some confusion for MNCs when deciding which group is to be targeted (I5, 2012).

Two additional characteristics of Indian consumers; the human interaction requirement and no-waste approach, were identified during the interviews. Furthermore, the empirical study has shown that the characteristics of Indian market and preferences of Indian consumers are changing as India keeps on growing. Some interviewees argued that Indian consumers in urban centers are becoming less price-sensitive and more brand conscious and they claimed that the frugality characteristic of Indian consumers is disappearing. This claim however, currently is only applicable partly at the urban centers of India and the rest majority of consumers are still in need of frugal products and services. Most important factor for companies when serving Indian market and consumers is to keep in mind that India is continuously transforming and a lot more change is to come. The characteristics, needs, demands and preferences of the Indian consumers will also change. Therefore, long-term success in serving Indian consumers requires careful tracking of the needs, trends of the market and the development of the country.

4.3. Frugal Innovation
All interviewees were asked to provide a definition of frugal innovation in order to make a sound definition of frugal innovation aligned with the previous literature. Furthermore, interviewees were asked to give examples of frugal innovation. Some of them had controversial ideas to frugal innovation, some of them stressed on different aspects of frugal innovation. This section presents
the ideas claimed, and collects different aspects of frugal innovation and their examples, ultimately provides an own definition of frugal innovation.

4.3.1. Corporate Practices of Frugal Innovation in India

Some examples of frugal innovation were given in the literature review section (3.4). This section here will elaborate more on the specific examples and also present the views on these examples from the empirical study. Examples of different products, service or business models that took place by corporations in India will be given.

All cases are considered as innovations with great impact on the needs of the Indian consumer; however empirical views differ on their frugality. These cases will be discussed and they will be used to develop the aspects of frugal innovation.

**Tata Nano Car**

Given the characteristics of the Indian market, Kumar & Puranam (2012:108) claim that India’s budget constraint consumers allow the emergence of capabilities for a certain kind of innovation in India and they see the launch of Tata Motor’s Nano car as a prime example to this innovation.

Tata’s Nano Car was launched in 2009 at a price of less than 100.000 rupees (about US $2000). The case of the Nano Car is a response to a domestic need. Two-wheelers with 4 passengers are a common but unsafe mode of transportation in India. Nano Car provides safer and at the same time affordable form of transportation for those who thought safe transportation was beyond their reach (Kumar & Puranam 2012:108).

The production costs of the car were drastically reduced by radically decreasing the car’s performance. Every element of the car was questioned and everything that was extra was removed from car’s features. Additionally, Tata developed an innovative distribution model to cut the overall costs further. The car was sold in kits to dealer-entrepreneurs who later assembled the cars when they were sold (Kumar & Puranam 2012:108).

During the interviews, one of the interviewee (I1, 2012) argued that the Nano car was not a successful frugal innovation since it was not diffused to other emerging markets. The reason behind this view is that the Nano car could not reach many consumers to leverage their conditions even though it was intended to address a domestic need. Another interviewee also argued that cheap products differ from innovation (I9, 2012). He concluded that the car is functional and affordable, but minimizing the resources used in the car is also very important in frugal innovation. As presented above, there was a massive de-featuring to cut costs of the Nano car. However, the input and the resources put by the engineers to develop it may not be at the minimum. Yet, it is controversial if a product or service innovation should be considered as frugal if the development was not made by minimum resources. One can still conclude that the Nano Car presents a good example of a frugal innovation by its main aspects.

**Godrej's refrigerator**

Godrej's refrigerator example is presented by Eyring et al. (2011). In order to understand the needs of the target consumers, Godrej designed and built a portable refrigerator from scratch and tested it in the field with consumers. The items such as compressor, cooling tubes or refrigerant that are found in a conventional refrigerator were removed and the product consisted of only 20 parts. It can
run on battery during power cuts and it uses less than half of the energy of a regular refrigerator (Eyring et al. 2011). In addition, Sehgal et al. (2010) presents that the refrigerator provides 6 liters capacity at a price of $55. According to the authors, Godrej successfully determines consumer needs by actually spending time watching them at their homes.

With its portable cooler, Godrej offers great value to the customers who move very frequently. The product is also reliable during the common electricity outages. Aiming to adjust the product to the specific needs of the consumers’ environment, Godrej re-designed a conventional refrigerator based on new technology and at an affordable price. Furthermore, the company management regarded the product as a new product category with the potential to sell at many income levels. In addition to the low-income level consumers, the company targeted the small shop owners, offices and manufacturing sites at the middle income level and car, boat owners at the high-income level to increase their penetration rate (Eyring et al. 2011). Godrej’s approach is a good example of frugal innovation as product and business model innovation. It creates mutual value by effectively addressing the needs of the consumers and intelligently defeating the extra parts of the product while increasing the penetration of the product by cleverly targeting potential consumers at different segments.

**Nokia’s cell phones**

Nokia uses ethnographic techniques to understand the way people use mobile phones in emerging markets, where mobile phones play an important role in people’s lives. To address the needs in rural areas in India, Nokia’s handsets are designed with flashlights (due to the frequent power outages), multiple address books for several users since different people in a family share a handset (The Economist 2011). Moreover Nokia built the phones with a nonslip silicon coating on its keypad and sides since intense humidity made the phones slick and hard to hold or dial. The handset is also equipped to resist damage from dust in arid climates. Besides these required features, the phones are simple and they can work longer between charges. Authors claim that these simple phones at price of $15-$20 are Nokia’s best-selling mobile phones ever (Sehgal et al. 2010).

Nokia brings value to emerging market consumers by providing affordable and functional mobile phones addressing the specific needs of the environment. Understanding and addressing the needs of the consumers is an important aspect of frugal innovation. Nokia uses minimum of its existing mobile phone technology, adding special features at an affordable price. In this sense, Nokia’s cell phones creates a frugal innovation by providing value to the consumers while reaching best selling numbers for Nokia.

One of the interviewees (I9, 2012) however was not convinced with the scarce use of resources while developing these products. Another interviewee (I8, 2012) argued that these mobile phones do not target the poorest. These arguments create a controversial situation on the definition of frugal innovation.

**Aravind Eye Hospital**

“If you can’t pay them you don’t have to. If you can’t come to them they will come to you. Each year they bring light to millions of lives. Their services are world-class, but the spirit that drives them is one of a kind...” (Krishnan, 2004)
Aravind Eye Hospital is the world’s largest provider of cataract surgery. It was founded by a dedicated doctor, Govindappa Venkataswamy in 1976 as an eye clinic with 11 beds in a country with 12 million blind people (Krishnan, 2004). In years this clinic has become the world’s largest provider of cataract surgery. The hospital has performed 240,000 surgeries in 2004 and treated 1.6 million patients. Dr. Ventakaswamy said that his goal is to “wipe out needless blindness” (C.K Prahalad 2006).

