Barriers and Opportunities to Innovation Management in Small and Medium-Sized Enterprises in Ecuador: An analysis of food processing sector

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ABSTRACT

The focus of this research is to identify the main barriers and opportunities that SMEs in Ecuador face to implement innovation management. It investigates the main drivers stimulating innovation and the main barriers perceived in SMEs to implement innovation management, particularly, in processed food producers. Additionally, the study analyses the role of government policies and programmes fostering innovation in these SMEs. The study is important in order to contribute with knowledge generation about the main obstacles that SMEs face to implement innovation management, in the context of Ecuador. This information is useful for policy makers and SMEs. Policy makers will gain a deeper understanding about the phenomena presented in this research in order to improve policies and programmes encouraging innovation in SMEs. Additionally, SMEs will gain a better understanding of the role of innovation management. This research project was mainly based on primary data collected from face-to-face structured interviews with 13 SMEs. Additionally, semi-structured interviews were conducted to relevant institutions and experts. The findings underlined that the main internal barrier perceived by SMEs is financial constraints, and the main external barrier, is related to laws, norms, regulations and taxes. These findings led to conclude that government policies present some fallacies that need to be addressed. This suggests that appropriate diffusion about innovation management and a better communication among SMEs and government institutions could foster innovation activities in SMEs.
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At the end and beginning, thanks to God, for all events that have shaped my life.
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LIST OF ABBREVIATIONS

AC  Absorptive Capacity
CAN/ACN  Comunidad Andina de Naciones- (Andean Community of Nations)
CAPIA/CSIA  Cámara de la Pequeña Industria del Azuay- (Chamber of Small Industry of Azuay)
CEPAL/ECLAC  Comisión Económica para América Latina y el Caribe – (Economic Commission for Latin America and the Caribbean)
EU  European Union
GDP  Gross Domestic Product
GMP  Good Manufacturing Practices
NIS  National Innovation Systems
OECD  Organisation for Economic Co-operation and Development
R&D  Research and Development
SMEs  Small and Medium-Sized enterprise
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CHAPTER 1: INTRODUCTION

1.1. Background

The Ecuadorian government has implemented a set of policies in order to transform the country’s productive matrix. The “productive matrix” is defined as the set of interactions among different social actors using the resources they have at their disposal to carry out productive activities. It includes “products, processes and social relations coming from those processes” (SEMPLADES, 2012, p.7).

This implementation decision aims to change Ecuador’s traditional production model based only on commodities with none or little value-added products, which has placed the country in a serious competitive disadvantage, and to significantly reduce the amount of technology and products with greater value-added imports. For instance, Proecuador (2014), in its monthly report, indicates that trade and investment in non-oil exports, primary goods represent 70% of exports and products with some degree of technological intensity only 11%. Consequently, Ecuador is still a major importer of raw materials (28.9% of total imports), followed by capital goods (25.5% of total imports) and consumer goods (21.6% of total imports). This situation is highly related to the lack of innovation activities among national firms, and as a result, there is an absence of supply for certain products at the national level which forces the nation to import products offered internationally.

In order to achieve Ecuador’s productive matrix change, “fifteen productive sectors and five strategic industries” (SENPLADES, 2012, p. 15) have been given priority by the government. Fresh and processed food is one of these important sectors which require improvement due to the fundamental role it plays in the Ecuadorian economy. In 2012, it generated a contribution to GDP of about 13% and contributed 7.7% to the gross value added in GDP of the country (Ekos Magazine, 2014). Regarding sales, on one hand manufacturing contributed a share of 27.37% of total sales, where 21% belong to the production of foodstuffs. On the other hand, agriculture contributed a share of 4.72%. These two sectors contributed more after trade sector, which had a turnout of 40.47% (INEC, 2014). Concerning, total employed population, agriculture generated the higher rate of employment at 27.43%, whereas the manufacture sector employed 10.71% (CEPAL, 2014).
Further to this, according to INEC (2014), the food industry is conformed mainly by micro, small and medium sized enterprises (SMEs) which constitute approximately 98% of the overall industry.

Therefore, the government’s objective is to encourage these firms to implement innovation activities to create quality products by improving its production processes. So, the capacity to create an innovative environment is vital to undertake this challenge. However, the main problem is that many of these firms lack awareness about innovation importance and/ or they have difficulties to implement innovation management. This problem affects their growth, productivity and competitive advantage either nationally and internationally.

1.2. Research focus

Many academics and policy makers are aware that SMEs are crucial for a country’s economic change, especially those where SMEs are highly predominant, as is the case of Ecuador. Considering the importance of SMEs, some studies have been carried out in order to gain a deep understanding on the necessity and effectiveness of implementing innovation in these economic players. For example, Heunks (1998) focused on studying the role of innovation in improving SMEs’ productivity and economic profitability having as a result, a positive effect. Nevertheless, serious issues are being raised concerning some impediments to the successful implementation of innovation in SMEs, and thus more studies have attempted to gain a deep understanding about these obstacles. For example, there have been concerns over SMEs having inadequate infrastructure, lack of financial resources, low Research and Development activities (R&D), less qualified employees, among others. Thus, the study of innovation activities and expansion of the research in SMEs is of such importance as the study of innovation in large firms. However, relevant literature is mainly related to developed countries and, few studies, to developing countries, so no pertinent literature exists concerning situations like that of Ecuador.

As explained above, fresh and processed food sector is very important for the Ecuadorian government, and it is mainly formed by SMEs. As innovation is seen as a new required process for advancement and policies to boost this process are relatively new in the country, these Ecuadorian firms encounter difficulties and are facing latent barriers to implement innovative management. However, the main focus of this study will be concentrated in the barriers and opportunities, to implement innovation management, faced by those SMEs operating in the food processed sector.
Critical to the value and logic of the research in this study, it is very important to gain deeper understanding about the role of innovation management in Ecuadorian SMEs, particularly those operating in the processed food sector, due to their significant role in Ecuador’s productive matrix change. Understanding how these SMEs perceive innovation, how well they are prepare to innovate, and what the main obstacles are they facing to innovate, hold significant value. Additionally, due to new governmental policies are implemented in Ecuador to shape innovation in SMEs. It is important to analyse to what extent government policies and innovation support programmes are affecting innovation management in Ecuadorian SMEs operating in the mentioned sector. Therefore, this research is worthy to conduct because it would contribute to knowledge diffusion about innovation among SMEs in Ecuador and it will also create awareness of the main problems they face to implement innovation. Finally, this study will be valuable for policy makers because they will gain further information about perceived barriers to innovation by SMEs, and also SMEs’ attitudes to government policies and programmes aiming to boost innovation among them. This information will allow policy makers to evaluate the efficiency of government policies in order to accomplish the main goal: to change the country's productive matrix.

In order to gain a deeper understanding of these issues, the main activities to be tackled are a review of relevant literature on the topic so as to be informed about previous research and theory, and to answer the main research questions and to ascertain research findings.

1.3. Research aim and research questions

The research aims to detect the main barriers and opportunities that SMEs face in order to implement innovation management. The study will be focused on the processed food sector. In order to achieve this aim, three research questions need to be answered:

1) What are the main forces driving innovation in SMEs operating in the processed food sector?
2) What are the main barriers to implement innovation management perceived by SMEs operating in the processed food sector?
3) To what extent government policies and innovation support programmes are affecting innovation management in Ecuadorian SMEs operating in the processed food sector?
1.4. Dissertation structure

Chapter 1: Introduction
This chapter informs the reader with background information about the need to implement innovation management in fresh and processed food sector in Ecuador. The focus of the research, research value, aim and individual objectives are explained.

Chapter 2: Literature review
This chapter introduces the relevant literature. Firstly, it defines the term “SMEs” and “Innovation” to clarify the main terms used in the research. Additionally, it clarifies the drivers for innovation identified in the literature. Then, the main studies and findings about innovation barriers are discussed. Further to this, the chapter presents a brief description about the role of governments influencing innovation adoption in SMEs, with a particular emphasis given to the Ecuadorian government. Finally, the need of empirical research on innovation barriers on SMEs in Ecuador is justified.

Chapter 3: Research methods
The research methods chapter informs readers about empirical data, including details on the research strategy to be adopted, data collection techniques and sample selection. However, it also addresses the main limitations presented in the research.

Chapter 4: Research findings and discussion
This chapter reports on the findings from empirical research. The findings are based on information gathered through interviews to SMEs, and Chambers, Associations and experts on the topic. This information is described under themes related to the main research questions. Next, discussion about these findings is presented.

Chapter 5: Conclusions and implications
This chapter revisits the overall aim and specific research questions of this study. The key findings are summarised and conclusions are presented. Additionally, findings implications are discussed, and implications for further research are recommended.
CHAPTER 2: LITERATURE REVIEW

2.1. Introduction
This literature review engages with the main issues surrounding innovation management in Small Medium Enterprises (SMEs), particularly those which operate in the food industry. In the first instance, key concepts and terms in the field of innovation will be reviewed, leading the reader to a better understanding of the role of innovation and its importance for SMEs. Additionally, the chapter will review and explain the main forces driving innovation. Consequently, the main barriers these firms constantly face in order to innovate are identified in the literature. Finally an in-depth knowledge and understanding of the government's role in boosting SMEs innovation performance, particularly the Ecuadorian government, will be assessed. At the end of this section, it is expected to highlight key ideas for the reader to enable them to retain a critical perspective of the research topic.

2.2. Small and medium-sized enterprises
Commonly, an SMEs’ definition varies across regions and is based on different features such as: annual sales, number of employees, and working capital OECD (2012). Therefore, there is no consensus on the definition and/or categorisation of a small and medium-sized enterprise used worldwide.

Table 2.1 shows the differences in SME categorisation between European countries\(^1\) and Ecuador\(^2\). Both of them are determined by the characteristics mentioned previously. The parameter related to employees differs slightly between the ones in the European Union and Ecuador, but, the annual turnover has a significant variation. An understanding of the differences in the definitions will help for better assessing the findings of this research. Thus, it is important to be aware about these differences as an SME is not the same in a European country versus in Ecuador.

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\(^1\) European Union countries acknowledge European Union Commission SMEs categorisation.

\(^2\) Ecuador acknowledges CAN SME’s classification corresponding to the SME’s Statistics Andean System.
2.3. Innovation literature and definition of terms

Innovation is a subject that has been widely studied due to its importance and influence in developing enterprises’ economic growth, competitive advantage and sustainability yielding an improvement of the overall nation’s economy. In the innovation literature, one of the pioneers and probably the most noticeable and influential author is the economist Joseph Schumpeter. In several of his works, he has paid particular attention to innovation’s and entrepreneurship’s role as the core of economic growth. His definition states that innovation is “a new combination of means of production that is a change in the factors of production (inputs) to produce (outputs)” (Schumpeter, 1939, p.87 cited in Godin, 2008). Later, Drucker (1989) considered the most significant author in the management discipline and influenced by the Schumpeterian stream, focused his attention on the study of innovation, but within a management context. He states that “[i]nnovation is the specific tool of entrepreneurs, the means by which they exploit changes as an opportunity for a different business or service. It is capable of being presented as a discipline, capable of being learned, capable of being practised” (Drucker, 1989).

A recent study carried out by Baregheh et al. (2009) suggests an integrative and “cross disciplinary” definition of innovation. Taking into account the nature, type, aim, social context, means and stages of innovation from 60 definitions, the authors propose that:

“Innovation is the multi-stage process whereby organizations transform ideas into new/improved products, service or processes, in order to advance, compete and differentiate themselves successfully in their marketplace” (Baregheh et al., 2009, p. 1334).

