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**MASTER'S THESIS**

**HOW EMERGING COUNTRIES WILL BE THE NEXT  
INNOVATION LEADERS OF THE FUTURE**

**The Case of China**



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## **ABSTRACT**

The present research investigates the main determinants and their effects in fostering entrepreneurship and innovation in emerging countries, considering the case of China. Firstly, this work aims to provide the reader with insights over the present literature and theoretically findings over emerging countries and secondly over the factors influencing the innovation capabilities and the entrepreneurial outcome of China as government and innovation policies, the research and development context, intellectual property rights, the management of human resources, the entrepreneurial environment and social cultural values. A comprehensive framework has been developed through the collection of secondary data from relevant global research institutions to support the analysis throughout the work and to provide the reader with a tool useful to further research over this topic. In conclusion, the study reveals that China has the potentialities to overcome its current economic and financial challenges and to become an innovation leader of the future.

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## 1. Introduction

Over the last years the rapid economic growth of “emerging countries” have captured the attention of the entire world. These countries were able to rise from poverty in a very short time and imposed themselves as new powerful global economies. The far-east Asian region is an incredible example of this where most of the countries have boomed in the second half of the 20th century, driven by high levels of exports and a strong manufacturing sector. In 2014 China became the world’s largest economy in purchasing-power-parity terms on earth according to the International Monetary Fund (IMF) after years of remarkable growth at double-digit pace. But, even though the Chinese economy is still growing much faster than many other economies in the world, it is experiencing a slowdown. The current economic growth model characterized by high level of investments, huge incentives to promote industrial production and trade and massive involvement of labour force nowadays is not increasing the country’s productivity anymore. Along with the ageing of population, the declining returns on massive fixed investments and the increasing internal consumption demand pushed China to pursue a more sustainable growth model fostering entrepreneurship and innovation.

The aim of the thesis is to develop a framework conducive to entrepreneurship and innovation and to generate strategic implications on how to foster them in emerging countries by basing our analysis on the case of China.

Even though scholars’ works over emerging countries still remains little, some have focused on developing models to understand strategic entrepreneurship (Bruton G, Filatotchev I, Si S, Wright M. 2013) and on researching how to foster innovation in emerging countries. Knowledge spillovers facilitate innovation (Jaffe, Trajtenberg and Fogarty, 2000) through foreign direct investments and human mobility across a country’s boundaries along with the presence of a developed financial market that encourages entrepreneurship (Dalzell 1987, Lamoreaux 1994). A nation’s social cultural factors are determinant for innovation and entrepreneurial activities too and Confucianism principles will be presented to support our argumentation within the Chinese context.

Entrepreneurship is crucial for emerging countries as it drives economic growth (Bruton G, Filatotchev I, Si S and Wright M. 2013) and promotes innovation activities through private initiative (Tan J. 2001). But, knowing that emerging countries have specific peculiarities that differentiate them from mature and advanced economies, how can these countries promote entrepreneurship and innovation? What are the determinants? How emerging countries will be the next innovation leaders of the future?

### **1.1 Structure of the thesis**

The thesis is divided in four main parts or chapters, beginning with the literature analysis that explains from a theoretical point of view the most influential determinants for entrepreneurial and innovation development in emerging countries used throughout the research.

The second part addresses the analysis of the Chinese economic and financial context of the last 15 years and it is supported by secondary data mainly from The World Bank and China Statistical Yearbooks of China's National Bureau of Statistics (NBS).

The third part researches and analyses the five framework conditions conducive to innovation and entrepreneurship in China as the following:

1. Government and innovation policies,
2. The research and development context,
3. Intellectual Property rights,
4. Entrepreneurial environment and social cultural factors,
5. Human capital,

and lastly, a discussion part addressing the findings related to the main research question along with limitations and the final conclusion will be presented.