Aravind treats 60 percent of its patients free yet it continues to operate profitably. The hospital organizes around 1400 one-day eye camps per year in rural areas and villages in south India to reach patients that doesn’t have resources to travel to the hospital. Doctors at Aravind screens the patients at the camp to identify the patients that need for surgery and these patients then are taken to the hospital accompanying with a relative, totally free of charge. Patients are also provided food and lodging near the hospital and nobody is denied access to care (Krishnan, 2004).

Aravind manages this by process innovation. At Aravind, the surgeon moves from one operating table to another to speed up the process while teams of two nurse-practitioners remain with the patient and continue the process where surgeon is not necessarily needed. Prahalad (2006) claimed that the process design is critical where the total task has been disaggregated and each member of the team knows what to do. Furthermore, Aravind produces its own intraocular lenses for the cataract surgery at $3 each. If imported, same lens costs $60 to $100. By producing its own lenses, Aravind cuts its costs dramatically.

According to an interviewee (I9, 2012), the case of Aravind Eye Hospital is an example of pure frugal innovation. It uses very scarce resources, develops a creative workflow, produces its own lenses and provides a fundamental service for free in a country with millions of curable blinds. Another interviewee (I8, 2012) shares the same opinion that Aravind is a good example of a service frugal innovation. He sees the cataract operation as a service, cleverly broken into parallel operations to increase efficiency.

**Unilever’s 1 rupee shampoo and sachet detergents**

Unilever sells shampoo and washing powder in small sachets in India. Most consumers in India cannot afford to buy big packages as in developed countries. Therefore Unilever developed a 1-rupee sachet of shampoo and detergents. Moreover, the company has teamed up with local NGOs and hired individual entrepreneurs to educate people on personal hygiene. This education practice has reached 130 million people and also helped the company to create a market for its products and generated a bond of trust with potential customers (The Economist 2011).

Under discussion, one of the interviewees (I9, 2012) claimed that this case does not reflect frugal innovation and it is just a packaging innovation. Contrarily, one can claim that Unilever developed a frugal innovation by observing and analyzing the market needs and consumer behavior, made a small but necessary change in the packaging. As a result the company created its own market within a population with great potential while creating value to millions of consumers by hygiene education practices.

**GE Healthcare’s Ultrasound and ECG machines**

GE Healthcare has developed a hand-held electrocardiogram (ECG) which is viewed as a masterpiece of simplification by the Economist (2011). The conventional ECG with multiple buttons has been reduced to four and the whole machine is miniaturized into a backpack size. Its bulky printer has
been replaced by portable ticket machine gadgets and batteries have been added. The new, compressed device costs $800 instead of $2000 of a typical ECG. This operation has also lowered the cost of an ECG test to $1 per patient (The Economist 2011).

GE also developed a cheap, portable ultrasound machine that could be used with a laptop computer with sophisticated software. This new machine was sold for $15000 which was less than 15 percent of the conventional ultrasound machine. Although the performance of the machine is not as high as a typical machine, it is good enough to be used in simple applications in rural clinics. The machine was also simple and easy to use for the doctors. The device has also been used in the emergency rooms in the United States, thus it has been also viewed as a reverse innovation case (Govindarajan & Trimble 2009).

Developing these two devices, GE did not just try to adapt its existing devices by simply scale down or remove features. According to Govindarajan & Trimble (2009) there was no way to de-feature existing large and expensive high-end devices. The company developed new, revolutionary products from scratch targeting the needs of the emerging markets and offered them in affordable prices. The functionalities were also included that the devices were portable and very easy to use. Given these arguments, this case can be considered as an example of frugal engineering and innovation. During the field work, some interviewees (I1, I3, 2012) did not agree that GE Healthcare’s devices were developed from scratch but argued that these products were scale-down versions of their existing products which do not match the definition of frugal innovation.

4.3.2. Frugal Innovation Aspects and Definition

According to an interviewee (I3, 2012), Indians have been overcoming the obstacles with self-reliance and clever improvisations until now, but the country needs to transform into systematic innovation for sustainable growth. He claims that the Indian way, Jugaad (clever improvisation) is based on individual ingenuity, it is not scalable and it lacks scientific knowledge. Therefore, a systematic approach is needed. Frugal innovation is one of the ways to contribute to the Indian society in a systematic way. The necessary aspects according to the views of interviews are presented below.

An underlined aspect of frugal innovation is that it should be driven by cost reduction (I3, 2012). However, it is also stressed that innovating at low cost is not a new thing. It is important to improve the efficiency and productivity while reducing costs. An interviewee (I3, 2012) stressed the further, unnecessary functionality of some devices. For example; very high-tech medical devices or a billion dollar scanner that we don’t even know what some functions stand for, provide further functionality than needed. As presented in the previous section, many people in India have grown up in a very scarce resource environment and they do not need fancy sophisticated products. In fact, a good enough solution providing the greatest value at the best price is favored. Therefore, accurate and simpler products that are functional and easy to use create the base of frugal innovation in India.

According to another interviewee (I8, 2012), the affordability of the product or service provided is very important to the targeted consumer. Naturally, targeted consumer group also requires cutting the production costs. The reflection of affordability and simplicity aspects of frugal innovation is presented by an interviewee as follows; “Simpler products that are easy to operate and use, would remove the requirement of a skilled technician. In addition to cutting the production costs, this
decreases the overall cost of using the product when you don’t need a technician...Costs come down substantially” (I3, 2012).

Designing and developing products and services from scratch for the specific needs of the emerging markets was presented as another aspect of frugal innovation by one of the interviewees. A scale-down version of existing products by taking away some features would not create a real frugal product (I3, 2012). One of the interviewees defined frugal innovation as; “innovation that uses frugal resources” (I9, 2012). This view claims that the innovation should not be called frugal if the company spends a lot of resources to develop a frugal product or service. An example to this is Aravind Eye Hospital case, which is considered as a pure frugal innovation example. On the other hand, under this view, GE’s ultrasound machine or Nokia’s 20$ phones are not considered as frugal innovation. Although they are great innovations addressing important needs of rural India at cheap prices, they are not designed from scratch for these markets and cost of developing these products does not align with the definition of frugal innovation (I9, 2012). Finally, the result of the interviews shows that, frugal innovation attempts to address the needs of low-middle income consumers in emerging markets with different requirements than the west.

As seen in the figure above, the empirical study has also found the same aspects of frugal innovation that were found in the literature review. However, there were conflicting views on the last two aspects; “Use of fewer resources” and “Development from scratch”. Due to these conflicting views, those aspects are shown in dashed lines.

4.3.3. Controversial Ideas on Frugal Innovation

Empirical results show conflicting views on two of the aspects of frugal innovation presented in the previous section. While two of the interviewees (I3, I9, 2012) mentioned “use of scarce resources” and “designing from scratch for the needs of emerging market consumers” as fundamental aspects of frugal innovation, others did not oppose the frugality of products and services which did not meet these aspects. In fact, another interviewee (I8, 2012) defended as it might not be as important if they can sell the product and services to large masses and justify it. These two aspects can be desired while developing frugal innovations but the innovation examples which reach limited income consumers and serve their needs with affordable and functional products in a simple way, can still be considered as frugal innovations even though they weren’t developed from scratch using limited
resources. The literature on frugal innovation does not provide clear limits to the required conditions for frugal innovation and contains examples of frugal innovation with/without satisfying these requirements. Therefore, under the light of the empirical data, one can conclude that it is favorable that companies design products and services from scratch and use minimal resources while developing them. On the other hand, there might be other cases considered as frugal innovation that create the same effect on the consumer and the environment without complying with these aspects of frugal innovation.