Innovation is a process that embraces different characteristics such as change, learning, knowledge and development. In today’s competitive markets, innovation implementation at the level of any firm is crucial for achieving economic rewards, competitiveness and sustainability.

2.3.1. Types of innovation

The literature identifies mainly four types of innovation: product innovation, process innovation, marketing innovation and organisational innovation (Tidd, Bessant and Pavitt, 2005; Varis and Littunen, 2010; Ettlie and Reza, 1992).

- **Product innovation** is the development of a completely new product or a significantly improved product in the firm;
- **Process innovation** is a change in the way that products are processed and delivered. It could take into account the implementation of new equipment
and/or new forms to transform the raw material into the final product, among others;

- **Marketing Innovation or “Position Innovation”** considers changes in the way that a product/ or service is introduced in the market. It could be a change in the design of the package, design of the product or the way that this product is commercialised.

- **Organisational Innovation or “Paradigm Innovation”** means a change in the form on which an enterprise is organised, and according to Bessant et al. (2005) means a change in “underlying mental models” (p.19) which are those that leads enterprises’ actions and decisions.

Economists agree that these types of innovation are not mutually exclusive but reinforcing of each other. Frequently, in several studies product innovation is highly related to process innovation or vice versa. Moreover, other studies measure the level of organisational innovation by the number of products and processes introduced by a firm at a certain time. And, some others, suggest that marketing innovation is the one which plays a key role because it attracts a customer to buy either the new and/or improved product and/or service by identifying their needs, and therefore, it will lead to product and process innovation as a consequence (Igartua et al., 2010). However, the propensity to apply product innovation in firms tends to be higher than other types of innovation (Adegoke Oke et al., 2007; Sawang and Unsworth, 2011; Egbetokum and Olamide, 2009).

Further to this, any of these types of innovation could be performed in an organisation, either incrementally or radically (Bessant and Tidd, 2007). **Incremental innovation** refers to a step-by-step process where innovation progress gradually, “doing what we do but better” (Bessant and Tidd, 2007, p.22). In contrast, **radical innovation** refers to a complete or extreme change within the firm in any type of innovation, “doing something completely different” (Ibid, 2007). In SME studies, the majority demonstrate that incremental innovation tends to be the trend in these firms.

### 2.4. Drivers for innovation in SMEs operating in the food Industry

Innovation in the food industry has been underestimated because it appears to require low technological change in comparison to other industries. For instance, it usually presents low research intensity and low dynamism in registering patents (Fearne et al., 2013; Falguera et al., 2012). However, in recent years, food firms’ attitude towards innovation has changed noticeably due to significant changes in demand conditions. Ultimately, customers are more aware about their health resulting in preferences for healthier products, while paying less attention to those which have only a good
The innovation process is initiated by different drivers which are usually interconnected allowing the correct flow of innovation between them. The main forces driving innovation are found in the context of Porter’s Diamond of National Advantage which embraces four dimensions: 1) Firm strategy, structure and rivalry; 2) related and supporting industries; 3) factor conditions and 4) demand conditions, and two external parameters: a) government’s role and b) chance (Porter, 1990). Although the “Diamond” was mainly originated to determine a nation’s international success, its dimensions are helpful to identify elements affecting SMEs’ potential to innovate. Therefore, the first and fourth dimension are related to competitive advantage; the second and third dimension are highly related to entrepreneurial orientation, networking and knowledge. Each of these elements boosting innovation is explained in the following sections.

2.4.1. Competitive advantage

According to Porter (1990) the success and growth of an enterprise is based on its capacity to generate competitive advantage through innovative activities, and, it is frequently determined by pressure and challenge. The main pressure put on SMEs is frequently exerted through external agents such as customers, suppliers, competitors and governments. They will influence firms’ performance and economic growth by forcing them to use innovation as a tool to compete in the market. Hence, competitive advantage leads to innovation.

SMEs operating in the food industry are constantly facing challenges to maintain their competitiveness and sustainability in this dynamic and variable environment. In addition to the fast-changing customer needs and preferences the biggest challenges are the technological and environmental changes (Earle, 1997). Globalisation, the biotechnological revolution, genetic engineering, international quality standards and environmental regulations are some of the examples presented which force constant innovation either in the manufacturing sector (by improving its processes and enhancing product quality) or agricultural sector (by improving agricultural practices).

For this reason, SMEs have to manage their efforts in introducing new products in the market, developing new processes, making changes in their organisational structure and exploring new markets (Avermaete et al., 2003) in order to create value added and differentiation from competition. It means innovation has to be present in all the stages
of the food system such as: “production, harvesting, processing, manufacturing and distribution” (Earle, 1997, p. 166).

A good example of this is the introduction of functional and organic products. These products comply with many customers’ requirements, governmental regulations and international organisations’ norms, such as freshness, food safety, nutritional and healthier components. In addition, the production quality includes ecological impact and animal welfare, as well as ethical and social quality (Traill and Meulenberg, 2002).

There is a consensus among several empirical studies which demonstrate the positive effects of competition in encouraging innovation in SMEs. The main argument suggests that SMEs which are exposed to high levels of competition tend to be more market-oriented. As a result they tend to develop more products as well as better processes in order to gain advantage in the marketplace (Grunert et al., 1995; Laforet, 2007; Salavou et al., 2004). Consequently, a competitive business environment should be fostered in order to encourage innovation (Ayagari, Beck, Demirguc-Kunt, 2007).

2.4.2. Entrepreneurship

Entrepreneurship is commonly associated with three main characteristics: creativity, value creation and risk taken (Bessant et al., 2007). These characteristics are independent of the sector, industry, or company size, but, all of them are required to start an innovation process. A study conducted by Pérez-Luño et al. (2011) among 400 Spanish firms indicates that the entrepreneurial orientation highly influences innovation. The two variables that are shown to have a significant role were risk taken and proactivity. Firms with these characteristics were more willing to generate innovation rather than just adopting it.

Further to this, Villanueva et al. (2010) conducted research in Colombia where the results were similar to those of Pérez-Luño et al. The research shows that SMEs which tend to be more entrepreneurial have a crucial effect on innovation performance generating more innovative products. Heunks (1998) confirms that in SMEs the influence of entrepreneurs’ educational level, leadership and confidence are important for any kind of innovation. Thus, the role of entrepreneurship could be considered as the motivational engine which leads innovation and it has to be stimulated within firms.

2.4.3. Knowledge

Knowledge is acquired mainly via two methods: experience and/or experimentation, or acquired through a process of research (Bessant et al, 2007). Quoting a well-known statement by Peter Drucker “knowledge has to be improved, challenged and increased constantly, or it vanishes”. Therefore, knowledge plays a fundamental role in creating
and sustaining a firm's innovation process. This knowledge is divided into explicit and tacit knowledge (Plessis, 2007; Bessant et al, 2007). On one hand, explicit knowledge is codified and easily transferable; on the other hand, tacit knowledge is usually assimilated by a "learning by doing" process and it is more difficult to be codified and replicated (McAdam and Reid, 2001). The combination of these two types of knowledge will create new and innovative ideas leading to innovation (Ibid, 2001) through strategic management.

According to McAdam and Reid (2001), those SMEs which leverage knowledge successfully increased the number of valuable innovations, their customer service levels were improved and they were better prepared for forecasting future trends in the marketplace. Additionally, Bessant, et al. (2007) suggest the following activities to create and to manage knowledge successfully such as: generate and acquire new knowledge; identify and codify existing knowledge; store and retrieve knowledge; exploit and embed knowledge in processes, products and services and; share and distribute knowledge across the organisation.

Knowledge should not be stagnated only in the management department but it should be disseminated properly to other departments and employees. According to Cohen and Levinthal (1990), employees are at the core of the development, growth and success of an organisation. Thus, a general diffusion of knowledge within the firm is most appropriate and is highly correlated to a firm's absorptive capacity.

2.4.3.1. Absorptive capacity
Absorptive capacity (AC) is defined as a firm’s ability to recognise, assimilate, exploit and use new knowledge (Cohen and Levinthal, 1990). This capacity consists not only of the individual learning process but it also involves effective interaction among individuals (as a group) within the organisation (Wang, Ahmed, 2003) aiming to spread knowledge efficiently. Grey (2006) conducted a study among 1500 SMEs in UK. The main findings show that AC’s output in individuals from a firm is highly dependent on the educational level, experience and source of knowledge (Ibid, 2006). Commonly, training and Research and Development (R&D) are viewed by some authors as important determinants to increase an individual’s continuous learning. Particularly in SMEs, R&D is a more effective contributor to absorptive capacity if it is developed inside the firm (Ibid, 2006).

As a result, in some food SMEs, R&D activities are taking place and becoming “more technology intensive”, but the trend to have low level R&D activities remains high. Nevertheless, it is compensated for the increased use of vertical and horizontal
cooperation in the value chain (Earle, 1997). Additionally, according to Flatt et al. (2011) strategic alliances boost a firm’s performance by increasing its absorptive capacity.

It has been stated by Earle (1997) that the level of innovation in the food industry, in particular, is highly related to innovation in other industries such as the packaging industry or retailing industry. For example, the development of new packages to preserve food or keep it fresh will clearly boost the development of a new product which, thanks to the new technology in the packaging industry, could be kept fresh and be sold to supermarkets chains. Thus, many SMEs turn to build strategic alliances, networks or clusters to absorb new knowledge or leverage its weaknesses to innovate.

2.4.4. Networking

Networks allow firms to overcome internal constraints such as a lack of resources and capabilities while reducing risk in the innovation process (Gellink, Vermeire, and Viaene, 2007; Confederation of British Industry, 1993). Networks are usually created through collaboration, partnership or alliances with external participants such as: firms, customers, government, research centres, consultancies, universities, and international organisations (Omta, 2004 cited in Gellink et al., 2007). The principal aim in developing networks is to “create, capture and integrate the many different skills and knowledge needed to develop complex technologies and bring them into the market” (Calia et al., 2006, p. 427).

There is a clear consensus about the positive effects that networks have on stimulating and/or increasing innovation activities among SMEs. On one hand, studies carried out in different developed countries concluded their empirical findings, specifically, by stating that firms which build networks improved significantly their knowledge and learning abilities (Rycroft and Kash, 2004 cited in Calia et al., 2007; Confederation of British Industry, 1993) and found “fast solutions to specific problems” (Calia et al., 2007, p. 407) On the other hand, studies in developing countries, particularly China and Chile, demonstrated that innovation activities increased thanks to networking. In China, the most successful networks used by SMEs were through research institutes and universities centres (Zeng et al., 2010).

Therefore, the use of networking activities is crucial to foster innovation by overcoming SMEs’ internal constraints. If food SMEs networks could be present in the coordination among industries within the value chain or complementary products (Moon et al., 1998), so the more networks formed, the more new skills and competences might be acquired.
2.5. Innovation barriers in SMEs

There are significant limitations inhibiting innovation success in SMEs. In fact, it has been noticed that several of these limitations include: lack of external linkages, shortage of employees' training, negative attitude to innovation, among others, might be caused by the misuse or absence of innovation drivers such as networking and knowledge among enterprises. Following, relevant studies are explained below.

A pioneer research study on the main obstacles that SMEs face to innovate was undertaken by Piatier (1984) who analysed eight developed countries of the previously named, European Economic Community (Madrid-Guijarro et al., 2009). The results showed that the main barriers were related to a lack of skilled labour, financial constraints and government regulations.

