

## Louvain School of Management

# Innovation regarding developing countries: The case of universities incubators in China and Colombia

Research Master's Thesis submitted by  
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# Introduction

This introduction is composed of four sections: the context, defining among others the definition of innovation system; the purpose of this paper; the method used to analyze this subject and finally the structure of this analysis.

## Context

Innovation is a key factor of the development of a country (Van Lancker et al, 2014). In order to study it and analyze its impact, it is important to define it first, understand its objectives and define the stakeholders involved.

At the beginning of innovation studies, the innovation was seen as a linear model of three steps: starting with fundamental research (invention), followed by applied R&D (innovation) and ending with production and diffusion. Nowadays, it is not the case anymore. Innovation is perceived as a system, more precisely as a systemic network. This standpoint highlights that the flow of information between stakeholders (Institution, Government, Business, etc.) is key to an innovative process (OECD, 1997). It turns an idea into a process, product or service on the market.

The concept of “innovation system” was first submitted by Freeman in 1987 and has had many different definitions since then (OECD, 1997; Siyanbola et al, 2016). This is the reason why we decided to give our own interpretation and definition on this subject. We will define it as all interactions and relations between players (producers, users, Governments and institutions) and all the support of facilities available (infrastructures, technologies, local resources, etc.), that will enable an idea/invention to be turned into a concrete process, product, or service on a market.

An innovation system is made of numerous and complex diversity of players working and interacting with each other on the generation, development and utilization of innovation regulated by various institutions (Bergek et al., 2008; Van Lancker et al, 2014). We identified in the literature two large characteristics of the socio-economic environment influencing the ability and readiness of innovation: institutional arrangement (technical standards and market mechanisms) and local resource endowment (capital, labor, knowledge) (Gailly, 2011).

In a nutshell, innovation is a key driver of the knowledge economy promoting the economic growth, productivity and employment. Developing countries are facing number of problems with innovation. Entrepreneurs in these countries especially experience a lack of support to turn their idea into reality. Yet, entrepreneurs play a crucial role to promote innovation in developing countries.

Amongst participants to the economic development of the country are Universities, particularly in developing countries. Their participations depend on the country's economic environment and are particularly important in a transition period. In an economic world where collaboration becomes increasingly important, we are willing to concentrate our research of innovation system and particularly on one type: University Business Incubators. Their aim is to help entrepreneurs to overcome the obstacles encountered during an innovation process in a context of increasing importance of innovation and economic growth. Their role is particularly important in developing countries (Scaramuzzi, 2002; Al-mubarak & Busler, 2013). They help entrepreneurs to overcome barriers due to the country's economics. Thus the most important added value is the development of a network to enhance cooperation and the sharing of knowledge.

Innovation is key in the development of a country and it is the reason why we have chosen to focus our analysis on this topic.

After having outline the context of our paper, we now explain its purpose.

## Purpose

The purpose of this paper is to analyze and compare the characteristics of University business incubators in two developing countries, through the prism of a theoretical model.

Business Incubators in developed countries and developing countries are facing different issues. As the type and the format of the Incubator will depend on the country's environment, this is the reason why we wish to focus on developing countries.

As a first step, our objective is to compare two Business Incubators from developing countries, China and Colombia, with the theoretical model of Business Incubator. With this analysis we will be able to see what is consistent with the theoretical model in relation to each

of the Incubators and what is not. Then, subsequently, we will highlight the similarities and divergences between those two Business Incubators in two different countries.

The Incubators we will analyze are both technology-based which will help the comparison between them.

As a matter of fact, Business Incubators in developing countries are non-profit making and sponsored by public resources and became very popular in recent years. This analysis will help us to understand the issues that Business Incubator face in developing countries and compared them. We will also emphasize their strengths and how they manage their system.

In order to pursue a relevant purpose, our analysis has to follow a rigorous method. The next section present the methodology followed by the paper.

## Method

The analysis of the theoretical model of incubator and the key dimension of the innovation context of those countries will allow us to extract the relevant characteristics pertinent for our case study.

The methodological approach of this work is exploratory.

Our analysis of the two Incubators will be based on case study research, as they are generalizable to theoretical propositions and not to populations or universes.

Robert K. Yin (2003) define case study as: “[...] an empirical inquiry that investigates a contemporary phenomenon within its real-life context”. In our paper, our objective is to make a descriptive analysis of the phenomenon of Business Incubators in developing countries by following a set of pre-specified procedures. The strength of the method is that it enables to use various research methods such as documents, interviews, observation and participative observation (Yin, 2003, p.6-8).

The purpose of our analysis is to understand if the definite framework developed in the literature relates to what we find in China and Colombia.

The methodology of case study describes five essential components of a research design:

1. The questions of the study,
2. Its proposals,
3. Its analysis unit,

4. The logic link of the data to the proposals, and
5. The criteria for putting the construction on the findings.

Our study questions will be as followed:

Do the Chinese University Incubator and Colombian University Incubator follow the theoretical characteristic of University Business Incubator? Are the theoretical models applied differently between the two countries?

Proposal: Since the two countries have the same characteristics, they should correspond to the different criteria analyze and the differences should be similar.

In order to focus our research and analysis on relevant information, we have to use the key points emerging from the literature review, taking into account the characteristics of University Business Incubators and the specificities of Business Incubators in developing countries.

All analytical units and subunits will then be used to establish a logical link with the data and analysis of the two incubators. With the precision of the units of analysis we can then compare those that go beyond the theoretical criteria and compare them between the two countries.

In order to carry out this analysis, we will base our research on scientific documentation as well as on the website of the selected Incubators and the different communication channels that they use. We will also run interviews with people who have worked or work for the Incubators to analyze.

This method and its different key points, enable us to implement a meticulous structure.

## Structure

This paper will first highlight the literature review concerning the key dimensions of University Business Incubators and the context of innovation. It will then apply the resulting frameworks to the two selected countries and their respective incubators, to finally compare these frameworks and draw some conclusions.

Our analysis of two incubators in developing countries will be presented as follows.

First, we will give an overview of the literature on the concept of innovation in which we will develop the key dimensions of University Business Incubator from which a framework will take shape. Then we will develop the key dimensions of the context of innovation.

Second, we will present the key dimension of the country's economic context and innovation context in a brief overview of the economic and development situation of the two countries, China and Colombia, in order to understand the evolution of innovation and the evolution of the business incubator in each country.

After that, we will analyze the two incubators, Bay West in China and Créame in Colombia, and their respective environment. We will present them; highlight their unit of analysis, in order to compare their differences and similarity afterwards.

Finally, we will make a conclusion with the main findings, the limitations and then present idea for further research.

# Chapter 1: Literature review

This section aim at defining the theoretical framework that enable us to, first, analyze the key dimensions of a business incubators and in particularly university business incubators, and then to highlight the important aspects of the innovation context in the selected countries.

## Key Dimension of Business Incubators

In this chapter we introduce the key dimensions of business incubators. After discussing general concepts on this subject, we discuss more deeply the notion of university business incubators that constitute the key point of our analysis. Finally, we highlight the important dimensions that we find in the triple helix thesis on this subject. Thanks to this analysis, we are able to extract the important points useful for the analysis of both incubators that we have chosen to study.

First, we highlight the role of business incubator. To this end, we look at the different type of services offered by an incubator and its objective, in order to understand how incubators influence the economic development of their region.

Business Incubator is widely recognized in the literature by many authors as an economic development tool (Scaramuzzi, 2002; Al-mubarak & Busler, 2013; Cohen, 2013). It is used to initiate the process of creating and growing start-ups. Their goal is to provide new qualified new companies. To do this, Incubators offer a set of facilities and services that will help start-ups from their beginnings and help them through to graduation. Once they have acquired the ability to survive alone, they leave the process. Graduates diversify economies, commercialize new technologies, create jobs and develop economic wealth at local and national levels.

New businesses and SMEs are flexible organizations because they have the capacity to adapt to the changing environment. However, those organizations are more fragile than others

because they generally suffer from a lack of resources in terms of finance and skills and from dependence in terms of staff, customers and key assets.

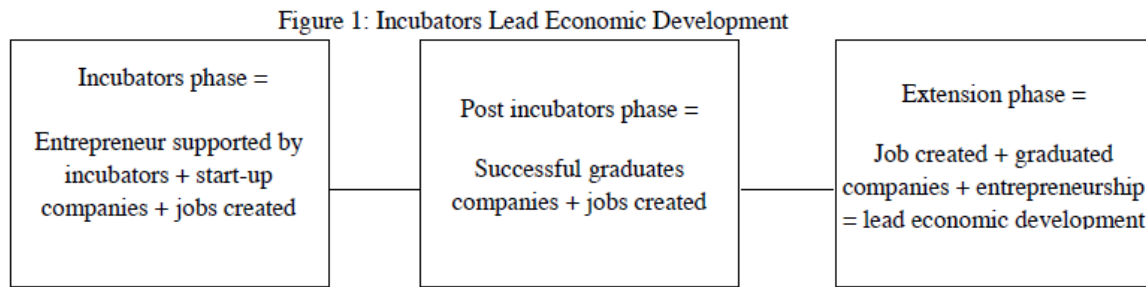
In general, Incubators play the role of parent companies and help projects to materialize. They offer support structures for the creation of companies based on research and innovation, designing the development of research strategies, helping them develop their network as well as marketing, strategic and legal advice. They mobilize resources for startups and facilitate access to them. They ensure the development and the success of the company in order to develop it, to become autonomous and financially viable (Scaramuzzi, 2002; Al-mubarak & Busler, 2013; Castro Abancéns et al., 2014).

Al-mubarak & Busler (2013) divided the different service offered by an incubator in four categories: 1) start-up consulting and business planning; 2) consulting in all areas important for business development and growth; 3) consulting for and/or access to financing; and 4) training and networking.

Since its start, Business Incubators model have evolved. Besides its primary function, “[...] it must be sought to position itself in external markets and consolidate as a bridge between research and development of Universities, how young people manage to do business to improve the competitiveness of each of their regions” (Braco, S., 2011, p 8).

As the objective of the Incubator is to ensure the success of new businesses, it helps to strengthen the local economy by supporting regional start-up and commercial development. Thus, job creation by start-ups generates a positive impact on the economy. These new ventures improve the community's entrepreneurial climate, keep businesses in a community, create or accelerate growth in a local industry, and diversify local economies. This means that indirectly, all successful Business Incubators contribute to the economic development of the region by facilitating business growth and technological innovation. Mostly, Business Incubators provide a higher rate of SME survival than outside the incubation program. In addition, Government offers funds and other support for Business Incubator, a way to increase successful start-ups in their region. (Scaramuzzi, 2002; Al-mubarak & Busler, 2013)

Al-Mubarak et al. (2013) have developed a model to explain the influence of Incubators in the economic development:



Thanks to the analysis of the general literature on Business Incubators, we can extract the points that relevant for our future analysis:

#### Objectives of a Business Incubator

- Parent company: manage development and coordinate businesses with support of services
- Creation of profitable company
- Promotion of regional economic development by generating new jobs
- Deliver government funds

#### Services offered by Business Incubator

- Support structure
- Start-up consulting and business planning;
- Consulting in all areas important for business development and growth;
- Consulting for and/or access to financing; and
- Training and networking.

Now that we have observed the different roles of a business incubator, its objectives and its influence on its economic environment, we are going to develop more precisely the type of incubator on which we will concentrate our research and analysis: University Business Incubators.

### *Key dimension of Universities Business Incubators*

In this section, we first present the different types of incubators. Then we define more precisely the characteristics that qualify a University Incubator. Finally we talk about the different services they offer.

Each models of Business Incubator offers different range and level of services. According to Scaramuzzi (2002), Incubator models vary from:

- Their mandate: for-profit or not-for-profit,
- The type of sponsorship they have: public, private or mixed,
- Their focus: mixed-use or niche.

For-profit Incubator are driven by the logic of efficiency and are funded by private investors, they take a share of the capital of the supported company, and seek to realize added value. On the contrary, non-profit Incubator doesn't have any share of the company capital and are supported by central or local Government resources, although they can also be sponsored by the private sector (Scaramuzzi, 2002; Al-mubaraki & al., 2010; Cohen, 2013).

Sometimes public incubators receive sponsorship from private company. It may be in their interest to invest in those Incubators in order to foster the Research & Development activities of some start-ups to expect that some of those ideas will become successful products and or services.

In addition to these different models, the business incubator is divided into different categories; we will focus our study on the ones related to Universities.

University Business Incubators are established in or by University campuses and include also different models. The most common ones are created by students and/or researchers, with the aim of stimulating the development of new research- and technology-based firms inside their facilities, (Scaramuzzi, 2002; Stefanivic et al. 2008). The success of University Business Incubators is mainly driven by their capacity to link research with the industry and the quality of this linkage (UNCTAD, 2011). "The role played by Universities consists of linking

research, technology, capital and know-how to leverage entrepreneurial talent, accelerate the development of new technology-based firms, and speed up the commercialization of technology”, (Scaramuzzi, 2002, p.7). Young entrepreneurs can then apply to benefit from the support structure offered by the University and get early stage assistance for their business.

“Technology-based businesses tend in particular to grow faster than other businesses and are often quoted on secondary stock markets in very short timeframes” (E. Scaramuzzi, 2002, p.31.). They are mainly very small structures and hire few people, but delivered with high added value goods and services. Universities Incubators are mainly technology-based Incubators, they benefit from the synergies of the work between Universities graduates and entrepreneurs. However, after the slowdown in technology markets, launching new technology start-ups became difficult particularly in developing countries (Scaramuzzi, 2002). This is the reason why technology-based Incubators are important in particular for developing countries.

A Business Incubator provides a physical environment that can be materialized by buildings or plots on the University campus. In this entity, entrepreneurs can find the support needed to graduate and finally move out on their own. Typically, a Business Incubator is composed of affordable share offices and equipment (Scaramuzzi, 2002). They provide expert monitoring service as hand-on management training, marketing support, accountant and legal counseling (Al-mubarak & al., 2010; Sepulva, 2012). These organizations also give access to some form of financing. Many have their own potential capital or are linked to potential funding sources, such as angel’s investors, Government or economic development coalition. University Business Incubator is also fostering the network of young entrepreneurs, due to the interaction they afford with young companies and/or start-ups. Broadly, those Incubators are oriented towards innovative and reward-based firms.

“Universities have a pivotal role in assisting business attract, develop and train talent” (The British Chamber of Commerce in Hong Kong, n.d.).

In order to carry out our future analysis, we can now extract from this information the key point that will be used later: first the main characteristics that define a Business Incubator created by universities and then the services that they generally grant to their clients.

The key points characterizing University Business Incubators are the following:

- a. Located near or on a university campus
- b. Research and Technology-based incubator

The services they offer can be structured as follows:

- 1) Physical environment
  - a) Affordable shared office
  - b) Equipment
- 2) Expert monitoring service
  - a) Management training
  - b) Marketing support
  - c) Accountant and legal counsel
- 3) Assist for financing
  - a) Own potential capital
  - b) Potential funding sources
- 4) Network

After having analyzing the different types of Business Incubator and extracting the key point for our analysis, some important elements from the Triple Helix Thesis have to be introduce.

### ***Key dimension of the Triple Helix Thesis***

University Business Incubators are part of the “third mission” of Universities, which will be explained below. The increasing importance of innovation in our economy has influence the role of the University. This is the reason why we have chosen to underline in this section the new role of the University, the importance of University-Business collaboration and the impact of the government in this context.

A key player contributing to economic growth is the university as a whole, as it trains many students and contributes to the absorption, adaptation and diffusion of scientific and technological knowledge. (Perkmann & Walsh, 2007; Guimón, 2013; Celis & Acosta, 2016)

In a transition time from an industrial and trade to an innovation driven economy, the role of Universities has changed opening up windows of opportunities for new interactions and collaborations. As knowledge creation became a driving force for innovation and economic dynamism, Universities have expanded their area of competences and researchers missions evolved (Creplet & Schaeffer, 2008). Therefore, Universities educate and raise highly qualified human capital and produce new knowledge with innovation potential (Monino & Sedkaoui, 2014; Celis & Acosta, 2016).

Universities have particularly increased their role in the innovation area in line with the cultural, social and economic development. They became a crucial economic player; it is related to the society and its graduates. It has to train its people and ensure their future employment. “Since the 1990s, the strategic mission of Universities has moved beyond the tradition of teaching and research toward a “third mission” related to better addressing the needs of industry and contributing directly to economic growth and development” (Guimón, 2013, p.2).

The idea is explained by the Triple Helix thesis:

“The potential for innovation and economic development in a Knowledge Society lies in a more prominent role for the University and in the hybridization of elements from University, industry and Government to generate new institutional and social formats for the production, transfer and application of knowledge” (Stanford University).

A central concept of this model is the "entrepreneurial University" (Ranga et al., 2013), which represents the evolution of the University in connection with the development of this "third mission". The entrepreneurial University is then a key player for the transition from the industrial to the knowledge society.

In innovation-based economic context, networks and heterogeneous working groups are emerging between Universities and Industries. They are called innovative networks (Creplet & Schaeffer, 2008) and are at the core of economic impetus driven by both scientific and technological evolution trigger by Government programs. With the collaboration, Universities and Businesses can exchange knowledge (which can be written, peer-reviewed or tested) to match the current situation of the Society and the evolution of student participation. Part of

the third mission of the University is to train student to entrepreneurial skills and to encourage them to launch their own start-ups.

The creation of networks is important for communication and for the development of trust between the public and private sectors, in order to ensure long-term collaborations. In addition, these networks allow access to sophisticated tools and equipment that are need by some companies, but that they don't necessarily have. More generally it concerns SMEs (Small and Medium-sized Enterprises).

It has been noticed by Ranga et al. (2013) that when UBCs (University-Business Collaborations) are established in an academic environment with high research intensity and a solid entrepreneurial environment, collaboration often takes part in a complex and innovative ecosystem. We find there various departments and academic units, various organizations involved in the commercialization of technology, supporting academic administration units, faculties, students, student associations, and so on.

“From a policy viewpoint, the promotion of collaborative research, University–Industry research centers and the involvement of industrial partners in academic research projects have become important concerns for Government” (Perkmann & Walsh, 2007, p.264). Consequently, the government's primary role is to provide and guidelines to provide some support to ensure good collaboration. Some examples are the implementation of an IP system (Intellectual Property), the quantity of funds provided and the development of common facilities and intermediate organizations such as science and technology parks, as well as Business Incubators. Government can also set up activities to promote networking and increase awareness of the importance of collaboration.

