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Information and Communication Technology (ICT) in Kenya: Exploring the possibilities of a prosperous market

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Abbreviations and Definitions

ATM - Automated Teller Machine

BoP - Bottom of the pyramid

BPO - Business Process Outsourcing

CEO - Chief Executive Officer

CBK - Central Bank of Kenya

CCK - Communication Commission of Kenya

CIA - The Central Intelligence Agency

EAC - East African Community

FDI - Foreign Direct Investment

FSD - Financial Sector Deepening

GDP - Gross Domestic Product

GNI - Gross National Income

ICT - Information, Communication Technology

KNBS - Kenya National Bureau of Statistics

Ksh - Kenyan Shilling

KSH/USD = 87.17363/1

MICT - Ministry of Information Communication and Technology

MNC - Multi National Company

MNO - Mobile Network Operator

M-PESA - Mobile Pesa (Pesa means money in Swahili)

NGO – non-governmental organization

Poverty line - US $2.5

PREM - Poverty Reduction and Economic Management Network

SIM - Subscriber Identity Module

SMS - Short Message Service

UN - United Nations

USD – United States Dollar

VAT – Value Added Tax

Abstract

Information and communication technology (ICT) has reportedly enabled the world's poorest, living at the bottom of the income pyramid, to earn an income, solve conflicts, reduce isolation and has assisted in emergencies. Kenya is one of the most advanced nations in Africa with a high level of technological development. The advancements in the ICT industry have been singled out as key drivers for Kenya's economic prosperity and have helped to alleviate poverty. The primary purpose of this thesis is to develop an understanding of Kenya's technological advantage in East Africa and to explore why multinational companies would prosper from a growing ICT usage at the bottom of the pyramid (BoP). The secondary purpose, serving to support the primary objective, is to create a clear insight into the conditions that are necessary to develop this advantage. The thesis seeks to answer two different research questions: First, what enables or prevents multinational companies in the ICT sector to enter the Kenyan market? This question is posed in order to understand what companies evaluate when entering into BoP markets. Second, which factors and/or conditions give Kenya an advantage for ICT establishment in East Africa? Taking into account the macroeconomic factors needed for an industry to thrive. These questions have been answered with the support of a blend of primary and secondary sources including, documents, statistical data and interviews. The research approach has been deductive and triangulation has been used in order to ensure coherency, accuracy and trustworthiness. The thesis concludes that there are many reasons for companies to enter the Kenyan BoP market. However, there are many changes that need to be made in order to continue attracting foreign direct investment and to sustain the current development. The thesis further concludes that Kenya has several competitive advantages over other East African nations, which have enabled Kenya's ICT sector to flourish.

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Chris Otundo, former management consultant at Deloitte East Africa

Robin Pettersson, Market Unit Manager at the Swedish Export Council in Nairobi, Kenya

Table of Contents

1. Introduction

This chapter aims to present a background to the thesis followed by a problem discussion. Thereafter, the purpose and research questions are defined continued by delimitations. Subsequently, macroeconomic information about Kenya and information about ICT in Kenya are presented. Last, a thesis outline is provided.

1.1 Background

Information and communication technology has reportedly enabled the world's poorest to earn an income, solve conflicts, reduce isolation and has assisted greatly at the occurrence of disasters. Mobile phone usage is expanding exponentially across the developing world, benefiting previously marginalized communities and connecting them to modern communication (Elder, 2013).

Africa is the world's second largest and second most populated continent, tormented by poverty and conflict, which is today seen as a direct result of its colonization days. The African continent has an estimated population of 1.033 billion people (World Data Bank, 2012). According to Erika Bjerström (2014), this view on Africa is outdated; African inwards foreign direct investment (FDI) has increased from US $9 to 62 billion between 2000 and 2008, almost equivalent to the Chinese inward FDI, relative to GDP. By 2040, Africa is expected to have become the home to 20 per cent of the young world population, housing the world's largest labour-force. Bjerström further states that the rate of return in Africa is higher than in any other developing region and that 22 out of 48 Sub-Saharan countries today are considered middle-income nations.

Bjerström (2014) emphasises that one ought to remember that Africa's economic development starts off from very low levels. Even though 18 countries in Africa are part of the stock exchange, their total value of shares only accumulates to the size of the Danish stock exchange's total value. Rosling (2014) states in a recent speech, however, that seven out of ten of the world's fastest growing economies lie south of Sahara. He believes that if this growth continues, many African countries will swiftly compete with more developed nations on an economic level.

Leke (2010) holds that the key reasons behind Africa's growth are, improved political conditions, macroeconomic stability and microeconomic reforms. Subsequently, governments have reduced inflation, debts have been trimmed and budget deficits have improved. Bjerström (2013) underlines the importance of a change in regime, where old uneducated leaders are being replaced by their younger and more educated counterparts. Many state owned enterprises have been privatized, corporate taxes lowered and trade barriers reduced.

Western advancement has systematically progressed over many decades based on a developed infrastructure including telephone landlines. This technology was later adopted in African nations, though economical challenges held back its expansion. Findings from the World Bank show that not more than two out of one hundred people had a fixed telephone in Africa in 2008, and moreover a number that consistently is decreasing (Word Data Bank, 2008). Simons (2012) puts this into context by describing that the African continent is leapfrogging. This means that African nations have been able to skip many steps that have been critical to western development, especially in the ICT sector. He holds that the lack of significant telecom infrastructure has been an advantage rather than an obstacle to develop genuinely transformative products leading to a re-conceptualisation of the very understanding of infrastructure.

East African nations, such as Kenya, Tanzania, Zambia and Ethiopia are amongst the fastest growing and most prominent economies on the African continent. Jackson (2012) states that Ethiopia's economy is growing ten times faster than that of the UK, having grown by 8.5 per cent in 2012. The economy has been on a high growth path since 2004 and the country is today amongst the top ten wealthiest African nations. Jackson further points out that, although one of the world's poorest countries, Zambia is one of Africa's most promising economies, growing with 7.6 in 2010 and 7.3 per cent in 2012. It has, additionally, reached a GDP per capita almost equivalent to that of Kenya (CIA, 2014). Kenya is one of the most advanced nations on the continent with a high level of technological development. Pettersson (2014), at the Export Council in Kenya, confirms that the country has a stable democratic system and that the financial institutions and the society have adopted western ways, making the country an attractive destination for inward FDI.

Bjerström (2014) states that the introduction of the mobile cellular phone in Africa has revolutionized life standards and the business environment. In 2012, mobile subscriber penetration had reached over 76 per cent (Lomas, 2012). In combination with the vast expansion of the mobile phone, Kenyan entrepreneurs have pioneered the world-first mobile money transfer system, allowing the continent yet another technological leap (Adeya, 2014). The transformative innovation is part of a larger revolution in mobile banking within Kenya. The system uses a virtual currency, which has adopted the name of the most popular money transfer system, M-PESA (Mobile PESA). Today, every mobile network operator (MNO) in Kenya offers their own M-transfer system, all of which can be used on every mobile cellular model since the application is SMS-based. According to Manson (2013), approximately 31 per cent of Kenya's GDP currently moves through the system.

In its vision to become a middle-income country by 2030, Kenya has identified scientific and technological advancement as key drivers for growth (Kenya Vision 2030, 2014). Bagha (2014) reports that Kenya is challenging continental superpower South Africa for the position as leading technological hub. This phenomenal development in ICT has drawn the world's attention towards Kenya. The country and the creation of the recorded spur in technology growth is hence an important and interesting subject to explore.

1.2 Problem Discussion

1.2.1 Why ICT at the Bottom of Pyramid (BoP) is of Interest

ICT is helping to alleviate poverty and is increasingly used by those living at the lowest socioeconomic level known as the bottom of the pyramid. The ICT sector has enabled Africa to skip many steps that have been critical to the western development; a phenomenon known as leapfrogging. 90 per cent of Africans may have mobile wallets by 2025 (Svensson, 2014). This means they will pay, borrow and save money through their mobile phones. Interestingly, many Africans do not have a bank account but instead perform all of their financial transactions through their mobile phones. In other words, they have already jumped ahead of many western societies. Examples of such technological advancements will be further explained later in the thesis.

According to Mckinsey, there are six areas that will be able to grow due to the expansion of ICT in Africa: The financial services will see improvements in payments, savings and loans. The education sector will benefit from online lectures and thus reach out to more students

helping to raise the number of educated people. The health service is likely to offer distance-based medical services, which can help treat many diseases in Africa. The retail sector will be able to distribute its products more easily, enjoy secure payments and reach larger markets through e-commerce. In agriculture there is a need for electronic weather forecasts et cetera. Finally, public administration will become more transparent if the information and communications technology industry (ICT) is further developed (Hattingh et al, 2012).

Mobile financial services or mobile money is rapidly taking over the traditional banking methods in some countries. The biggest ICT effects on economic development are likely to be seen in Kenya, a country, which is predicted to become a global ICT hub, fostering a dynamic tech ecosystem (Kendall, 2014). The question remains whether or not Kenya has the conditions necessary to obtain this leading position, in form of macroeconomic factors and support from multinational companies and local actors, willing to invest in the ICT industry.

1.3 Purpose and Research Question

The primary purpose of this thesis is to develop an understanding of Kenya's technological advantage in East Africa and to explore why multinational companies would prosper from a growing ICT usage at the bottom of the pyramid (BoP). The secondary purpose, serving to support the primary objective, is to create a clear insight into the conditions that are necessary to develop this advantage. Based on this purpose, two different research questions have been created. The first one is composed in order to understand what companies evaluate when entering new markets. The second question takes into account the macroeconomic factors needed for an industry to thrive.

- What enables or prevents multinational companies in the ICT sector to enter the Kenyan market?
- Which factors and or conditions give Kenya an advantage for ICT establishment in East Africa?

1.4 Delimitations

The study is restricted to Kenya and with sole focus on the mobile phone segment within the ICT industry. Further delimitation has been set to the lowest income bracket, known as the bottom of the pyramid, as its members act as key drivers for the exponential growth of this technology in Kenya.

1.5 Kenya - Macroeconomic Indicators

Kenya is a low-income country on the east coast of Africa, neighbouring Uganda, South Sudan, Ethiopia, Somalia and Tanzania. The country was colonized by the British and gained independence in 1963, as the Republic of Kenya and has English and Swahili as official languages and languages of instruction. In 2012, Kenya had a recorded population of approximately 48 million (World Data Bank, 2012). Nairobi is the capital as well as the largest city in Kenya with just over 3 million people. The city is one of the most developed in Africa and is considered a regional hub and home to many technological companies (Internet Governance Forum, 2011). The second largest city, Mombasa is also Kenya's main port. Akwiri (2014) states in a recent report that the Mombasa port is the largest in East Africa and serves as a regional gateway. The port is successfully expanding and has currently the capacity of just above 5.5 million tonnes annually (Akwiri, 2014). The report further describes that the country is building a second port in Lamu, north of Mombasa, with an expected capacity of 23 million tonnes annually.

Kenya's economy is the largest in Southeast and Central Africa with US $40.7 billion in 2012 (The World Data Bank, 2014). Kenya Economic Update 2013 indicates that the country's economic prospects have improved as a consequence of peaceful elections in 2013 as well as the subsequent shift in power. The forecasted growth in GDP is 6 percent in 2014, which is the strongest growth recorded since 2007. The report also states that Kenya's principal exports are agricultural commodities with tea, horticulture and coffee as the most prominent exports in 2012 (Poverty Reduction and Economic Management, 2013, p. 90).

1.6 ICT in Kenya

Kenya Economic Update 2010 identifies the ICT sector as a main driver behind the country's growth. The report states that "the ICT sector's growth has outperformed every other sector, expanding by 23 per cent annually during the last decade". The report further highlights that without the ICT sector the country's economy would have grown on average 2.8 per cent instead of 3.7 per cent since 2000. It is evident that the ICT sector has had dramatic effect on the country, directly affecting the financial sector and indirectly affecting other critical sectors, such as health care and education (PREM, 2010).

Kenya has grown to become a global ICT hub, fostering a dynamic tech eco-system. Over the last decade, Kenya's ICT sector has attracted global attention through its phenomenal growth

and Kenya Economic Update 2010 shows that the ICT sector contributed to approximately one quarter of Kenya's GDP. Bagha (2014) describes that Kenya is positioning itself to challenge South Africa as the continent's ICT hub.

Mobile devices and especially mobile money is considered to be the most innovative and important key driver for the ICT sector growth as well as a critical tool for poverty reduction. Manson (2013) reports that 70 percent of Kenya's population owns a mobile phone. Coincidentally, also 70 per cent does not have access to a bank. In 2010, approximately 3 out of 4 Kenyans used mobile money, thereby transferring 20 per cent of the nations GDP by phone. Manson reports this to have reached 31 per cent by 2013. PREM (2010) states that Kenya has the largest mobile money platform in the world with 15 million users in 2010. Mobile money is only one great example of how ICT helps stimulate economic growth and social inclusion.

The Kenya Vision 2030 (2014) outlines ICT as one of the key drivers of economic development, and significant reforms has been made by the government to further spur its growth. For example, the abolition of a state monopoly along with a new regulatory framework monitored by the Communications Commission of Kenya (CCK) has helped the ICT sector to flourish during the last decade. As a result, Kenya is now moving from an industry-based economy to a knowledge-based economy anchored on ICT.

1.7 Thesis Outline

This first chapter introduced the subject and the purpose of the thesis. The following chapter presents the theories used as structure for the empirical finding chapter and the analysis chapter. Thereafter, the methodology chapter explains how the research has been conducted through the application of general understandings of logic reasoning and data findings. The subsequent chapter, empirical findings, presents the observations and data, which will be analyzed in the following section. The chapter provides an extensive presentation of the ICT industry in Kenya. The analysis is structured to answer the thesis questions and analyzes the empirical findings by applying the chosen theoretical framework. Finally, the conclusion summarizes and critically assesses the most prominent findings from the previous chapter. Last, a future outlook and suggestions for future research are presented.

2. Referential framework

This chapter aims to present the two theories, which have been chosen to help answer the research questions of this thesis: The Proposed Phenomena of the Bottom of the Pyramid and Michael Porter's Diamond Theory from 1990. Commonly expressed criticism of each theory is presented and thereafter discussed.

2.1 Choice of Theories

Since Kenya has a geographically dispersed market and is known for having a vast amount of its people living in poverty, we wanted to explore how this might affect the ongoing ICT revolution. There are prominent differences between rural and urban areas' access to ICT. Currently, only commercially viable market segments have been served (often urbanized), leaving large segments untouched. Therefore, The Bottom of the Pyramid proposition was chosen as a useful tool for analyzing the potential demand for further ICT development in Kenya at the bottom of the income pyramid. ICT companies may change the way that most Kenyans live by creating new and highly innovative devices directly aimed at the lowest socioeconomic groups. The question that we ask is, what enables or prevents multinational companies in the ICT sector to enter the Kenyan BoP market? In other words, is there a prosperous market waiting to be explored by companies or is this a mirage?