Additionally, the OECD (2010) distinguishes different barriers. At the macroeconomic level, the main barriers are economic instability, regulations and tax policies, lack of international representation and no access to knowledge exchange through collaborations. At the firm level, the main internal barriers are restricted information on foreign markets, lack of managerial engage to meet international markets, lack of entrepreneurial orientation, no use of intellectual property and patents, low levels of R&D activities, poorly skilled labour and production of products which do not meet customer requirements. Studies conducted in other developed countries, such as Belgium, Hungary, Italy (Gellynnck and Kühne, 2009), Spain (García Martínez and Briz, 2000); (Madrid-Guijarro et al., 2009); (Segarra-Blasco, et al., 2008); Netherlands (Frances and Omta, 2009) have drawn similar conclusions.

In developing countries, Hadjimanolis (1999), in his research about the main barriers to innovation in Cyprus, before 2001\(^3\), identified that the top five external barriers perceived by owners/managers were: “1) innovation is too easy to copy – due to the majority of innovations are being incremental-, 2) governmental bureaucracy, 3) lack of government assistance, 4) lack of skilled labour and 5) bank policies on credit” (Ibid, 1999, p. 565). As internal barriers the study found: “1) lack of time, 2) lack of qualified managerial/technical personnel, 3) inadequate financial means and 4) resistance to change in the enterprise, and 5) inadequate R&D” (Ibid, 1999, p. 570). Further to this, similar results were found in Turkey, where the main barrier identified was the significant high cost to innovate for enterprises, and it is interrelated to the lack of appropriate sources of finance. Additionally, the lack of qualified personnel demotivates managers attempting to run innovative activities (Dermobas, n/d).

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\(^3\) Since 2001, it is considered an advance economy by the IMF.
In the Latin American context, research developed by the OECD and ECLAC (2012) indicates that Latin American SMEs usually implement informal strategies instead of a considered plan in order to innovate, and these strategies usually arise from the pressure that large firms create over them. Another issue that arose from this study is that these small and medium firms experience specific restrictions such as:

“access to credit and qualified human resources, a lower tendency to export, a lower capacity to interact with other companies and institutions that train human resources and carry out research, and their limited membership in networks” (Ibid, 2012, p. 106).

As observed, the majority of literature regarding innovation barriers is mainly focused on empirical research undertaken mostly in developed countries with little attention paid to developing countries, such as the case of Turkey. Concerning Latin America, a relevant study on the subject was presented by OECD and ECLAC (2012), however it focuses on Latin America as a region, paying lesser attention to the study of specific countries within the region. Contrary to this, there is not much data about previous studies or research about these barriers, particularly in Ecuadorian SMEs operating in the food industry, so the current literature about barriers in Ecuador is relatively poor. Therefore, this study aims to investigate if similar barriers to those presented in this chapter are similar or different to those presented in Ecuador.

2.6. The Government’s role in the innovation process of SMEs in Ecuador

Governments are considered key external players in enhancing and promoting a firm’s innovation through different national policies which shapes a firm’s propensity to innovate. In a SME-dominated country, as is the case of Ecuador, these policies have to be focused to promote development and economic growth of these SMEs. Some of these policies are focused on education and training, trade, tax incentives, labour market policy, public investment, the environment, and industrial and technological issues.

Chen et al. (2013), based on a case study of Taiwan, propose a “triple helix model” in order to facilitate developing countries’ adoption of national innovation policies, especially those with a high concentration of SMEs. The “triple helix model” comes from the study of the “National Innovation System” (NIS) which has reached the attention of academics and policy makers in the last twenty years. A NIS is formed by a group of public and private agents which mutually participate in developing a country’s innovation capacity (Lundvall et al., 2002). These agents are generally universities, firms, financial institutions, R&D centres and government agencies (Ibid, 2002). Therefore, the triple helix model is built from three institutions “government as public,
industry as private and university as academic" (Chen et al., 2013, p. 407). As a result, the collaboration of these three institutions, clustered in semi-government institutes, created a proactive and innovative environment in order to help SMEs to overcome three main constraints for their development: manpower, R&D and commercialisation. (Ibid, 2013). Even though this program focused mainly on developing semi-conductors industries in Taiwan, the model is a perfect example of how government can positively influence SMEs’ growth by adapting to specific needs in different industries.

Similar to other Latin American countries, Ecuador has started to implement new industrial policies to support research, technology and innovation. These include ambitious projects such as Yachay⁴, aiming to boost the scientific development and knowledge diffusion, as well as programmes focused on reinforcing SMEs growth. Having new industrialised economies such as Taiwan and South Korea as a model, these new policies aim to change the country's “production matrix”. Among these policies, the focal point is centred on investments, labour, entrepreneurship and training, transportation and logistics, innovation and finance (MCEPC, 2010).

Regarding innovation policies in Ecuador and SMEs in the food sector, the government launched several programmes in order to strengthen this vulnerable sector. A high priority has been given to fresh and processed products; considering that Ecuador still remains as a major producer of primary resources, and for this reason there is high interest in developing added value products. Among relevant programmes implemented are: EmprendEcuador, FONDEPYME, Credipyme, the credit program called “5-5-5”, and agricultural competitiveness and rural sustainable development projects, among others, all of which are working positively to help many SMEs (MCEPC, 2010).

Even though positive steps have been taken to improve considerably the country’s innovative, scientific and technological capability, there still exists scepticism and some critics. On one hand, some private actors are sceptical about their adaptability and successful implementation due to similar policies attempted since the 1990s which have failed on the grounds of practicality (CEPAL, 2010). On the other hand, others criticise these policies in terms of their reliability and efficiency. The relationship between investments, innovation, labour, trade and entrepreneurship policies, for instance, has been seen as ambiguous and at some point ineffective. It is because

⁴ Yachay is a project which pursues to build a city of knowledge aiming to boost a knowledge-based economy in Ecuador. This project is carried out in collaboration with South Korea through Incheon Free Economic Zone Authority (IFEZ).
“they have not opened new international markets, have not encouraged large-scale domestic production and export supply remains the same” (Líderes, 2013). Additionally, according to CEPAL (2010), many policies aiming to contribute to SMEs development are hardly compatible with each other and are even a little contradictory in their short-term implementation. Operationally, another problem presented is the lack of these policies’ correct diffusion which has prevented many firms from to get information about them (Ibid, 2010). Therefore, it is important to gain a better understanding of how these new policies are assimilated by Ecuadorian SMEs.

2.7. Conclusions and need for empirical research

The study of relevant innovation literature revealed that innovation can sometimes pose a complex and time-consuming process which has to be managed properly. The main forces identified as driving this process are competitive advantage which embraces particularly demand conditions, firm and market structure; entrepreneurship; networking and knowledge. However, it is seen that many of these drivers do not properly enhance innovation flow in SMEs due to the principal and consistent barriers which these actors face daily, or the lack of the entrepreneur’s awareness of these drivers.

The main barriers which were identified in the literature are divided into two groups: internal barriers and external barriers. The main internal obstacles for small and medium firms are lack of financial resources, low in-house R&D, absence of qualified personnel, organisation’s resistance to change and managers not being prepared to take risk. Externally, significant problems are market structure, difficulty to access credit, a lack of external cooperation and government support. The role of the government is important to reduce or eradicate those barriers linked to government support. For this reason, efficient government policies and programmes supporting innovation are relevant to boost SME’s development through innovation.

The literature review stressed the need to further study barriers and opportunities to manage innovation, explicitly in Ecuador. Many of the studies covered are predominantly based on empirical research conducted in developed countries and to a lesser extent in developing countries. However, the analysis of barriers in developing countries scarcely covers the Latin American context, and much less the Ecuadorian situation. Therefore, to arrive to a deeper understanding of how SMEs in Ecuador perceive those barriers and how they could overcome them, empirical research will be implemented. Specifically, such research will attempt to find out what are the main forces driving innovation in Ecuadorian SMEs, particularly in the processing food
sector; to explore the main barriers inhibiting innovation in Ecuadorian SMEs, and to analyse to what extent government policies and programmes are acknowledged and assessed by SMEs in order to innovate.
CHAPTER 3: METHODOLOGY

3.1. Introduction

This chapter functions to inform the reader about the strategy and methods used to collect empirical data in order to answer the main research question of this study: what are the barriers and opportunities that SMEs in Ecuador face to implement innovation management in the processing food sector? The necessity of conducting empirical research results from the scarcity of information about the phenomenon, particularly in the national context and specific the food industry of Ecuador. And, since the Ecuadorian government pursues a change to its productive matrix, it has already implemented a series of policies in order to improve substantially the role of innovation in the country, furthering the need for a comprehensive study. It is considerably significant important to explore these barriers and opportunities, from the point of view of these agents, aiming to gain a better understanding and information which will help to reinforce the measures already adopted.

This chapter outlines the research philosophy, research strategy, data collection techniques, and data analysis. Finally, it presents the main limitations and potential problems while conducting empirical research.

3.2. Research Philosophy

On one hand, the ontological view, meaning how the world and reality are viewed from the outside, is based on the premise that there is “no- single reality”. Thus the ontology, in this case, is constructivist. On the other hand, epistemology, which means how knowledge is obtained, is interpretivist. Combining these approaches, the purpose of this study is to understand and explain the main drivers, principal barriers and state policies influencing SMEs implementation of innovation management, specifically those in the processed food sector, in the Ecuadorian context.

3.3. Research Strategy

The research strategy which best suits to the main research objective is survey research strategy and it is mainly qualitative in nature. According to Fink (2003), “a survey is a system for collecting information from or about people to describe, compare or explain their knowledge, attitudes and behaviour” (cited in Sekaram and Bougie, 2013, p. 102). Additionally, qualitative research study “things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them” (Denzin and Lincoln, 1994, p. 2), whereas quantitative study deals
basically with quantifiable data and with a more scientific and statistical aspect (Zikmund et al., 2012).

Even though, survey strategy is commonly employed in quantitative studies, it is also very useful in collecting qualitative data about “people, events or situations” and answering different research questions (Sekaram and Bougie, 2013, p. 102).

Contrarily, a case study research strategy was discarded due to the purpose of this dissertation. Frequently, case studies are seen as the best option of attempting to get a qualitative approach (Saunders et al, 1997). According to Robson (1993), case study research gets a deeper and detailed knowledge about “a single case or a small number of related cases” (cited in Saunders et al, 1997). However, this research attempts to support an approach of obtaining different SMEs perspectives (through its managers) and thus provide a richer understanding of the “phenomena” (in this case innovation barriers) in the national context with a more expanded vision. Therefore, this research strategy was deemed inappropriate for the purposes of this dissertation.

The units of analysis are Ecuadorian SMEs operating in the processed food sector. Due to the short period of time to conduct the research, a cross-sectional study is applied.

3.4. Sample Selection

The sample is selected from a data base obtained from the Ministry of Industries and Productivity in Ecuador. This database contains a list of formally registered SMEs in different industries. The SMEs selected for the research were those operating in the industry and sector of interest indicated previously in this dissertation.

The sample techniques available are “probability or representative sampling” and “non-probability or judgemental sampling” (Saunders et al., 1997). In this study, the sample technique applied is non-probability sampling. It is non-probability sampling because the participants were approached through convenience sampling. This form of sampling is used due to timeframe constraints.