## 1.2 Motivation

The thesis' author motivation to write a work over China is driven by the passion and several experiences she had in Asia during her academic path and leisure time. During the 2012 summer studies over Entrepreneurial Strategy at Fudan University in Shanghai she had the opportunity to visit some foreign companies established in China, as Fiat Industrial. This company produces and sells to almost every east-Asian country several high-technological heavy-equipment machines (i.e. bulldozers, construction vehicles...) for different usages among which constructing and building highways or roads. At that time the company was performing well in almost all east-Asian markets but it was struggling to enter and to make profit in the Chinese one. The reason was that Fiat industrial's main competitor in China was still the workforce, less productive but at a much lower cost than the purchase of heavy-equipment machines.

Things are expecting to change in China, salaries are rising and along with the ageing of population the availability of low cost labour force will decrease. Innovation in key sectors is necessary and what will secure China to keep growing over the next decades.

## 2. Literature review

Over the past decades the world has seen the outstanding growth of new powerful economies coming out next to the post-World War II giant industrialized economies, namely United States, Germany and Japan. East Asian Tigers, China and more recently India, Indonesia and Malaysia<sup>1</sup> are only examples of new emerging markets that are changing the economic balance of the world. Yet, despite the importance of emerging markets in the world's economy and the uniqueness of their growth strategic model, scholars have done little research and have paid limited efforts in developing new theories that could explain phenomena in those countries (Bruton G, Filatotchev I, Si S, Wright M. 2013). Indeed the way Asian markets developed from the 1960 is unique and differs from what we have so far considered as a natural path of economic growth, outlined by Adam Smith in the *Wealth of Nations*. Adam Smith' book is taken as the fundamental of today's capitalism, countries have developed and grown thanks to something embedded in human nature: the maximization of wealth. Individuals' propensity to carry out businesses and to consequently exchange goods and to trade is the basis for the economic growth of a country. An "invisible hand" is what makes growth possible through division of labour, specialization, accumulation and innovation: the market is self-regulated and the state must not interfere with it. This statement has always revealed itself true considering the economic expansion of the Western societies, but it proves not to be suitable for Asian countries. State-intervention was fundamental and still is for far-east economies and it was mainly necessary at early stages of development when local companies were not able to compete globally so the state provided resources, ad-hoc regulations and incentives. This massive state-intervention lead to an incredible rate of growth in such a short time, especially considering of East Asian Tigers whom have had an average annual growth rate of 8% over three decades<sup>1</sup>.

Even though scholarship on emerging economies still remains limited and most of the scholars keep focusing on mature economies in Europe and North

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<sup>1</sup> "Tigers Adrift – East Asian Economies", The Economist, 5th March 1998



America (Bruton G, Filatotchev I, Si S, Wright M. 2013), others have focused on the peculiarities that characterize emerging countries. The literature review aims to reveal the main theoretical findings over entrepreneurship and innovation in emerging countries and specifically over the case of China, in respect to knowledge spillovers, cultural factors and access to capital.

## **2.1 What is an emerging market?**

In order to analyse entrepreneurship in emerging economies, we should start defining what is an “emerging economy”. The first person who coined the phrase “emerging markets” was The World Bank Economist Antoine van Agtmael in 1981, a man who grew up in the Netherlands and was uncomfortable with the bank’s view and contempt about the “third world”. Indeed during those times most of the world’s investments were captured by the United States and no attention was given to the “developing world” as it was defined before. The third world was seen as a poor area that could never developed and redeemed itself without the capital and the aids of the “rich world”.

The new tempting phrase “emerging markets” changed people’s view about the “third world” and banks, institutions and people started to not underestimate those areas anymore. Later on other scholars have enriched the definition of “emerging economies” stating that those countries are characterized by underdeveloped market-supporting institutions, weak laws, poor enforcement capacity of the formal legal institutions (Khanna and Palepu, 2000). Arnold and Quelch (1998) recognized that a major characteristic that differentiates poor countries from rich countries is the “rapid pace of economic development and government policies favouring economic liberalization through the adoption of a free market system”.