We further wanted to understand and investigate why Kenya has become an ICT hub on the African continent. In order to do so, it has been necessary to examine the various macroeconomic factors that have affected the growth of ICT in Kenya. Porter's Diamond theory was chosen because it gives a structured introduction to the driving factors behind a successful industry. This model is frequently used in the academic sphere and has thus become widely accepted as a tool for analyzing the advantage of an industry. By examining Kenya's macroeconomic environment, following Porter's framework, and comparing it to other East African nations, we explore: Which factors and or conditions give Kenya an advantage for ICT establishment in East Africa?

The overall aim, as the title reveals, is to analyse if the Kenyan ICT market is prosperous or not. Consequently, the combination of these two theoretical frameworks is necessary in order to fully understand how Kenya in the future can advance in the ICT industry.

2.2 The Bottom of the Pyramid Proposition

The term bottom of the pyramid (BoP) refers to the poorest socio-economic group in the economic chain. According to The World Economic Pyramid (Figure 1), the BoP consists of 4 billion people living with an income less than US $1500 annual per capita (Hart and Prahalad, 2002, p. 4). Most people at the bottom of the pyramid are found in regions such as South Asia, Africa, Eastern Europe, the Caribbean and Latin America (Subrahmanyan and Gomez-Arias, 2008). The BoP is a major potential market that has been unexplored and has remained in the shadow of the top tiers markets.

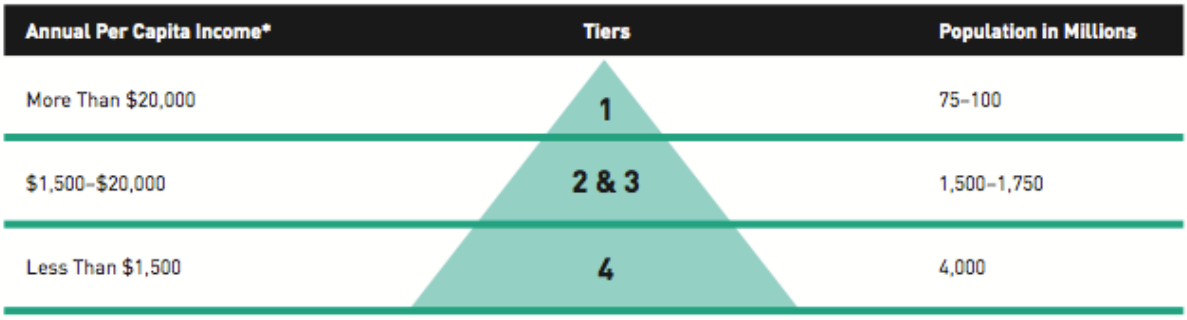

Figure 1: The World Economic Pyramid from Hart and Prahalad, 2002, p. 4

Pervez, Taimoor and Martiz (2013) state that given its size, the BoP could stand for a multi trillion dollar market and hold over 6 billion people in the next 40 years. Demographic studies support this theory, by indicating that birth rates are usually higher in the poorest socioeconomic areas but tend to decrease as development progresses. Today, the market segment represents two-thirds of the world population.

According to Hart and Prahalad (2002) MNCs should focus on inclusive capitalism and begin investing in developing countries. Indeed, MNCs that have the necessary resources and the persistence to enter this vast market will generate growth, profit and incalculable contributions to humankind.

There are several reasons as to why this large segment of the global population has previously been ignored and dismissed by most MNCs (Hart and Prahalad, 2002). Examples of a few orthodoxies listed in Hart and Prahalad's work are:

- "The poor are not our target consumers because with our current cost structure, we can not profitably compete for that market" (p. 4).

- "The poor cannot afford and have no use for the products and services sold in developed markets" (p. 4).
- "Only developed markets appreciate and will pay for new technology. The poor can use the previous generation of technology" (p. 4).

With these orthodoxies in mind, one understands that there is a need for new business models and strategies, in order for MNCs to enter this market segment. For example, the traditional strive to reach high profit markets must be changed, and MNCs must instead seek market efficiency and high volumes. If successful, this will create a win-win situation. Private companies will increase their profits while the well being of poor people is elevated (Kuriyan, Ray et al, 2008).

Even though MNCs are willing to change their strategies and are persuaded to enter developing countries, some people argue that it is difficult to beat the advantages of small and local organizations. However, according to Hart and Prahalad (2002), MNC have far greater resources, leverage and bridging possibilities. Entering a developed nation is a resource and management intensive task. MNCs have both the marginal and technical resources to create a complex commercial infrastructure from scratch. In contrast, local or small organizations might struggle to fund necessary research etc. MNCs have easy access to other markets due to their global operations and can therefore easily transfer business models from one nation to another. Finally, they argue that MNC are necessary catalysts that help bringing all players together, such as local governments and non-governmental organizations (NGOs).

In fact, no MNC can enter the BoP alone. Significant investments in commercial infrastructure must first be developed and this calls for multiple players. For example, local governments, non-governmental organizations (NGOs), communities, financial institutions, and other private companies must all collaborate in order to turn this segment into a profitable market.

According to Hart and Prahalad (2012), the BoP is an attractive market for MNCs and the vast segment is waiting for high tech businesses in the form of cellular telecommunications and financial services. Until now, NGOs and local business have been the ones making sure innovations have reached the BoP. Considering they have had far less resources than any MNC, the BoP is likely to see a tremendous change in the future as more MNCs decide to

enter. Hart and Prahalad (2002) comment on this saying, "we have only begun to scratch the surface of what is the biggest potential market opportunity in the history of commerce" (p. 14).

In December of 2004, the World Resources institute hosted a conference called, "Eradicating Poverty through Profit: Making business Work for the Poor". The United Nations (UN), the World Bank, influential NGOs, governments and MNCs all took part in discussing the challenge of meeting the twin goal of commercial profitability and social development. Information and communications technologies (ICTs) were regarded as an inexpensive way to establish market and distributions channels. As a result, 174 countries adopted the Tunis Commitment at the UN world summit on information society (WSIS), hoping this would assist in social development in BoP markets (Kuriyan, Ray et al, 2008). London (2008) also highlights this idea of mutual value creation, stating that it could be a win-win situation for both investors and members at the BoP.

2.3 Criticism of the BoP Proposition

Criticism has been directed towards the BoP proposition and researchers and authors in the field argue whether it is fortune or misfortune in the BoP market. A famous critic is Aneel Karnani, associate professor of strategy at the Ross School of Business at the University of Michigan, and author of both "Misfortune at the bottom of the pyramid" (2006) and "The Mirage of Marketing to the bottom of the pyramid" (2007). He argues that there are several fallacies in the traditional BoP proposition.

Karnani believes that there is misfortune at the bottom of the pyramid rather than fortune. He states in his paper that it is a "harmless illusion and potentially a dangerous illusion" (2006) and that the overall proposition is too good to be true. He brings up the following counter arguments:

- A fuzzy definition of the target market and that it is grossly overestimated (p. 91).
- The poor are geographically dispersed (except for those living in slums) and culturally heterogeneous. Including a weak infrastructure make it difficult to exploit economies of scales (p. 91).
- MNCs are going to have the least advantage to enter BoP markets due to the costs associated with serving the BoP market (p. 91).

- Companies overestimate the purchasing power of the poor and set too high prices (p. 92).
- People at the BoP should be viewed as producers rather than consumers (Pervez, 2013).
- The proposition rejects corporate social responsibility issues (p. 97).
- The poor should not be romanticized as "value conscious consumers", in other words, they do not lack self control and are no different from people with money (p. 97).

2.4 Porter's Diamond Theory

Porter's diamond theory investigates why some nations succeed and others fail in international competition and why certain countries do well in certain industries. Porter (1998) argues that four broad attributes shape a nation's environment in which the local companies compete. These attributes support or hinder the development of competitive advantage and are all simultaneously needed in order to develop a competitive advantage in a nation. The interaction between the different factors is described as equally important as the existence of a single attribute (p. 130).

Factor Endowments is one of these attributes and it describes a wide range of factors that affect the competitive advantage of a nation (p. 74). Porter acknowledges a hierarchy within these factors where basic factors are e.g. climate and natural resources and advanced factors, skilled labour and modern digital data communications infrastructure (pp. 76-78). The latter are what Porter find most crucial to the creation of a competitive advantage and explains that these factors are the product of investments. A country can thus grow these factors based on basic factors or simply through investment. A disadvantage in basic factors can lead to pressure to invest and develop advanced factors. Japan is a famous example where their lack of basic factors has forced the government to develop advanced factors. For example, Japan has more engineers per capita than most other nations (p. 79).

The second broad attribute that is needed in a country is the *demand condition*. Porter claims that the home demand is the most sensitive in developing a competitive advantage (p. 86). The shaping of products is thus highly influenced by the needs and characteristics of the home demand. Porter explains that a sophisticated and educated population helps push the development of a product since they then pressure the local companies to continue developing their products (p. 89).

Related and Supporting Industries is the third broad attribute that is explained by Porter as crucial to a country's creation of competitive advantage (p. 100). This factor explains the presence or absence of suppliers and related industries within a nation. Porter claims that a high density of such actors could benefit the country's competitive advantage in a thorough knowledge spillover in company clusters.

The fourth and last broad attribute needed to complete Porter's diamond is called *Firm Strategy*, *Structure and Rivalry* (p. 107). The theory states that nations differ in managerial ideologies and they, therefore, develop comparative advantages differently. Furthermore, Porter argues that vigorous domestic rivalry will benefit the creation of a comparative advantage and make it more long lasting. The comparative advantage is said to grow stronger due to a fast innovation pace that is brought on by strong competition (p. 119).

In addition to these four broad attributes, Porter emphasises the importance of chance and the role of the government. Factor related to chance could be of such sort as a sudden increase in input factors or inventions (p. 124). The government's role is portrayed by government policy, which may be an advantage or disadvantage for a company or an industry as a whole (p. 128). Porter views government intervention and chance as working through the four attributes, rather than contributing to a fifth and sixth determinant.

A further aspect of the theory is that it is not sufficient to simply develop a competitive advantage; it should also be sustained. This involves for instance investment in research institutes, upgrading and generation of ideas and infrastructure.

Michael Porter's Diamond

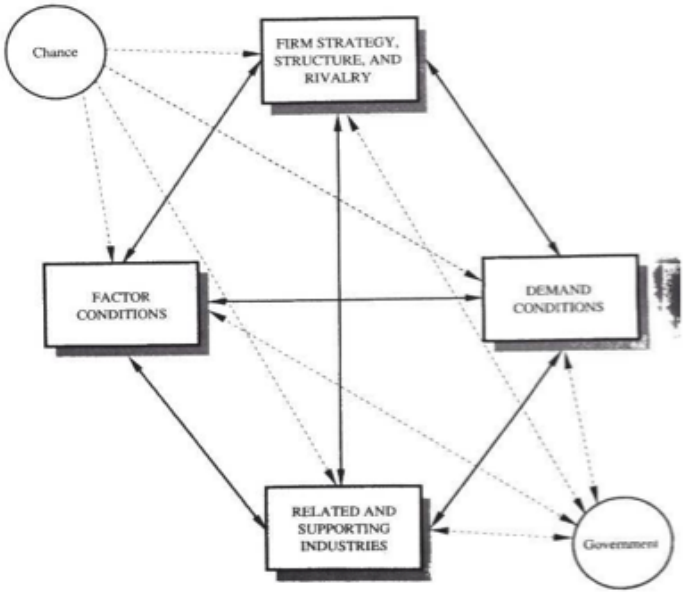

Figure 2: Porter's Diamond from Porter, 1998, p. 127

2.5 Critique of Porter's Diamond

A large amount of critique has been directed towards the diamond model. One of the most cited criticisms levelled at Porter is the multiple diamond approach by Dunning (1993). It discusses the theory's inadequacy to explain the role of multinational companies (MNC) in the development of national competitive advantage. Dunning (1993), argued that Porter was wrong in stating that the advantages of an MNC could be described by the domestic creation of a competitive advantage.

Rugman and Verbeke (2001), hold that a multiple diamond ought to be applied in order for Porter's model to work in the field of international business. Small countries are in specific need for the expanded version of Porter's theory, since they heavily rely on neighbouring countries to increase sales figures. The broadened theory has been applied on Canadian companies. Rugman and Collision (2006) show that the Canadian economy and competitive advantage profit from collaboration with its larger neighbour, United States of America.

According to Paul Krugman (1994), achieving a domestic competitive advantage is important in the development and growth of a country. He states however that it may lead to a worrisome obsession as it could result in trade conflict and protectionism. Krugman holds that the diamond model is mistaken in explaining business as a competition by asserting that one country's growth would reduce the standard of living in a competing country.

3. Methodology

This chapter seeks to present the manner in which the data used in this thesis have been collected. The first section describes the research approach, the second the data collection and the third and last section discusses the reflection and trustworthiness of the method used.

3.1 Research Approach

The research questions have led us to use the theoretical framework described in chapter two, and this in turn has directed us towards a specific choice of methodology. Given the nature of our research question our thesis is primarily composed out of quantitative data, which help create an understanding of the current market situation at the bottom of the pyramid as well as of macroeconomic factors. In order to support the quantitative information and to create a dynamic analysis, qualitative information has been gathered in form of interviews.

3.2 Collection of data

3.2.1 Qualitative vs Quantitative Data

There are several research models valid in the academic world; however, the two most common models are the qualitative and the quantitative research methods (Bell, 2000). Cepeda and Martin (2005) explain that each research method has advantages and disadvantages and no method is better than the other but one might be preferred. Holme and Solvang (1997) state that these two methods may be combined in the same thesis.

In general, a thesis written within the natural sciences tends to use a quantitative approach and those written within the social sciences, a qualitative approach. A quantitative method usually includes statistics and quantifications whereas a qualitative method examines personality variables such as attitudes, feelings and emotions (Taylor, 2000). This thesis uses qualitative studies in the form of interviews to capture a larger context and include many different variables to form a conclusion. This is an advantage according to Holme and Solvang (1997) who argue that it gives the researcher an augmented understanding of the logic and the social processes. In contrast, the quantitative thesis includes only a few data sets and statistics are necessary to analyze, explain and prove the hypothesis. Given the size of this thesis, quantitative usage has been necessary to form a structured view of the Kenyan development and is thus considered vital for the development of a logical analysis and conclusion.

The thesis is thus an example of the combined usage of both models, including both quantitative and qualitative variables, which is common within the social sciences.