The participants were approached through telephonic calls in order to request an interview appointment. During this process the researcher gave a brief introduction about herself as well as a brief explanation about research’s main objectives and importance of their participation. In some cases, it was necessary to show a research explanation letter written by the dissertation supervisor’s, Dr. Sarah Cooper, in order to support the research veracity.
From all the SMEs contacted during the empirical research period, 13 SMEs operating in the processed food sector from the cities of Cuenca and Loja, decided to participate in the research. In this case, the sample has not achieved a representative view of SMEs country-wide, and due to the small sample size, it might have a high risk of error. However, this research still achieves a qualitative insight into innovation barriers perceived by SMEs in a national context.

Additionally, institutions and topic experts were contacted and involved in this research. They were asked to express their views concerning Ecuadorian SMEs and innovation management in terms of their drivers and barriers to innovation, and their opinion about the role of the government in fostering innovation in these enterprises.

3.5. Data Collection

There are several methods to collect primary data through survey strategy such as self-administered questionnaires, interviews and observation (Sekaran and Bougie, 2013). As the main objective here is to capture qualitative data, primary data was mainly collected through face-to-face interviews. Although, this method is considered time-consuming and with high-cost constrains, it has different important advantages such as to establish rapport with the interviewee, allows for doubt clarification, and ensures a higher response rate with the opportunity to correctly understand responses. Additionally, it could allow the interviewer to detect some aspects of body language that would not be recognised through telephone interviews or email questionnaires, such as nervousness, stress, anxiety, among others (Ibid, 2013).

The face-to-face interviews were conducted in Spanish and took the form of structured interviews through questionnaires (SMEs) and semi-structured interviews (chambers and/or associations’ representatives and experts). The structured interviews were to ensure that the interview has a clear direction and theme related to the research objectives. But, there were also opportunities for SMEs managers to express their views, explain individual perspectives and expand on answers, as it contained several open-ended questions. The framework for the structured interview was based on information from an adaptation of the Manual of Bogotá and literature review. A small pilot test was conducted to 3 participants in order to address weaknesses and emergent issues in the prepared questionnaire. This pilot test also ensured that there are no misunderstandings with questions, control of time and acceptance.

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5 It is an adaptation of the Oslo Manual for Latin American and the Caribbean.
Additionally, after the structured interviews, semi-structured interviews were conducted with the Chamber of Industries in Cuenca, Provincial Council of Azuay, and experts on the topic. It allowed for a cross-comparison of responses and to validate to some extent, the reliability of information gathered (Saunders et al. 1997). This introduces the concept of triangulation, where different information of the same phenomena (in this case barriers to innovation) can be compared and contrasted. Triangulation is said to occur “as the use of different methods or sources, [it] requires that research is addressed from multiple perspectives” (Sekaram and Bougie 2013, p. 104).

The empirical research was conducted between 29th of May and 21st of June, 2014. Table 3.1 and 3.2 display information about interviews.

<table>
<thead>
<tr>
<th>Firm</th>
<th>Position of the interviewee</th>
<th>Location</th>
<th>Core business activity</th>
<th># of employees (range)</th>
<th>Interview date</th>
<th>Approximate time of interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>General Manager</td>
<td>Cuenca</td>
<td>Pasta/Cereals</td>
<td>10-49</td>
<td>June 10th</td>
<td>45 min.</td>
</tr>
<tr>
<td>C</td>
<td>General Manager</td>
<td>Cuenca</td>
<td>Meat processors</td>
<td>10-49</td>
<td>June 10th</td>
<td>52 min.</td>
</tr>
<tr>
<td>D</td>
<td>Owner/Manager</td>
<td>Cuenca</td>
<td>Confectionery</td>
<td>10-49</td>
<td>June 12th</td>
<td>1h12 min.</td>
</tr>
<tr>
<td>E</td>
<td>Production Manager</td>
<td>Cuenca</td>
<td>Pasta/Cereals</td>
<td>50-100</td>
<td>June 12th</td>
<td>43 min.</td>
</tr>
<tr>
<td>F</td>
<td>Production Manager</td>
<td>Cuenca</td>
<td>Meat processors</td>
<td>50-100</td>
<td>June 13th</td>
<td>42 min.</td>
</tr>
<tr>
<td>G</td>
<td>Production Manager</td>
<td>Loja</td>
<td>Meat processors</td>
<td>10-49</td>
<td>June 14th</td>
<td>1h05 min.</td>
</tr>
<tr>
<td>A</td>
<td>General Manager</td>
<td>Loja</td>
<td>Canned fruit and vegetables</td>
<td>50-100</td>
<td>June 14th</td>
<td>37 min.</td>
</tr>
<tr>
<td>L</td>
<td>General Manager</td>
<td>Loja</td>
<td>Confectionery</td>
<td>10-49</td>
<td>June 14th</td>
<td>42 min.</td>
</tr>
<tr>
<td>J</td>
<td>General Manager</td>
<td>Cuenca</td>
<td>Dairy products</td>
<td>10-49</td>
<td>June 15th</td>
<td>44 min.</td>
</tr>
<tr>
<td>H</td>
<td>Owner/Manager</td>
<td>Cuenca</td>
<td>Canned fruit and vegetables</td>
<td>10-49</td>
<td>June 16th</td>
<td>48 min.</td>
</tr>
<tr>
<td>I</td>
<td>General Manager</td>
<td>Cuenca</td>
<td>Canned fruit and vegetables</td>
<td>10-49</td>
<td>June 18th</td>
<td>36 min.</td>
</tr>
<tr>
<td>K</td>
<td>General Manager</td>
<td>Cuenca</td>
<td>Dairy products</td>
<td>10-49</td>
<td>June 20th</td>
<td>46 min.</td>
</tr>
<tr>
<td>M</td>
<td>General Manager</td>
<td>Cuenca</td>
<td>Pasta/Cereals</td>
<td>50-100</td>
<td>June 20th</td>
<td>1h28min</td>
</tr>
</tbody>
</table>

Letters do not follow a logic order due to it has been preferred to organise this information by date of interview (letters were assigned randomly to the companies).
Table 3.2: Overview of Institutions and interview dates (SMEs)

<table>
<thead>
<tr>
<th>Expert/Institution</th>
<th>Interview date</th>
<th>Approximate time of interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.P. Ex-president of the Chamber of the Small Industry of Azuay</td>
<td>June 18th</td>
<td>58 min</td>
</tr>
<tr>
<td>Senior Representative – Chamber of Industries of Cuenca</td>
<td>June 19th</td>
<td>38 min</td>
</tr>
<tr>
<td>Senior Representative – Provincial Council of Azuay</td>
<td>June 19th</td>
<td>32 min</td>
</tr>
<tr>
<td>U.M Senior Consultant</td>
<td>June 21st</td>
<td>53 min</td>
</tr>
</tbody>
</table>

Appendix A contains an example of an answered questionnaire and appendix B contains two semi-structured interviews that were conducted to the Chamber of Industries of Cuenca, and Provincial Council of Azuay.

Secondary information complements primary data analysis in this study. This data is retrieved from government reports, census data, and newspapers, among others. This data provides a rich picture of the studied phenomena and facilitates findings comparison in order to have a better perspective of the situation.

3.6. Data Analysis

Qualitative data analysis is seen as an iterative and reflexive process where description, analysis, and interpretation are involved (Wolcott, 1994; Creswell, 1997). An accepted approach to analysing qualitative data is presented by Miles and Huberman (1994 cited in Sekaram and Bougie 2013). They classify three main steps: data reduction, data display and drawing conclusions. Therefore, following the same approach, the data analysis in this study is reduced through codes and organised by themes. It facilitates a better understanding of gathered information and an effective manner to draw conclusions. As a first step, compiled information was allocated in different themes aiming to address each research objective separately. Presenting data organized by themes was considered appropriate in order to facilitate the reader´s comprehension. In some cases, the data will be displayed in the form of graphs and tables which will depict detailed results. Finally, information gathered through semi-structured interviews is also displayed through tables.

The process adopted to analyse the data in this study is presented in the following chart.
3.7. Ethics

The dissertation research process was ethically conducted. It strictly followed the requirements of the University of Edinburgh, and it was guided by the principles of “dignity, responsibility, respect, care for others, honesty, integrity, objectivity, openness and leadership” (University of Edinburgh, 2014)

The participants were clearly informed about the topic of this dissertation, its objectives and the general context in which the interview was going to be based on. Additionally, the participants were also informed, in an introductory message, that the research is merely academic and their data is held confidential. Based on this premise, the study does not reveal firms' names as well as their manager's information. However, a generalized description is given concerning the economic activities and firm's size of those participating in the interview in order to highlight that they were the unit of analysis of this dissertation and that the display of this information is purely related to the study.

3.8. Research Limitations

Consequently, there have been some limitations to this research. First, the limited timeframe to conduct the empirical research restricted to the scope and number of SMEs examined. In addition, as many managers were busy and did not want to offer part of their time for interviews, it was difficult to get interview appointments during the research time. Further to this, there was a lack of interest and perceived value of the research topic to some of the SMEs managers.

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As a first stage of this research, the study of firms operating in the fresh/and food sector was taking into consideration. The researcher approached several SMEs operating in this sector via telephone and attending to fairs, specifically organised by organic farmers and the Ministry of Agriculture. However, several problems to conduct interviews were encountered. The main problems were lack of interest in the research topic and/or lack of awareness about innovation in general.

Even though, there was also a few number of firms which decided to collaborate with the research, there was a significant lack of knowledge about innovation management in these SMEs, fact that impeded to proceed with the interviews. Therefore, these enterprises were excluded from the research.

Regarding the method, the study initially planned for the use of online surveys and skype interviews with SMEs managers; however many of them were not reachable and the online survey was not successful. Thus the decision to conduct face to face interviews in Ecuador.

Further to this, limitation related to the method used is generalization because of the reduced sample size, nevertheless the interviews draw useful qualitative data to analyse the phenomena in a national context. Moreover, some researchers suggest interviews are also limited by validity, reliability and forms of bias or inaccuracy. However, this research attempted to minimize these limitation as much as possible.

This chapter has provided details about the research strategy, operational methods and techniques used in order to collect information. In addition, it has also addressed the main limitations presented in the study and it has also explained the measures taken to minimise criticism. The next chapter, findings and discussion, will describe, analyse and discuss results of the empirical research.
CHAPTER 4: FINDINGS AND DISCUSSION

4.1. Introduction

This chapter focuses on presenting the empirical research findings. These research findings provide the main answers to the research questions outlined in the introduction section. It is structured as follows: First, a general overview of the primary data sample is introduced. Second, a brief explanation on the current role of innovation in participating SMEs, particularly in the processed food sector, is presented. This part aims to provide an overall understanding of the current situation regarding innovation among economic players. Then, the chapter is divided into two main sub-sections: findings and discussion. In the findings section, the main identified forces driving innovation in SMEs, in the national context, are presented. Then, the principal barriers perceived by SMEs are described. This chapter section follows the same classification structure introduced in the literature review. Thus, the barriers are divided into internal barriers (inside the firm) and external barriers (outside the firm). Additionally, information gathered through semi-structured interviews from different institutions is displayed in the form of a table. This information is complementary and it allows for further discussion on the topic. Finally, the participating SMEs’ attitude towards the government’s policies and innovation support programmes are exhibited. The second subsection provides a critical discussion related to the findings, followed by an explanation of implications findings and implications for future research.