Another controversial idea is that frugality is no longer a strong characteristic of Indian culture. Two of the interviewees have pointed out the changing consumer behavior in urban India. One of the interviewees gives an example; “If you look to the people in their 20s, they haven’t seen scarcity. They have grown up when the economy grew much faster... new generation; I don’t know what these people will do with this frugal thing” (I3, 2012). Another interviewee also stressed upon the increased consumption in urban India and signaled the change. However much this argument may be correct in the middle class of urban areas of India, the frugality will continue to be a part of Indian culture and need for the majority of the Indian consumers for some time more.

4.3.4 Reflections

Under the light of the collected data, empirical results on the views of frugal innovation aspects are summarized. Similar to the other types of innovation, frugal innovation aims to bring new products and services to the market by different business models, creative business approaches and addressing the right needs. It has been claimed by some interviewees (I3, I9, 2012) that low cost is not new to innovation, serving affordable products by cutting costs is also a fundamental factor of frugal innovation. Furthermore, frugal innovation aims to address the needs of the consumers at a just enough level. Not more or less. Thus, it aims to develop products and services that are simple, functional and cheap. Creating value for the emerging market consumers by addressing their needs with simpler and affordable products can be considered as the three main aspects of frugal innovation.

As discussed in previous section, two identified aspects of frugal innovation did not have full consent by the interviewees. These are; the use of scarce resources and starting from scratch to develop frugal innovations. Even though some might argue that products and services that were created without these aspects cannot be considered as frugal innovation, some examples of products and services that did not match these requirements have proved success by cheap and simple offerings that created value addressing the needs of the consumers. Therefore, these two aspects are considered as non-vital or optional aspects when defining frugal innovation.

Finally, based on the presented aspects of frugal innovation and frugal innovation examples, one can conclude that frugal innovation creates mutual value to the firms and consumers. The five aspects of frugal innovation identified in the literature review are validated by the empirical study. However, the two of the aspects has shown conflicting ideas in the empirical study. Therefore, it is concluded that frugal innovation has three main and two additional aspects; affordability, simplicity, value creation and development from scratch and using minimal resources. Value is created for customers by providing affordable and simple products that addresses the specific needs. Through affordability, consumers can benefit products and services that were not available to them before. In order to achieve the affordability targets and satisfying the main needs, simple and functional products and
services are needed. In addition to these main three aspects, use of minimal resources and developing for the specific needs by starting from scratch comes as desirable aspects of frugal innovation. Meeting these aspects also benefit firms from effective organizations, efficient supply chains, volume and scalability.

4.4. Challenges to Frugal Innovation

Previous section in the literature review about the challenges of frugal innovation for multinational companies presented the views of academics on the subject. Using the same framework of five topics on structural, operational, social, economical and western mindset challenges, the empirical data collected from the interviews on the challenges of frugal innovation is presented in this chapter.

<table>
<thead>
<tr>
<th>Challenges identified in the empirical study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural Challenges</td>
</tr>
<tr>
<td>Poor Infrastructure</td>
</tr>
<tr>
<td>Untrillable policymaking</td>
</tr>
<tr>
<td>Weak IP Protection</td>
</tr>
<tr>
<td>Institutional Weaknesses</td>
</tr>
<tr>
<td>Pirates</td>
</tr>
<tr>
<td>Environmental conditions</td>
</tr>
<tr>
<td>Low confidentiality</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Table 2: Challenges of frugal innovation for MNCs identified in the empirical study. Source: Author

The above table shows the challenges of frugal innovation for MNCs found in the empirical study. Some of these findings were not found in the literature review. In the sections below, each category of challenges found in the empirical study will be presented and compared to the literature review. The challenges that were identified in both studies are considered as validating each other and will be presented after the discussions at the end of this chapter. The additional challenges identified in the empirical study are considered as the contributions to the literature and will be shown in a final table added to the validated challenges in conclusions section.
4.4.1. Structural Challenges

Infrastructure bottlenecks in India were mentioned as a barrier to frugal innovation in India (I1, 2012). Reliability of infrastructure such as electricity, internet and roads etc. to support daily actions is very low. Companies should also adapt to the extreme temperature conditions of India (I5, 2012). In most of the places in India the infrastructure is very bad, so multinationals also need to invest in infrastructure (I8, 2012). Furthermore, the institutions in India are very weak and the inefficiencies in the political environment slow down the innovation process in India. Policymaking is not forceful in India which creates policy paralysis (I1, 2012). Another interviewee views this situation as dangerous since it creates uncertainty for businesses. He claims that the uncertainty will remain to be there and this can be a constraint for many multinationals in India (I8, 2012).

Protection of intellectual property and ease of copy were also mentioned as barriers to frugal innovation. IP is not well protected in India and this creates a lot of IP problems for MNCs; reverse engineering is very much possible. In addition, law cases are poor; who is going to spend a lot of time in the court (I8, 2012)? This situation creates barriers to innovate for MNCs; as appreciation of value for their innovations is very low. The legal issues were mentioned by another interviewee; companies should localize their components and share their technology with their local partners. The confidentiality even with the partners is low (I5, 2012). In addition to these institutional voids in India’s environment, one interviewee also mentioned that government schools are very poor quality and India does not have inputs to be innovative. People with this mindset and culture who lack teamwork skills as employees, might be challenges to innovation (I8, 2012).

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Desktop Research</th>
<th>Empirical Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor Infrastructure</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Tax System</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Unreliable Policy-making</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Weak IP protection</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Institutional weaknesses</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Corruption</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Pirates</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Extreme temperatures / Environment</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Low confidentiality</td>
<td></td>
<td>✔</td>
</tr>
</tbody>
</table>

Table 3: Significance of structural challenges, Source: Author

5.4.1.1. Reflections

Most of the structural challenges presented in literature and in empirical study align with each other; for comparison, see the table 3 above. For example, the poor infrastructure such as electricity, roads
and internet etc. have been presented as a challenge supporting daily activities. Furthermore, the uncertainty challenge due the weak institutional environment and unreliable policy making is also complied with the views on literature and empirical results. Some other challenges presented in the literature were also significant in the empirical study results. The poor education quality in India was presented to result in lack of teamwork ability and lack of inputs for innovation. The loose protection of IP rights was highlighted as an important barrier to innovation in India in the interviews, corresponding to the presented challenges of pirates and weak IP protection challenges in the literature.

In addition to the challenges presented in the literature, some legal procedures such as mandatory information sharing with legal partner and low confidentiality were presented as challenges in the empirical study. On the other hand, the challenges rose from the tax system and corruption mentioned by Pacek and Thorniley (2004:170) were not identified in the empirical results. Aligned with the views in the literature review, some interviewees mentioned that the investments of MNCs and their contributions to the Indian environment would help the improvement of the weak infrastructure of India.