3.2.2 Primary Data

The primary data used in this thesis have been collected through a range of different interviews. Due to geographical conditions, most of the interviews were conducted via telephone or Skype. The first interview was conducted in the very beginning of the thesis period in the sole purpose of gaining a more comprehensive image of the African technological development. This interview was with Stefan Isaksson at the Foreign Ministry in Stockholm, who works closely with African development projects. Another interview, primarily to support our general understanding of the ICT development in East Africa, was conducted in April with former Swedish Ambassador in Ethiopia, Jens Odlander. He could also provide detailed information on the technological climate in East Africa. More specifically, Odlander's knowledge of Ethiopia enabled us to compare and contrast Kenya's ICT with that in other East African nations. The third and fourth interview were held via Skype with Chris Otundo, former management consultant at Deloitte East Africa and Edna Gathiga, Business Development Manager at African media Initiative. Further consultancy has been made with Otundo via mail. These interviews were helpful in understanding the Kenyan culture and the nation's strive towards a flourishing ICT market. The interviews also provided information on the current macroeconomic situation. Finally, a phone interview was conducted with Robin Pettersson at the Swedish Export Council in Nairobi, Kenya. Interviews are of course prone to bias and subjectivity but for our purpose they are considered to be a valid research method, especially when combined with quantitative methods. The interviews were conducted with a combination of closed and open-ended questions. In order to avoid ambiguity and incoherent data, the interview questions were composed in advance and recorded during the interview with the consent of the interviewee. This has allowed us to reflect upon the answers given and to reproduce an accurate description of what has been said. The questions asked where compiled from our interest in the current macroeconomic conditions in Kenya as well as our curiosity for the bottom of the pyramid; ultimately helping to answer the research questions. The questions were tailored to the different interviewee's specific areas of knowledge. These exact questions can be found in the appendix.

3.2.3 Secondary Data

The secondary data collection is primarily built upon reports published by well renowned organizations such as, The World Bank, The United Nations, McKinsey & Company and Deloitte. These sources are considered to be trustworthy, accurate and up-to-date. Examples of reports that have been critical for our data collection are: The Kenya Economic Update (PREM), Fin Access National Survey 2013 (FSD), Kenya Economic Report 2013 (KIPPRA), Mobile Money: for Business Development (UNCTAD), Mobile Usage at the Base of the Pyramid in Kenya (infoDev, 2012), and the Rise of the African Consumer (McKinsey, 2012). Further, official web pages, newspapers and magazines have been consulted in the purpose of gaining an in depth understanding of the Kenyan ICT industry and its current challenges.

3.2.4 Deductive Reasoning

Schechter (2013) describes that deductive reasoning imply that the premises logically entail the conclusion, assuming correct reasoning. The premises can be explained as the writer's understanding and assumption of a situation. This reasoning contrasts inductive reasoning in the sense that the latter implies that the truth of the premises does not necessarily correspond to the truth of the conclusion.

This thesis uses deductive reasoning, as it begins with rather general and known premises, that Kenya has undergone phenomenal growth in its ICT sector. Other known factors are presented throughout the paper chosen from a specific framework, which is considered true. The paper aims to gain a logically certain conclusion, achieved through the process of coherent reasoning of the presented factors and the premises.

3.2.5 Triangulation

Triangulation is one of the most common methods used when conducting a qualitative and quantitative study and helps in obtaining accurate research results. This method is ideal when collecting information from diverse resources while aiming to form a consistent conclusion (Stake, 1995). Nightingale (2009) argues that triangulation can be divided into three different approaches: convergence, complementarity, and divergence. The first approach assumes that the different datasets produce the same picture of reality. For example, convergence is often looked upon when comparing quantitative data with qualitative data. This paper aims to apply convergence as it is used as a form of cross checking to make sure that different observers or institutions have captured the same phenomenon equally. Striving to achieve such verification, various interviews have been conducted with individuals of different

positions, all relevant to the substance of our premises. The second approach is complementarity, which suggests that quantitative and qualitative data sets can be combined together. Also a complementarity approach is used in order to create a fuller picture of the research question; Interviews conducted are often combined with quantitative data, which strengthens or contradicts earlier research and thus adds valuable information. Last approach is divergence, and normally inconsistency would mean there is a problem with the found data. However, scientists sometimes find inconsistency interesting especially when working with post-modern theories. Jack (2006) states that multiple sources of evidence enhance the quality of the research and the use of all three approaches is not uncommon. By using a wide range of information sources, contradiction is inevitable. These plausible inconsistencies aim to strengthen the analytical depth of the thesis.

The thesis consists of more than one data collection method and includes different data sets that are both quantitative and qualitative. These are analyzed independently, but at a later stage triangulation is used as a method to combine these various datasets to form an answer to our research question.

3.3 Reflection of Trustworthiness and Method Used

Kirk and Miller (1986) explain that no matter who conducts or when the research is being conducted, the research should yield to the same conclusion if it is completely trustworthy. Furthermore, a trustworthy thesis should be based on the collection of various sources that are compared for coherence and accuracy. McKinnon (1988) further states that a thesis is only valid if the researcher is studying the subject expressed in the purpose. In other words, collected data should be arranged logically according to the research question, which allows conclusions to be drawn from it.

Our thesis is trustworthy in the sense that we use triangulation as our primary method when collecting data. Instead of blindly trusting one source, we constantly compare data for coherence and accuracy. Our thesis is valid as it follows a logical structure based on our research question and chosen theoretical framework. Throughout our collection of both primary and secondary data, the research question has been kept in mind to avoid collecting redundant or unnecessary data for the purpose of this thesis. As a result, it is believed that anyone else conducting the very same research and using the same method would yield the same result.

4. Findings

4.1 BoP Findings

In order to explain the poverty situation in Kenya and to describe the extension of the Bottom of the Pyramid, this chapter begins by defining the BoP income level. Various recognized measurements for development and poverty are later stated in form of official data of the current status in Kenya for the purpose of profiling the population. Following the definition of poverty, the most prominent ICT products used by the BoP are described. Last, the value of these products to the members of the low-income segment and their availability is discussed.

4.1.1 Bottom of the Pyramid in Kenya Defined

As described in the presentation of the BoP framework, there are a number of definitions of what exactly constitutes the Bottom of the Pyramid. Hart and Prahalad (2002) argue that the income level for poverty is US $1500 annually. Dividing this by 365 days we find an approximate sum of US $4 daily. Hart and Prahalad have, however, received critique for their view on the size of the base of the pyramid by using an elevated level of income as the defining line. By using the World Bank's population tool, we find that US $4 daily would put 90 per cent of the Kenyan population below the poverty line using 2005 data (Poverty Trend). According U.S. Agency for International Development (USAID), the national poverty line is set to US $2.5 per day. This measure was also used by the World Bank in an infoDev survey on BoP in Kenya in 2012. Since US $2.5 per day is a recurring measurement in several reports, we have decided to use this income level as the defining line of the bottom of the pyramid (infoDev, Elder, USAID). Using 87.15 Kenyan Shilling (Ksh) to every US Dollar according to the May 9th 2014 exchange rate, US $2.5 would correspond to Ksh 218. Poverty data from the World Bank show that by this measurement, 76.6 per cent of the Kenyan population belongs to the bottom of the pyramid (Poverty Trend). Considering that these figures are from 2005, almost one decade of progress is overseen. Kenya Economic Update 2013, states that "Kenya's poverty rate is estimated to be in the range of between 34 and 42 per cent" using US $1.25 per day as poverty line (PREM, 2013 p. 4). The lead author of the report, Paul Gubbins, acknowledges that "A new survey is necessary to update poverty estimates and inform the government's poverty reduction strategies," and continues "without more frequent surveys, there is a missed opportunity to understand whether economic gains and government policy have generated pathways out of poverty for the poor" (The World Bank, 2013).

In The World Bank's publication on Geographic Dimensions of Well-Being in Kenya, the following map (Figure 3) indicates the percentage of people living below the US $1.25 daily poverty line based on a household survey made in 1997 and should therefore solely be used as visual aid to understand the income disparity. The two darkest shades are areas where up to 60 per cent or more people live in poverty. This pattern is still relevant today as, Kitui, Marsabit, Mandera, Samburu, Tana River, Turkana and West Pokot had poverty levels above 70 per cent in 2013 (KIPPRA, p. 20).

Poverty Incidence District Level Map

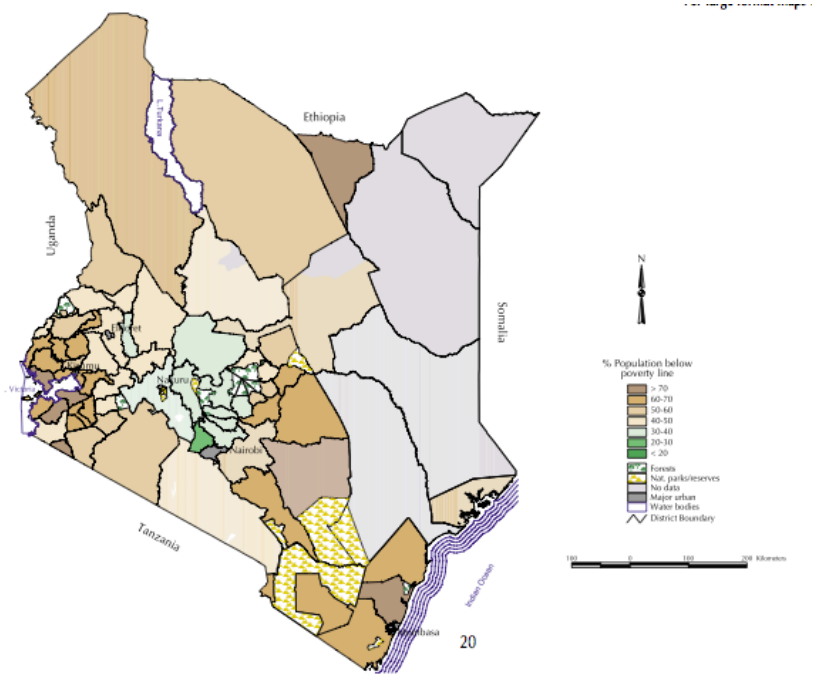

Figure 3: from Ndeng'e, 2003, p. 21

4.1.2 GINI

The Central Intelligence Agency (CIA) defines in 2012 the GINI index as a measure of the degree of inequality in the distribution of family income in a country. The closer a country is to equal wealth distribution, the lower its GINI number will be. In 2008, Kenya had a GINI number of 42.5 out of 100. This data shows that Kenya lacks equal distribution of wealth. It also shows that Kenya is less developed in this aspect than neighbouring countries, such as Tanzania and Ethiopia with figures of 37.6 (2007) and 33 (2011) respectively (CIA, 2012).

4.1.3 Human Development Index Rank

The Human Development Report measures a nation's development by combining indicators of life expectancy, level of education and income into a human development index (HDI). A

low HDI number indicates low development. Ranking from 0-1, Kenya receives a level of 0.519 in the 2012 evaluations carried out by the United Nations Development Programme. This level is higher than in neighbouring countries such as Tanzania with 0.476, Rwanda with 0.434 and Ethiopia with 0.3 (Human Development Index, 2012).

4.1.4 Urban / Rural Population

Kenya's population, urban as well as rural, is growing. The rural population is increasing in Kenya with over 32,5 million people living outside of the cities equivalent to 65 per cent of the total population (FSD, 2013). In 2012, the rural population growth was estimated to 2.2 per cent (The World Data Bank, 2014). Consequently, 35 per cent of the Kenyan population is urbanized and this segment is expected to grow by 4 per cent annually. The urban population growth is mainly propelled by rural-urban migration with focus on the main cities as well as smaller towns (FSD, 2013). The Kenyan Institute for Public Policy Research Analysis (KIPPRA) state in 2013 that the various counties differ greatly in level of urbanization where the Mombasa and Nairobi areas are 100 per cent urbanized (p. 26). KIPPRA (2013) expresses concern that most cities attracting this stream of migration lack the capacities to handle such surge in population growth. Urbanization contributes to demographic challenges, such as the development of slums. In 1990, Kenya had an estimated urban population of 6 million, of which 4 million lived in slums. In 2011, the urbanized population had reached 11 million and that 8 million of these living in slums. This indicates that the slum areas are increasing (p. 26).

Graph showing the Proportion of People Living in Rural and Urban Areas in Kenya

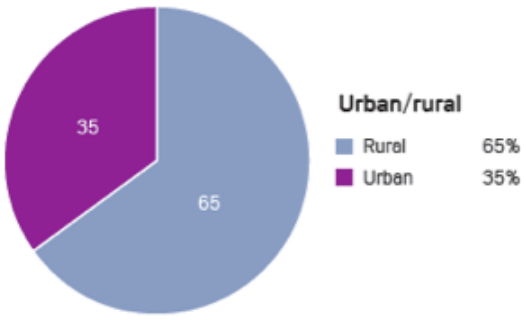

Figure 4: from FSD, 2013, p. 8

Today, approximately 60 per cent of Nairobi's population lives in slums, which merely occupy 5 per cent of the city surface (p. 26). If not managed appropriately, KIPPRA fear that the level of urbanization can have a negative impact on Kenya's development.

4.1.5 Accessibility of Mobile Phones at the BoP

Chinese imports help bring down the cost of purchasing a cell phone. The Mombasa port opens up to large amount of trade with the Middle East and Asia. According to recent statistics from the Kenya National Bureau of statistics (KNBS), 60 per cent of Kenya's total import in 2011 came from Asia, a number that is expected to rise in the future (p. 58). Knowing this, it does not come as a surprise that Kenya imported mobile phone units from China for over Ksh 2.5 billion in 2007 (Kenya Ministry of Trade). Gathiga (2014) explains that there is a phone for everybody and praises the low mobile phone prices due to elaborate trade with China. She holds this trade relation as a reason to why mobile cellular units have found a significant customer base amongst the Kenyans at the bottom of the pyramid and also suggests this as a factor to the gender equal usage of mobile phones. The cell phones available to the members of the BoP range from Nokia 3310 to Chinese affordable smartphones. The webpage of Safaricom shows units that range from 3499 Kenyan Shilling, which corresponds to approximately US $42.50 to Ksh 55999, which amounts to an approximate price of US $640 (exchange rates in May 2014). Gathiga (2014) explains that the second-hand market for mobile phones is very prominent and that a phone is easily found for US $10, approximately Ksh 872.

4.1.6 The Value of a Mobile Phone to the Members of the BoP

Access or ownership of a mobile phone increases the chances of earning money. A recent publication from infoDev (2012), states that there are three primary methods of earning money through a mobile phone: "micro-work, finding out about a job because of increased communication, and directly getting more jobs by being more reachable" (p. 37). In addition, phones can be used for finding safe water, food vendors, and getting valuable information about diseases.

People at the BoP prioritize their mobile usage over other commodities. Kenyans who are members of the bottom of the pyramid spend in general a total of Ksh 23 daily and that it is their single largest expenditure (infoDev, 2012, p. 41). People living at the BoP tend to

sacrifice other commodities in order to purchase a phone, reload airtime or credit to their phones. Several studies, including infoDev's, indicate a trend to forego household expenditures as a form of financing mobile phones. Most commonly people at the BoP forego buying food, paying bus fares and buying clothes (p. 40).