## 2.2 Entrepreneurship in emerging countries

Bruton G, Filatotchev I, Si S and Wright M. have published in 2013 a very interesting work based on the definition of “emerging markets” given by Hoskisson and colleagues (2000) that integrates all the previous ones: “an emerging economy is a low-income, rapid-growth country using economic liberalization as its primary engine of growth”. Their work is fundamental because it draws a model to understand strategic entrepreneurship in emerging countries, which involves four big categories: *emerging economy contexts, micro-foundations and macro processes, entrepreneurial activities and outcomes*. Entrepreneurship is crucial for emerging countries because it produces a “unique sets of activities which, in turn, produce unique sets of performance outcomes” necessary to grow and to develop (Bruton G, Filatotchev I, Si S and Wright M. 2013).

Contexts are the first elements to be described and they refer to the different contextual settings in which scholars can examine different types of entrepreneurship, according to four dimensions: temporal, institutional, social and spatial (Zahra and Wright, 2011). Temporal dimension takes into account a particular phase of a firms’ life cycle (Zahra, Filatotchev, and Wright, 2009), institutional contextual settings concern the effect of the local institutional and external environment in which the firm operates, the social dimension is what as commonly defined as “network”, social ties and relationships among people, entrepreneurs, universities that influence a firm’s life and lastly the spatial dimensions which defines the geographically concentration or dispersion of institutions and ventures on a territory.

Moreover drawing upon their work, there are two other broad dimensions in order to classify entrepreneurial strategic actions: a micro and a macro level. The micro level is referred to the individual side of entrepreneurship, it involves a cognition and a learning process (Abell, Felin and Foss, 2008), clearly seen in the case of China where networks, knowledge spillovers (Liu X, Wright M, Filatotchev I, Dai O, Jiangyong L. 2010) and the role of returnees (Li H, Zhang Y, Li Y, Li-an Z, Zhang W. 2012) led to higher levels of innovation performance and entrepreneurial activities. The macro level on the other hand is referred to

the complex process of gathering and structuring of resources, which emerging countries seem to suffer the most because of lack of institutional development, adequate infrastructures and characteristics of internal market.

The variety of potential entrepreneurial activities that come out from a specific context and in combination of the micro and macro aspects of a firm are distinguished among the rate, the magnitude of novelty and the type of entrepreneurial activities. Rate refers to the number of ventures in a country's economy, which in emerging countries is often the outcome of privatization of state-owned entities. Due to the fact that, as we stated earlier, institutional context in emerging countries is poor and not adequate yet in order to support the born of new ventures, "informal entrepreneurship" is common; according to the International Labour Organization, in the Asia 60% of the workforce works in a no-registered firm. Magnitude of novelty refers to an entrepreneurial firm that is able to bring to the market innovative products thanks to the revision of existing knowledge or the acquisition of new knowledge. Emerging countries are not usually classified as "innovative countries" because their economy at early stages relies on massive production but, in this case, novelty refers also to the production of low-cost products within the emerging economy.

Types of entrepreneurial activities refer to the multitude of sources from which new ventures can draw, for instance the role of returning entrepreneurs (Li H, Zhang Y, Li Y, Li-an Z, Zhang W. 2012) that are individuals that have returned to their home country after having spent years studying or working abroad in a developed country. Last dimension of G. D. Bruton et al. framework is performance outcome. The outcome of an entrepreneurial activity is the impact a firm has on the financial or social context of a country and it varies according to the focus of a scholars' work. A possible outcome of entrepreneurship is innovation, that has been defined by G. E. Hills as: "the process that takes place... that causes in the economic system through innovation brought about by individuals who generate or respond to economic opportunities that create value for both these individuals and society."

The model presented in G. D. Bruton et al. 2013' work matters because it gives us the basis to understand how entrepreneurial activities are developed in

emerging countries and it shows the various variables from social to institutional ones useful for further research on this topic.

### **2.3 Private entrepreneurship in China**

Entrepreneurship in China has always encountered many barriers, starting under the communists that in 1949 transformed the Chinese existing economy into a socialist economy where production and distribution were controlled by the central state. The private sector was eliminated and agriculture was centralized. However small entrepreneurship activities did not disappear entirely but turned themselves into a form of black market and underground businesses. Deng reforms in 1978 were implemented to foster the economic growth and they began with the decollectivisation of agriculture and the creation of township and village enterprises (TVEs) owned for the first time by local governments and not by the central state. According to Liao and Sohmen (2001) TVE's entrepreneurs are seen as the beginnings of modern Chinese entrepreneurship because they were in charge of the common managerial decisions that the state used to take. They were responsible for instance of pursuing profits through choosing materials, distribution channels and search for funding. The reform brought the number of private enterprises to grow of 93% in 1987 alone (Liao D. Sohmen P. 2001) but state-owned enterprises remained the most numerous ones.