Structural challenges, mentioned in the literature and the empirical study, are mostly generic challenges of operating in India for all MNCs and could be applied as barriers to all kinds of innovation. These challenges may hinder incentives to innovate by some MNCs due to ease of copying and the weak protection of IP rights and become barriers to frugal innovation. Furthermore, some of the infrastructural challenges may become roadblocks to deliver the frugal innovations that were already created. As a result, these structural inefficiencies in India may become challenges to frugal innovation. Multinationals can overcome these kinds of challenges by taking active role in the development of infrastructure and making long-term investments in India.

4.4.2. Challenges of a Western Mindset

Being a multinational company in India itself can create some challenges for frugal innovation. One claim of the interviewees was that MNCs take too long time to understand India (I8, 2012). This view was supported by another interviewee that MNCs have difficulties understanding the hidden needs of Indian society (I1, 2012). Even though most of the multinationals employ local managers to cope with this problem; many of those managers complain that they have to listen to managers from parent organization and they do not understand (I8, 2012). This situation comes to a conclusion that even if the local managers understand the needs, they don’t have the autonomy to implement and this result as a barrier to frugal innovation.

“I think the problem for multinationals is different. The problem is not they can't find out what people’s needs are, the problem is they have their own global strategy and they have their own global mandates, they have their own brand positioning globally. And For them to deviate from that is very difficult ... They don’t have enough flexibility usually to adapt to the local markets ... So they also understand Indian consumers but their whole decision making process, the way of they are managed and the way they are organized , that sometimes prevents them from addressing the needs of the local market. They tend to take some products that they already have and trying pushing them into the market rather than trying to understand what the market needs” (I3, 2012).

These words of an interviewee reveal some of the challenges that multinationals face in Indian environment. Another interviewee claimed; “It is more of a mindset; many MNCs come with a
mental baggage, thinking of introducing the same products and services, same portfolio in India” (I10, 2012). Other interviewees also mentioned this issue; one presented: most of MNCs love to keep their processes and this creates a barrier in India. They need to tailor their processes to India (I8, 2012). And another interviewee added on this issue that MNCs should be flexible and feel the pulse to change the trajectory. He presented the challenge with these words; “If they don’t want to deviate from their path, good luck!” (I1, 2012). A local manager of a multinational company said that they stick into their core company values such as quality (I5, 2012). However, thriving for frugal innovation without sacrificing their core values has become a great challenge for many MNCs in Indian environment.

According to an interviewee cost structures of MNCs are not suitable for frugal innovation (I3, 2012). He claims that due to their corporate values; they stress on quality, safety etc. and therefore even their vendors are much more expensive. For this reason, they have higher gross margins to be able to make profits. On the other hand the frugal innovation logic works oppositely; smaller margins through volume. He claims that MNCs are not comfortable with smaller margins and therefore cannot be genuinely frugal. Furthermore, he adds that many MNCs equate low price with low quality and they are worried about their brand image (I3, 2012).

The fear of MNCs of cannibalizing their own market is viewed as a barrier for them to take action on frugal innovations. Empirical data shows that taking this risk becomes a challenging decision for some companies. One interviewee (I1, 2012) argues that this situation may instead open up new markets and another interviewee (I3, 2012) claims that this is not a good argument since if they don’t do it themselves; there is a big chance that someone else will come and do it anyway. In summary, the empirical data shows that established large MNCs are not as flexible enough for frugal innovation logic. Their established values, processes and mindsets become barriers for them to innovate frugally in emerging markets.

<table>
<thead>
<tr>
<th>Challenges of a Western Mindset</th>
<th>Desktop Research</th>
<th>Empirical Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding hidden needs</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Western Norms</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Local adaptation</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Concerns on brand image</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Low margins for profitability</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Familiarity trap</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>High tech/ Low cost incompatibility</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Time to understand / adapt</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Inflexibility of global strategies</td>
<td>✔</td>
<td></td>
</tr>
</tbody>
</table>
5.4.2.1. Reflections

The western perspective and norms have been discussed to create challenges for MNCs to understand hidden needs of Indian consumers (Govindarajan et al. 2012:38). Several authors argued that MNCs are challenged to adapt to the local needs and furthermore, their western mindsets approaches to emerging markets with fear, which creates further challenges to frugal innovation. The empirical study has also shown that just being a multinational company in India is a challenge itself. Some interviewees (I1, I3, I8, 2012) have claimed that MNCs have their strategies, organizational structures and managing systems which run globally. With such established global structures, these companies do not have the flexibility to adapt; nevertheless they cannot provide the required autonomy to their local subsidiaries. Hence, it was claimed that MNCs cannot and will not create frugal innovations.

This set of challenges was argued to be the most important; causing the biggest barriers to frugal innovation. Frugal innovation requires a totally open-minded approach, usually with new business models and supply chains. According to Govindarajan et al. (2012) frugal innovation begins with forgetting. Even though managers of MNCs are aware of this requirement, their western perspectives cause fears on the brand image, low margins or cannibalizing their markets. These result in ambivalence and hinder the creation and development of real frugal products and services by MNCs (Govindarajan et al. 2012:41). The challenges of frugal innovation presented in the literature completely align with the results of empirical study. Both claim that the biggest problem of multinationals is understanding, adapting and letting go of their current business mindsets and processes. Empirical study has shown two additional challenges for MNCs to create frugal innovations in India, shown in table 4 above. These are; time to understand/adapt and the inflexible global strategies. Many interviewees (I1, I3, 2012) mentioned these as a challenge as the managers in the west do not have the understanding of the consumers and conditions in India. Furthermore, they have a global strategy which they do not want to make single adjustments per country. This also results in insufficient local adaptations.

In order to create frugal products and services, firms must first be mentally prepared and fully supportive on the process of frugal innovation. The challenges that rise due to the mindset and perspective are hindering the incentives to frugally innovate from the beginning, or impede the autonomy of local managers who actually understand the local needs and preferences. Thus, these barriers can be considered as the core obstacles to overcome, mentally preparing the firms to focus, adapt and address the needs of emerging market consumers. A multinational firm cannot surpass other challenges and deliver frugal innovations as long as it is trapped to its western perspective and processes.

4.4.3. Operational Challenges

As mentioned in the previous section on the challenges of a western mindset, the empirical data on the operational challenges of frugal innovation also show that MNCs are constrained by several operational factors. Most of the interviewees agreed upon the tendency to keep operational processes. Therefore, internal company management processes become challenges to frugal innovation for many MNCs in India.
Attempts of MNCs to localize the supply chain and lower costs result in several barriers from suppliers and distributors. A manager from a MNC in India referred to this challenge that they have certain demands on their suppliers for their global quality values; however most of the local suppliers do not meet their demands. According to him, most of the suppliers are used to work in local way; their culture, work and quality standards usually do not meet MNC’s requirements for quality and safety (I5, 2012). Another executive at an MNC in India claimed that there is a large pool of suppliers but there are not many eligible ones left after a strict short-listing (I2, 2012). They would like to localize a good portion of supply; however it is very challenging to find good quality suppliers (I2, 2012). Therefore, most MNCs need to set a standard, work with the suppliers and educate them, and bring them up to the level to be good quality suppliers.