4.2. Overview of the primary data sample

The sample consists of 13 SMEs that agreed to participate in the study. Of these, nine participants belong to the category of small companies and four belong to the category of medium enterprises\(^8\). Data from SMEs involved in the study are not disclosed for ethical reasons and confidential reasons which are explained in the methodology chapter. In this study, firms with fewer than 10 employees have been discarded due to their categorisation as microenterprises. Additionally, information obtained from firms which collaborated in the pilot study is not considered in the results displayed in next sections.

Furthermore, information gathered through semi-structured interviews from different institutions and experts on the topic is presented. This additional information is useful in the discussion portion of this chapter because it will allow us to compare and contrast

\(^8\) SMEs’ categorisation by number of employees and total turnover sales is displayed in table 2.1 introduced in Chapter 2.
information in order to obtain a clearer map of the situation that SMEs face to implement innovation management. The institutions which collaborated with the study are:

- Chamber of Industries of Cuenca
- Provincial Council of Azuay

The experts who also collaborated are:

- C.P - Ex-president of the Chamber of the Small Industry of Azuay; and
- U.M- Senior consultant with a vast experience in Ecuador and Latin America.

![Figure 4.1: Interviewed SMEs’ Core Business Activity](image)

### 4.3. Findings

#### 4.3.1. Innovation environment in Ecuadorian SMEs operating in the food industry

All the interviewed SMEs are aware of the importance of innovation as a tool, which contributes to firm performance, but how is the term innovation perceived among these SMEs? The following question was thus formulated: What is your understanding of the term ‘innovation’? Interviewees gave different responses which are displayed in Table 4.1. These responses lead to a conclusion that the term innovation is understood as a type of change. This type of change is strictly related to processes (mainly technical changes or through acquisition of new equipment) and new products creation.
Table 4.1: Defining ‘Innovation’

| What is your understanding of the term “innovation”? | “find new forms to make processes and products”
| | “to incorporate new equipment”
| | “a fundamental change in the company”
| | “a change and technical improvement of processes”
| | “new processes”
| | “to create something new”
| | “to improve what we already have and incorporate new useful elements”

Source: Author’s own, 2014
Information retrieved from interviews

Additionally, regarding the role of innovation as a planned strategy, the results showed that, in most of the cases, innovation is not considered in a firm’s strategic plan. When asked the following question: “Does your company have a consolidated strategic plan? nine participants had a negative response, whereas four of the participants had an affirmative one. Also, among the participants who confirmed that they have a strategic plan, 10 out of 13 do not take innovation activities into consideration in their strategic plan. The main argument behind this result indicates that innovation activities are implemented spontaneously according to the necessities that emerge over time. By contrast, three of the interviewees do consider innovation activities in their strategic plan.

A high number of SMEs do not have an allocated budget for innovation or R&D activities. In reference to innovation, in percentile terms, 71.4% of SMEs in the study affirm that they do not consider a specific budget for innovation, whereas 28.6% of SMEs assert that they do consider a specific budget for innovation activities. The budget invested by these firms in innovation activities has a percentile of total average of 6.5%. Regarding in-house R&D, most of the participants indicated that they do not carry out R&D activities. However, on the subject of external innovations, they were asked if they had searched for external linkages such as universities, professional consultants, or other institutions which might help them with R&D activities or knowledge diffusion. The results indicate that 15% of the participants had an affirmative response while 85% of the respondents stated to the contrary. The latter group argued that external consultant firms are too expensive and they do not have an established budget for it. Moreover, the study finds that several participants misunderstood the concept of collaboration with Universities to generate R&D activities. For example, some participants answered to this question indicating that they do collaborate with universities by accepting interns or students which conduct dissertation research in their firms. This concept is wrong, due to that core aim in collaborating with universities is to form a cooperative agreement to develop know-how within the firm and most of
the cases “serve to share costs” (Veugelers and Cassiman, 2005, p. 357). Thus, there is a notorious misinformation about the development of R&D activities through collaboration networks with Universities.

The next item concerns the types of innovation -illustrated in Table 4.2- carried out by those SMEs which are currently implementing innovative activities. The highest rate of investment is for process innovation and product innovation, while a lower rate belongs to marketing innovation and organisational innovation. In most of the cases, these products may not be new to the market but are new to the firms. In order to capture the level of novelty or change – incremental\(^9\) or radical\(^{10}\)- implemented on these innovations, participants were posed the following question: Did you implement these innovations with a radical or incremental process? All of the respondents stated that they implemented incremental innovations. This strategy, they argued, is easier, less expensive and has fewer risks. The following statements reflect this sentiment: “shocks are not easily adjustable. All require coaching, training and, of course, to have a cash flow to implement them” (Firm M, 2014). “Because when you implement radical changes, these changes need more funding and we do not have financial resources to do so” (Firm C, 2014).

Additionally, figure 4.3, indicates the number of new products and the timeframe within these products are developed by firms. These results indicate that those firms which invested mainly in processes innovations have a higher output of products developed rather than those firms which invested mainly only in products development. Hence, the greater the process innovation is, the higher the product output is. However, the level of patent products registered is insignificant.

Firms which mainly carried out process innovations stated that in order to develop those processes they have acquired new machinery. Contrary to this, those firms which have a reduced number of process innovation stated that they did not acquire new machinery for two main reasons: 1) high costs are involved to acquire new equipment due to is mainly imported from developed economies, for instance from Germany, and 2) operating machinery means that some firms do not feel the necessity to acquire new machinery while continuing to use the older. Surprisingly, in some firms, the study found machinery in operation for over 30 years. Additionally, findings on process innovation reveal a connection between the innovation level and new equipment acquisition. SMEs who recently acquired new equipment presented higher investment

\(^9\) Innovation is implemented gradually.

\(^{10}\) Innovation is implemented drastically.
in process innovation. In contrast the firms using obsolete equipment are lagging behind in terms of both, product and process innovation. This identifies new equipment acquisition as a crucial initial step for overall improved innovation level of Ecuadorian SMEs in the food sector.

<table>
<thead>
<tr>
<th>Firm</th>
<th>Core Activity</th>
<th>Firm category</th>
<th>Product</th>
<th>Process</th>
<th>Marketing</th>
<th>Organisational</th>
<th>Total number of innovation areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Canned Fruit and Vegetable</td>
<td>Medium</td>
<td>100</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>Pasta &amp; Cereals</td>
<td>Small</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>C</td>
<td>Meat Processors</td>
<td>Small</td>
<td>25</td>
<td>40</td>
<td>25</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>D</td>
<td>Confectionery</td>
<td>Small</td>
<td>-</td>
<td>-</td>
<td>100</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>E</td>
<td>Pasta &amp; Cereals</td>
<td>Medium</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>F</td>
<td>Meat Processors</td>
<td>Medium</td>
<td>30</td>
<td>50</td>
<td>10</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>G</td>
<td>Meat Processors</td>
<td>Small</td>
<td>40</td>
<td>60</td>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>H</td>
<td>Canned Fruit and Vegetable</td>
<td>Small</td>
<td>30</td>
<td>50</td>
<td>20</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>I</td>
<td>Canned Fruit and Vegetable</td>
<td>Small</td>
<td>-</td>
<td>90</td>
<td>-</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>J</td>
<td>Diary Products</td>
<td>Small</td>
<td>100</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>K</td>
<td>Diary Products</td>
<td>Small</td>
<td>45</td>
<td>55</td>
<td>5</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>L</td>
<td>Confectionery</td>
<td>Small</td>
<td>-</td>
<td>50</td>
<td>25</td>
<td>25</td>
<td>3</td>
</tr>
<tr>
<td>M</td>
<td>Pasta &amp; Cereals</td>
<td>Medium</td>
<td>12.5</td>
<td>25</td>
<td>50</td>
<td>12.5</td>
<td>4</td>
</tr>
</tbody>
</table>

**Figure 4.2: Investments in types of innovation**

<table>
<thead>
<tr>
<th>Firms</th>
<th>Products</th>
<th>Time</th>
<th>Patent</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>3</td>
<td>once every two years</td>
<td>no</td>
</tr>
<tr>
<td>C</td>
<td>5</td>
<td>annually</td>
<td>no</td>
</tr>
<tr>
<td>F</td>
<td>20</td>
<td>annually</td>
<td>yes</td>
</tr>
<tr>
<td>G</td>
<td>7</td>
<td>twice yearly</td>
<td>yes</td>
</tr>
<tr>
<td>H</td>
<td>3</td>
<td>it has not a defined timeframe</td>
<td>no</td>
</tr>
<tr>
<td>I</td>
<td>1</td>
<td>every two years</td>
<td>no</td>
</tr>
<tr>
<td>J</td>
<td>1</td>
<td>every three years</td>
<td>no</td>
</tr>
<tr>
<td>K</td>
<td>6</td>
<td>every three years</td>
<td>yes</td>
</tr>
<tr>
<td>M</td>
<td>12</td>
<td>three or four per year</td>
<td>yes</td>
</tr>
</tbody>
</table>

**Figure 4.3: Products development, timeframe and patent**

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11 Source: Author’s own, 2014. Information retrieved from interviews
4.3.2. Factors driving innovation in Ecuadorian SMEs operating in the food industry

The main drivers stimulating innovation among all the interviewed SMEs are mostly guided by three external forces: market competition, demand conditions, and governmental regulations. These categorisations are detailed in Table 4.2.

First, innovative activities are highly considered by SMEs which aim to enhance their level of competitive advantage nationally. This is mainly due to fierce competition presented by large firms that occupy a larger market share at the national level. Then, SMEs are obliged to improve their products in attempting to get a larger market share and introduce their products in supermarket chains. At this point, it is worth noting that the threat of competition is the major concern for small companies. This sentiment can be elicited from higher number of small firms rather than medium firms mentioning competition as a force to take part in innovation activities. Some of the main expressions used during the interviews are: “differentiate ourselves from the competition” (Firm A, 2014) and “to compete in a better way with our products in the market” (Firm G, 2014). Second, SMEs are more market-oriented and demand-oriented, so they are concentrated on fulfilling demand conditions in order to increase their sales volume and customer acceptance. Some of their comments included: “customers are looking for better products” (Firm D, 2014), “there exists a lack of high quality products offered in the market” (Firm I, 2014), “meet unsatisfied demand” (Firm E, 2014).

Finally, due to governments’ regulations, all firms operating in the food processed sector are bound to obtain a “Good Manufacturing Practices” certification. This regulation aims to substantially improve product quality and health conditions (El Mercurio, 2014). “Good Manufacturing Practices” certificate must be acquired within an established period of time. This period of time depends mainly on the epidemiological risk presented by the processed product. For instance, Firm D (2014) states that “we have decided to implement changes due to government’s regulations, as an example, I can mention the environmental regulations and GPM regulation. Due to these regulations we had to acquire new equipment”. Thus, the government’s role is undoubtedly an additional factor in driving innovation activities.
Table 4.2: Main factors influencing firm's innovation

<table>
<thead>
<tr>
<th>What are the main factors which influenced firm's decision to innovate?</th>
<th>“Competition”</th>
<th>“to differentiate ourselves from the competition”</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>“to offer new products to our clients”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“market competition”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“due to the high competition in the market”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“to be able to compete”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“survival”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“to insert new products and services offering a better quality than the competition”</td>
<td></td>
</tr>
<tr>
<td>“Demand conditions”</td>
<td>“to meet unsatisfied demand”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“to increase our market share”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“to increase our products demand. Customers are looking for better products”</td>
<td></td>
</tr>
<tr>
<td>“Government regulations”</td>
<td>“to comply with health regulations”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“due to new regulations implemented by the government”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“to comply with environmental regulations”</td>
<td></td>
</tr>
</tbody>
</table>

Source: Author's own, 2014
Information retrieved from interviews

4.3.3. Barriers to Innovation

To objectively assess the level of each perceived barrier affecting innovation in each SME respondents had to answer the following questions using a Likert-scale:

1) Please, indicate to what extent, in your opinion, the following internal barriers are affecting or affected innovation within the firm. (1= very little; 2= little; 3=some; 4= quite a bit; 5= significantly affect)

2) Please, indicate to what extent, in your opinion, the following external barriers are affecting or affected innovation within the firm. (1= very little; 2= little; 3=some; 4= quite a bit; 5= significantly affect).