Lately, University-Business cooperation has enlarged its action. On one hand, on business level, it has expanded to cultural, not-for-profit and civil Society organizations. On the other hand, on academic level, it spread to multidisciplinary research such as social sciences. Therefore, new organizational dynamics have appeared, characterized by a mix of Universities and companies values. Due to the evolution of these collaborations, the country's Government has to increase its impact on new areas such as “societal concerns for economic and social development at the national, regional and local levels, as well as greater responsiveness to firm and University needs” (Ranga et al., 2013, p.14).

Furthermore, the collaboration existing between Universities and industries will depend on the stage of the country economic development. The priorities are different when the country has a developed or **developing economy**. The reason is that “in many developing countries University-Industry collaboration is constrained by historically based cultural and institutional barriers, which take time to overcome” (Guimón, 2013, p.3). However, the benefits of these collaborations in those countries remain clear as they substantially contribute to the prosperity of business organizations and help the introduction of new products and patents.

This chapter first point out that business incubators are economic development tools due to their function in creating successful companies by the structure support they offer. Secondly, it highlighted the characteristics of University Business Incubators. Those are generally close to campuses and are generally technology-based. Thirdly, it has determined the range of services offered by this type of incubator, which can be divided into four large sections: Physical environment, Expert monitoring service; Assist in seeking for financing; Network support. Finally, we have highlighted the important elements of the Triple Helix thesis, the new mission and the crucial role of the University in the knowledge economy and the importance to encourage innovation, as well as the impact of the government on the resulting new collaboration.

In developing countries Business Incubators are significant players (Scaramuzzi, 2002; Al-mubarak & Busler, 2013). They help entrepreneurs to leverage the utilization of their financial resources, which is often the source in those countries.

The context also influences the characteristics of Business Incubators. In the next chapter, we outline the key dimensions of the context that will influence the incubators we have chosen to analyze.

## Key Dimensions of the Context

In order to understand incubators arising from Universities, we have to understand the context around it. On the one hand, it is the context around innovation in developing countries that is

enlightened in this section, and on the other hand, the context of the two countries, discuss in the second chapter.

In this part, first we define the concept of “developing” countries. Then we analyze the characteristics of business incubators in developing countries. And finally we identify the Key dimensions of innovation context in developing countries.

### *Definition of “Developing Countries”*

The term of “developing country” can be interpreted in different ways, and it needs to be correctly defined, in order to avoid ambiguity.

We use here as a term “developing” countries defined as low- and middle-income countries (World Bank, 2016). We consider China and Colombia as developing countries based on their Gross National Income (GNI) per capita calculated on the basis of the Atlas Method by the World Bank<sup>1</sup>. Indeed, in 2016, China had a GNI of 8,26 \$ and Colombia had a GNI of 6,32 \$, which is under the world average of approximately 10,3\$. The GNI per capita ratio is significant to determine if countries are developed or in development due to the fact that it better reveal the population welfare than the GDP per capita, as explain in the “Chapter 6: Indicateurs alternatifs du bien-être, in Réformes économiques, OECD in 2006, p.136”.

It is also confirm by the list of developing countries of the United Nations in their Statistical annex and the data of the World Economic Situation and Prospects (WESP).

Beyond, countries with low GNI, low Human Assets Index and high economic vulnerability, are least developed countries (LDC) as defined by the UN (LDC identification criteria & Indicators webpage), which is not the case of China and Colombia.

After defining the term of “developing” countries, we are now able to analyze the characteristics of an incubator in those developing countries.

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<sup>1</sup> <http://data.worldbank.org/indicator/NY.GNP.PCAP.CD?locations=CN-CO-1W-EU-US>

### *Business Incubator in “developing” countries*

The issues faced by Business Incubators in developing countries are not the same in developed countries. First of all, the benefits of collaborations between Universities and companies differ. Secondly, Business Incubators have different impacts on their country's economy. Thirdly, governments have bigger weight on business incubators and innovation, as well as banking system. Finally, these issues shape a characteristic type of business incubator, with its own kind of objectives and services proposal.

Business Incubators in developed countries and developing countries differ considerably as they face different issues. Indeed, the major concerns face by developing countries are the low quality of education and the lack of funding for Universities, resulting in the country's failure to integrate innovative industries (Dutt & al, 2016). The development of effective links between the University and Industries in this context takes time and effort. On the one hand, because Universities generally have little experience in industry collaboration and limited management capacity in research; on the other hand, historical cultural and institutional barriers also limit this collaboration (Guimon, 2013). However, the benefits of collaborations between Universities and companies in developing countries remain clear. Universities are seen as an economic lever for the country and their collaboration with industry contributes to the prosperity of companies and the introduction of new products and patents in their markets. Due to the specific nature of University-business collaboration in developing countries, and the adaptation of business incubator to its country's economic development, we have chosen to focus our analysis on University Business Incubators of developing countries.

Business Incubators in developing countries are playing a primary role in their economy, because in many dynamic economies, small companies are able to promote growth. Moreover, the number of Business Incubators is increasing rapidly. They become very popular, especially in the information technology sector due to the high level of creative opportunities. However, several players must ensure their success. Intermediaries are created to connect actors to provide value.

Given the challenges faced by developing countries, Governments are becoming important players in the development of Business Incubators. They define the policies, programs and

instruments that regulate the market and enable SMEs to find opportunities (Scaramuzzi, 2002). The Government has a role to put in place a structure and a system that will facilitate the efficient activities of the company. This creates new markets and new businesses and thus increases the creation of jobs. It is for this reason that public policies must be adapted to the new economy.

The country's banking system is also a crucial element for SME development, as well as the establishment of a regional venture fund and micro credit system, that will provide support to their activities (Scaramuzzi, 2002). Coalition between University's training programs and Government technical assistant has the goal to provide an improving business environment. Alike none efficient banking system and contract policies can slow down innovation, corruption is a major hurdle for entrepreneurship, mainly in developing countries.

The main types of Business Incubators in these countries are not-for-profit ones and they are sponsored by public resources. The main reason is that in those countries, the importance of relationships between Universities and the economy is increasing and it emphasizes the enterprise interest towards universities.

Al-Mubarak et al. (2013) set out, in their article, a list of objectives and services that Incubators in developing countries follow in theory:

#### Incubators Objectives:

- Job Creation
- Profitable Enterprises
- Research & Development stimulation
- Research promotion and Commercialization
- Entrepreneurship Awareness
- Export Revenues
- Policy Impact
- Income Generation.

#### Incubators Services:

- Management that develops and orchestrates business, marketing and management resources and relationships tailored to the needs of the business clients.

- Shared office services, training, technology support and equipment.
- Selection of clients and an acceleration process by which businesses become more independent and progress to graduation.
- Assistance in obtaining the financing necessary for business growth.
- Providing access to appropriate rental space and flexible leases in the Incubator.
- Hosting foreign business company's representation offices.

Incubators in developed countries support start-ups and stimulate new economies. As Incubators in developing countries concentrates skills for R&D, attract and gather Academic & Business high potentials. It contributes through partnership to rapidly enrich the newly emerging private sector.

Now that we have shaped the problems encountered by Business Incubators in developing countries, we can emphasize the specific key dimensions of the innovation context in developing countries.

### *Key dimensions of Innovation context in “developing countries”*

In order to understand the incubators that we analyze later on, we have to understand the characteristics of the context of innovation in developing countries. To fulfill this study, we rely on six main dimensions, elaborated below.

The “OECD Reviews of Innovation Policy” of several countries have been pointing out the framework conditions for innovation in developing countries, as well as the article written by Guimon in 2013, “Promoting University-Industry Collaboration in Developing Countries”. Out of these lectures we have identified six key dimensions of the innovation context in developing countries:

- Public policies implementation towards innovation;
- Strong Research & Development support;
- Rigorous patent system;
- Accessible and good education system;

- Supportive financial system;
- and the degree of entrepreneurship.

First of all, in the innovation context, the most important key dimension is the public policies implemented by the government to support innovation and entrepreneurship. They can concern the amount of funds delivered by the government to innovation infrastructures, but also the creation of infrastructure, or intellectual property rights. They can promote university-industry collaboration, stimulate collaboration through soft measure or have a regulatory role in order to regulate innovation.

“Given these challenges and the very limited budgets and multiple competing priorities developing countries face, their governments should concentrate efforts on the most appropriate policy instruments” (Guimon, 2013, p.5). These public policies concerning innovation aim at promoting it in order to create more jobs and stabilize the economy.

Secondly, in order to create a favorable context to initiate prosperous innovation, Research & Development is a crucial aspect that hasn't have to be neglect. Indeed, the more grand allocated and the more tax-incentives procure to R&D, the more it will be encourage and undertake by institutions, and the more innovation will grow. Another instrument promoting R&D are Innovation voucher. They consist in providing small lines of credit from governments to firms, “to purchase services from universities and public research centers, with a view to introducing innovations in firms' business operations” (Guimon, 2013, p.5).

Thirdly, the patent system and more precisely the intellectual property (IP) rights regime should be effective and well established, it is one of the essential aspects of a good innovation system. “But IP reform and commercialization efforts cannot compensate for a country's weak national innovation system” (Guimon, 2013, p.7). Once the innovation system is good, the patent system can make it better and represent its efficiency, but if the innovation system is weak, the creation or the improvement of the patent system should not be the main focus first. The initial concern should be to improve technological capacities of universities, create awareness of the benefits of IP, enhance interest among firms in technological development, and overcome institutional weaknesses (Guimon, 2013).

Fourthly, an education system of quality and accessible for a majority will have the impact of expanding the country national level of education performance and ensure highly qualified

human resource (HR), crucial for innovation. “Education and training remains one of the key roles of universities, especially in lower income countries where the lack of skilled workers is a major bottleneck hindering the competitiveness and innovative capacity of firms” (Guimon, 2013, p.8). This is one of the reasons why governments have to support and improve their educational system. Among which it can promote internship program, fostering collaboration between universities and companies in order to ensure the match of university programs and industry needs.

Fifthly, an accessible financial system is determinant in an efficient innovation context. In general, Banks make it easier for state-owned enterprises to obtain loans due to the higher risk that small and medium enterprises represent, but this isn’t favorable for innovation. Most entrepreneurs must rely on other kind of resources, such as family or friends’ funds, venture capital or bank loans but with expensive credits, with high interest rates and guarantees (OECD, 2008). A good regulation of loans contracts and specific programs for small entrepreneurs could be a solution to allow them to access financial loans. Banking system governance needs to be fair but strict in order to avoid doubtful loans. Another solution, more focus on innovation created by university-industry collaboration, would be that “Governments seek to stimulate university-industry collaboration through their role in funding public universities and (...) create reward systems for researchers” (Guimon, 2013, p.6).

Finally, entrepreneurship is favoring a good innovation context. Since entrepreneurship is at the center of our analysis, it is interesting to describe its characteristic in each country. To do so we will analyze for this part the survey of the GEM that resume it. These will enable us to understand in what circumstance the people of each country start a business as well as the barriers they face and the opportunities offered by their country.

To conclude, public policies, research & development, patent system, education system, financial system and entrepreneurship, are the six key points we can outline from this analysis of the innovation context in developing countries.

| Key dimension of innovation context in developing countries | Public policies                                                                                                                                                         | Research & Development                                                                                                                                                                                                | Patent system                                                                                                                                                                                              | Education                                                                                                                                                                                                                                                                                                        | Financial system                                                                                                                                                                                           | Entrepreneurship                                                                                                                                                                                                                          |
|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Characteristics                                             | <ul style="list-style-type: none"> <li>• Government funds</li> <li>• Infrastructure</li> <li>• IP rights</li> <li>• Soft measures</li> <li>• Regulatory role</li> </ul> | <ul style="list-style-type: none"> <li>• Funds are crucial for R&amp;D:               <ul style="list-style-type: none"> <li>◦ Grants</li> <li>◦ Tax incentives</li> <li>◦ Innovation vouchers</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• Highlight a good innovation system</li> <li>• Improve and reflect an efficient innovation system</li> <li>• If bad innovation system, not the priority</li> </ul> | <ul style="list-style-type: none"> <li>• Qualitative and accessible               <ul style="list-style-type: none"> <li>→ Education</li> </ul> </li> <li>• performance               <ul style="list-style-type: none"> <li>→ Highly qualified HR</li> </ul> </li> <li>• Effective innovation system</li> </ul> | <ul style="list-style-type: none"> <li>• Strict but Fair regulation of loans contracts</li> <li>• Specific programs for SMEs</li> <li>• Funds to public universities</li> <li>• Venture capital</li> </ul> | <ul style="list-style-type: none"> <li>• Starting a business out of opportunity or necessity</li> <li>• Improvement</li> <li>• Barriers towards entrepreneurship</li> <li>• Access to loans, infrastructure and foreign market</li> </ul> |

Through this theoretical analysis, we have also identified two more key points characterizing business incubators created by Universities. The first one is the need of creating entrepreneurship awareness and promoting the development of the local economy in a country in transition. And the second one is the impact of the university business incubators on local or national public policies.

Our unit of analysis will be composed of these key points characterizing business incubators created by Universities in developing countries:

1. Characteristics of a University Business Incubator
  - a. Located near or on a University campus
  - b. Research and Technology-based Incubator
2. Objectives of a Business Incubator in a developing country
  - a. Parent company: manage development and coordinate businesses with support of services
  - b. Selection of client and afford acceleration process
  - c. Creation of profitable company
  - d. Promotion of regional economic development by generating new jobs
  - e. Creation of entrepreneurship awareness and promoting development in transition economy.
  - f. Policy impact
  - g. Deliver Government funds and other support
3. Services offered by Business Incubator in a developing country

- a. Physical environment
    - i. Affordable shared office
    - ii. Equipment
  - b. Expert monitoring service
    - i. Management training
    - ii. Marketing support
    - iii. Accountant and legal counsel
  - c. Assist for financing
    - i. Own potential capital
    - ii. Potential funding sources
  - d. Network
    - i. Between entrepreneurs
    - ii. With graduates firms
    - iii. With Universities
4. The model of incubation
- a. Duration
  - b. The model.

This literature review has enable us to define, first the key dimensions of business incubators notably universities one and in developing countries, and secondly the key dimension of the context in which they are initiated.

Based on this literature review, we are going to analyze first the key dimension of the context of innovation in China and then in Colombia. Later on, we will shortly describe the close environment of the chosen incubators, to finally focus on the analysis of those incubators through the framework detailed by the key dimensions of university business incubators in developing countries.

## **Chapter 2: Key dimension of the country's economic context and innovation context**

We have chosen to apply this theoretical framework to two different concrete incubators in two different countries, China and Colombia. In order to understand in depth the context around these incubators, we consider that it is important to have a quick insight of the countries situations. This is the reason why we first present a general overview of the economy of the country at Global level. Secondly, the country actual situation is going to be briefly present with its most relevant characteristics. Finally, the country's innovative context is going to be analyzed on the basis of six carefully chosen dimensions.

### **China**

We first handle the key dimensions of the economic context of China having an impact on business incubators. Then we briefly outline the current situation of the China. Finally we apply the theoretical characteristics of innovation context highlight in the previous section to the case of China.

#### ***General overview of the economy of China at Global level***

From the evolution of its' economy to its' tremendous growth, China has been through multiple stage in the last fifty years.

During the second half of the last century, China has developed and transformed its economy from a centrally planned system to a market oriented one (CIA, 2017). The country became the world's largest exporter and the world's second powerful country by means of its outstanding development, mostly in its coastal regions (World Bank, 2016). This evolution has been achieved through the implementation of gradual and numerous reforms in different

fields. They operate on agriculture, taxation, bank and stock market system, foreign trade and investment (CIA, 2017). After thirty years of on-going growth, the Chinese economy is catching up OECD countries (Organization for Economic Co-operation and Development) due to the structural reforms. However, a main problem persists, “State-owned enterprises enjoy implicit Government guarantees and easy access to cheap credit, which make it hard to reduce excess capacity and deter the construction of new overcapacity” (OECD, 2015c, p.4). The Government also supports public companies in sectors considered as crucial on a world scale. Nevertheless, this had its impact since it helps the Gross Domestic Product (GDP) to increase more than 10 times the one of 1978 (CIA, 2017).

Currently, Chinese growth is slowing down because of several factors, including indebtedness “from its credit-fueled stimulus program, industrial overcapacity, inefficient allocation of capital by state-owned banks, and the slow recovery of China's trading partners” (CIA, 2017). To counteract, China proceeded to the ratification of several Free Trade Agreement, among which some have been signed and others are under consideration. A new five-year-plan released by the Government in 2016 aim to develop innovation and increase domestic consumption by fostering China’s independence on fixed investments, exports and heavy industry. It also targets to offset environmental damages and social inequalities. The main objective are to reduce pollution, increase power performance, achieve better education and enhance the health care system for all the population by setting up a social security (World Bank, 2016).

Other the past years, China has become the workshop of the world. Its economic system is mainly focused on mass production in order to export goods to the rest of the world for a minimum cost. China's manufacturing industry and infrastructure, played a key role in this transformation, and has enabled many Chinese companies to become world players. The effective market strategy of China has been to access and “putting to use the world’s stock of technological knowledge with cheaper costs, and at a greater scale, than can be managed by incumbents” (Hu & Mathews, 2008, p.1). Many large-scale Chinese or international investments have allowed the country to reach the present leading position. Its late arrival on the global market and its competitive prices has allowed it to become the world-exporting powerhouse. Yet, China is now badly experiencing the global downturn (OECD, 2015c). To remain prosperous, China future goals will thus be to move from an economy based on imitation, to an economy based on innovation (Hu & Mathews, 2008).

The rapid increase in resources devoted to research is favorable to the country's economy, although we note a lack of use of innovation. However, innovation and advanced education of the population are essential factors for the economic growth of the country (OECD, 2015c).

In a few years, China has become the workshop of the world, resulting in a rapid growth, providing the wealth needed to become more developed. This short overview of the China's economy evolution is important to understand the roots of the actual innovation system.

The rapid evolution of China's economy has a large impact on the actual country's situation that we shortly describe below.

### *Country's situation*

This insight of China's current situation will present the relevant information having an impact on innovation, such as population, urbanization and environmental issues.

China has the world's largest population with nearly 1.4 billion people, yet it is aging and this phenomena increase due to the restriction of one child per family (World bank, 2016). This problem added to the intern immigration is strengthening the demographic pressure. This rapid development also brought several issues, “including high inequality; rapid urbanization; challenges to environmental sustainability; and external imbalances” (The World Bank, 2016). Even though the overall standard of living of a large part of the population has been considerably improved, one person in ten remains below the poverty line.

During the last two decades, Chinese urbanization has been massive and will continue to grow and improve. In consequence the Chinese economy will not decrease either. It will continue to be productive by the means of multiple factors such as the continuous migration of rural citizens towards the towns, the renovation of shantytowns and the implementation of public services and social security. This growing urban population is such as the share of value added services has overcome that of manufacturing and will increase as China becomes richer and urbanization unfolds (OECD, 2015a). However, the main problem in this sector is the organic growth slowdown due to competition.