Even if they develop frugal products and services for the needs of the consumers in India, the poor distribution networks in India becomes a challenge to deliver them to the customer. According to one interviewee, operating in urban centers of India is relatively easy, however the small towns are dispersed and the road infrastructure is very poor. This makes servicing, marketing, selling and distributing a challenge. Furthermore, distributing in a cost-effective manner is also important for frugal innovations and distribution is usually a challenge for MNCs in India (I8, 2012).

Local partnerships that MNCs make in India are often unreliable and this also creates challenges for frugal innovation. According to an interviewee, local partners usually cannot deliver their tasks or cannot be trusted which creates further challenges for MNC (I10, 2012). Partnerships can include the companies on the supply chain or the joint venture partners and dealers. Lack of high quality supply and distribution partners was already discussed in a previous section as a challenge. The weak IP protection and knowledge sharing becomes another challenge with different kind of partners.

Employees in India create another operational challenge for MNCs. According to an executive of an MNC in Bangalore (I7, 2012), recruitment is a huge challenge in India. The market is very volatile and it is very difficult to attract challenge (I7, 2012). Other managers (I2, I4, I5, I6, 2012) have also mentioned this challenge that it is very hard to find the right skills. Those of good quality are very hard to attract and retain. They have also mentioned that most of the skilled people want to work in urban centers, which makes it harder for MNCs to spread their operations and distribution to smaller cities (I2, I4, I5, I6, 2012). The empirical data show that for several factors that were mentioned by the interviewees, MNCs face operational challenges to frugal innovations.
5.4.3.1. Reflections

Once firms have an idea of a frugal product or service to create value for the consumers, the operations in the supply chain begins. Due to the different characteristics of India, MNCs face challenges at different steps of the operation process in the supply chain. Both the literature and empirical results have shown that attempts to use local suppliers failed due to lack of good quality suppliers. Similarly, due to the weak distribution channels in India many MNCs need to invest in their own distribution systems; else they cannot reach smaller cities and rural areas in India. As cost-cutting is the most important aspect of frugal innovation; importing supplies, working with more expensive suppliers or investing in own distribution systems create challenges for MNCs for delivering their products and services in an affordable manner.

Empirical study has shown compatible results with the challenges presented in the literature, see table 5 above. The poor education system of India resulting in a limited number of skilled labors is presented as a challenge. Most of the interviewees at MNCs claimed that it is very hard to attract and retain the talent. This issue has been presented in the literature that some MNCs invest in specific field of studies in India for their own need of skilled personnel. Volatility of recruitment and retaining employees becomes a challenge keeping the information in house. Recruiting skilled personnel in smaller cities and rural areas is very hard and nobody is willing to move from the urban centers. According to some authors, it is easier for local companies to find right talent in smaller cities but much harder for MNCs. Finally, most MNCs rely on local partners in emerging markets. However the reliability of these local partners is also mentioned as a challenge (I10, 2012).
Operational challenges presented in the literature and the empirical data show that the challenges in the operating environment may hinder the supply, production, servicing and distribution of products and services. Hence, operational challenges can become barriers delivering the frugal innovations. These challenges may be diminished in time with the infrastructural and cultural changes in the Indian environment. Self efforts and investments of MNCs may also be required as mentioned in some cases in the literature.

4.4.4. Economical Challenges
Affordability can be considered as the most important aspect of frugal innovation. Many MNCs strive to cut their costs to develop frugal innovations and it is mentioned by several MNC executives during the interviews that this is the biggest challenge they have (I2, I4, I5, I6, I7, 2012). The R&D and product development expenses in addition to the fixed operating costs make it even harder for MNCs to reduce their costs. Given in the previous sections that many MNCs are not willing to let go of their values and processes, it becomes much harder for them to offer affordable prices while having a more expensive supply chain (I8, 2012). An executive mentioned this issue as their biggest challenge is to lower product cost without sacrificing their corporate values (I5, 2012).

An academician (I3, 2012) argued that the cost structure of MNCs is not suitable to frugal innovation mindset. According to him, MNCs have higher gross margin requirements in order to make profits since they have higher costs. And they are not comfortable with lower margin and higher volume business models. Furthermore, he claimed that the entire value chain should be low-cost for frugality, which does not fit MNCs which try to keep their corporate values at higher expenses. Finally, he argued that the entire supply chain should be low cost not just the product. In this sense, MNCs should make significant changes in their entire business model (I3, 2012).

Price sensitivity of consumers is one of the highest in India in whole world. According to an interviewee innovation at low cost is not a new thing; however addressing the needs of these price sensitive consumers, by offering affordable prices is frugal innovation. Given the characteristics of Indian consumers; they seek the best value at the best price and they don’t want any less or extra features than what they need, achieving this balance is a challenge for MNCs (I3, 2012). Frugal innovation success depends on radically cutting costs and transforming the entire business model according to the characteristics of Indian structure. MNCs which are viewed as to have come to India with a mental baggage from the west are challenged by these economic aspects of frugal innovation.
5.4.4.1. Reflections

Due to the very price sensitive and value seeking consumers in India, the affordability aspect of frugal innovation becomes the most important aspect. In order to deliver affordable and value-creating products and services MNCs thrive to cut their costs as much as possible. And given that they have path-dependent organizations, expensive supply chains, high quality and safety values; it becomes a serious challenge for them to cut down their costs and deliver frugal products and services. An executive of a MNC in India also claimed that their biggest challenge is lowering their product costs without sacrificing their corporate values (I5, 2012). Economical challenges claimed in the literature; lack of venture capital and the decreasing cost advantage of India were not significant in the empirical study results. Only three challenges are identified in both studies, shown on the table 6 above. R&D costs and costs of production were presented in the interviews as challenges since MNCs do not have incentives to invest in R&D due to the weak protection of IP rights.

NCs fears of low margins had contradictory views; while The Economist (2010) claimed that companies can only prosper in emerging markets by relentlessly cutting costs and accepting profit margins close to zero, Eyring et al. (2011) opposes that cutting costs by using low-cost labor and resources or selling largely in highest income tiers would not generate satisfying returns. They claim that devised profit formulas and new business models can both address the hidden, unsatisfied needs both affordably and profitably. The views resulted from the empirical study aligns more with the views of The Economist. An interviewee (I5, 2012) claimed that MNCs have higher costs and their cost margins are not suitable to deliver frugal products and services. However, under the condition that they can achieve an entire low-cost value chain, this can happen.