4.3.3.1. Internal Barriers

As observed in figure 4.4, a lack of financial resources is perceived by SMEs as a significant barrier. This result shows consistency, as a relevant barrier to SMEs, with those barriers identified by experts as shown in table 4.4. In this question, some participants expanded their answers by giving some comments on why this barrier had a major effect on them. For example, Firm C (2014) explained that a significant
decrease in sales volume has considerably reduced its investment budget, resulting in a significant impact on its innovation activity. In addition to this information, Mr. J.A. (2014) representing the Chamber of Industries argued that this lack of financial resource is a notorious effect caused by the size of SMEs and their relatively small market share when compared to that of large firms.

Additionally, financial constraints are highly correlated to acquisition of new machinery. As interpreted from figures 4.2 and 4.3, the old inefficient machinery is presented itself as a major barrier in the food sector which halts the innovation potential of SMEs.

The lack of qualified human resources was identified as a second important internal barrier within the firm. This barrier is highly linked to knowledge. It could also be connected to the employees' level of education. The predominant level of education among firms' employees is secondary education. A total of 42.6% of all SME employees received secondary education. The second most common level is primary education, with 30.9%. Bachelor and postgraduate education are located in the lower range with 16.5% and 2.3% of the total average respectively.

Figure 4.4: Internal Innovation Barriers (total average)

Considering in firm training, results indicate that many of the SMEs do not have a planned timetable devoted to employees' training. Therefore, it could be inferred from different responses given by the participants that they do training informally without following any plan or established guidelines. For instance, the repetitive statement in some SMEs was: “we do not have a defined training program”. However, SMEs which do consider training as an important tool to enhance employees’ knowledge and
productivity have a defined training plan. In these firms, the employee training plan takes place quarterly, twice yearly and/or annually.

Risk acceptance and resistance to change by Directors also rated highly as an internal innovation barrier. Some of the interviewees mentioned that resistance to change could be strongly related to cultural barriers. In addition, one of the interviewed managers described an instance where a member of the Board of Directors was the main opponent to some of the innovative changes proposed by himself to the company. These barriers were also emphasised as very important during semi-structured interviews conducted to experts (see Table 4.3) However, in many cases, SMEs are not aware of the main limitation that cultural barriers could have for their development.

4.3.3.2. External Barriers

The barrier identified as laws, norms, regulations and taxes showed the highest rate of perceived external barrier faced by SMEs in their quest for innovation. This barrier shows a high correlation with labour laws and regulation and is identified as the second most significant barrier. A lack of government support is the third item on the list. All three of these barriers are linked to the government’s role.

Market structure is perceived as another relevant barrier, along with the difficulty of accessing loans and lack of cooperation with external partners. However, licenses and patent policies, changes in technology, training costs and lack of information, are perceived as less significant barriers by SMEs.

![Figure 4.5: External Innovation Barriers (total average)](image-url)
4.3.3.3. Semi-structured interviews findings: SMEs barriers to innovate

At this point, it is important to highlight additional information given by relevant Institutions and experts. The main barriers these participants identified as important inhibitors to innovation development in SMEs are summarised in Table 4.3.

Table 4.3: Barriers to innovation: Semi-structured interviews findings

| Senior Representative-Provincial Council of Azuay | 1) Lack of productivity  
2) Lack of quality control  
3) Lack of technology access  
4) Difficulty of accessing the market  
5) Accessing loans is very limited  
6) “Cultural barriers”: a) people are not used to patenting their products; b) culture of imitation |
|-----------------------------------------------|
| U.M. (Senior Consultant) | 1) Lack of innovation knowledge diffusion  
2) Resistance to change  
3) Lack of financial resources  
4) Difficulty to access loans: “SMEs are lacking skills and capability to introduce good projects” as an effect of lack of information that SMEs have about the topic.  
5) Lack of partnership between Universities and firms: “a major cause could be lack of mutual trust” |
| Senior representative- Chamber of Industries of Cuenca | 1) Lack of financial resources:  
“Although there are credits for SMEs, credit agents are sceptical, because in many cases they perceive a relatively high risk”  
2) Lack of technical training  
3) Resistance to change |
| C.P. Ex-president of CAPIA | 1) Lack of market opportunities: “I think this is the main problem, as it acts as a bottle neck. Some firms do not produce new products due to the lack of commercialisation of these items, so they produce less quantity” |

Source: Author’s own, 2014  
Information retrieved from interviews

The main barriers identified by Institutions and experts are lack of credit access, resistance to change, as a result of cultural barriers, lack of financial resources and lack of technology and technological training. These findings are similar to those perceived by SMEs. However, the main exception was resistance to change. SMEs indicated this barrier as not highly significant, but institutions and experts perceive this barrier as very important in inhibiting innovation.
4.3.4. Government programmes and policies boosting innovation

The participants were asked about what specific governmental programmes they had heard about or been involved in. The participants mentioned several of them such as: Proecuador, GMP\textsuperscript{12}, National Financial Corporation (loans), biofuel programmes, jóvenes innovadores, renova industria and producir pyme. At this point, three respondents groups were identified. The first group is formed by those participants who had heard about the programmes and had participated. The second group is formed by those respondents who had heard about the programmes but had not participated. Finally, the third group consisted of participants who had a vague idea about these programmes but did not participate in them. Some of these third group participants do however participate in a few programmes organised by their associations or business groups on a smaller scale.

Participants were asked the following question: To what extent, in your opinion, have these programmes been useful for firms’ development and innovation? The first group had two different opinions: On one hand, they perceived these programmes as a useful tool. For example, some of the expressions were: “ProEcuaor support has been fundamental to start exporting” (Firm A, 2014), “We went to the GMP workshop and we found it useful. Instructors had explained to us all the procedures we have to follow in order to obtain the certificate” (Firm D, 2014). On the other hand, these programmes also received criticisms, which indicate that some of the information presented could not be adopted. Additionally, these programmes do not provide an adequate monitoring system; they become “just words”. A large number of responses agree with this latter opinion, illustrating that the information presented by the programmes is accurate and useful but it results in no effective outcome.

Participants were asked about what additional measures or policies should be implemented in the country in order to support innovation. Participants recommended that informative programmes about innovation or related courses should be expanded in universities. Additionally, innovation should have a major emphasis in governmental programmes, but it should be presented as an educational-training course. However many of the interviewees did not recommend new policies, but they emphasised the importance of modifying current policies and regulations which they feel are detrimental to their interests. The main policies mentioned during interviews were tax regulations, import substitution policy, loans policies and good manufacturing practices regulation. Some of the expressions related to these facts are presented in Table 4.4.

\textsuperscript{12} Good Manufacturing Practices
Table 4.4: SMEs’ attitudes to government policies

<table>
<thead>
<tr>
<th>Category</th>
<th>Attitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>“innovation diffusion”</td>
<td>“The government has to create innovation programmes in the national universities <em>pensum</em>. Additionally, it has to offer more training programmes, particularly, covering to enhance understanding about innovation”.</td>
</tr>
<tr>
<td>“taxes policies”</td>
<td>“Taxes policies have to be more flexible. Our firms need to be treated differently than larger firms&quot; “In my opinion I think that taxes are completely exaggerated, taxes policy should be reframed, all of our incomes basically pay taxes”</td>
</tr>
<tr>
<td>“import substitution policies”</td>
<td>“The government should modify the import substitution policy. This policy affected us significantly due to we used to import raw material such as pork, because of its higher quality than that offered nationally. However, this currently affects our prices in the market” “thanks to the import substitution policy our packages had a significant increase, but we need those packages for our products” “in order to produce a high quality pasta, the firm imports wheat, and now those prices are too high”</td>
</tr>
<tr>
<td>“loans policies”</td>
<td>“loan accessibility needs to be improved, it would be good if longer terms to pay them could be defined&quot; “The government states that it offers access to several loans to support SMEs. However, the reality state to the contrary. There are many restraints to access it and high interest rates”</td>
</tr>
<tr>
<td>“Good Manufacturing Regulation”</td>
<td>“Some of the changes the government is looking for are too radical and we have to accomplish them within a short timeframe. They have to consider the high costs that those changes imply”</td>
</tr>
<tr>
<td>“Others”</td>
<td>“The government should simplify and reduce the procedures to acquire the required certificates and/or licences. For example, the time spent to obtain a patent is too long”</td>
</tr>
</tbody>
</table>

Source: Author’s own, 2014
Information retrieved from interviews

4.4. Discussion

From the results, all the interviewees have a general understanding about the term innovation, and they are aware about the importance of implementing innovation for their core business activity. However, the need to more thoroughly spread information about innovation and its potential is palpable.

As a positive side, the results showed there are a high number of firms which are carrying innovative actives, even though there is still a reduced number of companies which expressed they do not invest in innovation. As a negative side, innovation is still an informal activity among participants. It is informal because innovation is not carefully planned and considered in a strategic plan and; thus developed according to needs that arise at a specific moment. Therefore, this informality may be the cause or the effect of existing constraints among SMEs inhibiting improved development of innovation management.
Findings showed a propensity to develop more process and product innovations rather than marketing and organisational innovations, and these innovations are mainly incremental. These results showed similarity to those presented in relevant literature such as Adegoke Oke et al. (2007), Egbetokum and Olamade (2009), Igarta et al. (2010) who state that there is a high trend to develop process and product innovation, particularly in SMEs.

The trend to primarily introduce process and product innovation could be linked to the three main identified forces driving innovation among these firms: high competition, the need to comply with customers’ requirements, and the obligation to respond positively to government regulations. Comparing these forces to those explained in the literature review, found in the context of Porter’s National Advantage, it is clear that they are mainly based on two dimensions. The first dimension is “Firm strategy, rivalry and structure” and the second dimension is “demand conditions”. Additionally, the government’s role, as an external parameter, showed high influence on innovation activities developed as a result of industry regulations. The main industry regulation for processed producers is “Good Manufacturing Practices”. According to this regulation, firms have a limited timeframe to obtain the GMP certificate which allows them to operate in the market. The regulation’s objective is considerably improve the production process and increase quality levels in processed products.

The main internal barriers perceived by SMEs are: 1) lack of financial resources, 2) lack of qualified personnel, 3) problems keeping qualified personnel, 4) resistance to change by Directors, 5) resistance to change by employees. On the contrary, the main external barriers perceived by SMEs are: 1) laws, norms, regulation and taxes; and 2) labour laws and regulations, 3) lack of government support, 4) market structure and 5) accessing loans.