The Chinese urbanization is on the ground due to the fact that rural China lags far behind the Chinese urban area in term of living standards and it is the source of high population immigration inside the country. Chinese population is moving from rural areas to cities, mostly located in the coastal region, the richer part of the country. Many of them quit agriculture, because of the small size of farms that inhibit production economies of scale, the mechanizations and the difficulty to obtain loans. Other rural problems are the lowest percentage of land in the country, poor supply of water and excessive use of chemical fertilizers (OECD, 2015c).

Air pollution, soil erosion, and water scarcity are mainly the causes of environment degradation. Air pollution in China is one of the worst in the world. The massive use of coal and oil is the main reason of air pollution, and that is why the Chinese Government is trying to become more independent from these energy sources and invest in new ones such as nuclear power and alternative sources (CIA, 2017).

All these reasons show that China is still a developing country. Its incomplete development, the division between its rural area and its richer coastal region, its partial market reforms, its low per capita income and the standardization it must achieve.

This current situation has an impact on innovation as it has an impact on the whole society. Some of these issues will need innovation in order to overcome the situation and find sustainable solutions. Let's now analyze the Chinese innovation context that may have a positive impact on the future evolution of the country.

### *China's innovation context*

After having highlighted the theoretical key dimensions of innovation context in a developing country in a previous section, we now apply the pattern to China's case.

China economic growth is slowing down. The Government hides real figures, to maintain a good spirit and global image. Therefore Chinese Government focuses on innovation and entrepreneurship to re-boost it. Actually, these tools have pivotal role to regain its economic

growth. Investment in these fields is key to generate a solid and sustainable growth. Indeed, “the importance the Chinese Government gives to innovation is perceived in its choice of innovation as one of the five keywords for the current Five-Year Plan, together with coordination, sharing, green development and opening up” (OECD, 2017b).

### *Public policies*

As we explained earlier, the Chinese economy is shifting from quality imitation to innovation. Experimenting with new knowledge and technologies is essential to improve productivity in companies and create innovation. The Government's priority is to promote the improvement of these leading-edge organizations, in particular through the implementation of several new policies focusing on innovation and job creation such as investments in basic research, Tax incentives and intellectual property rights reform (Gu & al, 2016).

Lately, the number and reach of policies have been increasing, but they were mostly top-down innovation policy and characterized by “push-technology”. The role of the Chinese Government was to choose the right allocation of funding support for technologies, projects and even companies. And they focus mainly on high-tech start-ups rather than raising innovative capabilities in existing firms and traditional industries (Gu et al., 2016).

### *Research and Development (R&D)*

Over the past decade, R&D investment has increased dramatically in China, but innovation is still not complete. R&D spending in China is above the EU average. In 2013, they have increased by more than 2% of GDP and are prepared to expect 2.5% by 2020. Of its total investments, it is estimated that just less than 30% comes from Government, and 70% or more from enterprises. However, those spending have been relatively sparsely invested in basic research, but have strongly supported the development of infrastructure in Science & Technology.

### *Patent system*

The health of an innovation process can be measured by the quality of patents and patenting activities, which are representative of a country's innovation system. And China is the country with the largest number of patent application in the world, with more than 825,000 in 2013, though it has only granted 7,921 ones in 2014. In terms of international patenting and trademark registration the Chinese innovation performance is weak. A large majority of patents is owned by Multinationals. Yet “Universities generate a large volume of patents, but their utilization rate is only about 5 percent, with the bulk of the research not relevant for business” (Zeng, 2015, p.1). Still China is catching up rapidly. The number of publications of scientific publications has exceeded some European countries, such as Germany.

### *Education*

The budget spent on education in China is close to the other BRICs expenses, but beneath the OECD countries' spending, in that field. However, the expansion of the education system has been restrained due to the initial salary of teachers, which is not very high compared to other jobs, and has rare possibilities for increases. Moreover, inequalities in the education system are considerable depending on the social class and the location, rural or urban area.

Over the past fifteen years, Universities and their affiliated Technology Parks have greatly contributed to the country's innovation capacity, particularly since the entry of China into the World trade organization. When one considers that the total knowledge of a country is reflected by its GDP, “Universities research & development expenditures are found to have a significant positive impact on GDP as a driver of patenting” (Hu & Mathews, 2008, p.1476). They contribute to innovation capacity due to their implication on GDP and the training of skilled manpower.

The Chinese innovation system has also become specific by the development of Universities spinoff ventures. As an example, China's "National innovative capacity depends, [...] on a few key sectors, with Universities playing a much more important role in China's case than in the East Asian Tigers” (Taiwan, Korea, and Singapore) (Hu & Mathews, 2008, p.1478). However, its reinforcement undergoes an obvious lack of contribution to the public sector.

### *Financial system*

The financial system of a country is crucial for the development of its innovation system. It includes the public financial system but also the private one. Concerning the private one, Mogollon (2010) identifies three types of external financing for incubators and start-ups:

- Venture capital or venture capital consisting of seed capital, venture capital funds and angels;
- Equity capital compounded by the stock market and similar organizations, and;
- Loans from the bank.

“China’s financial system is dominated by large state-owned banks” (OECD, 2008, p.42). They mostly provide loans to large State-Owned Enterprises, but many of them are performing at loss and, non-profitable doubtful credits have been gathered from banks. The Chinese financial system needs to react to that by reducing the amount of this kind of doubtful loans and by reforming China’s banking system governance to avoid them. Some improvements were made possible by the progressive opening of the Chinese Banking system to foreign competition. Therefore, China got access to the WTO (World Trade Organization), went through a State-Owned Enterprises reform and set up measures to reinforce the oversight and governance of the national banking system. However, “some important constraints on China’s financial system impact innovative activity in the business enterprise sector” (OECD, 2008, p.42). Indeed, since banks mainly favor State-Owned Enterprises, SMEs have difficulties obtaining loans and the banking system does not meet their needs. Hence, they are mainly self-funding. Several initiatives took shape “proposing funding mechanisms to support science and technology and innovation activities” (OECD, 2008, p.42).

New venture capital firms are important to promote innovation in a country. But, in China they run out of capital, of expertise and of legal and regulatory conditions to benefit from a general effective system. The number of new venture capital is increasing, whether they are national or international, but the capital is limited and business angels are rare. “Several initiatives have been taken to increase access to funding for high-technology SMEs and start-ups” (OECD, 2008, p.43) by the Strategic Plan for the Development of Science and Technology. This Strategic plan is also known as the 2006 National Medium to Long-term Plan (MLP) for the Development of Science and Technology (2005-2020) “calls for China to

become an “innovation-oriented society” by the year 2020, and a world leader in science and technology (S&T) by 2050” (Cao et al., 2006).

### *Entrepreneurship*

According to the Global Entrepreneur Indicator (GEM) the number of Chinese people starting a business out of opportunity rather than out of necessity is increasing. However, the Chinese entrepreneurial environment has only slowly improved since 2002. Chinese entrepreneurs have easy access to physical infrastructure and market openness, but the main constraint is the availability of financial support and entrepreneurial education.

To conclude, those six dimensions are essential to improve the innovation context, which can foster a better development of the country, they all matters at different levels and depending on the need in the country and what has been set up before.

In this section, we have shortly underscored the current situation of China and its economy. Then we have applied the literature review to China’s case in order to understand the key points of its innovation context.

China, which is the most populated country in the world, has succeeded in the last 50 years to kick up its economical situation from a very low level to catching up with OECD countries, particularly in creating a market oriented economy and focusing on industry and infrastructure.

Currently growth is slowing down; therefore China is ratifying some free trade agreement with other countries and focuses its five-year plan 2016-2020 on innovation and resources devoted to research increase. Environment protection, especially air pollution in China is also a current issue that can be tackle by innovation.

In terms of innovation context in China, public policies are promoting innovation, job creation and IP rights. Spending for R&D increase particularly for science and technology fields. China has also the biggest number of patent application in the world but most of them are coming from multinationals. The government should improve IP awareness to SMEs. The

number of scientific publication also increases. Regarding Education, there is large inequalities between rural and urban area, but the number of universities in the country has considerably increased with the creation of numerous technological parks. The Chinese financial system is dominated by state owned Bank from which SMEs have difficulties to obtain loans, but foreign competition has constrained the government to set up reforms. Entrepreneurship has slowly improved. The access to infrastructure for innovation has been facilitated but the acquisition of funds is still difficult.

In conclusion of this section on China's innovation context we can say that the country's rapid growth has brought its share of issues that need to be handle, creating a specific innovation context that still need to be improve but is already on the right tracks.

We will now have a look at the situation in Colombia and analyze the same key dimensions of the innovation system in this country.

## Colombia

This chapter examines the key dimensions of the economic context of Colombia having an impact on business incubators. It is first observe at a global level. Then the theoretical characteristics of innovation context highlight in the previous section will be applied to the case of Colombia.

### *General overview of Colombia's economy at Global level*

This section point out the general elements of Colombia's economy that are relevant for our further analysis. First, it describes the Colombian economic situation compared to the world and other Latin American countries, and then describes the policies that have helped the country improve its economic environment. Secondly it examines the evolution of Colombian

industry and the infrastructures that have had an impact on it. Finally, it presents the efforts that Colombia has made to liberalize international trade.

Colombia is Latin America's fourth largest economy measured by gross domestic product (in purchasing power parity) after Argentina, Mexico and Brazil, and the world's 31<sup>st</sup> largest (OECD 2014b; World bank data). Since the beginning of the century, the Government macroeconomic and fiscal policies have been prudent and effective via their National Development Plan (NDP) every four years (2006-10; 2010-14; 2014-18). The function of this plan is to improve the business environment and open progressively the country's economy (OECD, 2014c). The previous plan demonstrated effectiveness, as the real GDP of Colombia has grown by 4.8% per year from 2010 to 2014. In 2015, the GDP dropped as a result of a strong El Nino phenomenon. Yet the Colombian GDP is projected to be strengthened by an increase of 3% in 2017 (OECD, 2015a). Besides, due to this four-year period of economic growth between 2010 and 2014, the Colombian Government debt has been upgraded by the three major rating agencies, which help to attract record levels of investment (OECD, 2014b).

The structure of the Colombia's GDP by sector has changed quite significantly in the late twentieth and early twenty-first centuries, as have other middle-income countries. In 1945 the agricultural sector was dominating, still in 2015, the agriculture represented 6.8% of the nation's GDP, industry 34% and services 59.2% (World Bank Data). The foundations for the development of Colombia's economy, agriculture, energy and mining exports are sensitive to financial and economic crises. Nevertheless, the country has managed to overcome the last crisis better than others (OECD, 2014b).

Two types of infrastructure have particularly influenced the competitiveness of other Colombian economic sectors; advanced Information and Communication Technology (ICT) infrastructure, and transport services (roads, railways and ports) (OECD, 2014b). The penetration of fixed phone lines is low with strong regional disparities, but it is compensated by a relatively high mobile phone penetration. Between 2010 and 2014 the Colombian Government conducts a digital plan named Live Digitally Plan, which allows connecting 5 times more towns to the fiber optic network. In addition, the Fourth Generation (4G) coverage is ongoing since mid-2015 and will be followed by nine other projects (Osorio-Gallego et al.,

2016). Besides, the internal transport costs are relatively high due to insufficient investment and complex geography of the country, which is an obstacle to further international openness.

In the 1990s, Colombia began extensive liberalization efforts (OECD, 2014c). In this context, it significantly reduced tariffs and barriers to Foreign Direct Investment -FDI- and has signed various free trade agreements. In 2014, the Curaçao Chronicle numbered 13 free trade agreements that Colombia has signed with other countries, including the European Union (EU) and the United States. Colombia is also a member of the Pacific Alliance (Chile, Mexico and Peru) and a member of the Customs Union of the Andean Community (Bolivia, Ecuador, Mexico and Peru) and has signed a number of international treaties on property intellectual. These agreements are likely to encourage further international integration (OECD, 2014b). This openness has already made great strides thanks to the possibilities of accessing and capturing knowledge from abroad. New opportunities arise from the integration of Colombia into global value chains, knowledge and innovation networks. However, international trade accounts still account for a small share of Colombia's economic activity, but it is increasing. Its economy is moderately more open than that of Argentina and Brazil, but it is much less open than that of Chile and Mexico. The country still needs structural reform because its economy is hampered by poverty, inadequate infrastructure, drug trafficking and the uncertain security situation.

After having analyzed the general characteristics of the country, we give thorough consideration to its context of innovation.

### *Colombia innovation context*

In recent years, the context for strengthening Colombia's innovation system has been good, thanks to good economic performance, strong macroeconomic discipline, a well-integrated trade environment and an increased national security. Currently, the challenge of the Colombian economy is to boost its productivity and diversification. A crucial step in advancing value change is the development of innovation and entrepreneurship.

According to the OECD (review of innovation 2009) "in developing and emerging economies, it is particularly important to understand not only the current characteristics of actor-centered structures, but also the ways in which they are changing or not changing over time." That is why we will analyze the development of public policies and entrepreneurship in recent years in Colombia.

First of all, we must know that in Colombia the idea of innovation systems is closely linked to institutions. It is also a component of the National Development Plan (NDP). In addition, in Colombia, Science, Technology and Innovation (STI) activities are considered a separate area of the economy.

### *Public policies*

The main policy actors for innovation in Colombia are the National Planning Department (DNP), Colciencias (The Administrative Department of Science, Technology and Innovation), the Ministry of Commerce, Industry and Tourism (MCIT), the Ministry of Labor which runs the SENA<sup>2</sup>, The Ministry of Information Technology and Communications (MinTIC).

Since the early 1990s, significant **policy reforms** facilitated economic modernization and development. We will analyze the policies concerning innovation and entrepreneurship, as both will influence Business Incubators in the country in the promotion of entrepreneurship and the search for innovations.

In 1994 and 1996, two documents approached Colombia's first **Innovation** Strategy. They have laid the foundations for a large part of the national innovation system. The measures taken have promoted innovation in enterprises through a combination of credits, public co-financing of private innovation projects, a National Guarantee Fund and the start of venture capital financing. Moreover, smaller branch-based institutes replaced the main technologies of the 1960s and 1970s and a network of Incubators was set up.

Colciencias was founded in 1968 as the first State organization responsible for research and innovation policy and funding. In 2009 in order to strengthen the national STI strategy, a law

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<sup>2</sup> Servicio Nacional de Aprendizaje – National Service of Learning

changed the status of Colciencias to a Department of State and extended the role of the National Council for Science and Technology to cover innovation. In more recent years, more and more strategies at the national level have been set up. This is in line with the country's vision for 2019, which proposes a wide range of objectives for the research and innovation system and in which Colciencias should play a central and reinforced role.

The Government and the "Servicio Nacional de Aprendizaje" (SENA) have participated in the creation of norms and laws that allowed them to act jointly. At the start of the 1990s, SENA created the Entrepreneurship Training Program, which aimed to promote entrepreneurship in various economic sectors in order to create jobs and recover the economy. This alliance has created employment and is trying to replicate best practices of other countries to increase labor productivity and the ongoing creation of new companies. In 2006 the SENA and MCIT put in place the "Law for the Promotion of a Culture of Entrepreneurship" and in 2009 were created the "National Policy for Entrepreneurship".

The Law to Promote a Culture of Entrepreneurship establishes the National Network for Entrepreneurship. This network benefits from the support of several state institutions, as for example the National Planning Department (DNP); Colciencias; the Ministry of Social Welfare (on which SENA depends), etc. This allows us to say that this national network, that conducts the policy of entrepreneurship led by MCIT, is based on a collaborative scheme. Indeed, it links together a large quantity of the institutions to promote their development and the development of entrepreneurship in Colombia. (*Figure 2*).



knowledge on the part of judges create constraints. Furthermore, in Colombia, public sector officials cannot operate spin-offs because they cannot have sources of income other than their salary. This impedes public Universities to engage fully commercialization activity unlike private ones.

The following NDP in 2010-2014 had also three main objectives: Sustainable Growth and Competitiveness, Equality of Opportunities for Social Prosperity, and Consolidation of Peace. “The Government of Colombia seeks to strengthen productivity, innovation, and entrepreneurship through increased coverage and better quality of financial and education services, and stronger national systems for innovation and technology transfer, with a special focus on improving productivity and innovation in small and medium-size enterprises and the agricultural sector” (The World Bank, 2011, p.26).

Finally, in November 2016, the Colombian Government has signed a peace deal with the FARC (Fuerzas Armadas Revolucionarias de Colombia) (CIA). In line with the national development plan put in place for the years 2014 to 2018 with its three core pillars: Peace, Equity and Education (OECD, 2015a). The conclusion of the peace process should be a substantial social and economic ‘peace dividend’, coupled with ambitious reform efforts in order to boost regional capacities to improve equity and productivity. The end of the civil war will also give access to rural areas that have been under used during the past 60 years (OECD 2014c). The ongoing project of the NDP is key strategy. It is based on science, technology and innovation; it covers the improvement of education, fortification of the ICT and transport infrastructure and promotion of entrepreneurial development (OECD, 2015a).

### *Researches and Development*

Investments in innovation are few for Colombian firms, creating a gap in major productivity gain. R&D expenditures are weak and firms have a lack of strong business core. The OECD (2014b) underlines that Colombia’s innovation system need to be strengthened; the Gross R&D expenditure is only 0.2% of GDP, compared with 1.2% in Brazil and 2.4% in the OECD area. This proportion is negligible compared to the size of Colombia’s economy.

Nevertheless, some policies are setting up to provide incentives for R&D. “The Ministry of Information Technology and Communications (MinTIC) runs an extensive innovation

program with Colciencias to increase R&D in the information technology (IT) sector, foster innovation in the overall e-governance and ICT use by the public sector and promote innovation in ICT as a lever for economic development” (OECD, 2014c, p. 104).

### *Patent system*

The Colombia patent system is also very low. In 2014, only 62 patents were applied by Universities and only 12 have been granted (Celis & Acosta, 2016). One explanation is the R&D expenditure of the country, the lack of high quality human capital and the multiple barriers that hinder firms’ operations.

As few Colombian players can file in the international patent system (some Universities or large advanced firm) (OECD, 2014c); Colombian firms and institutions depend less on patents, trademarks, design rights and utility models to protect their inventions.

The OECD (2014c) tells us that Colombia is also a signatory of major international IP treaties, including the following:

- Berne Convention for the Protection of Literary and Artistic Works (1988)
- International Union for the Protection of New Varieties of Plants (UPOV Convention) (1996)
- Paris Convention for the Protection of Industrial Property (1996)
- Patent Cooperation Treaty (2001)
- Madrid Protocol Concerning the International Registration of Marks (2012)
- Trademark Law Treaty (2012).