Most of the Indian consumers and the consumers in emerging market are very price sensitive and value-seeking, and this constitutes the basis of frugal innovation; affordability of products and services. As discussed in the literature and presented in the empirical study; the corporate values,
expensive suppliers and cost structure of MNCs are not suitable for frugal innovation as they are. Therefore, they are required to make radical changes in their business models, supply chains and cost structures in order to successfully deliver affordable products and services and still make profits. Cutting costs and creating more efficient supply chains may sometimes become challenges to the inflexible structures of some MNCs and this can create barriers to frugal innovation. Even though an interviewee (I8, 2012) claimed that however much MNCs cut costs, they could still not be able to serve the lowest tiers of the market. On the other hand, this claim does not affect the frugality of the products and services delivered to the consumers at the middle or lower tiers.

4.4.5. Social Challenges

The characteristics of the Indian society and consumers differ significantly from the West. The preferences, tastes and needs of Indian consumers vary tremendously even in India. These characteristics, needs and behaviors of these consumers often create challenges for MNCs which target these consumers with frugal innovation. According to an Indian academian (I3, 2012) Indian consumers are presented to be quite sensitive. Ideally, they want value at the best price, and they constantly look for it. He argued that if MNCs want to address mass market in India, they should be able to get the product definition right and don’t offer a disappointing product or anything more than the customer is willing to pay. This balance might be one of the most challenging of all (I3, 2012).

An MNC executive (I5, 2012) referred to the big variety of the Indian consumers as a challenge. India is a country of extremes. The company gets very varied demand and feedback and this creates difficulty finding out the right strategy to follow. He also added that while designing their products they are supposed to anticipate the needs and preferences of 2-3 years ahead due to the product life cycle and this also becomes a challenge in the changing conditions of Indian environment (I5, 2012). Moreover, as mentioned in the consumer characteristics, some interviewees (I3, I9, 2012) claimed that the preferences of Indian consumers are changing that they are becoming more brand conscious while they constantly seek low cost and high value. Previous chapters have also underlined the value conscious characteristic of Indian consumers; which creates a social challenge for consumer products and services. It is a challenge for MNCs to build a brand image while offering low-cost but high-value frugal products and services.

Another social challenge claimed in the interviews is that the human interaction requirement of Indian consumers. An interviewee (I1, 2012) argued that Indian consumers are reluctant to book online trips, tickets etc. as they require human interaction (I1, 2012). This argument was also supported by another example that the culture is very paper oriented; a lot of processes work on manual processes with stamps and signatures (I7, 2012). These characteristics of Indian culture are viewed to contain the hidden needs of Indian consumers and argued to become challenges for MNCs to uncover (I1, 2012).

The prevalence of hierarchy in the society was mentioned by a MNC executive as a challenge. “It is a very hierarchical culture, you need to have a lot of approvals, you need to talk to the right people and have a lot of connections...” (I7, 2012). He also mentioned that Indian employees do not say if they don’t understand the task or if they cannot do it, which becomes a problem when the due date of the project comes since they cannot deliver (I7, 2012). A final social challenge due to the Indian culture is the unorganized way of life and flexibility of Indian society. Some of the interviewees (I1, I3,
2012) mentioned this phenomenon that when something unexpected happens, Indians don’t panic; they find a way to solve it and keep going. However, MNCs are not used to surprises and suddenly changing things is much more difficult for them (I1, I3, 2012).

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Desktop Research</th>
<th>Empirical Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nuanced customer needs</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Hierarchical progression of society</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Value-oriented consumers</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Variation in culture, religion, habits</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Attitude towards foreign brands and products</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Human interaction requirement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unorganized way of life/ flexibility</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Poor teamwork, scarcity of input for innovation</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

Table 7: Significance of social challenges, Source: Author

5.4.5.1. Reflections
Social challenges rise due to the different characteristics and habits of Indian culture. They are not direct challenges to frugal innovation, but difficulties to understand or failure to meet the requirements, lead to barriers to frugal innovation. All challenges identified in the literature review were validated in the empirical study. In addition, the empirical study has added three more challenges to frugal innovation shown on the table 7 above. These are; the human interaction requirement, unorganized way of life/ flexibility of Indian people and the attitude towards foreign brands and products.

Variations of Indian consumers have been discussed in the literature and in the empirical study. Indian people differ in culture, religion, language, food, habits, preferences and needs; in north and south India or urban and rural India. These differences increase the complexity of products and services delivered to satisfy different needs and preferences. Failure understanding these nuanced consumer needs can become a challenge to develop frugal innovations to address specific needs.

The value-oriented culture and the attitude of consumers toward foreigners were discussed as challenges in the literature; this has been also argued by an interviewee in the empirical study that
the Indian consumers would remain skeptical towards a firm or a product for a long time if they feel deceived (I5, 2012). Due to these characteristics of Indian consumers, another important aspect of frugal innovation was defined as simplicity. Indian consumers were presented as not asking more than what they need, and they want to pay for the best value. Therefore, de-features some products and services and providing only what is actually needed at the best price can become a challenge to understand and deliver for some MNCs.

The human interaction need and the flexibility in the unorganized way of life characteristics of Indian consumers were the two additional aspects of Indian consumers which identified in the empirical study. These characteristics could be hard to identify and adapt, thus lead to challenges to frugal innovation. Furthermore, some social characteristics of Indian society could lead to challenges not as consumers but as employees. In the literature some characteristics of Indian society such as; poor teamwork abilities, no tolerance to failure, lack of confidence and the hierarchical progression, were argued to create barriers to innovation (Krishnan 2010:137). Data from the empirical study also have shown that the hierarchical structure of the society is reflected at the workplace which can lead to challenges.

The social structure and the cultural characteristics of Indian society may sometimes be difficult to understand, adapt and serve for MNCs. Now it is very well known by all MNCs that India is very different than the west; all MNCs operating in India should already be prepared for these differences. Challenges raised due to these differences can become barriers to all operations and innovation incentives of multinationals. With respect to frugal innovation; failure to understand and address the needs of target consumer group and the employees lack with innovation inputs can be direct social challenges to frugal innovation.
Empirical results and reflections section has presented the empirical findings on the Indian market and consumers, frugal innovation and its challenges for MNCs. The findings on the challenges were shown under the theoretical framework and compared to the findings from the literature review. The findings which were significant in both literature review and the empirical study are considered as validating and shown on the table above. The additional findings of the empirical study in addition to above mentioned validated results will be shown in the conclusions as the answer of the research question.

5. Conclusion

The development and growth in the emerging markets with millions of consumers starting to demand more products and services have continuously increased the importance of emerging markets for multinational companies. In spite of many perplexities, many MNCs have concluded that they cannot avoid the potential of these countries. This started the exploration for innovation opportunities to address the hidden needs and demands of the emerging market consumers. Addressing specific needs of emerging market consumers is the purpose of frugal innovation.