Lack of financial resources resulted a clear barrier for SMEs to invest in R&D activities. As can be assumed from the findings neither in-house nor external R&D activities are conducted mostly by participants. Even though there are some companies which invest in them, it remains low. This situation notably diminishes innovation capacity within the firm. An efficient solution identified in the literature review is the collaboration with external networks (Gellink et al., 2007; Zeng et al., 2010). However, according to U.M. (2014) awareness about networking must be created. The main reason stated by U.M. is that the relation between SMEs and Universities remains weak and a significant lack of mutual trust between them is presented in the country.
Human capital is one of the most important intangible resources in an enterprise. For this reason, lack of qualified personnel is a serious barrier to innovation. As exposed in the findings, the majority of a firm’s human capital is formed by their employees with mainly secondary and primary education, whereas the number of those with bachelor and postgraduate education is relatively low. According to Gray (2006) an individual's educational level has a relevant influence on a firm’s ability to acquire, exploit and use knowledge. Unfortunately, this fact is caused by one of the country’s weakest factor conditions: education. This barrier shows consistency with studies conducted by Madrid- Guijarro et al. (2009), Barañano (2005) and Dermibas (2010). Additionally, problems keeping qualified personnel are identified as a third barrier. According to Freel (2010) the main causes are SMEs’ difficulty in offering: appropriate wage rates, future career development and/or job security.

Resistance to change by Directors could be similarly related to risk taken and entrepreneurial orientation of the company. However, it is also seen to some extent as a result of a cultural barrier. This barrier shows a consistency with previous studies carried out by Hadjimanolis (1999), Zwick (2002), and Galia and Legros (2004). According to Zwick (2002) resistance to change by employees is usually seen as employees' unwillingness to lose their current job or the need to acquire new qualifications.

Surprisingly, the three main external barriers identified by interviewees are highly related to the role of government. It was not expected to obtain this result due to several policies were launched, particularly, to boost innovation in the country and reduce SMEs’ innovation constraints. However, some of these policies are having a detrimental effect for SMEs. For instance, the principal policies that denote a high obstacle to innovation in SMEs are tax regulation, due to strict taxes control implemented in the country, and import substitution policy. Thus, it is clear that these policies instead of reinforcing innovation in SMEs, they are causing the opposite effect. This barrier has also a significant impact on SMEs by inhibiting innovation in in previous studies conducted by Galia and Legros (2004), Hadjimanolis (1999) and Freel (2010).

Additionally, from the findings, it is inferred that government policies show inconsistency between them. For example, firms have to get the good manufacturing practices certificate. In order to obtain this certificate, firms must implement several changes such as: infrastructure, acquisition of new equipment, quality certifications, among others, within the firm. Regarding acquisition of new equipment, it is mainly
imported from other countries, but, due to import substitution policies, the costs of acquiring this equipment increases and it has a major repercussion on a firm's financial resources, specifically for small firms.

Additionally, regarding governmental programmes aimed to support innovation and its influence on SMEs economic and innovative development, findings are drawn that many SMEs stated that these programmes and policies apply in theory but not in practice. For instance, the government implemented loans policies in order to reduce financial problems among SMEs. However, many participating firms still perceived accessing loans as a barrier. The main argument behind this is that there are too many requirements which inhibited their access to these loans.

Concerning governmental training programmes, there is still a high rate of absence presented by participating SMEs. Some of the implied reasons are: a lack of appropriate diffusion through effective methods, lack of diffusion of specific programmes devoted to SMEs' core business activity, a lack of dialogue between SMEs and government agencies, and appropriate follow up by governmental agencies.
CHAPTER 5: CONCLUSIONS AND IMPLICATIONS

5.1. Introduction
To begin with, this dissertation aimed to answer the main research question: What are the barriers and opportunities that SMEs in Ecuador, operating in the processed food sector, face when implementing innovation management? In order to achieve this aim, the research identified the main forces driving innovation in SMEs operating in the processed food sector, explored the main barriers to implement innovation management perceived by these SMEs, and analysed to what extent government policies and innovation support programmes are affecting the role of innovation management in these firms.

This chapter summarises the main research findings of this dissertation and will presents conclusions based on the findings. It intends to reflect the main answers to the research questions stated in chapter one. Further to this, research implications and recommendations for further research will be discussed.

5.2. Summary of key findings and conclusions
The literature review has identified, the following forces for innovation in SMEs analysed in this study. These drivers are competitive advantage (Porter, 1990), entrepreneurial orientation (Schumpeter, 1934; Bessant, et al. 2007), networking linkages (Gellink et al. 2007; Calia et al. 2007) and knowledge diffusion (Drucker, 2010; Cohen and Levinthal, 1990). In the case of Ecuador, as evidenced on the findings, the main forces driving innovation are highly related to competition, market orientation and governmental regulations. Regarding the public regulations, the quality certificate introduced by the government has played a role of incentive for improvement and development for products with higher quality. However, Ecuadorian SMEs fail to provide highly innovative products due to their weak networking linkages with universities and other institutions which has been identified as crucial for innovation development in the literature review. Therefore, there is still the need to spread awareness about significant drivers that are been ignored to have a successful development of innovation in SMEs operating in the processed sector. This will result in a great improvement of the innovation role in the country.

The three major internal barriers identified in the empirical research were: 1) lack of financial resources, 2) lack of qualified human resources and 3) risk acceptance. Additionally, the three major external barriers were: 1) laws, norms, regulations, taxes, 2) labour laws and regulations, and 3) lack of government support. These results
encountered major similarities with other empirical studies, in developing economies, conducted by Dermibas et al. (2011) in Turkey, and Hadjimanolis (1999) in Cyprus. For example, in both studies, the highest barriers perceived by managers were: lack of financial resources and lack of government support and detrimental policies. These results logically lead to conclude that the main reason for similar barriers depends on the innovation environment in less developed economies.

Finally, the findings on the role of government suggest that despite the increasing effort of the government for innovation improvement, the policies have not reached the expectations. SMEs have even perceived the new policies as detrimental for their interests. However, there is also a lack of interest presented by SMEs toward those programmes due to several SMEs stated that they did not attend many of them. Moreover, there is also a high rate of SMEs which are not informed about all the programmes available for SMEs. Therefore, it is concluded that a lack of communication between SMEs and policy makers, and also an ineffective diffusion of information is at the core problem of the correct assimilation of these programmes by SMEs.

5.3. Implication of findings
The main implication of the findings is of particular interest for SMEs, specifically those operating in the processed food sector and policy makers. The first group will obtain a better understanding of the role of innovation process contributing to knowledge diffusion among managers and entrepreneurs. Additionally, both interested parties, have the opportunity to be aware of clear and inherent barriers discouraging innovation management. These findings will benefit them to pay particular interest to specific weaknesses that firms have. Furthermore, policymakers could be informed about SMEs’ perceptions of current policies and deeply analyse them in order to make adjustments to enhance a policy’s effectiveness and to increase innovation outputs.

5.4. Implications for future research
The majority of implications for further research could be derived from some of the main limitations presented in this study. Earlier, the focus of this dissertation sought to study fresh/organic and processed food sector equally. However, due to different limitations presented while conducting primary research, it was not possible. Therefore, researcher would be interested if future research could focus on developing potentialities to innovate in this important sector of Ecuador’s economy. Considering that this research was mainly conducted in the cities of Cuenca and Loja, findings from this study may not be representative of the situation in the whole country. Thus, future
research could be extended, with a longer timeframe, to other important cities of Ecuador. Additionally, the study sample could be also extended to a probabilistic sampling technique pretending to obtain generalisation of results in the processed food sector. However, due to a lack of research about barriers to innovate in Ecuador, another interesting option for future research is to extend research topic on other industries.
References and Bibliography


Hadjimanolis, A. 1999. Barriers to innovation for SMEs in a small less developed country (Cyprus). Technovation, 19, 561-570.


McAdam, R., Reid, R., 2001 "SME and large organisation perceptions of knowledge management: comparisons and contrasts", Journal of Knowledge Management, Vol. 5 Iss: 3, pp.231 – 241


APPENDICES

APPENDIX A: Sample Questionnaire Answered

Dear Participant,

This questionnaire is designed to determine the barriers and opportunities that SMEs in Ecuador face in order to innovate, specifically, on those SMEs operating in processing food sector. The information you provide will help us to understand and identify what the main barriers are for SMEs when innovating. Because you are the one who can give us correct information on your experience and how you perceived the barriers presented in your case. I kindly request you to respond to the questions frankly and honestly.

I would like to stress that this research will be carried out for academic purposes only. Furthermore, the researcher is committed to keep the information provided strictly confidential. If you prefer, a summary of the results will be mailed to you after the data are analysed.

Thank you very much for your participation and time. I greatly appreciate the help of your organization and yourself in furthering this research dissertation.

QUESTIONNAIRE #_

Date: __________

Time: __________

Name: _____________________________
Surname: ___________________________
Position: ___________________________
Enterprise Name: _________________
Province: _______________________
City: ______________

Office telephone: _________________
Mobile phone: _________________
E-mail: _______________________
Office address: _______________________

SECTION I: GENERAL COMPANY INFORMATION

S1 Q1 When was the company established?
There were two important moments. The first one when my father founded it almost 60 years ago, and then when it was legally formalized in 1978, so the company has almost 37 years (it was founded in February)

S1-Q2 How many years has the company been operating in the food industry?
The company has been operating ever since it was created. Now also operates in other sectors, but always related ancillary services-producing.

S1-Q3 What was the source of funding to establish the company? (Please indicate an approximate percentage)
a) Self-financing _____%
b) Family: 100%
c) Friends ______ %
d) Private Banks _______%
e) State Banks _______%
f) Other (please specify) _______%

SI Q4 How many employees does the company currently have?
33 (thirty three)

SI Q5 What is the level of education of the employees of the company?
   a) Primary education (1st level) 20%
   b) Secondary education or secondary school (2nd level) 60%
   c) College Graduated (3rd level) 18%
   d) Graduate (4th level) 1%
   e) None 1%

SI-Q6 The staff of the company in the last three years has:
   a) Decreased
   b) Increased
   c) Remained unchanged

Please explain the reason.
Labor laws involve serious risks to the employer by having employees working for
more than 5 years in the company. The Employer cannot ask the employees to work
overtime without going through a long process of previous agreements; also you cannot
ask the employees to work night shifts for more than 4 hours. This attitude is due to the
political discourse of rejection of private property and do not see the business as
partners.
The solutions we have found are to reduce the current staff and replaced them for
people with better education, creating additional work incentives for better results and
processes.

SI-Q7 How often does the company staff get professional training?
They get training at least 3 times per year.

SI - Q8 Is your company part of a professional, business and / or professional
association?
   a) Yes  Chamber of Industries and Chamber of Commerce
   b) No

SI-Q9 What is the approximate range turnover of the company? (USD)
   a) From USD 0 to USD 99,000
   b) From $ 100,000 to $ 999,999 US
   c) From US $ 1,000,000 to $ 4'999.999 (in this range)
   d) From $ 5,000,000 onwards
SI-Q10 Sales in the last 3 years have:
  a) Increased  
  b) Remained the same  
  c) Decreased  

Please explain  
Cuenca’s population has increased over the years

SI - Q11 The general profits of the company in the last 3 years have:  
  a) Increased  
  b) Stayed the same  
  c) Decreased  

Please explain  
For the reason cited above, and because we put greater emphasis on improving marketing and increasing the variety of products even if they are not produced by us. However, the proportion of income that the company should have in relation to the increase in sales has decreased.