4.1.7 Mobile Phone Ownership and Socioeconomic Attributes at the BoP

Age, education and income are considered socioeconomic attributes that affect the percentage of mobile phone ownership among Kenyans. The FSD (2013) report holds that the highest percentage of phone ownership was found among people between 18 and 40 years old. Further, those with higher education are more likely to own a phone than those with lower or no education at all. The report also indicated that the majority of people not owning a phone are illiterate. Not surprisingly, the higher income the higher percentage of mobile phone ownership. Nearly 20 per cent of those within the lowest income bracket, defined by Wesolowski, (incomes of less than Ksh 1000 per day approximately US $ 11,5) own a phone. Those who did not own nor use a cell phone were mostly female, married, had no education and were effectively illiterate (Wesolowski, 2012).

There are also clear distinctions between ownership in rural and urban areas. The difference can be tremendous. For example, in Marsabit, a known poor district, only 9 per cent owned a phone. In contrast, 84 per cent living in the capital, Nairobi, owns a phone (Wesolowski, 2012). According to a recent report from FSD (2013), ownership of mobile phones has risen to 61.5 per cent and 83.8 per cent in rural and urban regions respectively (p. 32).

For those who cannot afford a cell phone, sharing is a possible alternative. Elder (2013) states, "SIM cards are a popular alternative to owning a mobile phone". Phone sharing is most common in rural areas where phone ownership is relatively low. Many individuals in a small village can share one phone. However, as phone ownership saturates less people are in need of sharing (Wesolowski, 2012).

4.1.8 ICT Usage

Initial adopters of many different technologies have been shown to be more affluent, more educated, urban, younger, ect. (Ono and Zavodny, 2003; Rice and Katz, 2003). Manyika (2013) states that the African population holds more than 200 million people in the ages of 15-25 years, a generation, which can easily adapt to fast changing ICT market. The KIPPRA

(2013) report indicates, "Youth between 18 and 25 years of age are the fastest growing segment among those at the BoP to adopt to mobile devices" (Elder, 2013).

InfoDev (2013) Annex of the report, highlighting iHub's research, also shows that men and women with no formal education use their phones quite differently than those who have post primary education. Only 23 per cent of people with no formal education say that they use texting. In contrast, 92 per cent of those with post Primary education use texting. 3 per cent of the uneducated respondents browse the Internet compared to 36 per cent of the more educated. However, when it comes to M-PESA (see following section for further information) the difference is much less. 61 per cent of the respondents with no formal education use M-PESA. A number that can be compared to 85 per cent of those with post Primary education.

Table showing the percentage of people using M-Pesa and their education level

Highest education level * do you use MPESA				
	Yes		No	
	Count	Percent	Count	Percent
No formal education	19	61%	12	39%
Primary education	205	77%	61	23%
Post primary education	424	85%	73	15%

Table 1: from infoDev Annex, 2013, p. 40

4.1.9 The BoP Products and Services

4.1.9.1 M-PESA

The main phone activities among BoP members are: calling, SMS and mobile money transactions (infoDev, 2012, p. 61). "Many financially excluded are not excluded from mobile networks" (Reeves and Sabharawal, 2013 p. 155). In 2007, former wholly state owned MNO, Safaricom launched the first mobile money application in the world; M-PESA, which in Swahili means money. By 2009, approximately 40 per cent of the Kenyan adult population was using the application (Tiwari, 2013). UNCTAD (2012) reports that the application had approximately 15 million users by the end of 2012, transferring Ksh 56 billion monthly. It is estimated that 68.8 per cent of the members of the BoP use mobile money in Kenya (infoDev, 2012, p. 60).

Mobile money refers to money stored on a subscriber identity module (SIM) card with a phone number as the identifier instead of an account number as in conventional banking. The

customer can easily access their balance on the highly intuitive mobile application, which is SMS based, hence accessible with almost every mobile phone (UNCTAD, 2012, p. 1). 71.3 per cent of the total mobile subscriptions are also subscribers to M-PESA, which is linked with 25 banks. Mobile money transactions (m-transfers) can both be national and international, the latter enabled through agreements with Western Union. Domestic m-transfers do, however, dominate the market and the largest transactions are urban to rural, as family send back money to poorer relatives. Such transactions previously required finding a trustworthy person who was travelling to the village to which you were sending money at the appropriate time. This person would also be required to recognize the recipients of the transfer and also be willing to arrange a meeting with them in order to deliver the money; i.e. a multitude of events could go wrong (p. 5).

Timing has been reported an important difference, which has spurred the growth of economies in poor areas; PREM (2010) reports that agricultural productivity has increased because of M-PESA since it enables fast transfers of capital, especially helpful in unpredicted emergencies. Transaction periods have been reduced from days or weeks to mere minutes. School attendance has reported increasing number of students, also studied in larger amounts of net transfers from urban to rural areas at the times when school fees are due (PREM, 2010, p. 23). Mobile money has reportedly benefitted women by giving them more independence being able to store away their money from their husbands. Local businesses and street vendors have in the same sense profited from digitized money as they often convert their earnings to M-PESA at the end of the day (PREM, 2010, p. 24).

Today, all Kenyan MNOs have their own money transfer services; Yu has Yu Money, Airtel has Zap and Orange has Orange money (infoDev, 2012, p. 27). According to Manson (2013), approximately 31 per cent of Kenya's GDP currently moves through the system.

4.1.9.2 M-KESHO

Seizing second place in awareness measures and number of users is M-KESHO, which is Equity Bank's savings application, launched in 2010. PREM (2012) states that banks initially avoided mobile money but have in recent years started to recognize its potential. Mobile money users can today withdraw money from an ATM instead of fully relying on agents. Some banks have also begun working together with MNOs, resulting in M-KESHO; "a branchless banking system". This application consists of interest earning accounts, which are

accessed via M-PESA. The product also offers micro-credit and a micro-insurance program. These applications combined help further connect the previously marginalized members of the bottom of the pyramid who are increasingly able to access basic products of modern financial services (PREM, 2010, p. 25). Despite 56 per cent of the respondents of an infoDev study in 2012 had heard of M-KESHO, only 4 per cent had used it (infodev Annex, p. 37).

4.1.9.3 Additional Products

Other products available range from M-Farm, a software solution to link farmers to buyers and update these on current market prices (M-Farm), to M-Maji, which helps allocate clean water (M-Maji), education application M-Prep and bookkeeping application Jamboi (infoDev, 2012, page 43). All of these applications only require SMS function.

infoDev (2012) holds that members of the BoP tend to use several SIM cards in order to profit to a maximum amount of offers given by the MNOs. It is also common to own multiple mobile phones because of the hassle to switch SIM cards as well as the fear of missing calls. InfoDev also reports that 60.5 per cent of the members of the BoP in Kenya (at poverty level US $2.5 daily) own a mobile phone, but that 82 per cent have at least one SIM card. Over 15 per cent own two SIM cards (p. 23). Products have been created to fit this demand; Mobile phone manufacturer, TECNO has developed the world's first dual SIM card phone (TECNO, 2014). Also, Nokia has adjusted their product line, offering phones able to hold two or even three SIM cards. These products are increasing in popularity among BoP members (infoDev, 2012, p. 23).

4.1.9.4 Additional Applications Specific for the BoP Market

Among the respondents of iHub's research, making up the basis for info Dev's report on mobile usage at the BoP very few respondents recognized the various applications available on the market. The survey suggests, that basic tools such as long battery life, alarm function and calculator were most desired by people at the BoP. However, advanced applications, specifically made for the BoP, were recognized among relatively few respondents. One reason behind this was that small start-ups do not differentiate their marketing towards the BoP and the rest of the population and their marketing methods are inaccurate. Thus, leaving large parts of the BoP uninformed (infoDev, 2013, p. 49).

Table showing the Awareness of Application among the BoP Respondents

Awareness of Mobile Phone Applications		
	Frequency	Percent
M-Pesa	794	99.9%
M-Kesho	443	55.7%
M-Kilimo	59	7.4%
PesaPal	55	6.9%
Kazi560	46	5.8%
Medic Mobile	32	4%
M-Maji	30	4%
Other	28	4%
Child count+	23	3%
Clubsoci	18	2%
M-Life saver	18	2%
M-Farm	17	2%
Fishmate	15	2%

Table 2: from infoDev Annex, 2013, p. 37

In the survey people were asked what services they would like to access through their mobile phones. The top three categories were health, educational and government information. Women felt that health related application were most important, where as men rather had access to government information. This suggests that men and women have different preferences when it comes to applications.

4.1.10 Marketing Strategies Towards the BoP

Most people at the BoP get their daily information from media outlets such as, TV, radio and newspapers. However, looking at the top market player's advertisements, one finds that they are mostly composed in English very few are composed in Swahili (Safaricom, 2014). This suggests that those who have not learnt English, often living at the BoP, are excluded from obtaining information. As a result, the people at the BoP rely on word of mouth for information. On the other hand, smaller start-ups dismiss all form of marketing as they consider it to be too expensive. This has resulted in that BoP is often unaware of newly established services available to them. (infoDev, 2013, p. 49).

4.2 Porter's Diamond Findings

In this section of the chapter the different segments of the Porter's Diamond Theory are applied on the current situation in Kenya in the purpose of gaining a macroeconomic perspective of the ICT development. The four broad attributes are selected as main headlines under which corresponding findings are described. The prominent role of the government is discussed whilst chance is briefly presented in the same section. The ladder is not given equal attention, as it is difficult to explain academically with relevant data. Additional findings that lack a clear reference to one of the attributes are defined as unknown factors.

4.2.1 Factor Endowments

4.2.1.1 Skilled Labour

In order to build a strong labour force, education is key. Berger and Fisher (2013) state that investment in education can build a solid foundation for shared prosperity and economic success. They further explain that access to high quality education expands the economic opportunities for the country as well as its population. Furthermore, infoDev (2012) states that there is a stronger likelihood of technology usage by those with higher education. The report further explains that a majority of respondents lacking formal education used ICT less than their more educated counterparts. In order to study the level of skilled labour in Kenya, this paper presents four attributes; literacy rate, secondary education completion rates, education as university level as well as a rather new phenomenon; Incubation centers.

4.2.1.2 Literacy Rate

The World Data Bank (2007) show that both adult and youth literacy rates have declined over the last decade and has experienced close to no development over the last 25 years. Adult literacy rate is defined by the World Bank as; "the percentage of people ages 15 and above who can, with understanding, read and write a short, simple statement of their everyday life" (World Data Bank, 2014). Youth rate is similarly described with an age delimitation of 15-24. In 2000, Kenyan youth literacy rate showed promising figures of 93 per cent. High youth levels forecasted an increase in adult rate. Recently, there has been a decline in both groups. According to the World Data Bank in 2007, the adult literacy rate had dropped 10 percentage units from 82 per cent in 2000, to 72 per cent and the youth ratio was lowered by 9 percentage units. However, these numbers are still greater than those in Tanzania where the youth rate is 75 per cent and adult literacy rate is 68 per cent. In Uganda, these numbers

correspond to 87 and 73 per cent respectively. Ranking Kenya's literacy rate between the two countries (The World Data Bank, 2010).

4.2.1.3 Secondary School Completion

According to the World Bank study, Highlights of the World Development indicator from 2014, secondary school completion rates have increased by 66 per cent over the last 20 years in middle- and low-income countries. The same study show that East Asia and the Pacific, as well as the Middle East and North Africa have downward sloping figures. Sub-Saharan countries, on the contrary, show steady improvement. Though positive numbers, the rates of lower secondary school completion in these African nations constitute less than half of completion in the other regions. The World Data Bank (2014) defines gross secondary school enrolment as the ratio of total enrolment, regardless of age, to the population of the age group that officially corresponds to the level of education. In 2009, the gross enrolment level constituted for 60 per cent in Kenya, having grown from 43 per cent in 2002. However, looking at population as a whole approximately 27 % has a secondary education (FSD, 2013). This is slightly above the sub-Saharan average of 26% completing lower secondary education (World Development Indicators, 2014 p. 28).

4.2.1.4 University Data

Bloom and Canning (2006) show that university enrolment rates in sub-Saharan Africa are among the lowest in the world, averaging 5 per cent. According to a 2013 national survey conducted by FinAccess, the number of individuals who do not partake in any level of education surpasses the number of Kenyans with a university degree (FSD, 2013).

Peake (2012) state that the scarcity of qualified IT talent is the largest challenge for the future development of ICT in Kenya. The Ministry of Information Communication and Technology expect significant growth in IT employment but Peake worries that students are unqualified and will need retraining. Yet another concern is the large number of high performing students who leave Kenya without returning. As shown in the image approximately 10% of the Kenyan population have a university degree.

Graph showing the Percentage of the Population with a Certain Education Level

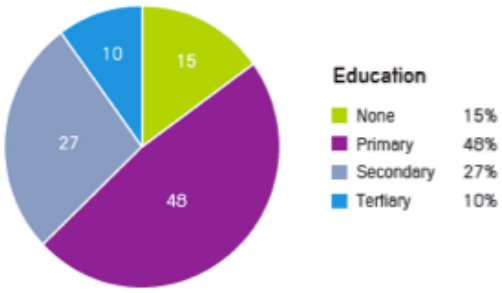

Figure 5: from FSD, 2013, p. 8

4.2.1.5 Incubation Hubs

Innovation hubs such as M:lab East Africa, iLab, iHub, 88mph and many others work to produce new and innovative applications that will stimulate local innovation and growth (infoDev, 2012, p. 53). Kenyan Business Incubation centers and research labs play a key role in the ICT and mobile application development. Otundo (2014) explains that entrepreneurs and "techies" gather around these institutions and share ideas and collaborate on various projects, often without any charge. Renowned Strathmore University, in Nairobi, has created iLab Africa where students and faculty work together to generate new and innovative mobile applications. These programmes are primarily focusing on ways to overcome development challenges in education and health.

The Incubation center has teamed up with various strong profiles such as Safaricom and Samsung. Google has also noted the potential of iLab and funds mobile application camps at the university. iLab receives financial support from the Clinton Foundation and the Kenyan Ministry of Health. InfoDev (2012) states that Kenya, through these technology hubs, has developed highly innovative products focusing on poverty alleviation on various levels and are thus critical for the continuing growth of the Kenyan ICT sector.

4.2.1.2 Infrastructure

KIPPRA's economic report from 2013 states that infrastructure is critical to the ICT development and that its investments constituted for 19.1 per cent of the GDP in 2012. 2.1 per cent was directly linked to post and telecommunications. The following infrastructure is relevant for ICT in Kenya: Internet access data, mobile cellular usage as well as the extension of fixed telephone lines.

4.2.1.2.1 Fixed Telephone Lines

UNCTAD (2012) states that the existence of fixed telephone lines has been a historical measurement for the level of infrastructure in a country for the last hundred years. Joint together with the indicator 'mobile cellular subscribers', they form the broadest and most commonly used measurement of the development of the telecommunication within an economy. Telecommunications development is closely linked with that of the economic, social and institutional development. Though this indicator is historically well used, it is rather difficult to apply to most Sub-Saharan countries. In the article, "The Limits of Leapfrogging" (2014) it is stated that many African nations have leapfrogged past this otherwise natural step in an industrial revolution and the measurement has, therefore, the measurement of fixed telephone lines has lost some of its accuracy and relevance.