Previous studies conducted on frugal innovation and frugal engineering underline the importance of frugal innovation and express methods to create them. Several successful frugal innovation examples accompany these studies. However, a roadmap was lacking; the possible challenges on the way have not been clearly mentioned by any of these studies. Therefore, this thesis aimed to address this gap, by providing likely challenges for MNCs in the process of frugal innovation in India. The characteristics of the country, market and the consumers were also analyzed to explain the possible reasons of the challenges. The following research question was answered in order to put light on the challenges that cause MNCs to struggle in creating frugal innovations in India;

<table>
<thead>
<tr>
<th>Structural Challenges</th>
<th>Western Mindset Challenges</th>
<th>Operational Challenges</th>
<th>Economical Challenges</th>
<th>Social Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor Infrastructure</td>
<td>Understanding Hidden needs</td>
<td>Human capital</td>
<td>Cutting costs</td>
<td>Nuanced consumer needs</td>
</tr>
<tr>
<td>Unreliable policy-making</td>
<td>Western norms</td>
<td>Unreliable local partners</td>
<td>Price sensitive consumers</td>
<td>Hierarchical progression of society</td>
</tr>
<tr>
<td>Weak IP Protection</td>
<td>Local adaptation</td>
<td>Lack of proficient suppliers</td>
<td>Operation expenses</td>
<td>Value-oriented consumers</td>
</tr>
<tr>
<td>Institutional Weaknesses</td>
<td>Concerns on brand image</td>
<td>Weak distribution networks</td>
<td></td>
<td>Variations in society</td>
</tr>
<tr>
<td>Corruption</td>
<td>Low margins for profitability</td>
<td>Inefficient transportation</td>
<td></td>
<td>Poor teamwork, scarcity of input for innovation</td>
</tr>
<tr>
<td>Piracy</td>
<td>Familiarity trap</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High tech / low cost incompatibility</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 8: Validated challenges in both studies. Source: Author
What are the challenges of western multinationals for developing frugal innovations in India?

This thesis has focused on the frugal innovation process in emerging markets and its challenges for MNCs. The main focus has been the Indian market and consumers. Data input of the thesis was divided into two parts; literature review and empirical study. First, previous studies on emerging markets and consumers, frugal engineering and innovation and challenges for MNCs presented in the literature were carefully reviewed. The characteristics of the Indian market and consumers were sought in the literature and presented. A clear definition of frugal innovation and its aspects are provided. Finally, the identified challenges of frugal innovation in the literature were grouped into five categories under the theoretical framework. Second, an empirical study was conducted with ten interviewees in Bangalore, India. Four of the interviewees were from an Indian academic institution and six were representatives of MNCs in India. Data collected in the literature review was sought and questioned in the empirical study. Results were compared and analyzed, then presented in five different groups in the theoretical framework.

The findings of the thesis are presented in four categories below; the characteristics of Indian market and consumers, definition and aspects of frugal innovation and the challenges for frugal innovation. Information on the market and consumer characteristics and definition of frugal innovation has been a base to understand the challenges of frugal innovation from MNCs perspective. Finally, an aggregated list of challenges that were identified in the literature review and the empirical study are presented as the answer to the research question.

Indian Market
First information on Indian market and reasons why India has become very important for MNCs was explored. Answer was the market size in India and the promising growth rate that makes many MNCs feel the need to be there. This phenomenon is presented and agreed upon by both literature and empirical studies, however it is also stressed that India is more likely to bring success in long-term investments. India is expected to undergo many changes which will leverage its growth even further, but the results of the empirical study have stressed that any MNCs that come to India with short-term goals will not succeed. Data from the empirical study have also shown that Indians are actually not satisfied with the current growth rate, as they believe it has a potential for much more. Both studies have claimed that investments and contributions of MNCs will play an important role for further development and growth of India.

Indian Consumers
The characteristics of the Indian consumers were explored in the literature review and in the empirical study. Both studies have shown that due to the dispersed environment of India, the tastes, preferences, demands and needs of Indian consumers are highly nuanced. The most common characteristic of Indian consumers, generalized for the majority of consumers in India, have been the price sensitivity and value-oriented behavior. Both studies underlined that limited-income conditions have been the most important factor to consider about Indian consumers. The empirical study have shown that the middle class consumers in India mostly in the urban centers have started to change; becoming more brand conscious and less price sensitive. This change initiation was a warning that frugal needs of Indian consumers will be decreasing in time. However considering the limited income population in India, this would take a long time to generalize to the majority of consumers.
Frugal Innovation
Understanding of Indian market and the characteristics of Indian consumers are the underlying keys to frugal innovation. Followed by the presentation and discussion on Indian market and consumers, definition of frugal innovation was sought in the empirical study. Given that there was no consensus on a definition by several authors in the literature review, this thesis aimed to provide a clear definition of frugal innovation identifying its aspects and processes. Views and definitions of frugal innovation were asked to all interviewees and the most important aspects were collected. These were then compared and analyzed with the results of the literature review and a definition for frugal innovation was provided; frugal innovation is creating new products and services in order to address the specific needs and requirements of the emerging market consumers in a simple and affordable manner.

Addressing needs of these consumers make improvements in their lives and provide them more products and services in their reach; therefore creates value for them. Offering simple and functional products and services in affordable prices and creating value were identified as the three main aspects of frugal innovation. The other two aspects, starting from scratch and using fewer resources, were found in the literature review and the empirical study. However, some interviewees did not agree on those aspects. Furthermore, there are examples of frugal innovation which does not contain these aspects. Thus, the other two aspects were marked as desirable but not main aspects.

Frugal innovation was defined as a process. The process starts with exploring and understanding the market and needs of consumers, continues with coming up with an idea of a product, service or a business model that can leverage the lives of consumers by addressing the identified needs. The successful commercialization and diffusion of the product or service finally concludes the frugal innovation process. Frugal innovation might occur in one or all steps of the process.

Challenges of Frugal Innovation for MNCs
The final section of the empirical study and reflections presented the challenges of frugal innovation found in the empirical study. The framework of five challenge groups was used and the challenges identified in the empirical study were then compared to the challenges identified in the literature review. These challenges were presented in comparison tables after each category of challenges. The categories of challenges in the framework were; Structural challenges, Challenges of a western mindset, Operational challenges, Economical challenges and Social challenges.

Views and real-life experiences of MNC representatives and academicians from the empirical study were used to compare and validate the challenges presented and additional challenges identified in the empirical study were added in the results. The data collected from the empirical study was highly parallel with the information presented in the literature. Author’s reflections were discussed at the end of every section, where economical challenges and challenges of western mindset were argued to be direct challenges to frugal innovation whereas others were argued to indirectly affect the frugal innovation process. This classification was made through the empirical study and own observations.

The final list, as the answer to the research question is presented below on table 9. It contains the validated challenges of the literature review and also new ones added through the empirical results. The pink color cells on the table shows the challenges added to the validated findings through the empirical study. The added challenges are the contribution of this thesis to academia and starting point for further research for validations in practice.
To summarize, the importance of creating frugal innovations for Indian market has been on agenda of several previous studies (C.K Prahalad & Mashelkar 2010), (Sehgal et al. 2010). This thesis aimed to piece together the ideas and descriptions of frugal innovation and explore the challenges of frugal innovation from an MNC’s perspective. As a result of data collection from previous academic studies and the empirical research, a definition of frugal innovation is generated; frugal innovation is addressing specific needs and demands of emerging market consumers in a simple, functional and affordable way. The aspects of frugal innovation were identified and discussed. And finally, the answer of the research question is given with a list of identified and validated challenges of frugal innovation for MNCs on the table above.