### *Education*

Highly qualified human resource is crucial for innovation and the Colombian Government is clearly aware of it (Celis & Acosta, 2016). Simultaneously with their prudent macroeconomic management and improvements, they have expanded their effort on education and innovation.

Since 2002, following the *Revolution Educativa* program, the quality and the accessibility of education have been improved in Colombia (OECD, 2014b). As part of this, in 2015 the Colombian Government has launched a program to expand school coverage and better link training with firms demand (OECD, 2017c). Their wish is to expand the country national level of education performance up to the average levels of the OECD countries. “In Colombia, 42% of 25-64 year-olds attained at least an upper secondary education, a much smaller proportion than the OECD average of 75%. [...] Despite this small proportion of people with an upper secondary qualification, 20% of adults in Colombia attained a tertiary qualification in 2012. This proportion remains low compared to the OECD average (32%). [...] The three other Latin American countries with available data (Argentina, Brazil and Chile) have smaller proportions of adults with this level of education” (OECD, 2014a, p.1).

However, the return to higher **education in Colombia** is quite heterogeneous and depends on the higher education institution (Celis & Acosta, 2016).

We count 81 Universities in Colombia, 32 are public and 49 are private and most students are attending public Universities (OECD, 2014b). Even if Colombia is more encouraging PhD compared to the US, only a small share of teachers in tertiary education has a PhD concentrated in the elite Universities (Celis & Acosta, 2016).

The SENA with the Ministry of Labour is also a crucial player to the training of the workforce below the tertiary level (OECD 2014c). It fulfills the State's role of investing in the social and technical development of Colombian workers. It provides and execute comprehensive vocational training for the incorporation of people into productive activities contributing to the social, economic and technological growth of the country (Mattiz Bulla & Cruz Gatner 2004). However, the educational performance of SENA is often not well known and its programs and students are often forgotten by the national data on tertiary education (OECD, 2015a).

### *Financial system*

Since 2011, Colombia has again been ranked by the main rating agency, which has strengthened and encouraged the country's international investment (OECD, 2014b). These private equity funds invest primarily in large companies and sectors, such as infrastructure,

hydrocarbons and energy, but do not serve much to promote innovation. There is little funding for new Colombian companies. Most entrepreneurs must rely on their own resources or those of their family and friends (Zarate Torres, 2015).

In Colombia, sources of financing for entrepreneurs are minimal and little developed (Botero et al., 2007; Rodriguez, 2015). As a result, most entrepreneurs rely on bank financing. Indeed, the Colombian banking system is well capitalized and profitable, but credits are expensive. This is because the interest rates and the overall cost of financial services are very high. Moreover, the guarantees they require are too high, the long and bureaucratic process and financial access are particularly core weakness for micro, small and medium-sized enterprises. Loans are generally non-refundable and subject to 33% tax (GEM). The average interest rate on loans to SMEs is set at 20.4% in 2014 (OECD, 2016a), while in developing countries it should focus on the links between the business-to-business Academic enterprises. In Colombia, in particular, bank lending is the main source of financing for SMEs, although it is the main constraint of business creation and innovation (OECD, 2016a). Moreover, banks have a high degree of risk aversion due to poor regulation of loan contracts (OECD, 2014c). Even for Universities, the level of research funding remains limited and hinders the increase in research.

Even today, there is a real lack of specific programs for small entrepreneurs so that they can access financial loans. This factor is also a problem for the country's economic development because it tends to slow down the process of creating new businesses. However, the Colombian Government made some recent policy measures to alleviate financial constraints in order to promote innovation and productivity.

However, initiatives exist even if it remains insufficient in the face of the investment needs of Colombian entrepreneurs. Two sources of venture capital are found in Colombia. One is the Emprender Fund (Mogollon, 2010), a seed capitalization fund that finances an entrepreneurial project in the productive sector, operated by SENA. Its objective is to provide seed money to those who have recently completed SENA courses or University graduates. The other is Bancoldex, the Colombian economic development bank, headed by the Ministry of Commerce, Industry and Tourism, as a second-tier bank (OECD, 2016a). It designs and delivers financial and non-financial instruments to foster competitiveness, productivity, growth and development of PMEs and large Colombian companies.

Other financing sources also exist as (Mogollon, 2010) :

- Mercurius Venture: The only Private Venture Capital Fund created in 1999 on the initiative of some of the country's entrepreneurs.
- Capitalia Colombia: A network of financial connections whose purpose is access to financial resources of business plans or companies with high expectations of growth.
- Fundación Coomeva: a Venture capital fund.

### *Entrepreneurship*

The Global Entrepreneurship Monitor (GEM) came in 2006 in Colombia (Rodríguez, 2015). Their study (2016) highlighted that Colombia has a relatively high rate of adults involved in new entrepreneurial activities and on average Colombian people see entrepreneurship as a good career option (72%) and estimate that the country has good business opportunities (58%). Moreover, the OECD (2016b) notices that barriers to entrepreneurship are lower compared to other Latin American and Caribbean countries.

The GEM study also highlight that twice as many Colombians start a business out of opportunity (67%) rather than necessity (33%). However, the rate of adults managing an established business has fallen significantly in recent years, but all establish firms still expect to grow in the next years. One weakness of those enterprises is that they use old technologies.

In Colombia, most educated entrepreneurs are more prone to formalize their enterprise and they prefer the regular channel of financing. Although the banking system does not suit their needs and entrepreneurs face severe liquidity constraint. Colombia faces a lack of support for business creation and a weak development of its financial market.

Nowadays the Colombian micro, small and medium sized enterprises (MSMEs) sector employs about 81% of the workforce and contributes to 35% of the GDP. Moreover MSMEs constitute about 68% of the business population. But, only 29% of them subsist after 5 years against 65% of the big firms. Of particular concern is the low level of diversification of MSMEs. In addition, less than 5% of them are exporting their products.

To summarize, since the turn of the century, the policies of the Colombian government have been prudent and effective. The various national development plans have improved the

country's trade environment. Colombia, although its economic foundation is sensitive to the crisis, has managed the last ones better than others. In addition, its sectors of activity has changed, today the country is more based on the services sector than on its agriculture. And the development of ICT infrastructure and transport services has influenced the competitiveness of the Colombian economic sector. Moreover, since the 1990s, Colombian liberation efforts have been intensified. Even if they are still weak, they are likely to encourage future international integration and create new opportunities for the country.

Colombia's innovation context has been good in recent years, and its current challenge is to increase its productivity and diversification. Since the 1990s policy reform have facilitated economic modernization and development. Those have been sustained by various actors as Colciencias to strengthen the STI strategy; and the SENA to promote the entrepreneurship. In Colombia, each NDP has several objectives and has led to improvements in the country's economy. The current one is based on science, technology and innovation; and one of its objective is the promotion of entrepreneurial development.

This chapter also points out that the country's R&D remains low despite political incentives. Moreover, It finds that the number of patents is low, in part because the country's R&D spending, the lack of high-quality human capital and the multiple barriers to business operations. Since 2002, the quality and access to education have been improved and programs have been introduced to encourage school attendance, but the number of PhD students in the country remains low. The sources of financing for the entrepreneur are minimal and underdeveloped, and most of them rely on banks but the guarantee is often too high because of its high risk of advancement. Others initiatives exist but still are insufficient. In Colombia, the barrier of entrepreneurship is lower than that of other lac countries, but it still lacks support and funding for start-ups.

This chapter enables us to understand the current innovative situation of both countries. Indeed, in China and in Colombia the overall context of innovation in the country is rather positive for incubators. In China, it has been managed by the government funding's for R&D in science and technology, underscore by the number of patent application. However, the country still suffers from inequalities between rural and urban area in particular in the education. The government still needs to improve the access to loans for SMEs in order to ensure a stable innovation process.

In Colombia, it has been achieved thanks to a series of institutions and the implementation of several programs and laws relative to innovation. Nevertheless the country still suffers from a lack of openness to the rest of the world and of an uncertain stability. At the level of its innovation context the government has set up a good reinforcement in the past years and implemented an objective of promotion of entrepreneurship. The main issues remain the low rate of spending's for R&D and the low number of patent applications, as well as a significant funding challenge for entrepreneurs.

After having analyzed the general characteristics of the context of China and Colombia as well as their context of innovation, we can now carry out the analysis of our incubators.

| <b>Key dimension of innovation context in developing countries</b> | <b>Public policies</b>                                                                                                                                                                                                                        | <b>Research &amp; Development</b>                                                                                                                                                                        | <b>Patent system</b>                                                                                                                                                                                            | <b>Education</b>                                                                                                                                                                                                             | <b>Financial system</b>                                                                                                                                                                                                                         | <b>Entrepreneurship</b>                                                                                                                                                                                                                             |
|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Characteristics</b>                                             | <ul style="list-style-type: none"> <li>• Government funds</li> <li>• Infrastructure</li> <li>• IP rights</li> <li>• Soft measures</li> <li>• Regulatory role</li> </ul>                                                                       | <ul style="list-style-type: none"> <li>• Funds are crucial for R&amp;D : <ul style="list-style-type: none"> <li>◦ Grants</li> <li>◦ Tax incentives</li> <li>◦ Innovation vouchers</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• Highlight a good innovation system</li> <li>• Improve and reflect an efficient innovation system</li> <li>• If bad innovation system, not the priority</li> </ul>      | <ul style="list-style-type: none"> <li>• Qualitative and accessible <ul style="list-style-type: none"> <li>→ Education</li> <li>→ Highly qualified HR</li> <li>→ Effective innovation system</li> </ul> </li> </ul>          | <ul style="list-style-type: none"> <li>• Strict but Fair regulation of loans contracts</li> <li>• Specific programs for SMEs</li> <li>• Funds to public universities</li> <li>• Venture capital</li> </ul>                                      | <ul style="list-style-type: none"> <li>• Starting a business out of opportunity our necessity</li> <li>• Improvement</li> <li>• Barriers towards entrepreneurship</li> <li>• Access to loans, infrastructure an foreign market</li> </ul>           |
| <b>In China</b>                                                    | <ul style="list-style-type: none"> <li>• New policies focusing on innovation and job creation</li> <li>• Government funds</li> <li>• Infrastructure</li> </ul>                                                                                | <ul style="list-style-type: none"> <li>• R&amp;D spending in China is above the EU average</li> <li>• Strongly support Science &amp; Technology</li> </ul>                                               | <ul style="list-style-type: none"> <li>• Largest number of patent application in the world</li> <li>• Majority owned by Multinationals</li> <li>• Large amount of publications of scientific reports</li> </ul> | <ul style="list-style-type: none"> <li>• Good financing</li> <li>• Considerable inequalities</li> <li>• Good universities system and technological parks</li> </ul>                                                          | <ul style="list-style-type: none"> <li>• Large state-owned banks</li> <li>• Need reduction of doubtful loans and reform the banking system governance</li> <li>• Need more support to SMEs and innovation</li> <li>• Venture capital</li> </ul> | <ul style="list-style-type: none"> <li>• Starting a business out of opportunity</li> <li>• Slowly improved</li> <li>• Easy access to physical infrastructure</li> </ul>                                                                             |
| <b>In Colombia</b>                                                 | <ul style="list-style-type: none"> <li>• New policies focusing on research and innovation system</li> <li>• Entrepreneurship Training Program</li> <li>• National Network for Entrepreneurship</li> <li>• Peace deal with the FARC</li> </ul> | <ul style="list-style-type: none"> <li>• Weak R&amp;D expenditures</li> <li>• Setting up incentives for R&amp;D</li> </ul>                                                                               | <ul style="list-style-type: none"> <li>• Low number of patent application</li> <li>• But signatory of major international IP treaties</li> </ul>                                                                | <ul style="list-style-type: none"> <li>• Since 2002, quality and accessibility of education have been improved</li> <li>• 2015: New program to expend school coverage and better link training with firms demand.</li> </ul> | <ul style="list-style-type: none"> <li>• Private equity funds</li> <li>• Minimal sources of financing for entrepreneurs</li> <li>• Loans for SME's with high interest rates and unaffordable guarantees</li> <li>• Venture capital</li> </ul>   | <ul style="list-style-type: none"> <li>• Starting a business out of opportunity</li> <li>• Low barriers to entrepreneurship</li> <li>• SME's employ a majority of the workforce but they are weak and don't have the capacity to export.</li> </ul> |

## Chapter 3: Business Incubator Analysis

After having highlighted in the literature review the key dimensions of business incubators, understand the key dimensions influencing it and extract the key dimensions of the innovation context, we have applied the key dimensions of innovation context to the two countries. We are going now to use the analytical framework of business incubators defined in the literature on concrete incubators in both countries. First, we study the development of business incubator in the country. Secondly, we develop the local situation in which the incubator is located, from a regional or town level, to the presentation of the parent-university. Finally, we present and analyze the incubator and use the framework developed in the literature review to study it in a table representing the Units of analysis. The table will resume the key point of our analysis and help us to better outline the relevant data for the following comparison of both incubators. This scheme will be applied to the incubators of both countries

### China

The scheme develop above will be use in the following sections. First, the development of business incubators will be develop, then we have a look at the local situation in which the incubator is located, from a regional or town level, passing by the area level, to the presentation of the parent-university.

#### *Business Incubators development in China*

I In the past twenty years, the Chinese government has heavily encouraged the development of entrepreneurship. The country had very low entrepreneurial activities as an impact of the oppressive political regime of Mao in the nineteen-seventies. In this chapter we will analyze the Chinese innovation environment and with the case study of the Zhejiang University Incubator: Bay West.

The Chinese development of technology-based Business Incubators has the characteristic to have had an early move compared to other developing countries. In its first stage, the main

purpose of technology-based Incubators was to reinforce the creation of a science project designed by University researchers. Since then, Business Incubators in the country have been developed on a constant basis.

The first Incubators were established in the late 1980s in accordance with the 1981-85 national plan and the Torch program in 1988, (OECD, 2008). The national plan is concentrated on the technological development of the country. The Torch program enables the Chinese Ministry Science and Technology (MS&T) to support high Technology Business Incubators in order to stimulate the merchandising of products, resulting of scientific and technological findings.

The Torch program was launched by the MS&T and implemented by the Torch-based Hi-Tech Industry Development Center, which is under the Ministry's control. It is also implemented at the provincial level by offices for science and technology. Its purpose was to create a community of entrepreneurs, but also to create links between Universities, public research institutes (PRIs), high-technology start-ups and the market. It was design to promote the commercialization, industrialization and internationalization of new technologies. Over the years, the three main instruments created by the Torch program are Science and Technology parks, Technology-based Incubators and Innofund, the innovation fund for Technology-based SMEs, (Grumbach, Liang & Hesters, 2004).

The hidden agenda of Torch was to acquire rapidly foreign Innovation through partnerships, incubated or transferred in the centers by locally offshored business organizations.

As part of the Torch program, the Chinese Ministry of Science and Technology has under its control Science and Technology parks, national technological-based Business Incubators, productivity promotion centers, technology markets (Liu, 2014). It has also been the main support of spin-offs. This Ministry is controlling the Incubators on a macro-level, whereas the local Government, with Universities and public companies contribution, is regulating Incubators on a micro-level.

Chinese Incubators are mostly (more than 90%(OECD, 2008)) situated in Sciences and Technology parks, also known as high-technology zones. These parks have flourished during the same period as Business Incubators and are managed by two ministries: The Ministry of science and technology and the Ministry of education, (OECD, 2008). Sciences and Technology parks were originally created to receive high-technology companies . But they

have become favorable environment for University-based Incubators, where professors and students can create spin-off companies (Wu, 2003). Indeed, they can benefit from a favorable scientific sector and academic investigation results. Those spin-offs can be created in Incubators but they are not all related to Universities. The role of these parks is central in the country's innovation development. It is a link between University and companies, empowering start-ups that go for high technology, training and supporting skilled and creative person, with the ultimate goal of promoting the results and technology. Besides, Business Incubator became useful to Universities as resource base.

Universities and their technology parks loom large in the country's economic development, particularly since the entry of China in the World Trade Organization (WTO). Moreover, the increase in the number of Incubators in the country has been exponential (Hu & Mathews, 2008).

High-Technological parks are suitable and crucial for the expansion of innovation. The OECD economic survey from 2017 (p.75) explains that in 2015 there were 146 High-Technological parks in the whole country. These parks host more than thirty thousand high-tech firms, representing 41% of the country's total. Some of them provide "an integrated service package including technology trade, Incubator guidance, international liaison and finance" (OECD, 2017, p.75).

One of the main characteristics of China's innovation system is that the Government has a predominant role as it is very influential and has a real impact. In the case of a high-technology zone, government support plays an important role in the area of investment and the operational environment. An example is the implementation of the innovation promotion platform and preferential tax treatment, (OECD, 2008). By implication, Incubators depend heavily on Government and mainly on public funds because of the lack of risk capital. However, the market for incubation is well developed. This phenomenon mainly results in more standardized business models than in other countries, (Chandra & Fealey, 2009). However, China has the objective of decreasing the predominant role of the State in its economic, institutional and financial infrastructures, by improving it, as well as opening and deregulating its market to global competition.

The national innovation system combined with local policy and innovation context are creating a fertile ground modeling the liveliness of research Universities and spin-offs arising. Mr. Wu claims that "In particular, the critical policies determining the national R&D

framework, the investment priorities for institutions of higher education, and the decision to reward commercialization are largely decided by the central Government” (Wu, 2016). Some policy instruments, such as institutional and legal framework, have been initiated by the Chinese authorities.

In China we can find three types of Incubators: Government-based, business-based and the ones based on the Multi-investor cooperative models.

The first type represents the majority of incubators in the country. These are usually non-profit organizations located mainly in high-technology development areas and university science parks, (OECD, 2008). Their objective is to establish the link between the authorities and the emerging companies. They also control the proper use of Government funds. The second ones are “set up by private enterprises and are for-profit organizations” (OECD, 2008, p. 228). Finally the last ones are “funded by two or more investors according to a cooperative agreement signed by all parties” (OECD, 2008, p. 228). The main sectors that Incubators support are predominantly I.T., Energy industries and slightly less biomedical industry. A University Incubator can be in each of this categorize. It only depends on the source of funding’s: from the Government, from companies in partnership or private investors.

China innovation system is under two positive influences and two negative ones.

The first positive influence is concerning Incubators. One of the forces of Universities Incubators in China is its ability to be well managed; therefore they provide an efficient and useful support close to the developed countries.

The second positive influence is the fact that the link between knowledge and practice is heightened in Chinese Universities thanks to the open-mindedness and tolerance of administration and faculty members towards involvement in local economies, much more than in other developed countries. “Perhaps a more salient feature of the Chinese experience is the increasing entrepreneurial bent of its elite Universities” (Wu, 2016, p.195).