Though Kenya is developing, The World Data Bank (2014) reports that the existence of fixed telephone lines is decreasing in ratio to the population number, from just over 2 per cent in 2008 to merely 0.25 per cent in 2012. Between 2001 and 2010, however, the government invested an equivalent to 3 billion dollars in fixed telephone infrastructure (PREM, 2010).

4.2.1.2.2 Mobile Cellular Usage

Nottebohm (2012) further explains that mobile subscriptions in aspiring countries have increased from 53 per cent in 2005 to 73 per cent in 2010. Africa is the fastest growing in the global cellular market. In seven years, the number of subscribers grew from 2 million in 2000 to more than 150 million by 2007 (The World Data Bank, 2014). Christine Qiang predicts that virtually all new mobile customers will be from aspiring countries and amongst those mainly in rural areas. She further explains that the ICT platform, therefore, is reaching large sections of illiterate and low-income populations. The expansion of mobile technology, and more specifically niched SMS functions, has provided revolutionising tools for a variety of activities in Africa, many of which give way for leapfrogging opportunities (Qiang, 2013).

Mobile cellular usage is first documented in Kenya in 1992, with 1100 subscribers. Over the following twenty years the initial figure greatly accelerated to, in 2012, roughly 31 million users. This number corresponds to a penetration of 84.375 per cent (The World Data Bank, 2014). Mobile usage in Kenya has boomed and attracted global attention over the last decade, especially since the introduction of mobile money by Safaricom (PREM, 2010). According to PREM, major investments in critical infrastructure have been done by government. Over US

$ 3.2 billion was invested in mobile services between 2001 and 2010. Looking at neighbouring countries, such as Rwanda and Tanzania, Kenya has one of the highest penetration rates.

4.2.1.2.3 Internet Access

Nottebohm (2012) states that about two billion people worldwide are connected through the Internet. Half of these users are from the developing world. He further explains that one indicator of a nation's development level of adoption to the Internet. Once a certain level is reached, the country can start climbing the ladder of development.

Internet was introduced in Kenya in 2001 and the user number started growing instantly (The World Data Bank, 2014). According to PREM (2010), 1.6 per cent of the Kenyan population in 2004 was using the Internet. By 2012, 32 per cent of the population was connected (World Data Bank, 2014). Compared to other African nations such as, Tanzania and Rwanda with 4 per cent and 8 percent Internet penetration in 2012 Kenya is at the forefront of Internet usage along with South Africa, Ghana, and Nigeria. (World Data Bank, 2012, p. 15). PREM (2010) reports the successful installation of three fiber optic cables at the cost of US $700 million, which has contributed to lower tariffs and broaden the network throughout the nation. Today, Kenya has five optic cables, which fuel the ICT development and help ample Internet access (Otundo, 2014).

4.2.2 Demand Factors

4.2.2.1 Culture

Culture directly affects the home demand in a country (Brown, 2014). Otundo (2014) holds culture as one of the major factors as to why ICT has such a positive development in the nation: *"One of the reasons for the success of ICT is simply because we are Kenyans. Maybe we are gullible, but we jump on new ideas and are enterprising people"*. Geert Hofstede has through a number of dimensions attempted to explain the cultural differences between countries and how populations act differently from one another. The dimension Uncertainty Avoidance has to do with the way that a population relates to an uncertain future. Kenya scores 50 out of 100, which indicates that the population has no clear preference in this dimension (The Hofstede Center, 2014). Robin Pettersson, at the Swedish Export Council in Kenya, claims, however, that an open mind to new products and an entrepreneurial spirit is not exclusively found in Kenya and can thus not be held as one of the major contributing factors as to why Kenya has adopted the ICT system stronger than many of its neighboring

countries. On the contrary, Pettersson (2014) argues that the country has adopted western ways from its colonial times, making it an attractive destination for foreign direct investment.

During a television interview, Dr Catherine Adeya, states that Kenyans are impatient; *"we want our wine to mature overnight, leading it to lose its quality"*. She explains that this hampers the knowledge level of Kenyans and that the country is far too modest in its investments in R&D and that the nations is not growing enough skilled workers. Adeya brings up development differences between South Korea and Kenya, as they were considered on the same stage of development in 1965. She argues that the Kenyan impatient attitude towards long-term investments in education and research is the reason why South Korea is so far ahead today (Adeya, 2014).

4.2.2.2 Language

Similar to Tanzania and Uganda, Kenya's official languages are English and Swahili (CIA, 2014). Kenyans, however, commonly learn a local indigenous language first, their mother tongue, of which there are 65 different (Kenyan Languages, 2014). Swahili is learnt as a second language at school and English is taught later. Secondary education is commonly conducted in English (Kioko). Pettersson (2014) stresses the importance of English proficiency level in a country for the adoption process of ICT. This view is shared by Otundo (2014), who further explains that the proficiency level does to some extent reach individuals at the bottom of the pyramid. Both Pettersson (2014) and Otundo (2014) argue that English, as the official and instruction language, has contributed to the number of companies that want to establish their operation in Kenya.

Though the level of English is widespread throughout the nation, Swahili is still the dominant and the most used language by the mwananchi, the common man. Both Otundo and Gathiga claim that the successful ICT companies in Kenya have marketed their product to these users and often use catch phrases in Swahili and have the option of Swahili on web pages. Gathiga moreover states that Kenyans are proud of their heritage and that Swahili marketing is, therefore, highly applicable to all levels of society and helps bridge the social gap.

4.2.2.3 Demography

US Census Bureau's International Database describes that the nation has an expansive demography, which is typically found in developing nations (International Database, 2013). The International Database indicate that the current national population growth rate in Kenya

is 2.11 per cent annually, similar to that of Tanzania and Uganda (2.8 and 3.2 respectively). Factors that affect the demographic pyramid are birth rates, death rates and immigration. KIPPRA (2013) indicates that Kenya is now approaching the third stage of the demographic transition model. This stage is characterized by declining birth rates, low death rates and more people living to an old age. Indeed, Kenya has both lower birth rate and death rate compared to other East African countries, such as Tanzania and Uganda (International Database, 2013).

Fertility rates vary depending on a woman's location and education. Kenyan fertility rates in urban areas are significantly lower than those in rural areas with 2.9 and 5.2 lifetime births per woman respectively. KIPPRA (2013) shows that the cost of bearing children is much higher in urban areas than in rural and may thus contribute to the large difference. Furthermore, the report states that the level of education affects fertility rates amongst women. Women with no education have a fertility rate of 6.7 children. In contrast, women with secondary school education have a fertility rate of only 3.1 children. Overall, Kenya's fertility rate has declined and is lower than those of Tanzania and Uganda (International Database, 2013).

As a result of conflicts in neighbouring countries, Kenya annually receives a large amount of refugees. These come primarily from South-Sudan, Somalia and Ethiopia. Over 600 000 incoming refugees are recorded annually (UNHCR). Also neighbouring countries such as Tanzania receive refugees; however, not nearly as many. UNHCR has registered roughly 200 000 incoming refugees every year, though the numbers are declining. Similar statistics are recorded in Uganda where refugee numbers lie between 350 000 and 450 000 per year (UNHCR).

Kenya is predicted to have a demographic pyramid similar to nations like the UK in 2050 based on KIPPRA's predictions. The dependency ratio (the proportion of the population below 15 and above 64) has been declining for many years and this in combination with a large working population suggests a promising future. KIPPRA (2013) reports that the most significant changes belong to the 15-35 year old bracket, which corresponds to the largest portion of the population. The report expresses concern on how this section of the population is managed and explains that the Kenyan future depends on it: "it is likely to be either a blessing or a curse" (p. 21).

Table showing Kenya's Projected Population Size

Year	Population Projections (millions)
2009	38.6
2010	40.5
2011	41.6
2020	56.6
2030	65.9
2050	85.0

Table 3 from Kenyan Institute for Public Policy Research and Analysis p. 157

4.2.2.4 Gender

Gender division in usage of ICT affects the demand of the good. Many studies claim that a considerable gender divide in access to ICT exist and especially so in the poorer brackets of developing countries (Zainudeen, 2010, p 550). This gender division has been known as one of three facets of the larger "digital divide", explaining why and why not people can take part in the ICT development (Gurumurthy, 2004). Lack of skills and money explain the limited access among women, as well as cost, location and culture (Hafkin and Taggart, 2001). Smoreda and Licoppe (2000) state that gender roles and identities may influence the levels of ICT usage; In developing countries, women are very likely to stay at home and focus of maintenance of relationships whilst men use ICT for business purposes, hence the figures may be affected by this notion and somewhat skew gender related ICT statistics.

The infoDev (2012) states that very few members of the bottom of the pyramid in Kenya could afford to acquire mobile phones between 1997 and 2001 (p. 21). Gathiga (2014) notes that there probably was a gender difference at this time. She explains it as having been more of "a male issue" at the beginning of the ICT implementation period in Kenya, i.e. between 1997 and 2001. Gathiga claims however that over time the difference, in terms of subscribers, has decreased and is today "not that great". This supports the notion by Zainudeen (2010) that it is likely that as overall penetration levels in a country increase over time, the "gender

divide" will narrow. Ford (2014) report that the gender divide is also narrowing in Uganda whilst Kassim (2014) explains how the gender gap in Tanzania still is a problem.

Women and men have shown to use similar activities and services on their phones, but certain studies show that there is a difference in mobile phone ownership. A recent Financial Access report found poor Kenyan women are still underrepresented in mobile phone ownership and usage. The same report shows that M-PESA is mostly used by men (FSD, 2013).

4.2.3 Related and Supporting Industries

4.2.3.1 An MNO to Provide Mobile Phone Infrastructure

Williams (2011) describes that the mobile phone segment dominates ICT investment in sub-Saharan Africa. Three quarters of these come from various Greenfield mobile projects (p. 127). Kenyan ICT received third most infrastructure investment in Africa between 1998-2008, with South Africa and Nigeria as more investment rich nations (p. 125). Deloitte (2011) states that MNOs are contributing to the Kenyan infrastructure by rolling out electricity, building new masts, and making electricity more accessible to the rural population. MNOs also facilitate the improvements of roads. Elder (2013) underlines that intense investments in infrastructure by the private sector has decreased the call tariffs and made mobile phones accessible for the members of the bottom of the pyramid. Sterling Capital Limited announced in 2013 Safaricom's planned capital expenditure of Ksh 10 billion (approximately US $115 million) over the coming five years. This investment would primarily fund an extension of the already existing micro fiber network from 6 to 24 hundred kilometres, reassuring its competitive edge. According to Safaricom's 2012 annual report Ksh 25.74 billion (approximately US $295 million) was invested (p. 28). In its annual report, the company further underlines that they will continue to invest heavily in 3G and associated technologies in order to enable data business growth (p. 12).

4.2.3.2 Financial and Regulatory Institutions

4.2.3.2.1 Ministry of Information, Communications and Technology (MICT)

The Ministry of Information Communication and Technology was created in mid-2004 and is one of the most important institutions in the development of the ICT sector in Kenya. Its core functions are activities such as developing ICT policies, facilitating the development of ICT and enhancing universal access to information. MICT strives to create an environment, which

encourages expansion, development and the use of ICT. The institution is in charge of various projects such as the rollout of national fiber optic cables, which will help lower the prices of ICT commodities. The ministry is also responsible for the development of Konza Technology City, which is part of the Government's elaborate 2030 vision discussed in chapter 4.4 about the government (Ministry of ICT).

4.2.3.2.2 The Communications Commission of Kenya (CCK)

The Communications Commission of Kenya (CCK) was established in 1999 with the mandate to regulate as well as liberalize the ICT sector in Kenya. At the time of establishment, Kenya was dominated by a monopoly from Kenya's Telecom and the country had only two GSM mobile operators and one fixed telecom. However, both monopoly and duopoly were outlawed as the government gazetted Section 5(5) of Kenya Communications Act in 1988. In 2004, the monopoly ended and the CCK began its process towards creating a more liberalized market. After the adoption of the Kenya Communications (Amendment) Act of 2009, the CCK's regulatory scope and jurisdiction was further enhanced. Today, The CCK plays a central role in maintaining orderly competition, creating effective and transparent tariff regimes, and monitoring the ICT sector. The CCK believes in a fair environment in which rules apply equally to all industry players. For example, with the support from the Kenya Information and Communications Act, CAP 411A, the CCK ensures that dominant operators do not misuse their market position by reviewing and approving all interconnection tariffs before they are executed. As a result, call rates have dropped with over 70 per cent since its establishment with the average mobile tariff per minute ranging from Ksh 31.03 (approximately US ¢36) in 1999 to Ksh 3.02 (approximately US ¢3.5) as of December 2010. Further, the CCK organizes several pilot programs in the country, including the establishment of 16 school-based ICT centers, four community telecenters and eight centers for persons with disabilities. The Kenya Information and Communications Act, CAP 411A, is specifically adopted by the CCK "to provide incentives for infrastructure roll out in unserved and underserved areas, as well as support capacity building and innovations in the ICT sector" (Corporate Profile, 2014, p.13).

4.2.3.2.3 Central Bank of Kenya

The Central Bank of Kenya (CBK) was established in 1966 through an Act of Parliament. Its current vision is to be a world-class central bank and its mission is to formulate and implement monetary policy for price stability and foster a stable market-based inclusive financial system (CBK, 2014). Obera (2012) states that the Central Bank of Kenya greatly

contributed to the upswing of Kenyan ICT by stepping into agreement with Safaricom before the launch of M-PESA, promising full backing. Peake (2012) explains that the CBK later allowed open banking channels for non-bank agents in 2009. After this Banking Act was passed, operators began providing mobile money services that would compete with M-PESA.

4.2.3.2.4 Equity Bank

Equity Bank was founded in 1984 and is today Kenya's largest bank in terms of customers. The institute's logo, a modest house with a brown roof, symbolises its determination to contribute to a better life for Kenyans who historically have been excluded from financial resources. This supports the bank's vision of being the champion of socio-economic prosperity of the people in Africa. In 2007, Equity Bank won the Global Vision Award in Microfinance "For initiating a concept of the future that will shape the Global Economy" (Equity Bank). Obera (2012) explains that Equity Bank has contributed to the ICT sector through it partnering with Safaricom on both M-PESA and M-KESHO. The partnership entails that all Equity Bank users may withdraw their M-PESA money from the bank's ATMs, at any time of the day. The M-KESHO service allows depositing to and withdrawing from one's Equity Bank account.