All in all, the additional challenges identified in this thesis are suggested to further study for validation in practice. Identifying methods and making suggestions on how to overcome these challenges is also a further study recommendation. To conclude, as all the other authors and interviewees agreed, emerging markets and specifically India is growing in importance for MNCs. Frugal innovation is one of the key areas MNCs should focus on these markets. On their journey for frugal innovation in emerging market, this thesis is hoped to shed light on the challenges that may arise.

Table 9: Aggregated findings of challenges for frugal innovation. Source: Author

<table>
<thead>
<tr>
<th>Structural Challenges</th>
<th>Western Mindset Challenges</th>
<th>Operational Challenges</th>
<th>Economical Challenges</th>
<th>Social Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor infrastructure</td>
<td>Understanding hidden needs</td>
<td>Human capital</td>
<td>Cutting costs</td>
<td>Nuanced customer needs</td>
</tr>
<tr>
<td>Unreliable policy-</td>
<td>Local norms</td>
<td>Unreliable local</td>
<td>Price-sensitive</td>
<td>Hierarchical</td>
</tr>
<tr>
<td>making</td>
<td></td>
<td>partners</td>
<td>consumers</td>
<td>progression of</td>
</tr>
<tr>
<td>IP protection</td>
<td></td>
<td>Lack of proficient</td>
<td>Operation expenses</td>
<td>society</td>
</tr>
<tr>
<td>Institutional</td>
<td></td>
<td>suppliers</td>
<td></td>
<td>Value-oriented</td>
</tr>
<tr>
<td>weaknesses</td>
<td></td>
<td>networks</td>
<td></td>
<td>consumers</td>
</tr>
<tr>
<td>Pirates</td>
<td>Low margins for</td>
<td>Retaining / Attracting</td>
<td>Low-cost value chain</td>
<td>Attitude towards</td>
</tr>
<tr>
<td></td>
<td>profitability</td>
<td>employees</td>
<td></td>
<td>foreigners</td>
</tr>
<tr>
<td>Environmental</td>
<td>Familiarity trap</td>
<td>Inefficient</td>
<td></td>
<td>Human interaction</td>
</tr>
<tr>
<td>conditions</td>
<td></td>
<td>transportation</td>
<td></td>
<td>requirement</td>
</tr>
<tr>
<td>Low confidentiality</td>
<td>High tech/ Low cost</td>
<td>Internal company</td>
<td>Unorganized way of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Incompatibility</td>
<td>management processes</td>
<td>life/flexibility</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Time to understand/ adapt</td>
<td></td>
<td>Poor teamwork, scarcity of input for</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Innovation</td>
<td></td>
</tr>
<tr>
<td>Inflexibility of</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>global strategies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To summarize, the importance of creating frugal innovations for Indian market has been on agenda of several previous studies (C.K Prahalad & Mashelkar 2010), (Sehgal et al. 2010). This thesis aimed to piece together the ideas and descriptions of frugal innovation and explore the challenges of frugal innovation from an MNC’s perspective. As a result of data collection from previous academic studies and the empirical research, a definition of frugal innovation is generated; frugal innovation is addressing specific needs and demands of emerging market consumers in a simple, functional and affordable way. The aspects of frugal innovation were identified and discussed. And finally, the answer of the research question is given with a list of identified and validated challenges of frugal innovation for MNCs on the table above.

All in all, the additional challenges identified in this thesis are suggested to further study for validation in practice. Identifying methods and making suggestions on how to overcome these challenges is also a further study recommendation. To conclude, as all the other authors and interviewees agreed, emerging markets and specifically India is growing in importance for MNCs. Frugal innovation is one of the key areas MNCs should focus on these markets. On their journey for frugal innovation in emerging market, this thesis is hoped to shed light on the challenges that may arise.
6. References


Infinite Vision, Dr. Govindappa Venkataswamy,2004, [DVD], Pavithra Krishnan, India, Aravind Eye Care System


7. Appendices

7.1 Interview list

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Assistant Professor, Corporate Strategy &amp; Policy- IIMB</td>
<td>19.04.2012</td>
</tr>
<tr>
<td>2  Sr. Manager , Strategy &amp; Product Management - Volvo Buses India Pvt Ltd.</td>
<td>20.04.2012</td>
</tr>
<tr>
<td>3  Professor, Corporate Strategy &amp; Policy Area - IIMB</td>
<td>23.04.2012</td>
</tr>
<tr>
<td>4  Assistant General Manager, Advanced Tech. And Research, Volvo India Pvt Ltd.</td>
<td>23.04.2012</td>
</tr>
<tr>
<td>5  Chief Engineer, Chassis &amp; Vehicle Dynamics, Volvo Trucks India Pvt Ltd</td>
<td>23.04.2012</td>
</tr>
<tr>
<td>6  SAP Team Lead, Volvo IT India Pvt. Ltd.</td>
<td>24.04.2012</td>
</tr>
<tr>
<td>7  Assistant General Manager, Volvo IT India Pvt. Ltd.</td>
<td>24.04.2012</td>
</tr>
<tr>
<td>8  Professor, Organisational Behaviour and Strategy - IIMB</td>
<td>25.04.2012</td>
</tr>
<tr>
<td>9  Professor, IIMB</td>
<td>21.04.2012</td>
</tr>
<tr>
<td>10 Project Manager, Swedish Trade Council</td>
<td>27.04.2012</td>
</tr>
</tbody>
</table>

7.2 Interview questions

- Can you tell me about the structure of the organization and your position here?
- How is your company locally adapted to India? (Product development, business model etc.)
- Can you explain the market structure?
- Is there brand recognition and loyalty?
- What kind of challenges/barriers do you face in India? Why do you think these challenges are specific to India?
- Do you think Indian market offer good opportunities for MNCs? How?
- How do you think marketing and communication with the customer differs between a Western and an Indian customer?
- What kind of difficulties are there when developing products for Indian market?
- Can all MNCs create frugal innovations or are specific resources or capabilities needed? If so, what are these capabilities?
- Do you think Indian engineers can develop better products for Indian market than internationals? (Understanding the customer needs better)
- Have you heard the term frugal innovation? What is your definition?
- Important factors that influence the Indian market?
- Is it likely that a frugal innovation developed for an emerging market also will be successful in a developed market? How much would you have to adapt it? Is it profitable?
- What kind of challenges can be faced in India regarding the society and culture?
- How do you think a company should organize itself in general to support frugal innovation?
- Do you think developing cheaper products for emerging markets would cannibalise their current products in developed markets?
- Do you think your company is creating frugal innovations, how?
- What are the barriers to produce frugal products and creating frugal innovations in India?
- What kind of local partnerships does your company have in India and how do you think it effects your business?
- To what extent do you agree that Indian consumers appreciate local products better?
- How do you think the Indian market will develop in 10-20 years?
- To which income level of customers does MNCs mainly serve in India?
- Have you observed/suggested specific patterns of applications/changes of business models or operations MNCs to be successful in India?