Yet, there is a negative part, as another influential operating method having a huge impact on the political and administrative systems in China are the informal contacts, or personal relationships, called “Guanxi” in Chinese, but also corruption. From this, ensue one of the most problematic issue of the Chinese economy, there is a preferential treatment grant to big public companies (the national champions) by the innovation policies compared to the mostly private SMEs, that are left on their own to face competition. This issue is compromising the

well development of the innovation capacity of Chinese company in particular by the emergence of a dichotomy between large and small companies. These small companies are a real opportunity for China to accelerate the development of its innovation. For this purpose several actions have to be set up, such as the implementation of measures strengthening the linkage of SME and public researches, the break of the dichotomy between large and small enterprises and the creation of real connection between them.

The second negative part of the Chinese innovative system concern inequalities regarding Incubators. Indeed “they were created by different entities, under various economic conditions, with diverse status, modes of functioning, size and variety and quality of services” (OECD, 2008, p.233). As said previously, regional asymmetries are also predominant in China, with most of the economic activities located on the coastal regions. It is due to the fact that only 15% of Incubators are in Western provinces (OECD, 2008). To offset this imbalance, several collaborations between regions or other countries Incubators have been launched in order to “establish efficient information and resources platforms”(OECD, 2008, p.233).

The role of Incubators is essential in the economy of a country. Indeed, it helps creating new businesses by scholars or young entrepreneurs and it creates jobs. It has also “improved technology transfer and promoted industrial development of high and new technologies” (OECD, 2008, p.233).

To conclude, the evolution and improvement of innovation in the country has been achieved by the mean of several tools, such as incubators, scientific and technologic parks and the Torch program. The role of the government in this evolution need to be mention, as well as positive and negative influence that have shape the actual innovation system. The positive influences are tolerance and rigor anchor in the mentalities, but the negative influence are inequalities and corruption.

After having portrayed the business incubator development in china, we are now presenting the context around the chosen Chinese incubator: Bay west

*The context around the Zhejiang University Incubators: BayWest, in “Dream Village”, Hangzhou.*

*Hangzhou*

Hangzhou is a very innovative city that host a lot of innovative companies and is one of the cradles of innovation in China.

Hangzhou, the capital city of the Zhejiang province, is the second largest city of the basin of the Yangtze River, just after Shanghai. Hangzhou’s Metropolitan area is 16,596 square kilometers, and the 5th biggest city of the country. In 2014, its population is 8.84 million with a density of 533 persons per square kilometer (Qian, 2015, p.44). It is a sub-provincial city.

“Hangzhou is a transitional city known for its prosperous non-state economy, especially Town and Village Enterprises and domestic private industries” (Qian, 2015, p.42). In 2015, its GDP was around 120 000 Yuan much higher than the national average of 50 000 Yuan (Jiang, 2016). The tertiary sector contributed up to 74,6% of the increase of Hangzhou GDP. Indeed 52,9% of Hangzhou production comes from it. This sector employs 44,4% of the city population. Closely followed by the secondary sector that provide 43,9% of the industrial production and it employs 44,8% of the local population (Qian, 2015, p.44). The primary sector is far behind (3,2%). Hangzhou is a city from the east coast, where the exploitation of raw materials is sinking because of it is less profitable.

The historical past of the city as a royal capital enables to get an ancestral power to be a major commercial hub. This created the great interest of the town for innovation. Hangzhou’s nickname is “the Chinese silicon valley” as mention in the French newspaper “Le Monde” in 2016. Indeed, since the development and success of the company Alibaba, the city became one of the most innovative cities of China. Hangzhou is a particularly well-developed city that highly promotes entrepreneurship and innovation. The most important factor favoring this development is that the local Government is opened to modern varieties of enterprises. As a matter of fact, “local authorities have particularly put efforts in financial incentives, infrastructure development, investment environments, and welcoming attitudes towards preferential investors, aiming to further improve the reputation and market potential

of the city” (Qian, 2015, p.44). These supports have been concretized by investment funds, cash subsidies and Incubators construction.

For Schuman (2016), Hangzhou has naturally the favorable attributes to become China's center for an entrepreneurship boom. 1980' s Chinese capitalist reforms mark the start of the start-up fever and the "Zhejiang province, of which Hangzhou is the capital, emerged as a leading base for the export industries that fueled the country's rapid growth", (Shuman, 2016). Hangzhou is a dynamic, modern, international and open city encouraging entrepreneurship and innovation. It is becoming a perfect town for entrepreneurs, with a very attractive environment for start-ups coming from all other the country but also for investors. It is where private economy develops fast, innovation and entrepreneurship is strengthened and e-commerce spread out. This focalization on innovation has a vast positive impact on the city's economy mainly by it specification in high tech.

Currently, one of the major assets of the city is that the company Alibaba was created there. The success of this company provides huge opportunities for start-up and new business, mostly in e-commerce sector. Indeed, “Hangzhou is home to China's most famous internet company, the e-commerce giant Alibaba, which has become a training ground for would-be entrepreneurs”, (Schuman, 2016).

The local Government has a financial policy allocating financial assistance to some innovative institutions as well as funding trainings to highly qualified people. There is different level of grants. The first level is providing funds to high-performance people for innovation activities, up to 5 million Yuan (Chen, 2016). “The second level is going up to 20 million Yuan for leading entrepreneur team projects. The last level rise up to 100 million Yuan for the major programs of the best talents and groups ”, (Chen, 2016). These grants had significant results with 1,034 talents attract in 2015 (Chen, 2016).

Hangzhou's Government support to entrepreneurship and innovation is unique in China. It aims at attracting start-ups by creating a perfect innovative environment “through special economic zones, high-tech Incubator centers and low-cost capital to young entrepreneurs.” (Jacobs & Gough, 2014).

This environment leads to a real entrepreneurship spirit in the town where bold thinking and risk taking are settled in the mindset.

Hangzhou seems to be a good environment for the development of an incubator, and in particular the Dream village, one of Hangzhou area.

### *The Dream Village*

Hangzhou city Government has created and built, in 2014, a platform for start-ups also called “Dream village”. Its name is *Future Sci-Tech City - Haichuang Park*. It has the purpose of facilitating and gathering benefits allocation such as subsidized rent, training and expertise or shared resources. “It is featured with abundant technological resources, vibrant regulations and system, convenient and high quality public services, and active entrepreneurship and innovative activities.” (Future Sci-Tech City website, 2017).

The aim of this project is to accelerate the process required to start a business. It pursues the target of strengthening a national talent strategy, becoming the world leader in scientific and technological innovation for the purpose of intensifying the economic transformation.

“In just one year, Dream Village has become home to 640 projects and nearly 5,900 start-ups. Among them are 75 projects that have received more than 1 million Yuans each, in financing. At last, they received investments of 2.58 billion Yuans.” (Wang & Shi, 2016). Most of the funds are coming from Hangzhou and Zhejiang Government. These funds are crucial for the Research & Development aspect of start-ups.

Their benefits are appreciated and very attractive for business coming from all over the country but also from the American Silicon Valley.

Inside the Dream Village, there is the University Science Park. With an area of 113 hectares, this park and the agencies that moved in it, provide services and consultation, regarding law, finance, investment, patent application and technological transference to students and University faculty. It enables them to start high-tech businesses and to industrialize their research achievements.

### *Zhejiang University*

The Zhejiang University is based in Hangzhou. It is one of the oldest Universities of the country. With more than 47 thousand students in 2016 (Times Higher Education, 2016), this public University is in the top 10 Universities of China and member of the C9 League, (the China's Ivy League). It also has a "leading position in China in output indicators including publications, patents" (Zhejiang University, 2017).

The Zhejiang University is very active in promoting innovation and entrepreneurship. Jacobs & Gough for The New York Times, describe it as a "feeder farm for local high-tech firms that aggressively recruit graduating seniors". Indeed, "Zhejiang University has the highest rate of entrepreneurial activity among all Chinese Universities (4.61%)", (ASES Zhejiang, 2017). It aims to become a key hub and cradle for successful innovation and create talent abundantly. In order to achieve it, the University has developed a school-sponsored Business Incubator, with exercises, cooperation opportunities and affordable working spaces for students or alumni, (ASES Zhejiang, 2017).

After having explored the several layer of the environment around Bay West incubator, we are now going to analyze it in order to understand how an incubator in china operates.

### ***Zhejiang University Incubator: Bay West***

In this section we study the characteristics of Bay West incubator through the framework arising from the literature review and based of the units of analysis. The relevant data will be then resume in a grid.

Bay West is a University Business Incubator located in Hangzhou, in the Dream Town Internet village. It has been founded in 2015 by the Zhejiang University, with the cohesion of several people. The large majority of these people are angel investors. The main founders are Mrs. Jie Zhang, also called Jennifer, and her husband, a famous serial entrepreneur, Mr. Fang Yi. Mrs. Jie Zhang is also the founder of Huadan Angel Investment, the main financial support of Bay West Incubator.

The creation of Bay West has been supported by the University, to which several investment organizations have donated funds, such as Liyuan Venture Capital and Fengrui Investment. Other structure has also supported the foundation of Bay West, such as Fudi Start-up Incubator Center, Fangyi, a serial entrepreneur, and Ruan Hao, an architect.

Some teachers from the Zhejiang University and from American Universities are advisors for the Incubator, as well as Gordon Davidson, chairman of Fenwick & West, an American law consulting company.

The Dream town Internet village, where Bay West is located, is built and supported by the Government. It is about 8 kilometers from Zhejiang University (ZJU). It is not far from Alibaba Company, but the Incubator does not have many contacts with it. Bay West is classified as a national Incubator. This means that it receives funds from national Government, higher funds than if they were only local Incubator. Moreover, they have a privileged office in the Internet village. Bay West is 3500 square meters and can host approximately 20 start-ups at the same time. It provides shared office, meeting rooms, gym machines, Wi-Fi, tearoom, pet's area, and air-conditioning...

Bay West Incubator, is focusing on mobile Internet start-ups mostly initiated by college students who want to create their start-ups. This new Business Incubator has been established to provide venture capital, human resources, products and services, such as global business services.

It includes overseas resources connection and international exchange incubation, especially between Zhejiang University and the USA: Stanford University, Massachusetts Institute of Technology and Silicon Valley entrepreneurs. It has also connections with Chinese and foreign senior consultants from related service agencies.

Bay West organizes international entrepreneurship competitions, connection with overseas capitals, trips with local entrepreneurial team to Silicon Valley and exchange between international organization such as international Incubators and Universities and other international exchange activities.

The main objective of this Incubator is to coach young graduates or alumni from the Zhejiang University to create their start-up, to link them to the entrepreneurial world, to investors and strong companies that can support and coach them.

Bay West vision is that young entrepreneurs should play in the big league, and that knowing the bigger world is the first step to change it. Its mission is based on the belief that coaching is more important than money. Bay West mainly promotes management support.

The typical profile of an entrepreneur at Bay West is 20 to 30 years old, with minimal or average work experience and with technical or vocational training. Most of them have studied at Zhejiang University or in a University of the town of Hangzhou, and they have already work few years in a company.

The monthly economic support supplied by Bay West depends on the start-up, its field of research, its needs, and its potential.

The majority of Bay West start-ups are not developing high-tech programs.

Most of the entrepreneurial teams are creating start-ups Internet mobile oriented, focused on business model innovation. Therefore they need money to design and produce the products as well as for making advertisement about it. In China, research laboratory are not closely connected to real commercial practice.

Hence, the major needs of start-ups are financial support, as well as expert points of view on the feasibility of their business plan and their robustness on the market. Concerning the need of funds, it can first be covered by the funds that the Incubator receives from the Government or from investors, or it can be covered by the network of investors that the Incubator provides to the start-ups. On this basis the start-ups need to defend their project to convince investors to believe in it.

The need of an expert point of view can be fulfilled with the expertise of University teachers, coach or successful CEOs. This is one of the reasons why University collaboration is important for these start-ups. Coaches are not necessarily teachers, but they are experienced and determined to successfully complete a project. They have a solid entrepreneurial background and can be successful CEOs. They will have discussion with start-ups teams, and give them not only advises but also practical help.

Policies are favoring the development of Incubators too. The whole Internet village is built and supported by the Government and the land is provided. They give to well running Incubators financial awarding. Bay West received 3 million RMB for 2017. The Government also holds entrepreneurship competitions and related activities to help Incubators get more exposure and help.

Bay west has created useful resources pool including contacts of media, Government, companies, Universities and investors for the start-ups.

Several aspects are boosting the network of contacts available for the young entrepreneurs. They are increasing the Incubator's and its start-ups' visibility.

First of all, most of the founding teams are investors and entrepreneurs. They have international experience and have studied in University such as Stanford, Princeton, Berkeley, Harvard... They share their social network. Mrs Jie Zhang is also very influential in entrepreneurship and is often quote in article and Chinese innovation review.

Secondly, Bay West has created close cooperation with Technological media such as 36 Krypton, Technode, CSDN, TechDaily and Huxiu.; a Strong partnership with Sina and Xinhua News, and exchanges with Hainabai chuan and Ufrate. New cooperation's are currently being negotiated with MIT Trust Center, YC (Y Combinator), Plug & Play, 500 Start-ups.

Thirdly, Bay West has a privileged contact with Zhejiang University and with Hangzhou Normal University.

Finally, an application has been developed including more than 3000 contacts in all kind of fields. This will give support to the start-ups in term of network/ That is very important in China.

Bay West incubation process methodology is complex to define because it is adapted to the needs of the start-ups. There is no standards' process. It helps the start-ups to strengthen its Business model if required. It trains and coaches young entrepreneurs how to pitch. It helps to structure the investment plan and create business accompaniment. All these services are included in Bay West supports according to the start-ups need. Bay West will also decide if it is worth for coaching them completely or for a selection of supports.

“Basically when the CEO comes to find Jennifer (Mrs. Jie Zhang), she will be glad to offer some help like consulting or introducing them to people they may find helpful. Bay West has an extensive relational network since Jennifer is very famous.” Miao

In the Dream town Internet village of Hangzhou, called the Chinese Silicon Valley, the entrepreneurial mindset is very intense in the area. To increase the entrepreneurship awareness, Bay West has taken part in international start-ups competition. It organizes also entrepreneurship tours to the Silicon Valley and Cambridge, in order to create short-term and long-term exchanges, to investigate and to learn from local companies and to help international companies to get branches in Hangzhou. Mrs. Jie Zhang is a judge of a National start-up reality show, called “We are the Hero”.

Bay West tries to provide what young entrepreneurs can not access easily, such as resources and experience. Start-ups are supported from project development to production, and to sales, from Human resources to funding. Each step involves risks, and start-ups are guide by the Incubator to avoid them.

Now let's look at the units of analysis. In order to facilitate the analysis of the incubator, we will extract the key points of our analysis in the following table.

First, we check that the analyzed incubator corresponds to the characteristics of a University Business Incubator, then we extract the key points founded in the review of literature: the objective of the incubator, the services it provides and its incubation model.

| <b>Characteristics of an University Business Incubator</b> |                                                                                                                                                          |
|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| a. Located near or on a University campus                  | Bay West is located in Hangzhou, in the Dream town internet village.<br>It is about 8 kilometers from Zhejiang University (ZJU).                         |
| b. Research and Technology-based Incubator                 | Not a research & technology based Incubator, but it mostly focus on University students, and internet companies related to education, finance, health... |

We can notice that this incubator follows the characteristic of a university business incubator, but is not particularly focus on research and technology and concentrate more on university students.

| <i>Units of analysis</i>                                                                                   | Bay West Incubator                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Objectives of a Business Incubator in a developing country</b>                                       |                                                                                                                                                                                                                                                                                                                                                                                 |
| a. Role of parent company: managing business development and coordinating businesses with services support | <div data-bbox="464 999 767 1464"> </div> <p>Bay West provides everything a team needs, from tools, product launch, management suggestions, market analysis, sales support to fund raising and legal advice.</p>                                                                                                                                                                |
| b. Selection of client and acceleration process                                                            | <p>Design for entrepreneurs with solid projects. A first meeting is organized to understand their idea and analyze their determination. The business plan, the team and the market scale are the most important in the decision. The entrepreneurs need to be able to handle the project and the project needs to be worth it. The majority of them are under 30 years old.</p> |
| c. Creation of profitable company                                                                          | <p>In two years, Bay West has incubated more than 20 start-ups. All of them are growing well. Over quarter of them reached the Pre-A investment round and 2 startups reached the A investment round. The huge majority of the start-ups are profitable. In case there are not, they are expelled from the incubator.</p>                                                        |
| d. Promotion of regional economic development by generating new jobs                                       | <p>The incubator, as an individual organization didn't create a lot of jobs, but the start-ups that have pass by the incubator did.</p>                                                                                                                                                                                                                                         |

|                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>e. Creation of entrepreneurship awareness and promotion of local economic development in transition economy</p> <p>f. Delivering government funds and other support</p>                                                                                                                                                                                                                                               | <p>Bay West is located in the Dream town internet village of Hangzhou, called the Chinese Silicon Valley. The entrepreneurial mindset is already very intense in the area.</p> <p>Increase of entrepreneurship awareness:</p> <ul style="list-style-type: none"> <li>- International startup competition.</li> <li>- Entrepreneurship tour to the Californian Silicon valley and Cambridge,</li> <li>- Mrs. Jie Zhang is a judge of a national start-up reality show: “We are the Hero”.</li> </ul> <p>Bay West is a national incubator. It receives funds from government and advises it to create regulations.</p> <p>In 2017, Bay West received 3 million Yuan from the government.</p>                                                                  |
| <p><b>2. Services offered by Business Incubator in a developing country</b></p> <p><i>a. Physical environment</i></p> <ul style="list-style-type: none"> <li>i. Affordable shared office</li> <li>ii. Equipment</li> </ul> <p><i>b. Expert monitoring service</i></p> <ul style="list-style-type: none"> <li>i. Management training</li> <li>ii. Marketing support</li> <li>iii. Accountant and legal counsel</li> </ul> | <div style="background-color: #cccccc; height: 40px; margin-bottom: 10px;"></div> <p>Bay West is 3500 square meters and can host approximately 20 start-ups at the same time.</p> <p>It provides shared office, meeting rooms, gym machines, Wi-Fi, tearoom, pet’s area, and air-conditioning...</p> <p>When the startup has been chosen to integrate bay West, it has already its business plan and its team.</p> <p>Management training</p> <p>Marketing strategy</p> <p>Product development</p> <p>Sales support</p> <p>Fund raising</p> <p>Legal counsel offered by Mrs. Jie Zhang friend and partner, Mr. Gordon Davidson, member of FENWICK &amp; WEST.</p> <p>Entrepreneurship awareness: occidental exchange tours (Silicon valley, Cambridge).</p> |

|                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><i>c. Financial assistance</i></p> <p><i>i. Own potential capital</i></p> <p><i>ii. Potential funding sources</i></p>                    | <p>Bay West has strong connections with Huadan Angel Investment. This investment company supports some of Bay West start-ups after a rude selection.</p> <p>Lots of policies are favoring the development of incubators.</p> <p>Government supports:</p> <ul style="list-style-type: none"> <li>- Procure land to the Internet village,</li> <li>- Provides financial award to national incubators. Bay West received 3 million Yuan for 2017,</li> <li>- holds entrepreneurship competitions and related activities to increase incubators exposure and help.</li> </ul>                                                                                                                           |
| <p><i>d. Network</i></p> <p><i>i. Between entrepreneurs</i></p> <p><i>ii. With graduates firms</i></p> <p><i>iii. With universities</i></p> | <p>Creation of Resources pool.</p> <p>Set up of an application including more than 3000 contacts.</p> <p><i>i. Most of the founding team is composed of investors and entrepreneurs with international experience. They have a wide social network that can useful to young entrepreneurs.</i></p> <p><i>ii. Close cooperation with Technological media. Strong partnership with Sina and Xinhua News, and exchange set up with Hainabai chuan and Ufrate. New cooperation's are being negotiated with American innovation organizations and incubator.</i></p> <p><i>iii. Bay West has a privileged contact with Zhejiang University but has also contact with Hangzhou Normal University.</i></p> |
| <p><b>3. The incubator model</b></p> <p><i>a. Duration</i></p> <p><i>b. The model</i></p>                                                   | <p>Average 1 year</p> <p>Selection (Business plan and team already strong and valid)</p> <p>Structure of investment plan</p> <p>Business accompaniment</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

This study has given us the key elements to compare in an upcoming chapter this incubator with the one from Colombia.