4.2.3.2.5 Kenya Financial Sector Deepening (FSD)

At the beginning of the 20th century, the Kenyan Government saw significant changes in both wealth creation and poverty reduction. In response to this, a new program called The Kenya Financial sector Deepening was established in 2005, in order to develop a financial market available to those emerging from the lower income segments and or having small enterprises in need of financial support. The program operates as an independent trust under the supervision of professional trustees. On their official website, it is specifically stated that they work towards "making markets work for the poor". The government of Kenya, the Swedish International Development Agency (SIDA), and the Bill and Melinda Gates Foundation are only a few examples of developing partners that help to found FSD's projects (FSD, 2014).

4.2.3.3 An Agent Network

According to UNCTAD, the widespread agent networks in Kenya, especially in the main cities, have contributed greatly to the success of mobile banking. Agents serve as ATMs, cashing in and out money, as well as enable other key functions, such as registering new users and selling credit (p. 31). Though every Kenyan network service operator has an m-transfer service, most users still prefer M-PESA, mainly because of its extensive agent

network (infoDev, 2012, p 27). In 2012, 37000 agents were serving approximately 15 million M-PESA customers (p. 15). This means that there is one agent for every 405th customer. The agent ratio can be compared to the quite limited ATM network, which is equal to two ATMs per 100 000 people (Infosys, 2012).

4.2.3.4 Merchants and Retailers who Accept Mobile Money

UNCTAD (2012) reports that MNOs are currently cultivating merchants to adapt to using m-payments. Doing so, they focus on larger entities, such as supermarkets. Safaricom is for instance working with two large supermarket chains in Kenya, Uchumi and Naivas. Kenya Airways (2014) states that they allow registered M-PESA customers to pay their flight tickets using their cell phones. The expansion of merchants who accept mobile money is however held back since many small businesses do not qualify for the m-payments. In order to be granted the right to charge customers via m-payments, the merchant or retailer is required to open a corporate account, which in itself requires a large number of documents as well as a permanent physical address (p.7).

4.2.3.5 Business Usage

M-PESA and M-KESHO are prominent examples of businesses that utilize applications in order to carry out their services. The former reaches out to a wide majority of the country's mobile phone users with 68.8 per cent of BoP using mobile money in Kenya (infoDev, 2012, p. 60). Following the success of M-PESA, all other MNOs in Kenya have developed their own mobile money transfer, resulting in high levels of connectivity. As previously stated, major investments are being directed towards the production of new applications and a wide amount are produced yearly, with various level of uptake.

4.2.3.6 Equipment Manufacturers

4.2.3.6.1 Manufacturers

The Kenyan market is currently dominated by three phone manufacturers; Samsung, Nokia and TECNO. Other companies, such as China-based mobile phone company ForMe, Japanese Huawei and LG battle the 18 per cent that remains of the market (Gicheru, 2013). Samsung is the undoubted leader in sales, with over 400 thousand units sold in 2013 (Fripp, 2014). The company currently holds nearly 50 per cent of the market, Nokia 23 per cent and Spanish TECNO comes in third with 9 per cent of the sales (Gicheru, 2013). Allocating the products is Kenya's largest and most seasoned telecommunications dealer, Mobicom. The company covers 90 per cent of the Kenyan sales with 15 stores in Nairobi alone (Mobicom, 2014).

4.2.3.6.2 Application Providers

As previously discussed, Incubation hubs are an increasing phenomenon in Kenya. These are developed with the main purpose of creating new and innovative applications to help alleviate poverty in the nation. Nsehe (2013) reports that US $ 1.6 million was invested by the government in 2013 to launch a Technology Incubation program with Nairobi Incubation center Nilab. The program is described as an effort to support growing information and communication technology's start-ups.

4.2.3.7 Donors and Investors

In Kenya, international donors and investors have mainly spurred the ICT growth. There is no historic available data on Kenyan tech start-ups, which suggests that local companies are finding it difficult to compete with international giants. A report by infoDev (2012) holds that the locals are those who know the market the best and collaboration between them and MNCs would be beneficial. Investments are directed towards the large amount of application providers, such as Incubation hubs. On the other hand, donations are primarily given to the bottom of the pyramid (p. 59). The report further states that large MNCs can help the bottom of the pyramid start ups as part of their Corporate Social Responsibility strategies (p. 60). As mentioned above, donors like SIDA and the Bill and Melinda Gates Foundation are invaluable for the Kenyan ICT development (FSD, 2014).

UNICEF is known for its contributions to the developing world and a great example of how international organizations can help spur the technological wave of making mobile phones more accessible to the poor. As an example, they have started a program called U-report. Mr. Sapra, UNICEF Representative, states: "U-report offers a cost-effective, easy-to-implement means of assuring accountability by tapping community knowledge to learn the local and personal impact of policy and development schemes, health interventions and outbreaks". UNICEF is working closely with telecommunication companies to equip telephone booths with U-report service, making it available for those without access to a mobile phone. The programme is currently piloted in Uganda but clearly shows what donors and investors can do in East Africa (U-report, 2012).

4.2.4 Strategy Structure and Rivalry

4.2.4.1 Players on the Market

The different mobile markets in East Africa differ greatly. In Tanzania, seven players compete for sales and the leading company Vodacom owns 21 per cent of the market (Tanzania Telecom, 2014). Quite opposite, the Ethiopian telecom market is a government owned monopoly, with low uptake on ICT and weak development (Odlander, 2014). The Kenyan mobile network market is divided between four operators. Safaricom dominates the market with 64 per cent, Indian company Airtel owns 16.5 per cent, French Orange holds 10.5 per cent and Essar Yu consists of 9 per cent of the market share (infoDev, 2012, p. 25). Safaricom origins from the state owned Telephone Company. In the late 90's, Safaricom was incorporated as a private limited company and was by 2002 made public. The government kept 60 per cent interest in Safaricom through Telekom Kenya Limited (TKL) until 2008 when they sold another 25 per cent, resulting in ceased control over the mobile operator (Safaricom). According to Otundo (2014), Safaricom has through their early actions gained a large and loyal customer base, cementing their dominant position. The launch of M-PESA has also helped boost the Safaricom market share. 68 per cent of the respondents of an infoDev survey states that this application is the sole reason as to why they stay loyal to the company. Otundo (2014) further explains that Safaricom has created a solid network of agents who can be found on every street corner, to such extent that it is almost impossible for other operators to catch up.

Though Safaricom has a head start, stiff price competition has emerged through an increased influx of MNOs. PREM (2010) states that the strong competition on the Kenyan market has, together with infrastructure investments, been the basis of the sharp reduction of average call tariffs per minute (p. 33). This is in accordance with previous statements from CCK (4.2.3.2.2) that tariffs declined from Ksh 31 (approximately US ¢36) in 1999 to Ksh 3.02 (approximately US ¢3.5) in 2010 (Corporate Profile, 2014, p.13). Otundo (2014) explains that Airtel entered the Kenyan market with a distinct "no frills" strategy, similar to airline company RyanAir; cutting down on excess services in order to minimize the price. 73 per cent of Airtel and Yu subscribers state that the low cost service is one of the main reasons for using the operator (p. 26). Otundo holds that Safaricom will continue to remain undefeated despite stiff price wars and the notion that the operator does not offer the lowest tariffs. One

reason for this is that the m-transfer systems are not synced, resulting in heavier transaction costs linked to money transfers between different operators. The incentive to join Safaricom as a majority market owner will thus continue to remain high (UNCTAD, 2012, p. 38).

4.2.4.2 The Market is Changing

The reshaping of the Kenyan telecommunications market is most current. Reuters reports that Safaricom and Airtel are joining in to buy their smallest rival, Essar Yu (Mirini, 2014). The CCK claims that the two companies pay US $100 million together for the infrastructure of the company. Business Daily Africa notes that the exit was the result of large accumulated losses of Ksh 3 million annually (approximately US $34 400) (Kang'aru, 2014). French mobile operator Orange announced recently that they, too, have decided to exit the Kenyan market following major losses. Jackson (2012) states that the company has made a loss of US $105 million. Competition will, as a result, fall drastically and the large telecom market will be shared between Safaricom and Airtel. Danson Njue, research analyst at Informa Telecoms and Media, told CNBC Africa in a recent interview that "[The number of acquisitions we're seeing] is either good news or bad news. Good news in the sense that we're going to see a new wave of competition. Over the last three to four years we've been seeing competition in terms of price, which means a lot to the voice sector" (Maboja, 2014).

Bitange Ndemo, former Permanent Secretary of Kenya's Ministry of Information and Communication, states that the telecom market has reached maturity in the sense that the revenues have remained flat for a period of time. Thus, the only solution for companies is to reinvest in new innovations, expand or divest into some other areas. However, Ndemo points out that maturity has only been reached in the areas of voice and that data is only at the growth stage. He explains this further by saying, "you will no longer listen to a person speaking to you" and argues that video calls will become more frequently used in the future. Safaricom and Airtel are at the moment left alone, however, Dr. Ndemo does not believe there will be a super monopoly because these new innovations of data require more actors. He predicts new top market players to emerge within the next three to four years. Four companies have applied for licenses, including Equity Bank, which are targeting the new digital market. New business models will be necessary due to these technological changes.

For example, voice will be offered as a flat rate per month instead of price per minute (Business Center Interview, 2014).

4.2.5 Government

A research paper conducted by infoDev in 2012 states that a government plays a critical role in the creation of beneficial business, legal and political framework that encourage cooperation between media, MNOs, tech-start ups and manufacturers (p. 59). Elder (2013) gives several suggestions on how national governments can help promote ICT development. First, the government could adopt new economic regulations in favour of the industry. Second, the government could try to reform the market into a fair and competitive environment for all industry players. Last, and perhaps most importantly, the government allows positive democratic tenets to flourish. However, it is also argued that the best thing a government can do is to not stand in the way for private institutions. In fact, in India, where the ICT sector has flourished, the government did very little to help organizations on the way. Through tax regimes a government can also support specific industries by reducing or eliminating taxes on products and services offered (p. 34). A publication from the infoDev (2012) reveals some additional measures that can be taken by the government to spur ICT growth. For example, the government could take use of the existing technologies and demand institutional payments, such as government welfare distribution payments and taxes to be paid through developed ICT systems like M-PESA. The available technology could also be used in other public sectors such as, agriculture, education and health (p. 60). In a recent report, Nottebohm (2012) also explains that governments can facilitate the expansion and improvement of ICT development through education and infrastructure. State officials can support network rollout and stimulate demand through introduction of e-government services. Governments could invest in and supported the infrastructure development through low-cost loans, regulatory concessions as well as subsidies.

4.2.5.1 Governmental Taxes on MNOs and Consumers

Kenya is well known for having taxes above the African average and this remains true for the ICT sector. According to Deloitte's (2011) research, taxes make up 80 per cent of the industry's value added. The taxes are to some extent beneficial for consumers and the economy but hinder MNOs. Petterson (2014), at the Export Council confirms this idea that the taxation level of ICT products may hold back an even stronger adoption of the sector due to lower levels of investments and consumer usage. He explains, however, that neighbouring

country Tanzania has even higher taxation levels of the mobile network operators, thus giving Kenya a relative leading edge.

Deloitte (2011) explains that the mobile industry has less governmental support than other sectors. Kenya is a tough investment environment for MNOs and expansion of mobile networks is more expensive than in other African countries. For example, MNOs must pay tax on fuel used to power generators needed for construction, where as some other industries are excepted from such taxes. On top of this, the corporation tax in combination with taxes on revenues and turnover affect MNOs negatively. However, the Kenyan corporation tax is very close to the African average of 29.5 per cent.

Even though the government and other businesses benefit from MNO's infrastructure investments, MNOs are not compensated. MNOs must undertake necessary civil works alone, such as building roads and installing electric generators in order to expand their services and networks into rural areas. Kenya is therefore, an expensive country for MNOs to expand their current networks.

Breakdown of 2011 tax revenues from MNOs in Kenya by source

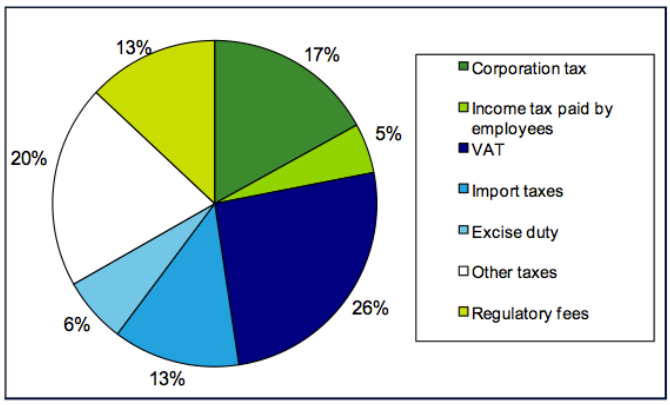

Figure 6: from Deloitte, 2011, p. 22

The customers are also affected by governmental taxes. In fact, 21 per cent of the average annual cost of mobile ownership can be traced to taxes. This includes the relatively unusual tax on airtime. This specific mobile taxation is 10 per cent and considered as one of the highest in the region. Only Gabon (18 per cent) and Uganda (12 per cent) have a higher tax on airtime. In contrast, the majority of countries including, Ethiopia, Chad, South Africa and Zimbabwe, has no taxation at all (Deloitte, 2013, p. 25).

In June 2009, the government exempted value added tax (VAT) on mobile handsets, as they believed this would increase the number of mobile handsets sold. Short there after, prices fell and the highest percentage of mobiles in Kenya were sold during 2009 (infoDev, 21). The sales of mobile handset rose with more than 200 per cent between 2009 and 2011 (Deloitte, 2011). Late 2013, president Kenyatta passed the bill, which imposed tax on commodities with 16 per cent. Wolniczek (2013) states that the bill instantly resulted in higher prices on most commodities, including mobile handsets. The Daily Nation cites Mr. Kwame Owino, chief executive officer of the Institute of Economic Affairs, who states that the law will disproportionately affect the poor (Kiberenge, 2013).

4.2.5.2 Kenya Vision 2030

The Kenyan government aims to turn Kenya into a globally competitive and prosperous nation with high quality life by 2030. The project is based on pillars, which are considered critical for the national development. The Economic pillar seeks to achieve 10 per cent GDP growth in every region by 2030. A medium term plan was set within this pillar between 2008 and 2012 with sole focus on three priority sectors, where IT enabled services was considered one. The government has chosen one flagship project to lead the IT development, which is the development of Konza Technology City (officially launched in 2013). The project seeks to promote the nation as a destination for business process outsourcing (BPO) and strengthen the attractiveness of Kenyan BoP services. In a television interview with Dr. Adeya, CEO of Konza Technopolis Development Authority (KOTDA) Kenya is referred to Silicon Savannah and Konza City is a stepping-stone in cementing that notion.

4.2.5.3 Kenya Open Data

In 2011, the President Mwai Kibaki launched the Kenya Open Data Initiative. Key government data is now freely available to the public through a single online portal. According to the website, Kenya is “the first developing country to have an open government data portal, the first in sub-Saharan Africa and second on the continent after Morocco”. This initiative shows that Kenya is trying to improve its governance and wants the country’s progress across all sectors be available to all. The website provides data on school enrollments, national expenditures as well as the documentation on health facilities just to mention a few. Ndemo twittered on April 3rd, 2014, “Within the first month of open data #Kenya, more than 50 mobile applications had been developed leveraging on the data” (Ndemo, 2014). In other words, the public responded positively to the website, and requests

more information to be made available. The information is extremely valuable, especially for researchers, policymakers, and not at least ICT developers.