Justin Tan' work on a comparative study of Chinese managers and private entrepreneurs, published in 2001, matters because it outlines the main entrepreneurial differences between the two figures and because it puts the basis for future research on innovation and risk-taking in transitional economy. The work shows how private entrepreneurs play a key role in transitional economies thanks to their willingness to take risks and their motivation to innovate, making more ambitious strategic actions. But, even after the reforms that fostered the growth of the private sector, managers of State Owned Enterprises (SOEs) remained the most numerous ones and have always been on a better position too. They enjoyed a special treatment through government

policies and ad-hoc regulations that private entrepreneurs didn't receive. SOEs had also priority on sourcing activities and easier access to capital that resulted in an unfair competition. Even though it seemed that SOEs were on an advantaged position among private owned enterprises (POEs), managers of SOEs perceived the regulatory system and the information about it difficult to obtain (Tan J. 2001). Their managerial decisions and innovation activities were frequently inhibited and discouraged by the government due to the related risky outcome. Thus innovation was mainly driven by private entrepreneurs, that were the most suitable to think out-of-the-box because of their history and hostile path they had to face in order to survive. On the other hand, other scholars have argued that being innovation the outcome, entrepreneurs who have returned to their home countries after having spent years studying or working in a developed country, possess a number of important characteristics that differentiate them from local non – returnee entrepreneurs. Local non – returnee entrepreneurs may indeed lack of important skills too as sources of knowledge, advanced technology and new ideas.

### **2.3.1 Knowledge spillovers**

Human mobility is the easily movement of skilled labour across national borders that contributes to the diffusion of knowledge. The diffusion and the exchange of knowledge are possible thanks to the intrinsic link between human mobility and knowledge spillovers that have implications for both entrepreneurial inter-firm activities and innovative activities (X. Liu et al. 2010). The majority of firms do not possess all the internal knowledge needed to innovate, so they have to access to it externally. Knowledge spillovers make the acquisition of external knowledge possible and facilitate innovation activities (Jaffe, Trajtenberg and Fogarty, 2000).

Previous studies over knowledge spillovers through human mobility have mainly focused on two different types of them: foreign direct investment (FDI) and trade, which have been considered as the main knowledge vehicles since then (Blalock and Simon, 2009; Blomstrom and Kokko, 1998; Buckley, Clegg, and Wang, 2002; Grossman and Helpman, 1991; Keller and Yeaple, 2003; Liu and

Wang 2003; Liu, Wang and Wei, 2009; Marin and Bell, 2006). But, more recently, scholars have started to examine a new type of knowledge spillover where entrepreneurs act as a channel for knowledge transfer because of a new global trend.

Since 1978 more than 2.6 million Chinese students have gone abroad to study in developed-countries universities and according to China's Ministry of Education reports, about half of the students have returned to their home country making a huge difference in China's economy and society. They are so-called "Sea Turtles" because they are returnees that have obtained a degree from a foreign institution and they have the capabilities to bring back expertises and advanced knowledge necessary for China to continue to grow. Apart from codified knowledge that is easy to access, returnees play also a crucial role in the diffusion of tacit knowledge (Michael Polanyi, 1966) through local networks. Tacit knowledge is the kind of knowledge that can be transferred more effectively through human mobility (Kaj, Pekka, and Hannu, 2003; Song et al. 2003).