We now apply the analytical framework of business incubators defined in the literature on the Colombian incubator.

## Colombia

In order to begin the analysis of the study of the Business Incubator in Colombia, we will put it in context. The two sections below develops first the history of the implementation of Business Incubators in the country and then the economic development of the region in which it is located, Antioquia. We proceed then to the analysis of the incubator and place the key element on the analysis grid. The table shows the relevant data from the analysis in parallel with the data we have extracted from the review of the literature.

### *Business Incubators development in Colombia*

In order to better understand the analysis of Colombian incubators, we have to make a brief review of its history. First, this section develops the different programs and institutions set up to promote their development. Then, it develops the basic criteria of Business Incubators in Colombia, the function they have for the country, the difficulties they face and the help they receive.

The deployment of business development and innovation is the result of the convergence of several factors in Colombia. The exchanges and relations of the various actors at different levels have allowed the development of SNCTI (sistema nacional de ciencia, tecnología e innovación) and incubators (Charry & Perez, 2013). The story of incubators in Colombia is very young. In 1990, a first law was established to promote sciences researches and technological development, which also promote the creation of business incubators. As a

result the first Colombian business incubator, Corporacion Innovar, was set up four years later in Bogota, the capital (OECD 2014a; Charry & Perez, 2013).

In 2002, the SENA set up the National Business Creation and Incubation System (SNCIE) defined as “The chain of national efforts that allow the development of a value chain for the creation of new companies” (F. J., Matiz Bulla, 2004, p.9). The aim of this system being to support and strengthen the process of incubators in the Colombian territory after discovering difficulties in articulation, coordination and integration of effort among them and the entities that support them as universities. As a consequence of the close relationship with universities, entrepreneurs, corporate and incubators, the SENA becomes a key entity in this knowledge.

In addition to its role in vocational education and training, the SENA with the Ministry of Labor (Mintrabajo) runs 15 technology parks, named Tecnoparque, in 11 regions of Colombia (OECD 2014a ; OECD 2014b; Charry & perez 2013). They also manage together two dedicated technology development institutions, a small industrial extension service and fund R&D projects related to training. The technology parks were set up by the entities in order to develop R+D+I projects (development of research and innovation) in Colombia so that they can be materialized in functional prototypes. Moreover, those technology parks help to develop and foster entrepreneurial ideas. They provide help from professionals, laboratories and ICT trainings following four technological lines which promote technology-based entrepreneurship:

- Electronics and Telecommunications,
- Virtual Technologies,
- Engineering and Design
- Biotechnology and nanotechnology,

Two other Ministries are helping businesses to foster and developed themselves.

The ministry of Trade, Industry and Tourism (Mcit) run the productive transformation program. Its purpose is to coordinates activities to develop human capital, regulations, infrastructures, sustainability, strengthening industry and innovation. This ministry also funds the INNPULSA program to promote faster business’s growth focusing on innovation, entrepreneurship and regional ecosystems. The program is operated by BANCOLDEX, the state development bank (OECD 2014a; OECD 2014b).

The second other ministry is the Ministry of Information Technology and Communications (MinTIC). It runs an extensive innovation program with Colciencias, the Administrative Department of Science Technology and Innovation of Colombia. Their purpose is to increase R&D in the IT sector, foster innovation in the e-governance and ICT use by the public sector. They also encourage innovation in ICT as an important part for economic development (OECD 2014a).

In 2009 the establishment of the law 1286 has realigned the policy and function of Colciencias (OECD, 2014a; Charry & Perez, 2013). Nowadays, its mission is to lead and coordinate the national policies of science, technology and innovation. Its objective is to generate and integrate expertise to the social, economic, cultural and territorial development of the country. Concretely, Colciencias helps improve the Colombian productivity and competitiveness level in the business sector due to the promotion of the participation, collaboration, articulation and interrelation of diverse actors in function of common objectives.

As a consequence, the period between 2002 and 2010 was favorable for business creation in Colombia. The result of the coordination of practical knowledge of business entrepreneur management added to the proximity of unions with strategic entities, such as SENA, and the dynamism for business incubators.

More recently, the Colombian Government has focused on innovation to develop their economy.

“Colombian policy concentrates on innovation modes that involve characteristics such as research-based product innovation; intensive use of PhD-intensive knowledge links with Universities and research institutes; implementation of innovation via new start-ups that are often best suited to science parks or Incubator facilities; and high reliance on access to high-risk, new venture funding.” (OECD, 2014a, p.31)

Incubators organizations in Colombia are also considered a lever of the economic development for the country (Braco, 2011). Through the creation of businesses they will generate more employment and they will create technological development and innovation across the country. They provide support to public and private organizations and are used to accelerate the development and success of business.

The members of a Business Incubator board in this country are generally including representatives of the SENA, Universities and entrepreneurs. And Universities and firms are sitting on the national and regional boards of the SENA. In addition, SENA's close relationship with Universities, entrepreneurs, businesses and Incubators has led it to become one of the key factors for innovation in entrepreneurial politics. These factors have influenced the inclusion and strengthening the entrepreneurial policy in Colombia.

Since the first law in 1990 and the first incubator, many others were built and nowadays, we can count about 31 business incubators across the country, which are mostly non-profit ones. “They mainly provide office space, services to support the writing of business plans, specialized consultancy, and assistance in finding funding” (OECD, 2014a, p98). Furthermore, according to the GEM, Colombian science parks and incubator provide effective support for the creation and the development of businesses, as training support, business plan elaboration and development thinking. They also provide contact with public and private networks through various strategic alliances. Those new businesses are considered more sustainable in averaged than others and have low risks of collapse (Braco Garcia, 2011). Generally they are competitive and create employment. Nevertheless, Colombian incubators are facing some difficulties. There is a strong aversion to capital risk and lack of contact with investors, markets or customers outside incubators. In addition to this, the percentage of unsustainable firm created by incubators is still high.

The SENA is an important actor as they provide a first capital of 50 million of pesos (about 1500€) for each incubator in the sectors of technology-based, agro-industrial, software industry, solidarity, cultural companies and creative industries, among others. Incubators are composed of various actors interested in the development of regions, municipal and departmental administrations, local and national entrepreneurs, financial institutions.

It is important to notice that Colombia is a diversified country and there is no politics that can apply equally in the country. Every solution has to be adapted in each region and city. And each region produces and implements its own regional innovation and development policies. This is why we have chosen to focus our research on the region of Antioquia.

The following section presents the context around the selected Colombian incubator.

### *Antioquia region introduction*

This section discusses the economic development of the Antioquia region, which may have an impact on the business incubator.

Antioquia is the second biggest department of Colombia and one important for the economic development of the country. Its population represents 13.3% of Colombia's population with over 6 million people. The economy of this department is based on natural resources, manufacturing industry and a growing service sector. Its capital Medellin forms with Bogota and Cali "The Golden Triangle", where we can find a high concentration of industrial activity, tertiary education, R&D investments, population and income (OECD 2012).

In the Antioquia department almost half of the population is below the poverty line and it's concentrated in the rural, sparsely populated areas. The unemployment rate is high and half of the population works in the informal labor market.

After the armed conflict with the FARC's, Antioquia achieved a constructive period through the economic and social development in order to move up in the value chain. Many efforts made particularly in education where they are performing better than other places in Colombia.

The tertiary education in Antioquia is well diversified. Missions and responsibilities of Universities and non-University institutions are different and have improved the supply of human capital in terms of participation, quality and relevance. This is due to the "Education Revolution" policies placed by the Government as well as the *departmental* innovative program call "Access with Equity" (Cobertura con Equidad), a public-private partnership. These two programs also help to give access to the tertiary education institution to more first generation students from low income families, besides the access to tertiary education is still far from equal in the department.

The economy of Antioquia is a mainstay of the country's economic development and prosperity, as it is a leading region in science, technology and innovation. The department has developed partnerships between public sector, companies and Universities, which as show a gradual increase of R&D development capabilities. And it's also a pioneer in setting up new agencies and organizations in the fields of sciences, technology and industry directorate;

“such as the Science, Technology and Industry Directorate that was established to stimulate co-operation and to develop a regional Science, Technology and Industry Plan; the Regional Commission of Competitiveness; and the Council for Science, Technology and Industry, CODECIT, that will co-ordinate a fund originated from the 10% of the income generated by the General Royalty System” (OECD, 2012 ,p.15).

In the department of Antioquia, many university-business collaboration and inter-institutional collaboration have been set to support the development at a local and regional level in the department. To quote on example, the CUEE, University–Firm–State Committee, was created under the impulse of the University of Antioquia. The committee gathers 12 public and private tertiary education institutions, 21 companies, 7 regional research and development centers, the governments of Antioquia and Medellin, and the national associations of entrepreneurs and micro and small and medium-sized enterprises (OECD, 2012).

One challenge of those partnerships is the coordination between the department of Antioquia, the tertiary education institution and the city of Medellin in order to transform it into a center of high technology, creative industries and tourism (OECD, 2012). In order to face it the University of Antioquia has set up five Centers of Excellence for Research and Innovation (CIIE) in collaboration with industry, social and governmental institutions and other tertiary education institutions. Their function is to focus and develop areas in health, energy, biotechnology and ICT. But, so far, they are still facing a lack of collaboration between universities and technological institution.

The entrepreneurial tradition in the department is strong and particularly in the city of Medellin helping by the SENA which stimulates the creation of SMEs by provided starting capital and tutorship but so far results remains modest and have a high failure rate in the first years (OECD, 2012). We find many entrepreneurial and entrepreneurship development initiatives in the department, they promote practical work by students, link research to the productive sector and foster the transfer of knowledge and its dissemination amongst the community.

Medellin, the department capital, is a reliable example of rapid transformation and social and economic change. The city has moved from a declining traditional industry to a dynamic value-added economy in the last three decades. This development was able due to the joint project between the public and private sector of the city and the region and through the participation of all actors of the regional innovation system. The objective of all actors of the

city is to make Medellin a competitive city based on innovation. And it's recognized nationally and internationally for its urban, social and economic foundations in terms of participatory public policies and social inclusion.

After having discussed the context of the business incubator selected in Colombia, we are going to analyze it.

### *Antioquia Incubator – CREAME*

This analysis takes up the history of the incubator in its beginnings and its development until today and then develops in details the different services that it offers. The key point will be resume in an analysis grid.

The Technological Base Incubator of Antioquia (IEBTA - Incubadora de Empresas de Base Tecnológica de Antioquia) was founded in 1996 with the participation of 29 academics, institutions and companies (Charry & perez 2013). We can quote the National University of Colombia, The University of Antioquia, the EAFIT University, the Medellin City Hall, the Antioquia governor's office officials as well as many companies and trade union associations (Bulla & Gartner 2004).

This Incubator was set up in order to try to answer to two questions of the Society back then:

- Where are the companies that Colombia and the regions need?
- And where are the jobs that Colombia and the regions need?

The main objective of this Incubator and business accelerator is to promote and foster innovation based on a process management. They play the role of first parent of venture they receive and accompany.

They promote the ability of working together in the same direction between the state, the academy and businesses. They believe that the economic development will be possible by building a network of all players involved: Universities, public sector, businesses, multinational, the equalization funds and trade union. Their crucial focus was and still is the social wealth of the city, the region and the country.

That kind of Incubator has specific needs, indeed, technology-based firm are mainly very small structure and hire few people, but deliver high added value goods and services. This is the reason why they need to collaborate with Universities, institutes or research centers. These institutions allow them access to high technology at a discount price in order to commercialize new product based on the technology. This is the prime principle of University-business collaboration.

Given that the IEBTA was the first technology-based Incubator of Colombia. With the consequence that many institutions relied on it for the operation of enterprises and territorial development programs.

“The incubation model defines the criteria and parameters on which the value chain of business creation is based and in general terms determine how the Incubator performs its function.” (Botero et al., 2007, p.41)

During its first years the IEBTA were composed in 3 processes: search, pre-incubation and incubation. Botero et al. (2007) developed these different processes as

Search: No calls were made, the initiatives were sought, and this section aims to select the best idea that initiate the pre-incubation program; it guarantee the arrival of good projects to the Incubator. This process lasted about 12 months.

Pre-incubation: aimed to prepare the selected business initiatives, to start the incubation process, through the accompaniment in the preparation of the Business Plan, the structuring of the work team and the search for Resources for the start-up of the company. This process lasted 6 to 12 months.

Incubation: As the main stage of the process, it aims to structure, develop and consolidate sustainable EBT, guaranteeing the maximization of its business value. This process lasted 12 to 24 months.

The typical profile of the entrepreneur was 20 to 30 years, with minimal or average work experience and with technical or vocational training.

Moreover the Incubator offered economic support of 50 SMMLV; a support network of research, evaluations and referrals; and the establishment of international cooperation link (Charry & Perez 2013).

Between 1999 and 2005 they also work on the awareness about the communication as a key process for the entrepreneurship and the setup of alliances with big companies as Oracle, Asemarcas IBM, Corfinsura, SBI, SENA, the German Government (Charry & Perez 2013).

Since 2002, they have also promoted and help to build knowledge and entrepreneurial culture in other countries of Latin America.

In 2003 they have developed their first spin-off, Capital Colombia, an investment bank, through which they obtain capital. It gives impetus to seed capital mechanisms and venture capital funds. One of the objectives of the Incubator is not only to create new companies, but also to generate companies within the institution itself. They spin-off have been sale since in 2013.

This Incubator is also a key player in the development and promotion of entrepreneurship in Colombia for the creation of a new company, reducing para-fiscal taxes to new companies, dismantling VAT for services exports and regulating risk capital.

Since 2004 they are strategic partners of the fulfillment of a public policy at the national and municipal departmental level. They promote the regional entrepreneurship policy and begin to operate the Business Plan Contest, Cultura E (Charry et al. 2014).

Over ten years the Technological-Base Incubator of Antioquia contributes to the creation and strengthening of 937 businesses and provided to the region of Antioquia a leading entrepreneurship corporation, self-sustaining and recognized for the fulfillment of its function and achievements (Charry & Perez 2013). Furthermore, it influences the development of new technology-based Incubator in 25 cities of Colombia as Pereira, Barranquilla, Manizales and Cartagena.

In 2006 the organization became Créame. The self-sustaining organization owes its transformation through the accumulated experience. It is located in the Technology and Business Services Network, Tecnoparque nodo Medellin, of the SENA where they afford two complete floors, about 800 meters, for its services and host the new businesses (Charry & Perez 2013). The building is dedicated to private individuals, and they have access to offices, counseling points, training rooms, meeting rooms and a counseling space. Créame operate in 80 municipalities and 19 departments of Colombia.

Créame is an Integral Center of Business Services, one of the first in Colombia, its function is to create and accelerate businesses to get on the national or international market to become more competitive. They offer entrepreneurship programs and an incorporation model for business in order to integrate the financial and global market. As they tend to offer the best tools to stimulate the Colombian economy.

In 2010, Créame inaugurates the first angel investors' network in Antioquia, a project that marks a milestone in the country's early business investment processes. And in **2014**, they create a new spinoff, Cuántica, which is an organization specialized in the creation of corporative enterprise services for large and medium companies.

On their website are defined the mission and the vision of the organization:

- The mission is that of a Business Incubator and accelerator, sets connections and generates a favorable and competitive environment for the consolidation and business enhancement.
- The vision of Créame is to be the best option in servicing that maximizes the entrepreneurial values of their clients as quickly as possible.

This organization is famous for its constant innovation of their business model and their services offered. They adapt the organization to the environment and to the entrepreneurial ecosystem encountered.

In 2013, G. Perdomo Charry, J. E., Arias Pérez observe three strategic objectives that the Integral Center of Business Services tend to reach:

- The creation of businesses and business enhancement through business and rural development centers;
- The improvement of financing conditions of new and existing ventures through Capitalia Colombia;
- And finally they operate jointly entrepreneurship programs with institutions, organizations and territorial entities of the region and the country.

How to access Créame? Entrepreneurs come to the “nodos” through the call of business initiatives where they select the best. Their idea or company then receives a comprehensive

accompagnement that lasts about a year and is called: management planning according to the state in which they are.

On the website of Créame, we find 8 subcategorize:

- Creation and enhancement
- Accelerator
- Environmental
- Agribusiness
- Enhancement and suppliers
- Corporate social responsibility
- Resource management
- Transfer of knowledge

We will focus on the first sub-categorization: creation and enhancement and the accelerator, which is considered appropriate for the proposed University Incubator model.

Créame creation is described as a highly efficient support model in which they turn business ideas into a reality and create a profitable, sustainable, viable company with a potential market, achieving greater chances of success in the medium and long term. To do so Créame provides a support focus on operational, commercial and financial areas.