4.2.5.4 Level of Stability

Kenya gained its independence in 1963, and is a relatively stable country compared to its East African counterparts (CIA, 2014). The IMF has helped the country various times, which is an indication of their stability (Lagarde, 2014). The Transparency International report in 2014 ranks Kenya 133 out of 177 on their list of control of corruption. Kenya's score is 27 out of 100 where 0 is considered highly corrupt and 100, very clean. In comparison to Uganda and Tanzania, Kenya lies between the two with 21 and 37 respectively (Transparency International, 2014). Pettersson (2014) finds that the legislative and financial systems are well developed and westernized since its colonial days. He holds that this is enabled by and contributing to the stability level.

In 2008, following the presidential election in late 2007, a civil war broke out in Kenya. This violence was triggered by ethnical disagreements, something that has pervaded the country since its independence (Odlander, 2014). More recently, Kenya has for some time been under threats of terrorism, which have lately escalated. Al-Shabaab, a militant group, has carried out several attacks in response to Kenya's military invasion in Somalia (Karimi, 2014). Myrenberg (2014), reports that President Kenyatta, however, opposes any negative impact on trade and the development of the nation.

4.2.6 Unknown Factors

4.2.6.1 Geographical Position

Otundo (2014) argues that the Mombasa port helps connect Kenya with overseas countries and promotes trade. On march 27th, 2014 Bitange Ndemo twittered, “The port of Mombasa or Lamu should be the gateway to East and Central Africa and replicate Singapore in the East” referring to his article “Kenya should be a logistics global hub” (Ndemo, 2014). Pettersson (2014) claims that Kenya’s geographical location has been a contributing factor to the rapid uptake of ICT in the sense that Kenya has a coastline, which many of its neighbouring countries lack. He further explains that the most obvious effect that the country has had from its coast is that it has enabled Kenya to install fiber optic cables, which contribute to higher ICT access and a noticeable price decrease. In addition to this, Pettersson highlights that Kenya’s geographical position in the middle of the continent, is an important factor for the development of the nation. He explains that Kenya is a natural meeting point for trade and is ultimately beneficial for the development of the ICT sector.

5. Analysis

The analysis has been organized according to the research questions and the theoretical framework. First, the BoP proposition is analyzed from a company's perspective, discussing what may enable or prevent multinational companies to invest in Kenya's low-income brackets. We end the BoP analysis by giving our opinion on whether the BoP in Kenya is a prosperous market, or as critics claim, only a mirage. Second, Porter's Diamond is used to highlight Kenya's technological advantage compared to other East African nations. By exploring various attributes, following the framework of Michael Porter's Diamond theory, certain macroeconomic factors are highlighted as key drivers behind the success of the ICT industry in Kenya.

5.1 Bottom of the Pyramid

The first part of the analysis aims to answer the question: What enables or prevents multinational companies in the ICT sector to enter the Kenyan market?

When studying various reports, it becomes obvious that the population size at the bottom of the pyramid is rather uncertain, partly because of disagreement on how to define poverty. Hart and Prahalad (2002), the creators of the BoP proposition, argued in chapter 2 for a poverty line set at US $4 per day whereas many studies on the subject have chosen a much lower income level to define the BoP population size. We have noticed that this is partly because there is a lack of coherent and up-to-date sources to define the extent of this market since there has not been any thorough household survey since 2005. We imagine that there might be an absence of birth and death registrations in rural areas since we have found that members of the bottom of the pyramid often are completely excluded from modern society. In order to evaluate the potential investment in a country, the size of the addressable market is a critical factor for companies that cannot be ignored.

Kenya is geographically dispersed and counties have undergone different socio-economic developments. We believe that this has contributed to an uneven income distribution and created remarkable gaps between rural and urban areas. Consequently, a large part of the Kenyan population has been excluded from modern technology and isolated from taking part in the ICT revolution. We predicate this through Kenya's relatively high GINI index, which is a measure for the degree of inequality in the distribution of family income in a country. We find no evidence indicating a change in the nearest future. During our research, we have gained the understanding that the BoP market is expected to increase. For example, slums are expanding and birth rates are still high in low-income areas. This supports Prevez, Taimoor

and Matiz's (2013) beliefs that the BoP population is growing. We believe that the unequal income level across Kenya has made it difficult for companies to grasp and understand how to reach the vastly dispersed market. Companies investing in the Kenyan ICT industry must keep in mind that complex distribution channels are necessary in order to reach the entire BoP segment.

Studies show that people living in the lowest socio-economic brackets are demanding access to technology. Mobile phones, especially, are considered potential sources of money and gate openers leading out of poverty. Increased access to clean water, medical aid, and education are a few examples of ways that the mobile phone can help the most vulnerable. A common misconception is that the poor cannot afford mobile phones. Hart and Prahald (2002) claimed this to be the one of the main reasons as to why multinational corporations (MNCs) do not invest in the BoP. However, our findings clearly show that even the poorest are willing to sacrifice an essential part of their income in order to have access to technology. For example, individuals forego essential expenditures, such as food and clothing, only to gain access to a phone. At the poverty line of US $2.5, only 65 per cent of the members living at the BoP own a phone. Wesolowski's (2012) study reveals that merely 20 per cent of the poorest (less than Ksh 1000, US $11.40 a month) within the BoP market owns a mobile cellular handset (2012). Considering the cost of a second-hand phone (US $10) in relation to a new phone ($US 42.5) we wonder how many mobile phone subscribers at the BoP really purchase a new mobile handset, leaving us to question the prosperity for phone manufactures in Kenya. The low level of ownership indicates, however, that a significant section of the BoP market is yet to be connected to ICT. We hold that these findings point towards a strong demand for ICT products. Hence, there is a stronger demand for ICT than what initially would be expected by multinational companies considering the low-income levels.

It is currently accepted as a fact that the ICT sector is booming in Kenya. However, there are no records that show that more than one application, M-PESA, which is a mobile money transfer system, has really taken off commercially on the BoP market. The savings app, M-KESHO, developed after M-PESA's success story, is known as the second most successful ICT product among the BoP segment. The application has, however, a very low usage rate. Safaricom, which is partly state-owned, has launched both products. We believe that the government has played a significant role for their success. As an example, M-PESA was fully backed by the Kenyan central bank at the launch, securing the continuation of the company

regardless of the outcome. Since we have found no reports showing that start-ups are successful within the ICT market in Kenya, except for those linked to state owned organizations, we wonder how open the Kenyan consumers are to new companies. The success of the industry is mainly driven by two products suggesting that Kenyans are either loyal to the state owned companies or are simply unaware of new products. The latter is proposed due to the notion that the awareness of available applications is strikingly low among the BoP members, as mentioned in chapter 4.

A challenge for companies is to make products and services that are applicable to the BoP customers. As stated by Berger and Fisher (2013), education is closely linked to ICT uptake. Since many of the members of the bottom of the pyramid are uneducated and often illiterate, we believe that conventional products are not marketable. For instance, the most valued functions of a mobile phone, according to the people at the BoP are: long battery life, alarm function, and calculator, all of with are simple tools available on low-end phones. This backs that an intuitive product, such as M-PESA, which is an SMS function and can thus be used on low-end phones, is what the BoP desires. We have found strong evidence that companies, such as Nokia and TECNO, through their efforts to tailor their products to the Kenyan BoP market have become popular. These findings contradict Hart and Prahalad's understanding that global operations can easily transfer their business models onto low-income markets (2002). These discoveries, however, also oppose some criticism to the BoP proposition, which claim that local companies always will have the upper hand, ultimately supporting Hart and Prahalad’s vision that MNCs can be successful at the BoP. We have, however, not encountered any Kenyan mobile phone manufacturers and must therefore hold this open for discussion.

Nevertheless, strong evidence also argues in favour for the statement that local companies will always have the upper hand. Two MNOs have recently been forced to leave the Kenyan market after having been outplayed by a local dominant actor. It is clear that Safaricom receives a dominant portion of the governmental support, creating an unfair advantage. It becomes evident that companies must heavily invest in R&D in order to reach the BoP market. Traditionally, companies see returns that cover their initial investment at an early growth stage of a product. However, given the BoP price sensitivity, prices must be kept low and the return on investment might therefore take longer than normal. On top of this, marketing strategies must be altered since a large section of the BoP does not speak Swahili

and is even less likely to understand English. There are more than 60 indigenous languages spoken in Kenya, emphasising the present marketing difficulties and the associated cost. As a result of high investment costs and a long payback time, we think it might be difficult to motivate why companies should risk this investment. Furthermore, since BoP products and services are characterized by low-margin revenues, uncertainty adds to the investment calculation. The risk of investment is higher since small margins require a large amount of sales. Keeping in mind that the market size of the BoP is difficult to estimate, high number of sales cannot be guaranteed. Higher risk requires a stronger financial position, directly eliminating the possibility for a large number of companies to enter Kenya's BoP market. Furthermore, the lack of governmental initiatives such as tax alleviations and financial support for building infrastructure adds to higher cost and financial uncertainty for MNCs.

To summarize the BoP section of the analysis, we have found many indicators that may explain why companies are hesitant to enter the ICT market. These include, an uncertain market size, a geographically dispersed market as well as low profit margins. However, we agree with Hart and Prahalad (2002) that there is a BoP market and that MNCs are underestimating the purchasing power of the bottom of the pyramid. The key to unlock the profits at the bottom of the pyramid is to think globally and act locally, in other words, adapt products and services to the BoP customer and understand how to reach them. If successful, we believe, mutual value creation can be achieved, and Kenya's low-income population as well as the investors will prosper. Thus, we find that the BoP is a prosperous market in Kenya. By making previously ignored markets commercially viable, Kenya, as a whole will thrive from a more unified market. Ultimately, this will have an effect on Kenya's macro economic environment, leading us into the next section of the analysis.

5.2 Porter's Diamond

The second part of the analysis aims to answer the question: Which factors and or conditions give Kenya an advantage for ICT establishment in East Africa? We examine Kenya's macroeconomic environment relative to that of neighbouring countries using Porter's Diamond model.

Porter's Diamond recognizes the need for certain factor endowments in the development of a competitive advantage of an industry. We have decided to analyze Kenya's level of education and infrastructure in order to see if these can be held as important factors for Kenya's ICT

development. Starting with education, one notices that Kenya, like other East African nations, is known for its low level of education and poor literacy rate. As explained by research, presented in chapter 4, ICT uptake and education are positively correlated, which technically should argue against the strong ICT adoption in Kenya. Not only does the low education level affect the usage of technology, it also holds back the development of ICT. There is a lack of qualified workers to sustain the growing ICT industry, which Peake (2012) holds as one of the largest challenges for the future of the industry. We do, however, acknowledge that Kenya has recognized the need for skilled labour to support the continuous development of the technological sector. One direct response to the education gap, as well as a mean to promote new innovations and start-ups, is the emergence of Incubations hubs. However, based on these findings we believe that Incubation hubs cannot alone fill the void of education since supporting industries also will suffer from the lack of skilled workers. Thus**,** we believe that education cannot, as of now, be credited as one of the reasons behind Kenya's ICT revolution.

Moving on to the next factor endowment, infrastructure, we have found that Kenya has an advantage compared to other East African nations. Looking at traditional measurements of infrastructure, such as fixed telephone lines, Kenya's development seems to be regressing. However, based on the notion by Simons (2012) that the very understanding of infrastructure is in need for re-conceptualization due to extensive leapfrogging across the African continent, we decide to overlook this infrastructural development. Studying the heavy investments made by both the government and various MNOs, such as the introduction of fiber optic cables, it has become clear how relevant infrastructure is for ICT development. Thus, choosing to look at Internet penetration and mobile cellular usage, we find that Kenya is in the forefront of infrastructure in East Africa. We think that the investment in relevant infrastructure has been an essential factor for the country's ICT development.

Porter's diamond suggests that demand factors also influence an industry's competitive advantage. We have therefore chosen to analyse Kenya's culture, language, demography and gender, all of which affect the domestic demand for ICT. Otundo (2014) underlines that Kenyans are known for being curious and open minded and holds this as one of the key reasons for the intense ICT uptake. Furthermore, it has been suggested that Kenyans are impatient and have therefore historically not valued long-term investments, such as education and R&D (Adeya, 2014). We suppose that there might be a negative correlation between

education levels and this cultural aspect. If not dealt with, we fear that this might turn into a vicious circle where the Kenyan ICT leap will stand without a qualified workforce to sustain it. However, if education and R&D are properly promoted, we think that Kenya's economy is likely to enjoy even greater growth, propelled by the expanding population. We therefore argue that the cultural aspect can either be a blessing or a curse for continuous ICT development.

Pettersson (2014) highlights that the English language also is an important factor, which has helped attract many international investors to Kenya. However, we cannot claim the high proficiency level to be a national advantage, which has stimulated ICT growth, since cross-border countries also have English as their official language. The language situation is rather complex, unlike many western countries with only one or two spoken languages, Kenya holds an extensive amount of 67 used languages. Many Kenyans only speak their indigenous language and this complicates all forms of information sharing and ultimately argues against the high level of ICT uptake.

Our findings show that the largest proportion of the population is found within the 15-35 year old bracket. The Kenyan culture in combination with a large young demographic segment, easily adapting to new technology, is thus promising for the Kenyan ICT industry. We based this understanding on Elder's description that "youth between 18 and 25 years of age is the fastest growing segment of the BoP to adopt to mobile devices" (2013, p. 21). A concern for this young and large population is how the nation will be able to support it. Moving into the third step of demographic development, it is critical for Kenya that education is prioritized in order to withhold a positive progress in human development index and to support the ageing population. The demographic structure could be turned into an advantage if the population is supported with the necessary means to excel.

The gender divide in Kenya is closing, which, based on our findings in chapter 4, helps spur the growth of the ICT industry through a larger amount of sales. Neighbouring country Uganda is seemingly in a similar state of development, as its gender gap is reported to be decreasing. Tanzanian women, on the other hand, seem to be discriminated on a larger scale than in the two other countries. It is evident that the ICT industry has profited from a larger customer base and that further equality will increase sales.

Another important attribute in Porter's Diamond is the presence of supporting industries, structure and rivalry. When examining the network of supporting industries that have spurred ICT growth, we find that these are MNOs, institutions and manufacturers. For example, MNOs are critical contributors to the nation's infrastructure and have invested heavily to broaden their networks. This has taken place without government subsidies, with the exception for Safaricom, where government provided initial support. The expanding operations have created positive external effects, such as providing electricity and water supplies to name a few. These tangible gains are particularly brought to low-income individuals in rural areas, adding to the development of the nation as a whole.