SI - Q12 What are the company investments?  
Improve of marketing networks  
Improve of marketing  
Improve of human resources

SI - Q13 Does the company have a consolidated strategic plan?  
  a) Yes (Yes, we have it)  
  b) No

SECTION II: INNOVATION ACTIVITIES, RESEARCH AND DEVELOPMENT (R & D)

SII - Q1 what do you understand by innovation for your company?  
To improve what we already have and add new useful items.

SII - Q2 Given the following definition of innovation: "Innovation is the process whereby organizations transform ideas into new and / or improved products, services or processes, in order to advance, compete and differentiate themselves successfully in the market. Has the company innovated over the years? 
SII Q3 What innovations has the company make for the last 3 years?
With the concept of innovation that you quote in this interview, it is productivity, to improve our quality of products and services allows us to capture new market niches. Another innovation is saving money on machinery and staff time. The administrative part is computerized; we created an active web page and other good stuff. To Improve production processes and to maximize time and develop the best plan to record fast delivery times of our products.
Currently we have a serious problem because 70% of our customers do not know what a computer is, and many others do not have an email. The Government has ordered the Internal Revenue Service that digitally bills you and has not considered the training of the population to both receive and handle this type of technological advancement.

SII Q4 What are the main reasons why the company has decided to innovate?
(Please list at least three reasons)
Survival
Insertion of new products and services of better quality than the competition

SII Q5 How is the role of research and development in your company?
It is Important and difficult to finance SMEs.

SII Q6 What percentage of the total company revenue (before taxes) is invested in Innovation?
10%

SII Q7 What percentage of total company revenue (before taxes) is invested in innovation and Progress?
5%

SII Q8 Which of the following types of innovation has primarily invested in your company? (Please indicate an approximate percentage)
a) ___% Product innovation (development of new or significantly improved products for the company products)
b) ___% Process Innovation (changes are created in the way of developing products, distribution channels, etc.)
c) ___% Marketing innovation (changes in the way products are introduced into the market, for example, design, price, promotion, etc.)
d) ___% Organizational Innovation (implementation of new organizational methods as management value chain, introduction of software tools to support business management, etc.)
SII – Q9 What kind of innovations mentioned above have been implemented in a way:
  a) Radical
  b) Incremental

Why? The Shocks cannot handle all required training and to have a cash flow for them

SII – Q10 How many new products has the company introduced in the last three years?
12

SII – Q11 How often does the company introduce new products?
3 or 4 per year

SII Q12 Does the company have an international standard of quality or performance, for example, ISO?
  a) Yes
  b) In process
  c) No

SII - Q13 Has the company acquired new equipment in the last three years?
  a) Yes : To prevent overtime
  b) No

SII - Q14 Has the company introduced new ways in product development?
  a) Yes : Methodology
  b) No

SII - Q15 Has the company developed new ways to promote their products?
  b) Yes. To reach customers with faster sales and in better condition than the competition
  b) No

SII - Q16 Has the company made significant changes within the organization, value chain or implementing software that helps with business management?
  a) Yes
  b) No
### SECTION III: BARRIERS TO INNOVATION

**A) Internal Barriers Business**

SIII - Q1. Please, indicate to what extent, in your opinion, the following internal barriers are affecting or affected innovation within the firm. (1= very little; 2=little; 3=some; 4= quite a bit 5= significantly affect)

<table>
<thead>
<tr>
<th>Internal Barriers</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of financial resources</td>
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<td></td>
<td></td>
<td></td>
<td>x</td>
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<tr>
<td>Lack of qualified personnel</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
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<tr>
<td>Problems keeping qualified personnel</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
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<tr>
<td>General enterprise policies</td>
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<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Economic instability inside the enterprise</td>
<td></td>
<td>x</td>
<td></td>
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<tr>
<td>Internal problems in the enterprise</td>
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<td>x</td>
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<td>Risk acceptance</td>
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<td>x</td>
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<tr>
<td>Resistance to change by employees</td>
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<td>Resistance to change by the Directive</td>
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<td>x</td>
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</tbody>
</table>
B) External Barriers Business

SIII - Q1 please, indicate to what extent, in your opinion, the following external barriers are affecting or affected innovation within the firm. (1= very little; 2= little; 3=some; 4= quite a bit; 5= significantly affect).

<table>
<thead>
<tr>
<th>External Barriers</th>
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<tbody>
<tr>
<td>Market structure</td>
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<td>Fluctuation in market prices</td>
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<tr>
<td>Consumer response/acceptance to new products and processes</td>
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<td>x</td>
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<tr>
<td>Lack of information</td>
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<td>x</td>
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<tr>
<td>Difficulty of accessing loans</td>
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<td>x</td>
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<tr>
<td>Training costs</td>
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<td>x</td>
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<tr>
<td>Lack of government support</td>
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<td>x</td>
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<tr>
<td>Laws, norms, regulations, taxes</td>
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<td>x</td>
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<tr>
<td>Labour laws and regulations</td>
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<td>x</td>
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<tr>
<td>Licences and patents policies</td>
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<td>x</td>
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<tr>
<td>Lack of cooperation with external institutions (Universities, Consultants, R&amp;D centres, etc)</td>
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<td>x</td>
</tr>
<tr>
<td>Changes in technology</td>
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<td>x</td>
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</tbody>
</table>
SECTION IV: IMPLICATIONS OF GOVERNMENT

SIV – Q1 Have your company been involved in government programs dedicated on improving innovation of small and medium enterprises?
No

SIV – Q2 In your opinion, how do you think these programs have helped the growth of the company?
To motivate us to seek new information and not just accept what they tell us.

SIV – Q3 Finally, what measures and / or additional policies to support innovation do you believe are necessary to implement in the country?
I think Logic, common sense, better technology, reliable information.

APPENDIX B: Semi-Structured Interviews

Interview: Chamber of Industries of Cuenca

PART I: GENERAL INFORMATION
How many members does the chamber of industries have?
Well, now the Chamber of Industries of Cuenca has 84 companies of which 90% belong to the industry and create services for the industrial sector.

What approximate percentage does the food and beverage industry represents?
Currently, this sector has 5-7% industries in which the largest company is PRONACA, which focuses on the production of a variety of food products

How do you consider the performance of small and medium entrepreneurs in the country in the last 5 years?
Small and medium businesses in the country are considered very important, mainly because they depend on improving production processes, add and offer quality products in the market.
Currently the food industry should consider quality as its priority because consumers are increasingly looking for this in the products they wish to purchase. If you look closely when going to markets people only buy fresh, healthy products and thus maintain a healthier diet.
Economically I think the market has been stable.

How would you describe the role of research, development and innovation in SMEs?
Lately, this topic has begun to become important within SMEs. Especially because employers are increasingly aware of their needs, especially when they face foreign competition that still affects domestic firms. In my opinion, this should be mandatory for every company. However, as I mentioned before many SMEs have difficulties in getting funding to implement research and development; as well as innovation.
Do you think this trend can be generalized in the country?
In my opinion, yes, this can be generalized across the country. You must be aware of the policies that the government has been implementing to strengthen innovation in the country. Especially for the food industry because of the color label law was implemented. This law means to label food and inform consumers about the product, for example to implement the red, green, yellow. For this reason, they are also starting to promote the importance of qualify laboratories just to investigate if the food does not have ingredients that may be carcinogenic, as this concern to society.

PART II: Innovation Activities and Barriers

What do you think are the main objectives developing these innovations in the industry?
Well mainly to improve product quality. This can have a negative effect on production, but positive effect for society. This improvement could represent an obstacle in the production of certain products and this is something small and medium businesses cannot afford, therefore reduce output and reduce the amount of products. Furthermore, taxes are another problem encountered in industrialized products that demand payment of various taxes. However, companies that offer fresh and organic products do not have much restriction in this sense they do not pay this Tax.

Of the following types of innovation, which could you indicate that is mostly prevalent in the industry?
a) Product innovation (development of significantly improved products or new products for the company)
b) Process Innovation (changes are created in the way of developing products, distribution channels, etc.)
c) Marketing innovation (changes in the way products are introduced into the market, for example, design, price, promotion, etc.)
d) Organizational Innovation (implementation of new organizational methods, introduction of software tools to support business management, etc.)

In the industry, process innovation is the most widely applied, if I could give a percentage of frequency in which these processes are applied, I would say that 60% is designated to process innovation and 20% to product and marketing innovation.

In your opinion, what are the biggest internal obstacles that most SME face to implement management innovation?
The lack of technical training is a big problem that SMEs face because employers place less emphasis on these kinds of training. The culture of the entire country, it is certainly another important barrier because people do not want to accept the idea of a change. The industry in this case has a problem because people think that an industry means damage to the environment and others. Well the industry also has many problems with the government regulations.
What do you think are the main external barriers that SMEs face to implement management innovation?
The lack of incentives is certainly one of the greatest difficulties. Additionally, the lack of technological development and the number of procedures to be performed and the time it takes to complete a task. Besides there is this problem with imports, especially of machinery that has to be new and there is no way to import machinery that in developed countries is already out of date, but for developing countries like ours, these machines would work well.

What do you think about the support programs for innovation that the government has launched to promote innovation in the country?
Well, I think the idea is not bad, but it really stays as an idea because its implementation is not being very effective. It takes 8 to 12 months to get permits.

What policies do you think should be taken to stimulate more innovative activities in the food industry, especially small and medium enterprises?
I think the first thing the government should do is to gather information about what its really missing in industry, it would be helpful, because the biggest problem is that the government takes policy without knowing the real issues that entrepreneurs are facing. One measure that the government should take care of is to consider the laws of imports especially related to technology.

Interview: Provincial Council of Azuay

What actions has the Province of Azuay taken to support innovation in the food industry?
Well, since 1998-1999 we start creating programs to improve partnerships, because small companies alone were not competitive. International aid has been the key on increasing development plans. For example, we have been working for about 7-8 years with the support of Dutch supporter’s studies.

How do you think it has been the development of small and medium businesses in the last five years?
Well, I think that the progress of these small and medium producers have been notorious; however there are several gaps that allow its overall growth, with respect to an innovative form to make their products, as well as to perform the processes to create these products.
I can mention 5 main gaps that affect them SMEs.

The first gap is the lack of productivity. Most small business owners who are responsible for developing products have small plots and the plot size does not allow them the option to create many products, and for this reason their productivity is very limited, so there is a lack of production.
The second gap that arises is the lack of quality control. Many of these produce products without having a rigorous process control, and it is for this reason that a lot of the time the products are different, which is why there are times that good quality products are given and sometimes they find products that have nothing to do with the
The third gap is the lack of access to technology. This is very important since there is no doubt that technology is definitely a great help to start improving processes. Another big problem is that these entrepreneurs have market access. They have too many barriers to entry and these obstacles are certainly linked to the aforementioned problems.

Finally, access to productive credit is very limited, since very few companies have access to these productive loans. Here, at this point, let me say something very interesting, the National Finance Corporation has already begun with a guarantee fund to allow small and medium entrepreneurs to access credit. However, it is new and not very well publicized.

**What should be done to encourage innovation?**
The first thing it is to increase the production levels that occurs in business and all this can be achieved through sensitivity and awareness on the subject. However, I must say that there are exceptions and have created good numbers of associations, a good example of this is the Red and Coprogiron Cas.

**What policies do you think should be taken to stimulate more innovative activities in the food industry, especially small and medium enterprises?**
Well, first I think the first thing you have to do is to create policies that are sustainable over time. Additionally, it is very important to create awareness about the importance of cooperation between SMEs.