This is specially designed for entrepreneur with projects that have proposals for innovation, value added or potential in the market. The objective for Créame is to produce added value for the entrepreneurs through nimbly and low investment of the product or service market validation; the identification of penitential client ; a marketing strategy and the articulation of the contact network in order to create alliance and investment;

In order to put this in place they use the following methodology:

- Business model
- Pitch training
- Structure of investment plan
- Business accompagnement

With this section, they have already support 205 business initiatives (83 traditional businesses and 122 mid-sized businesses) and create about 559 jobs (169 and 390 each).

Créame enhancement has for purpose to follow start-ups and first operations of business by setting up the key strategic points on which they have to focus to achieve the optimization of their business capabilities.

This service is provided to formal companies that are aligned to the competitive bets of the regions, and having market potential and added value. With those conditions, Créame offers to the businesses a specialized support by area whether legal, corporative, operational, and organizational and business models. They also help the businesses to measure their impact (Income generation, financial management, business efficiency and employment).

In order to put this in place they use the following methodology:

- Map the selected companies in the program
- Formulate the improvement plans for each company to intervene
- Implement improvement plans formulated for each company
- Measure the impact generated by the intervention

In this section, they have already support 1217 business initiatives (1073 traditional businesses and 144 mid-sized businesses) and create about 1794 jobs (1110 and 684 each).

Moreover Créame estimate that these two sections, creation and enhancement, have built awareness to about 18.832 people and ability to 4.759 people.

Créame acceleration is a practical tool framed in the short, medium and long term so that companies between 1 and 5 years old can have a commercial strategy that allows them to consolidate, grow and actively participate in the market.

The Business Acceleration program gives early stage companies the opportunity to quickly scale their sales, define their funding path, and increase their contact networks by ensuring their growth in the market.

This section is composed on three pillars: financing, market and networking.

The program accelerates businesses and helps them to find out a diagnosis to identify barriers to growth, access to new markets, smart capital and financing. They also bring advisory and specialized support in legal, administrative, financial and marketing matters.

The program is divided in 4 stages:

#### 1 – Search and selection

- Selection of companies to accompany through business analysis and scalability potential backed by stakeholders
- Verification of requirements and documents, consultant's visit, concept of technical expert, interview with expert panel, results and selection of companies.

#### 2 – Strategic direction

- Development of short, medium and long-term growth strategies. Understanding short term, such as the year in which they receive the accompaniment, medium term, one year after the accompaniment, and long term, two years or more after the accompaniment
- Development of scalable value proposition definition of customer segment (channels, value chains), business architecture, customer relationship strategy, network of strategic allies

#### 3 – Financial structure

- Generation of financial tools with a view to understanding the prospective of the business and the development of processes understanding of its lines of business, cost structure.
- Financial structuring, structuring of the balance sheet and generation of strategy, economic analysis, definition of the financing route

#### 4 – Scaling

- Custom accompanying plans that offer possible combinations of different components to achieve business growth.
- Components: commercial management, market construction, innovation management and networking events.

The Incubator also organizes different events every year to develop the networks of the companies it welcomes but also that of the region. We can cite two of them:

- Capital Semilla Medellín is a contest that selects innovative ideas with differentiation and added value. It is carried out by the municipality of Medellín with the collaboration of Créame. It seeks to generate opportunities for the city to promote entrepreneurship as a social transformer. The ideas selected at the end of the contest will be followed during 5 months in the administrative, legal, commercial, financial, design and operational areas in order to strengthen them and make them a business reality. This contest will also create and foster incentives for new entrepreneurial ideas.
- Net-Me Networking Business Days. This event has for objective to create an effective relationship space where interaction between several players from the regional entrepreneurs, businessmen and investors can meet. The purpose is to establish new strategic alliances that help strengthen business ideas and accelerate business growth. The Entrepreneurial Pitch is one of the spaces offered by this event, where entrepreneurs characterized by their innovative business models present to the attendees and experts their business and market ideas, through a 5-minute Pitch.

More generally the entrepreneur profile we found in Créame is 25 to 30 years old, with high work experience and having had an entrepreneurial training.

To simplify the analysis of the incubator, we recap the relevant informations for our analysis in the following table. This will help us to better observe the pertinent data extracted from the analysis of the incubator and facilitate the comparison with the Chinese incubator.

First, we check that the analyzed incubator corresponds to the characteristics of a University Business Incubator, then we extract the key points founded in the review of literature: the objective of the incubator, the services it provides and its incubation model.

| Characteristics of an University Business Incubator |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| a. Located near or on a university campus           | <div>No information found concerning the location of the incubator at its origin, but we suppose that it was in the campus of the university of Antioquia, in another university campus or already in the Tecnoparque.</div> <div>Nowaday, it is located in the building on the Tecnoparque of Medellin, a technology and business services network of the SENA, not far from the campus of the University of Antioquia and the offices of SENA in Medellin</div> |
| b. Research and Technology-based incubator          | <div>Cream is the first technology-based incubator of the country.</div> <div>It is now an integral center of business services</div>                                                                                                                                                                                                                                                                                                                             |

We can notice that this incubator follows the characteristic of a university business incubator, it is situated close to an University business incubator and is focus on Research and Technology.

| <i>Units of analysis</i>                                                                                         | IEBTA                                                                                                         | CREAME creacion                                                                                                     | CREAME Fortalecimiento                                                                                                                                                           | CREAME aceleracion                                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Objectives of a Business Incubator in a developing country</b>                                             |                                                                                                               |                                                                                                                     |                                                                                                                                                                                  |                                                                                                                                                                                  |
| a. Role of parent company: manage development of new business and coordinate businesses with support of services | Promote and foster innovation based on a process management.                                                  | Provide a support focus on operational, commercial and financial areas.                                             | Follow start-up and firsts operations of business by setting up the key strategic points on which they have to focus to achieve the optimization of their business capabilities. | Gives early stage companies the opportunity to quickly scale their sales, define their funding path, and increase their contact networks by ensuring their growth in the market. |
| b. Selection of client and afford acceleration process                                                           | In the Pre-incubation phase.                                                                                  | design for entrepreneur with projects that have proposals for innovation, value added or potential in the market    | provided to formal companies that are aligned to the competitive bets of the regions, and having market potential and added value                                                | companies between 1 and 5 years                                                                                                                                                  |
| c. Creation of profitable company                                                                                | Creation and strengthening of 937 businesses in 10 years (96-06)                                              | Have support 205 business initiatives and create about 559 jobs.                                                    | have support 1217 business initiatives and create about 1794 jobs                                                                                                                | Creation of 17 companies and about 273 jobs.                                                                                                                                     |
| d. Promotion of regional economic development by generating new jobs                                             | key player in the development and promotion of entrepreneurship in Colombia for the creation of a new company | Set connection and generate a favorable and competitive environment for the consolidation and business enhancement. |                                                                                                                                                                                  |                                                                                                                                                                                  |

|                                                                                                             |                                                                                                                                                                                                                                                          |                                                                                                                                             |                                                                                                             |                                                                                                                        |
|-------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| e. Creation of entrepreneurship awareness and promoting local economic development in a transition economy. | 2002 CREAME helped to build knowledge and entrepreneurial culture in other countries of Latin America.                                                                                                                                                   | CREAME estimate that those two sections, creation and enhancement, have built awareness to about 19.890 people and ability to 4.835 people. |                                                                                                             |                                                                                                                        |
| f. Policy impact                                                                                            | 2004 : impact on the public policy at the national and municipal departmental level.<br>Promoting the regional entrepreneurship policy and operate the Business Plan Contest, Cultura E                                                                  |                                                                                                                                             |                                                                                                             |                                                                                                                        |
| g. Deliver government funds and other support                                                               | No specific information but we suppose that the government by the intermediary of the SENA offered fund to the incubator at is beginning and other support. The location as the Tecnoparque is a concrete example this place is owned by the government. |                                                                                                                                             |                                                                                                             |                                                                                                                        |
| 2. Services offered by Business Incubator in a developing country                                           |                                                                                                                                                                                                                                                          |                                                                                                                                             |                                                                                                             |                                                                                                                        |
| a. Physical environment                                                                                     |                                                                                                                                                                                                                                                          | They afford 800 square meters for its services and host the new businesses.                                                                 |                                                                                                             |                                                                                                                        |
| i. Affordable shared office                                                                                 | Preparation of the Business Plan<br><br>Structuring work team<br><br>Search for resources                                                                                                                                                                | market validation;<br><br>identification of penitential client<br><br>marketing strategy;<br><br>contact network                            | Specialized support by area whether legal, corporate, operational, and organizational or model of business. | identify barriers to growth,<br><br>access to new markets,<br><br>access to smart capital,<br><br>access to financing, |
| ii. Equipment                                                                                               |                                                                                                                                                                                                                                                          |                                                                                                                                             |                                                                                                             |                                                                                                                        |
| b. Expert monitoring service                                                                                |                                                                                                                                                                                                                                                          |                                                                                                                                             |                                                                                                             |                                                                                                                        |
| i. management training                                                                                      |                                                                                                                                                                                                                                                          |                                                                                                                                             |                                                                                                             |                                                                                                                        |
| ii. marketing support                                                                                       |                                                                                                                                                                                                                                                          |                                                                                                                                             |                                                                                                             |                                                                                                                        |
| iii. accountant and legal counsel                                                                           |                                                                                                                                                                                                                                                          |                                                                                                                                             |                                                                                                             |                                                                                                                        |

|                                      |  |                                                                           |                                                                                  |                             |                                                                                    |
|--------------------------------------|--|---------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------|------------------------------------------------------------------------------------|
|                                      |  |                                                                           |                                                                                  |                             | advisory and specialized support in legal, administrative, financial and marketing |
| <i>c. Assist for financing</i>       |  | 50 SMMLV (Current Legal Minimum Monthly Wage)                             | 2003 Capitalia Colombia improve financing condition of new and existing ventures |                             |                                                                                    |
| <i>i. own potential capital</i>      |  | No information found but probably already in contact with some investors. | 2010 inauguration of the first angel investor's network in Antioquia             |                             |                                                                                    |
| <i>ii. potential funding sources</i> |  | Alliances with big companies                                              | Capital Semilla Medellín                                                         |                             |                                                                                    |
| <i>d. Network</i>                    |  |                                                                           | Net-Me Networking Business Days.                                                 |                             |                                                                                    |
| <b>3. The incubator model</b>        |  |                                                                           |                                                                                  |                             |                                                                                    |
| <i>a. Duration</i>                   |  | Max 48 months                                                             | 12 months                                                                        | 12 months                   | Max 60 weeks                                                                       |
| <i>b. The model</i>                  |  | Search                                                                    | Business model                                                                   | Map in the program          | Search and selection                                                               |
|                                      |  | Pre-incubation                                                            | Pitch training                                                                   | Improvement plans           | Strategic direction                                                                |
|                                      |  | Incubation                                                                | Structure of investment plan                                                     | Implement improvement plans | Financial structure                                                                |
|                                      |  |                                                                           | Business accompaniment                                                           | Measure the impact          | Scaling                                                                            |

| Key dimension of university business incubators | Distance with University + Research and Technology-based                                                                                                                   | Objectives of a Business Incubator in a developing country                                                                                                                                                                                                                                               | Services offered by Business Incubator in a developing country                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Business Model                                                                                                                                                                                                                                                              |
|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Bay West</b>                                 | <ul style="list-style-type: none"> <li>• 8 kilometers from Zhejiang University (ZJU)</li> <li>• Focus on University students, and internet companies</li> </ul>            | <ul style="list-style-type: none"> <li>• Parent company</li> <li>• Strict selection of clients</li> <li>• Creation of profitable economy</li> <li>• Promotion of regional economic development:</li> <li>• Creation of entrepreneurship awareness</li> <li>• Dispatching government funds</li> </ul>     | <ul style="list-style-type: none"> <li>• Shared office and other infrastructures: meeting rooms, gym, ...</li> <li>• Equipment: Wi-Fi, air-conditioning, ...</li> <li>• Expert monitoring service: <ul style="list-style-type: none"> <li>◦ Management training</li> <li>◦ Marketing strategy</li> <li>◦ Product development</li> </ul> </li> <li>◦ Sales support</li> <li>◦ Fund raising</li> <li>◦ Legal counsel</li> <li>• Financing assistance: <ul style="list-style-type: none"> <li>◦ Contacts with business angels</li> <li>◦ Government support (infrastructure, award, ...)</li> </ul> </li> <li>• Network <ul style="list-style-type: none"> <li>◦ Mobile application: +3000 contacts</li> <li>◦ Influential founding team</li> <li>◦ Cooperation with technological media</li> <li>◦ Contact with universities</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• Duration: average one year</li> <li>• Model: <ul style="list-style-type: none"> <li>◦ Selection</li> <li>◦ Investment plan</li> <li>◦ Business accompaniment</li> </ul> </li> </ul>                                                |
|                                                 | <ul style="list-style-type: none"> <li>• In the building of the university Integral Center of Business Services</li> <li>• Integral Center of Business Services</li> </ul> | <ul style="list-style-type: none"> <li>• Parent company</li> <li>• Less strict selection of clients</li> <li>• Creation of profitable economy</li> <li>• Promotion of regional economic development:</li> <li>• Creation of entrepreneurship awareness: 19890 people</li> <li>• Impact policy</li> </ul> | <ul style="list-style-type: none"> <li>• Infrastructure of 800 square meters</li> <li>• Expert monitoring service: <ul style="list-style-type: none"> <li>◦ Market validation</li> <li>◦ Identification of potential client</li> <li>◦ Marketing strategy</li> <li>◦ Contact network</li> </ul> </li> <li>• Financing assistance: <ul style="list-style-type: none"> <li>◦ 50x1 Current Legal Minimum Monthly Wage</li> <li>◦ Angel's investors network</li> </ul> </li> <li>• Network: <ul style="list-style-type: none"> <li>◦ Alliance with big companies</li> <li>◦ Net-Me Networking Business Days</li> </ul> </li> </ul>                                                                                                                                                                                                                    | <ul style="list-style-type: none"> <li>• Duration: one year to 3 years</li> <li>• Model: <ul style="list-style-type: none"> <li>◦ Business model</li> <li>◦ Pitch training</li> <li>◦ Structure of investment plan</li> <li>◦ Business accompaniment</li> </ul> </li> </ul> |
| <b>Créame</b>                                   |                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                             |

## Chapter 4: Comparison of the analysis of both Incubators

After analyzing both University Incubators in these developing countries, either in Hangzhou, China, or in Medellin, Colombia, we will now compare them to analyze their similarities and differences in order to draw up assumptions.

We will first compare the different innovation context of the two countries, followed up by the characteristics of these Incubators. Then we will have a look at their objectives in developing countries and analyze the services they offer. Finally we will discuss the findings of this research.

### Comparison

#### *Innovation context*

Both countries are developing countries, but they have been developing their entrepreneurial context in different ways. In the first instance, the comparison of regions and countries as well as their history will allow us to better understand the differences in global characteristics and the influence of the environment in which these Incubators are. In a second step, we will compare the innovation context of both countries based on the key points highlighted in the literature review and applied to the countries.

#### *Comparison based on the country's characteristics*

The history of Incubator's implementation of the two countries began at about the same time. The Torch program in China was launched in 1988, and in Colombia the first steps for Incubator implementation have taken place in 1990. Furthermore, both countries have put in place a system or program in order to promote the development of Incubators in the country.

In China it is the Torch program and in Colombia it is the SNCIE. Moreover those programs are put in place by Governmental entities: the ministry of sciences and technology for China and the SENA for Colombia. The emergence of programs and policies related to Business Incubators in both countries corresponds to the global trend in the 1990s with the emergence of the third mission of the University. In fact, it must now meet the new environmental needs, with the beginnings of collaboration University business etc.

Following our analysis we can see similarities between the two countries. In both cases, science and technology parks are under the control of Government entities. In China, they are being run by the Ministry of Science and Technology and the Ministry of Education. In Colombia, it is the SENA and the Ministry of Labor that manage them. This similarity shows the importance that each Government has in relation to the development of Incubators and technology parks in their countries. We can therefore assume that both countries have understood the importance of the role of Government in the regulation and promotion of these institutions. As well as the role of Technology Park and Business Incubator as infrastructure and local initiations that shapes the innovation capacity of a region.

However, the numbers are quite different in both countries. By 2015, there were about 146 high-tech parks in China, while the SENA and the Colombian Ministry of Labor runs only 15. This difference in numbers between the two countries is probably due to differences in the evolution of the two countries in terms of technological parks and can be explained by the economic and cultural history of the country. The law of promotion of the entrepreneurial culture in Colombia has established a national network for entrepreneurship. It means that all the institutions in Colombia are linked and dependent to one another. More specifically in the case of Incubators, they are directed and directly supported by Universities, SENA, scientific parks and MTIC. There is therefore logic of supervision and direct support. Whereas in China, we will rather find a logic of competition between the different Incubators with a selection that will be made more "naturally". The state intervenes less directly in the Incubators and in the scientific parks.

During the analyses of technology parks we can observe that both country are focus on slightly different fields in that point. As in China the priority for scientific areas of the Torch program is:

- Electronics and Microelectronics (Micro Electro Mecanical Systems),
- The development of new materials,
- Energy control and new sources of energy,
- Biotechnology,
- Environmental protection
- and the development of new drugs.

In Colombia Tecnoparques focus on:

- Electronics and telecommunications,
- Virtual technologies,
- Engineering and design
- Biotechnology and nanotechnology,

These differences can be explained by development priorities depending on the market and the evolution of the country in different fields. For example, in the economic overview, we have seen that two types of infrastructure which particularly influence the competitiveness of other sectors. Information & communication technologies (ICTs) and transport services (roads, railways and ports). This explains why the development of electronics and telecommunications as well as virtual technologies are particularly important in Colombia.

Moreover both cities are deemed for their entrepreneurial advancement: Hangzhou is considered as the Silicon Valley of China with its highest number of Incubators in China and Medellin is the most entrepreneurial city of Colombia. But the success in this field of those two cities comes from different event. Hangzhou success is due to the development of

Alibaba Company and the development of UBC in Medellin was lead in the region by the University of Antioquia and the creation of a committee.

Both countries see Incubators as an important part of their economic development. This shows that they both understood the importance of state-enterprise-University collaboration in their developing country context. Universities are economic levers for the country and their collaboration with industry contribute to the prosperity of companies and the introduction of new jobs, new products and patents in their markets.

*Comparison based on the Key Dimensions of the innovation context defined in the literature review.*

China and Colombia are both developing countries, their innovation contexts have similarities but also differ from one another, based on the theoretical framework the study analyze them.

In terms of public policies, China and Colombia are both trying to implement new policies to regulate and improve their innovation context. The Chinese government also provides funds and infrastructure whereas the Colombian one focuses on training ship and network improvement.

Concerning Research & Development supports, China deploy far more extensive resources than Colombia, either in funds or in infrastructure. In the same vein, China has the largest amount of patent application in the world whereas Colombia has a very low amount of patent application but has signed international IP treaties such as China.