In addition, we have found clear evidence that Kenya has well functioning regulatory and financial institutions backed by the government and that their work has favoured the ICT market. Over the last decade, these institutions, such as the Communications Commission of Kenya (CCK), the Ministry of Information Communication and Technology (MICT) and the Central Bank of Kenya (CBK), have liberalized the market, making it an attractive environment for investment. In fact, Kenya is considered as one of the most liberalized communications markets in the East African region, giving it a clear advantage over neighbouring nations. The liberalization has enhanced customer choice, stimulated deployment of new and innovative services as well as improved the quality of services offered to end consumers.

Manufacturers, such as TECNO and Nokia, have clearly altered their products offered on the Kenyan market in order to fit the customer demand. The multiple SIM mobile handsets, for instance, correspond to our findings on Kenyan mobile usage that it is common to have several SIM cards in order to profit from as many MNO offers as possible. We find that the high adaptability by mobile handset manufacturers is a reason for increased sales and ultimately a contributor to the ICT growth. The many Incubation hubs around the country primarily financed through investors and donors, is an example of how industries work together in order to spur the Kenyan ICT expansion. Consequently, we find that the combined efforts of various actors translate to the success of the ICT industry. It is essential that the collaboration across players continues in order to keep Kenya's leading position as regional hub for ICT.

Next, we examine the structure of the market, and find that Kenya geographically lies between two market extremes. Tanzania has a completely liberalized market with no dominant player whereas the Ethiopian market is characterized by government monopoly. The ICT penetration in Tanzania has been shown to be much lower than in Kenya and Odlander (2014) explains that in Ethiopia it is more or less non-existent. The Kenyan market emerged through the government supporting one dominant player, which developed a blockbuster product, M-PESA. This protectionism gave the industry one stable first mover to pave the way, which set standards for new companies on the ICT market. The presence of regulatory institutions in Kenya has ensured a healthy environment for competition, and thus, we have seen an influx of MNOs, which have contributed to the infrastructural expansion. Safaricom's governmental support has forced its rivals to make their products more affordable and attractive to the Kenyan customer. We believe the recipe behind Kenya's thriving market is government's control, support and regulation of competition.

The impact of rivalry on Kenya's ICT market is evident. We see a connection between a large part of the population, falling below the national poverty line, and the MNOs' priority to cut costs. This has ultimately pushed half of the players off the market. We believe that inexpensive mobile cellular hand units, as a result of easy trade and rivalry, combined with price wars between MNOs, have narrowed the ICT usage gender division. We base this on the notion presented by Hafkin and Taggart (2001) in chapter 4 that gender usage division declines as prices fall. We hold that the diminishing gender division in usage has contributed to a higher number of subscribers, and has thus contributed to the growth of the industry. The high degree of competition has great impact on this development in form of price wars making the products available to more people.

Porter's Diamond highlights the importance of having a well functioning government backing up an industry. The government has clearly been a driving force behind the growth of the ICT sector in Kenya. Major investments in infrastructure have been made and clear visions are set for the future development of the industry. The Kenya Vision 2030 also highlight the ICT sectors' importance by claiming it to be a key driver for the country's future GDP growth. For example, The Konza Technology City project shows the governments desire to take part in international competition.

Overall, Kenya has a tax rate that is above the African average. The taxes have a direct effect on both MNOs and consumers in the sense that marginal costs increase substantially. Since Kenyans are price sensitive, the latest rise in taxes might affect the usage of mobile phones. However, if these tax payments are well allocated for further investment, it will, to some extent, directly or indirectly benefit the ICT growth.

Kenya ranks number 133 out of 177 countries on level of corruption, which might discourage investors and hold back the ICT growth. According to our findings, however, donors and investors consider Kenya to be a relatively safe and attractive destination for foreign direct investment, despite this high level of corruption. We believe that the adoption of a westernized business environment make investors comfortable. Governmental institutions have backed ICT development through rigorous monitoring, insuring a fair and competitive market, which we believe have been critical for attracting investments. Last but not least, the Kenyan government has recognized the value of having open record keeping systems, unlike many other East African nations. This opens up tremendous possibilities for ICT developers who can easily download statistical and expenditure data to help form new and innovative products applicable to the Kenyan market. All of this makes us believe that the government has been a key factor for Kenya's booming ICT industry. Comparing this to the known development and level of government control in cross border countries, we consider the Kenyan government to be more pro-active to the ICT development in relation to its neighbours.

Porter states in his theory that the combination of the above mentioned factors is necessary for a thriving industry. We find that there is a clear interdependence between Porter's broad attributes, which backs the theory's notion that all segments have to work together in order to create a competitive advantage. In other words, some factors might have contributed more than others, but no factor can alone explain Kenya's ICT development.

Alike Porter, we have not ignored the role played by chance. However, we have actively decided to not include this attribute as its own section in the findings chapter, since it is difficult to be explained academically. Kenya is considered to be a stable country compared to other East African nations. However, the country has recently experienced turbulence due to the 2008 civil war and the current terrorism threat from Somalia. President Kenyatta assures that these incidents will not affect the business environment. Still, we acknowledge

that there is a risk that external and internal disturbances may negatively affect the ICT industry due to investor fallouts.

During our research it has become clear that Porter does not take into account certain fundamental factors. For example, Porter's framework cannot be used to explain the critical impact of a coastal line and a well-functioning port for the competitiveness of an industry. Mombasa Port connects Kenya to the rest of the world and enhances its trading capabilities with other nations and thus, helps lower the prices of ICT products. The port's significance can be highlighted through the investment in an even larger second port in the northern part of Kenya's coastline. Moreover, Porter ignores the importance of neighbouring countries to support a nation's development, through trade as well as knowledge spill over, and the creation of regional hubs. Last, we believe that Kenya's geographical position, being placed at the middle of the continent, makes Kenya a natural connecting point for all African nations. Kenya will in many cases have shorter distance to critical trading partners within the continent and is likely to be the spider in the web, connecting African countries to one another.

6. Conclusion

This chapter begins with our concluding thoughts on what enables or prevents multinational companies in the ICT sector to enter the Kenyan market. The following section reveals our final opinion on which factors, and or conditions that give Kenya an advantage for ICT establishment in East Africa. Last, the possible advancement of the Kenyan industry in the future is reflected upon followed by suggested future research.

6.1 Thesis Conclusion

There is a shortage of qualified information on the BoP market size, which this thesis concludes to be a major component as to why companies withhold efforts to enter the Kenyan BoP market. The thesis supports Hart and Prahalad's (2002) beliefs that multinational companies should focus on inclusive capitalism and invest in developing countries, in this case Kenya. The thesis acknowledges the difficulties to reach out to the entire segment but, however, suggests that the BoP is a potential market for ICT companies, particularly if this issue of accessibility can be solved. Furthermore, there is a high underlying risk in BoP investments, but there are potential gains for resource rich companies with leverage possibilities. However, it is critical that these companies tailor their products in order to fit the market.

The thesis opposes orthodoxies directed toward the BoP proposition, such as the poor cannot afford ICT products and that only developed markets appreciate and are willing to pay for technology. Findings prove these statements to be fallacies as low-income individuals are willing to give up a large part of their income in order to gain access to ICT. These sacrifices sometimes even include daily meals. The thesis suggests that MNCs are hesitant to enter the BoP because they underestimate the purchasing power of BoP customers. Thus, they neglect a large potential market. Therefore, uncertainty on financial outcome might be one of the main reasons as to why companies are hesitant to invest in the BoP. Lastly, the thesis proposes that the simple statement that ICT in Kenya is successful is misleading and that the low success rate might discourage companies from entering the market.

We have analysed the contribution of Porter's Factor Endowments the Kenyan ICT growth. Although, our findings show that the Kenyan education level is slightly above the sub-Saharan average, resulting in a minor advantage relative to its neighbouring nations, this cannot be considered a key contributor behind the rapid ICT development in the country.

Extensive investments in infrastructure over the last decade have contributed to the leading position of Kenya's ICT industry compared to cross-border countries, and can thus be held as a competitive advantage for the industry.

Factors that affect the domestic demand have had various impacts on Kenya's advantage. Culture influences the development of the nation as well as its home demand. However, the cultural attributes cannot be considered unique to the region; and therefore, not a competitive advantage. Similarly, the positive contribution of a high level of English proficiency does not qualify as an attribute that has distinguished Kenya from its neighbours. On the other hand, the expanding demographic structure plays in favour of ICT development. However, since a growing population characterizes most developing countries, demography does not make Kenya stand out in comparison to its neighbours. Similarly, a narrowing gender gap has clearly benefited the industry. However, since Uganda has reported the same positive development, this factor cannot fully be considered a competitive advantage to Kenya's ICT development.

The supporting industries in Kenya can be considered a competitive advantage, which has helped spur the ICT growth. Combined efforts of companies, regulatory and financial institutes as well as investors in Kenya are unique in the East African region and play a key role in the ICT success story.

The thesis concludes that the rivalry on the Kenyan market has been advantageous for ICT growth. Rivalry between MNOs has allowed modern technology to reach a larger audience. However, it is uncertain how the exit of half of the players will affect the future of the industry. Nevertheless, this attribute cannot fully constitute an advantage over neighbouring countries as Kenya's market rivalry falls in between the two extremes present in the region.

Kenya's government has proactively worked for the success of the ICT industry and has thus provided a significant advantage to Kenya's technological leading edge. For instance, the Open Data Initiative has already been proclaimed a gate-opener for future investments by MNCs in the ICT sector. The governmental operation to open up the Kenyan market as well as their regulation and monitoring of the market have clearly spurred the growth of ICT in the country. However, the Kenyan government needs to deal with the high level of corruption, as it endangers the future prosperity of the ICT industry and might discourage future investors.

The thesis highlight that there is an underlying risk of both internal and external disturbances in the form of civil war and terrorism threats that may affect the ICT industry negatively. Finally, we conclude that Michael Porter (1998) does not acknowledge the importance of geography, but still hold that Kenya's coastline has added a competitive advantage to the ICT development.

6.2 Future Outlook

Looking into the future, Kenya is likely to advance further in the ICT industry. In order to do so, uncertainty of the BoP market size must be eliminated and new household surveys need to be conducted. Furthermore, multinational companies must stop neglecting the large market potential of the bottom of the pyramid in Kenya, and more consistent market data will help them to accomplish this. We hold that the Kenyan BoP market would benefit from less fragmentation, as it would facilitate the launch of new products on the market. Expanded use of ICT will in itself help narrow gaps in society and such consolidation would help the Kenyan economic development to reach its fullest potential. We recommend MNCs to collaborate with local actors as well as supporting industries in order to gain a foothold on the market. On top of this, it is important that companies tailor their products to fit the BoP market. Since the market is changing, due to existing players, it is also crucial that the government continues with proactive policies, ensures the attractiveness of the market, and restores lost competition. To help alleviate hesitation from multinational companies to stretch their operations into Kenya, we propose subsidies, lower taxes and granted financial support from the government. Further, if the growing population is adequately supported with widespread education, healthcare and political stability, the demographic structure of Kenya could turn into a true catalyst for the ICT sector. This in turn would also have a positive effect on the macroeconomic environment. This potential advantage would also promote similar improvements in neighbouring countries and ultimately benefit the entire continent.

6.3 Thesis Contribution and Suggested Research

The thesis contribution to research is a well-informed understanding of the macroeconomic factors, which have helped, and can continue to help, spur the ICT industry in Kenya. Our thesis is valuable to the Kenyan government as it gives information on how the nation should further support the development of the industry and attract multinational companies to invest in Kenyan ICT. The thesis is also a contribution on a firm level for multinational ICT companies, as it identifies opportunities as well as hurdles for profitable business in Kenya.

We find that it would be interesting to carry out similar research with a more general approach, focusing on ICT in the developing world as a whole rather than on a specific country. Such research would generate a larger contribution to the research and add a second perspective.

Since we have performed our research on the ICT sector in Kenya and compared macroeconomic factors to other East African nations, it would also be of interest to study the industry on a microeconomic level. This would help understand why the ICT industry is so prominent in comparison to other sectors and provide additional valuable information to the sector. This research could preferably be conducted by the use of Michael Porter's Five Forces theory, in order to follow the same logic as our framework.

We have found that the ICT industry has enabled international mobile money transactions within the East African Community. It would therefore be interesting to study how future collaboration between East African nations would impact the ICT growth in the region. Last, it would be appealing to conduct a comparative study on other continents than Africa. Throughout our research we have read a number of reports, highlighting the success of ICT on the BoP market in Latin America and Asia. A final suggestion would be to conduct similar research, explaining why a certain country within these regions, like Kenya, has gained an advantage relative to neighbouring countries.

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Appendix

Interview questions for Chris Otundo and Edna Gathiga

1. Do you believe that Kenya has had any benefits to its ICT industry due to its geographical position?
2. Do you think that culture has affected Kenyan ICT uptake? If so, why?
3. Do you think that language has affected the Kenyan ICT uptake? If so, why?
4. What do you have been the largest contributing factor/s to the ICT development in Kenya?
5. What is the government's role in this development?
6. In what way has ICT helped to improve the public sector? For example, has the education, health care and public governance changed at all?
7. Are there any other institutions that have played a vital role for ICT development?
8. How would you describe the educational system in Kenya?
9. Can you give a specific example on how ICT has spread among Kenyan's.
10. How would you describe the competition on the telecommunications market?
11. To what extent can people afford mobile phones in Kenya?
12. Do men and women have equal access to cell phones?
13. Is there any company that is particularly known for targeting people at the bottom of the pyramid?
14. In general, how do telecommunications companies market their products? And to whom are their market campaigns directed?
15. What language is commonly used in marketing campaigns?
16. Could you please describe the level of corruption in Kenya and how this might affect the business environment?
17. We found very few successful local companies. However, who do you believe help spur this development the most? Is it local, multinational companies or perhaps a combination of many different actors?
18. Do you think Kenya is an attractive environment for foreign companies to invest in? And if so what has been done in order to attract foreign direct investments.

Interview questions Stefan Isaksson

1. What do you find critical for ICT development?
2. What does the East African innovation environment look like?
3. What is your overall take on ICT in Africa?

Interview questions for Jens Odlander

1. What does the Ethiopian ICT sector look like?
2. How stable is Kenya in your opinion and why?
3. What is your overall take on ICT in Africa?

Interview with Robin Pettersson

19. Do you believe that Kenya has had any benefits to its ICT industry due to its geographical position?
20. Do you think that culture has affected Kenyan ICT uptake? If so, why?
21. Do you think that language has affected the Kenyan ICT uptake? If so, why?
22. What do you have been the largest contributing factor/s to the ICT development in Kenya?
23. What is the government's role in this development?
24. In what way has ICT helped to improve the public sector? For example, has the education, health care and public governance changed at all?
25. Are there other institutions that have played a vital role for ICT development?
26. How would you describe the educational system in Kenya?
27. Can you give a specific example on how ICT has spread among Kenyan's.
28. How would you describe the competition on the telecommunications market?