The educational system of both countries has to be improved due to several inequalities even though they are making efforts. China should focus on the access of education in rural area, whereas Colombia should focus on the financing of its educational system.

The Chinese financial system is dominated by large state-owned banks that don't take the risk to invest in SMEs and innovation but rather lend to big state-owned companies that may turn in doubtful loans due to corruption. The Colombian SMEs have the same issues and have difficulties to borrow capital due to high interest rates and unaffordable guarantees. Both countries SMEs rely on Venture Capital.

Regarding entrepreneurship, both countries entrepreneurs start a business out of opportunities rather than out of necessity, which is a good thing. In China the entrepreneurship environment has slowly improve but the access to physical infrastructure has been facilitated. In Colombia there are low barriers to entrepreneurship, which allow the creation of a lot of SMEs employing the majority of the workforce of the country. But most of them are weak and don't support economic fluctuation.

These key dimensions of the innovation context in those countries prove that they are still developing countries, they need to invest and develop more their innovation system.

After having compare the two innovation context in which the incubator selected have been evolving, we are going to compare the units of analysis of those incubators, divided in three part, the characteristics, the objectives and the services proposed by the University business incubators.

### *Characteristics of the University Business Incubators*

The Characteristics of University business incubators is the fact that they are close to Universities and research & technology-based, developed here by their similarities and differences.

The first similarities that we can notice between the two Business Incubators selected, are the fact that both are located in technology parks, near or on a University campus. We have seen in the theory that those parks promote collaboration between companies and research institutions by bringing them together. Moreover, they often include Business Incubators that support young entrepreneurs as seen in our two examples.

One of the biggest differences between the two incubators is that Créame, the Colombian business incubator, has been transformed into a full service business center.

Créame is a Research and Technology-based incubator, whereas Bay West is only technology oriented and focus on internet-based industry and computer science.

The fact that those business incubators are Universities ones determines their objectives, but they can have divergences.

### *Objectives of a Business Incubator in a developing country*

The theoretical framework arising from the literature review has allowed us to highlight the relevant characteristics of a University business incubator. After applying this theoretical framework to the two incubators in a previous chapter, we will now compare the result of this analysis, in the case of their objectives.

Créame has more influence in Colombia than Bay West in China because there are less Incubators in Colombia than in China and because Créame was Colombia's first Incubator.

Both incubators have a role of parent companies. They manage development of new business and coordinate businesses with support of services in operational, commercial and financial areas. Bay west also provides a legal support if needed.

Concerning the selection of clients, Bay West selects them on their Business plan, their team composition and the market scale basis it will work on. Where Créame select projects that have proposals for innovation, value added or potential in the market, but not necessarily a strong business plan yet. Créame will help them to design it.

We can consider that the Chinese incubators are more competitive on their selection, due to the fact that there are many of them and the competition is tough.

Due to the fact that the two Incubators have not been created the same year, they do not have the same scale, so it is difficult to compare the number of profitable company that they have created. Bay West was founded two years ago, whereas Créame is more than 20 years. Bay West incubation process has incubated more than 20 start-ups in two years, with an average of 10 per year, and Créame creation has supported 205 business initiatives in more than 20 years, and that is also an average of 10 per year. So both Incubators support approximately the same number of start-ups per year. It is important to notice that Bay West is only at the beginning of its life and it may incubate more start-ups a year, due to the fact that it host 20 start-ups at the same time with an average stay of one year.

Créame has a real impact on the promotion of regional economic development, through the entrepreneurship it creates and the number of company it helps to develop. Its biggest support for the regional economic development is the creation of new jobs.

Comparatively, Bay West does not have much impact on the regional economic development due to the fact that it is a young organization and that the region is already well developed. Indeed it is already called “The Chinese Silicon Valley” thanks to the huge neighboring company Alibaba, that has created more than 30 millions of jobs in China since 2003, directly for the company but also indirectly by the need of subcontractors. Bay West benefits from the economic and entrepreneurial synergies of the region, while Créame has been creating those synergies since its inception.

Créame has created a real entrepreneurship awareness that helps the development of its Colombian transition economy, but also the economy of several other Latin American countries. The awareness is primarily done due to a good communication during the year's 1999 and 2005 and through alliance with big companies and governmental institutions. Nowadays, this awareness is also created by the Net-Me business day put in place by the incubator and it is increasing participation as well as the Capital Semilla Concurs organized by the secretary of the economic development in collaboration with Créame.

Bay West is also promoting entrepreneurship awareness, but on a different scale, as it is more local. First, it has developed an International start-up competition, with the start-ups it incubates and the ones from partnership created with the US. Secondly, it coordinates an Entrepreneurship tour to the Californian Silicon valley and Cambridge University, in order to enable the start-ups to analyze how entrepreneurship is successfully managed. And finally, Mrs. Jie Zhang, the founder of Bay West, and Huadan Angel Investment, is a judge of a national start-up reality show promoting entrepreneurship awareness, called “We are the Hero”.

In terms of policy impact, Bay West as an organization doesn't have much impact. But again, Mrs. Jie Zhang, the founder of Bay West, wrote a proposal about the promotion of Incubators to the Government in May 2017, so she has influence to impact some public policy in the promotion of Incubators and entrepreneurship.

In turn, Créame had an early impact on public policy as it has influence public policies since 2004. Créame influence regional entrepreneurship policy and begin to operate the Business Plan Contest, Cultura E.

As seen in the development of the innovative context of the two countries, China's Government is providing huge financial support to Incubators and other kind of organizations

assisting entrepreneurship. It classifies them, as local or national organization, which defines the amount of funds they will receive and which decision-making level is in charge of it. As a national Incubator, Bay West receives funds from the Government. In 2017, it received 3 million Yuan.

Concerning Colombia, we didn't find any information on the government funds towards innovation. But we know that they offer a financial support of 50 million pesos to business incubator in the technology-based sector as their first capital.

All Incubators have their own range of services available for the start-ups in order to meet their needs. Créame offer 3 group of services fragmented into Créame Creation, Créame Enhancement, Créame Acceleration: an incubation section, a reinforcement section and an acceleration one. To host all these sections and create an ideal environment for the development of start-ups, Créames' office is 800 square meters, with the provision of shared offices.

In China, Bay West office size is more than 4 times Créame's office. Indeed it is 3500 square meters and can host approximately 20 start-ups at the same time. It provides shared office, meeting rooms, gym machines, Wi-Fi, tearoom, pets' area, and air-conditioning...

The two incubators have different strengths and weaknesses; explain by the fact that they don't have the same maturity. Créame has more influence on its environment due to the fact that it is older; it has more experience, it impacts at a larger scale and that there is less competition.

The objectives of an incubator will influence its range of services available for the Start-ups.

### ***Service proposal***

After applying the theoretical framework of key dimensions of business incubators to the selected ones in a previous chapter, we will now compare the result of this analysis, in the case of their service proposal.

In terms of service, both Incubators offer approximately the same range of support. Bay West offers management training, marketing strategy advice, product development, sales support, fund raising for all the start-ups that needs it. As well as external consultant support

about legal counsel offered by Mrs. Jie Zhang friend and partner, Mr. Gordon Davidson, member of Fenwick & West, if necessary. Bay West is also oriented on entrepreneurship awareness with the organization of occidental exchange tours in the Silicon Valley and Cambridge.

Créame offer different types of services depending on the three different programs, creation, and enhancement or acceleration process. The creation program helps start-ups to validate the market, on which they will handle, the clients towards which they will sell, their marketing strategy and the important relational network. The enhancement program adapt its support to the needs of the start-ups and the area in which they do business, such as legal advice, corporative, operational, and organizational support. It can also be concerning their business model. Finally, the acceleration program assist start-ups to identify barriers to growth, access new markets, smart capital, or funding, and bring specialized support in legal, administrative, financial and marketing field.

The Colombian Incubator focus more on the evolution of each start-up development, and adapt its service to their progress, its procedure are more adaptable, while the Chinese incubator has more rules and new services, not decided at the beginning of the process, will have to be negotiated.

Concerning financial support, there are two types of sources, the Incubator own potential capital and the potential external funding sources. Regarding its own capital Bay West has a close relationship with Huadan Angel Investment. This investment company supports some of Bay West start-ups after a rude selection. In terms of external capital, the government supports are major. Lots of policies are favoring the development of Incubators. Indeed, for Bay West, the government has procured the land for the Internet village construction, this means that there is also no rent to pay to stay there. But it also provides financial award to national Incubators. Bay West received 3 million Yuan for 2017. And it holds entrepreneurship competitions and related activities to increase Incubators exposure and help.

With the example of Créame, we can see that in Colombia, the level of funding is less powerful than in China. At the beginning of Créame's life, during the IEBTA phase, it was providing 50 Current Legal Minimum Monthly Wage (SMMLV) equally allocated to the start-ups. We didn't find the accurate information, but we suppose that it should be approximately the same.

In 2003, Capitalia Colombia, an investment bank, improves financing condition of new and existing ventures and in 2010 there has been inauguration of the first angel investors network in Antioquia.

Network, also called “GuangXi”, is the most important aspect to do business in China. It is essential to have contacts in order to know who is able to have recommendations or become a support of any kind.

A major strength of Bay West is its network by means of Mrs Jie Zhang relational network, as well as the contacts of other co-founders. Most of the founding team are investors and entrepreneurs with international experience. They have a wide social network that can be useful to young entrepreneurs. Bay West has also close cooperation with Technological media. Strong partnership with Sina and Xinhua News, and exchange set up with Hainabai chuan and Ufrate. New cooperation are being negotiated with American innovation organizations and Incubator. Secondly, Bay West has a privileged contact with Zhejiang University but has also contact with Hangzhou Normal University. Finally, the Incubator has make available resources pools in order to make it easier for start-ups to find contacts information. It set up of an application including more than 3000 contacts.

The situation in Colombia is similar, Créame has several alliances with big companies. The major one is with Capital Semilla Medellín, a town hall program manage by the secretariat of the economic developments that tend to generate opportunities and entrepreneurship spirits in front of investors. Créame organize also the Net-Me Networking Business Days, which allows start-ups to be in contact with other companies and enlarge their relational network.

The services offered by an incubator can be decisive as it defines its quality. Most of the services offered by the two incubators are relatively similar. But they also adapt some of their services to the needs of their clients. In China, network is essential to launch a business, it is the reason why Bay West offers lots of services concerning this topic.

This Comparison of the key dimensions of the innovation context of the two countries and the key dimensions of the University business incubators has bring to the fore some distinct findings, detailed in the next section.

## Findings

Last but not least, here is a quick overview of the findings of this paper.

Both University Business Incubators studied in each country follow the theoretical characteristics of university business incubator in developing countries. They stick to the objectives identified in the methodology. These incubators are both parent companies applying meticulous selection of client, creating profitable start-ups that expands and hire more people, which has the effect of promoting the regional economy of these developing countries. They aim to create entrepreneurship awareness and deliver government funds. Bigger they become, bigger is their influence on innovation policies and better is the promotion of development in transition economy.

The detected differences of the University business incubator in the case study, are related to the political and economical environment in which they are evolving.

The two countries don't have the same vision. China is more short-term, while Colombia is more focused on the long term, resulting by the fact that start-ups in China remain in the incubator one year on average and in Colombia they stay from one year to three years. The Culture of both countries is also very different. In China, they work following the model 9-9-6. They begin the day at 9 a.m. , finish at 9 p.m. , with a short break for lunch, and this six days a week. In Colombia, the role of entrepreneurship in their culture is not the same, pressure is not that strong. Colombian start-ups can take the time to create their business plan while they are in the incubator, but the Chinese start-ups have it already when they enter the incubator. The government funds will also evolve following these economical curves. In China, most of Incubators are private, while in Colombia most of them are public, and university related.

Throughout this chapter we have highlight the similarities and difference of these two University business incubators in their own innovation context. Those have enable us to identify the main findings of this paper developed above, namely their concordance with the theoretical framework developed in the literature review and their divergent vision of the length of the process.

# Conclusion

The conclusion of this paper will highlight the major similarities existing between China and Colombia.

Despite their obvious differences, these two countries have similarities regarding innovation and Business Incubators.

For China, the need to achieve global innovation at a rapid state is mainly due to two drivers, offsetting a slowing growth rate and the need to foster innovation

The first one is offsetting the economic downturn and maintaining an acceptable growth rate in order to maintain social peace and harmony. If the GDP declines too much, there will be a risk of inflation and an increase in the price of commodities such as rice, pork, soya. In this case, the tacit social contract between the ruling Communist Party and the population will be broken, and the risk of social outbreaks and unrest will increase. The current policy of the Chinese government to stimulate the economy by credit is made to avoid this disaster scenario. This is the reason why social peace is maintained by a highest as possible GDP growth and in providing work form that could be achieved by innovation. The risk should not be underestimated because China is already experiencing unemployment, overproduction and surplus for the last few years.

The second factor is the need to acquire, at a fast phase, innovative high technology, and to foster innovation. The Chinese culture has promoted, during centuries, the “copy and paste” education. Due to this education, the economy is less innovation oriented. Moreover, during the twentieth century, and according to the different regimes that succeeded at the head of China, all the elites were eliminated. Political elites, but also artistic, intellectual, entrepreneurial, commercial, etc. This has resulted in a loss of transfer of know-how and knowledge from one generation to the next. This heritage has a strong impact on the Chinese mentality, and they need time to acquire an innovative-oriented way of thinking. Chinese companies are looking for foreign creativity and for innovation that is in advance compared to the Chinese capacities. The Chinese innovation process is to be accelerate thanks to foreign innovation technology transfer, process patents and external growth, acquiring western companies. They need acceleration of innovation process because they want to reach this

global innovation leading position in order to complement the world manufacture edge underworld leader. The global leadership paradigm is well illustrated by Incubators.

Looking for Global leadership as rapidly as possible, the Chinese Government selected the fastest way to complement their past-present global World Manufacturer position with the one of a global Innovator. This Innovation is acquired quite easily and fast, thanks to technology research and transfers from local incubators and technical centers in partnership with western business organizations. Thus we can conclude that business incubators support China's growth, development and leading global success.

For the Colombian Government, ensuring the development of the country economy has been a main objective in the last years. They achieve it through prudent and effective policies as well as openness of their market. With their well-managed economic development, Colombia was able to understand the importance of the new economic dynamics driven by innovation. The country has therefore put in place several programs and policies in order to promote entrepreneurship, in particular through the implementation of a national network in which are integrated Business Incubators.

The second factor motivating the Colombian Government to stimulate innovation through business incubators is to join the Latin American leading group of countries and benchmarking on the most motivating ones (such as Brazil and Chile). It attracts and stimulates its entrepreneurs, as well as new business in order to acquire new technology and faster research & development.

In spite of their differences, both countries have the same objectives, maintaining a stable economy and becoming leader in the field of innovation.

By this analysis, we notice that despite the factors that those two countries, China and Colombia, are very different, in size, economic performance, power, culture, and government, despite all these factors, the two countries seem to finally follow the same path, economic driven to possibly reach this paradigm of leadership. On each part, China is more looking for globalization and Colombia is more looking for Latin American leadership, through innovation.

Thus, Business Incubators are the privileged way to generate - integrate and develop innovation and leadership. Business Incubator role is deemed to faster innovation at all levels for all parties, to the interest of local and foreign industrials and as well as the Government.

This thesis is the result of extensive studies and research through scientific documentation on Internet (Cf. References), newspaper resources, the interview of International Business Professionals expert: Mrs. Miao; and advice from an international Business consultant innovation expert specialized of China: Cowinr, Mrs. Isabelle Dreuilhe. She precise that University incubators are emanation of Universities where experiences and best practices are shared, including with foreign companies. It is a win-win situation, the Chinese organizations integrate and learn the knowledge and best practice, and big foreign companies produce low cost. But this situation is not worth it for western SMEs, because they are being acquired by the external growth of Chinese companies. The main objective of contract with big western companies is patent appropriation in order to boost their technology processes owing to the research of western countries. While copying western technology, they learn very fast how to do it themselves.

From all the professional exchange realized and the analysis of these incubators, we can conclude that incubators are growth drivers of developing countries and enable this growth at an accelerated pace.

In the next two sections will explain the difficulties we face from a practical point of view in the development of our master's thesis and then future research, which might be interesting to analyze.

## Limitations from a practical point of view

This section explains the difficulties we have faced from a practical point of view in our master's thesis, first to find information about incubators and then to contact people to make interviews.

During our research, we have been facing difficulties from a practical point of view to find information on our subject. For China's case study, we have had contacts quickly with a person working in an incubator but it was not a university incubator but a private one; so we had to enter in contact with someone else in order to get more relevant information's. Moreover, it is particularly difficult to access Chinese websites from Europe because some of them are not accessible outside the Chinese territory. Lots of organizations don't provide information about their way of operating because they watch out for copy, even their business model. And when we get to find an accurate website, this one has no or very few English translation.

Concerning Colombia, unfortunately, we did not have the opportunity to make an interview with the incubator because we didn't have receive any response to the numerous emails we have sent to different email addresses, either a response for an interview, nor a response to the questions we asked. However, the websites in Colombia are very comprehensive and detailed and the information are clear and precise, which means that we essentially have lacked of answers more about the state and regional policies directly affecting the incubator and its location before it was in the Tecnoparque, than about the incubator itself. And we didn't have the opportunity to make a reconfirmation of our information with local people.

The two countries we have analyzed have lack of communications o access to information. Fortunately we knew tire a maximum of what we had and to deepen at best our research to be able to realize this master thesis.

All the ressources used to accomplish this analysis, such as interviews, official websits, reports, are comeing from the organizations themselves. It is therefore necessary to take a step back from these data, to remain objective towards informations received, and the opportunity to take stock out of our analysis is essential.

## Further research

After doing this master thesis, other research related to this topic seems interesting to analyze, here is an idea for conducting future research

The first further research that could be done for this case study would be to have the opportunity to go to those countries and make a face-to-face interview or witness the way of working with our own eye and gather concrete data. It could be helpful to understand subtleties, and confirm our findings.

The second further research could be the study of the impact of each culture on innovation and entrepreneurial mindset.

The third further research that could be set up would be to use the units of analysis in order to easily compare more than one incubator in each country and better understand the influence of university business incubator in each of them.

The fourth further research would be to compare our results to other developing countries, to see if they have the same characteristics and impact. It would be also interesting to observe the evolution of the incubators development in each country, in order to understand which way is the most sustainable and help the most a developing countries.

The last further research resulting from our paper would be a comparison of our results or the results of a larger study about developing countries to the same analysis in developed countries in order to analyze the divergences.

We hope that some of these proposals will inspire you and that this thesis has given you the interest in doing further research on our subject.

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