Liu X, Wright M, Filatotchev I, Dai O, Jiangyong L. (2010) work is a very interesting analysis over the link between human mobility and knowledge spillovers in high- tech firms. Returnees, defined as "scientists and engineers returning to start up new ventures in China after several years of business experience and/or education in country-members of the Organization of Economic Cooperation and Development" (Saxenian, 2002a) possess different peculiarities that make them to outstand in the entrepreneurship field. First, during their experiences abroad, returnees possess better education and have gained a unique amount of human capital (knowledge or expertise) more advanced than the one they could get in their home countries. Second, they may have developed social capital and important networks in the host country that can last also when they come back and decide to start a new venture. The result of X. Liu et al. (2010) is that returnees firms are more innovative and perform better than non-returnee firms in term of innovation. But since returnees

are channels for knowledge transfer they can also affect the innovation performance of non-returnees firms, where local connections and networks are present.

Moreover, another relevant work published in 2012 by H. Li et al. based on previous studies such as the one of X. Liu et al. (2010) argues that while returnees have advantages compared to non-returnees entrepreneurs in terms of more sophisticated knowledge and experience abroad, they have also certain disadvantages in terms of lack of local connections and local knowledge. Returnees can mitigate these disadvantages if they develop a good understanding of the context where they are in since, according to G. D. Bruton et al. (2013) model, contextual factors can either help or hint entrepreneurial activities. China's context does not support entrepreneurship in the way it supports SOEs because the State still plays a crucial role in the allocation of resources. Thus, ventures that grant state controlling ownership can build local connections, can access easily to local knowledge and can better understand the institutional environment in which they are. Another aspect that mitigates returnees' disadvantages is the contingent effect of venture age. It is clear that new ventures or start-ups struggle more to develop local connections, suppliers, partners than mature ventures, because the more they grow the less they rely on the founder entrepreneur's connections. So a venture's performance depends also on its age, where older the venture is, the more knowledge it has gained overtime.

### **2.3.2 Cultural factors**

Another important factor outlined by G. D. Bruton et al. (2013) is the social context dimension affecting entrepreneurship in emerging countries. The different characteristics of networks, social ties and relationships among people in Western and Eastern societies have fostered organization management scholars to research over this topic. China's cultural and institutional environment favouring *guanxi* likely explains the dominance of returnees disadvantages over their advantages. The Chinese term *guanxi* refers to the

exchange of favours or connections that are beneficial for the parties involved and it can minimize natural obstacles and barriers in doing business in China. Returnee entrepreneurs that may lack of social relationships and local connections struggle not only because of the weak regulatory and institutional system that are factors that can be mitigated with state controlling ownership and older venture's age (H. Li et al. 2012), but also because of the Chinese social structure emphasized in Confucianism (Hofstede G, Harris Bond M. 1988). Confucianism refers back to the teaching of Confucius, a Chinese teacher who lived about 500 years BC, that it is not considered as a religion but as a set of pragmatic rules for daily life, summarized in four main principles:

1. The stability of society is based on unequal relationship between people,
2. the family is the prototype of all social organizations,
3. virtuous behaviour toward others consists of treating others as one would like to be treated oneself and,
4. virtue with regard to one's tasks in life consists of trying to acquire skills and education, working hard, not spending more than necessary, being patient, and persevering.

An interesting view over the first principle of Confucianism is given by Hui C, Lee C, Rousseau D. (2004) work that investigates the dynamics of employment relationship in contemporary China. Starting from the five fundamental basic Chinese relationships (*wu lun*) required for the stability of the society: ruler/subject, father/son, older brother/younger brother, husband/wife, older friend/younger friend Hui C, Lee C, Rousseau D. (2004) argue that either government nor political institutions are included. In this way traditional Chinese people tend to relate to individuals and to favouring *guanxi* instead of committing to organizations or to the government, making it also difficult for both returnees and foreign entrepreneurs to easily do business within this social context.

The outcome of the presence of strong interpersonal ties in a society's culture is the need of a higher level of trust among individuals. In fact China's economic



relations are strongly dependent on trust (Child J, Mollergering G. 2003) and trust plays a significant role in modernizing societies where institutions are not as yet effective. Moreover according to the second Confucian principle where the family plays a central role in Chinese society, trust is not easily extended outside familiar circles. But, on the other hand, Confucian values of persistence, diligence, thrift and the strong role played by the family are considered as key supporting factors for entrepreneurial development, also thanks to the success of East Asian countries' economic development (Liao D. Sohmen P. 2001).

Geert Hofstede, a professor of organizational anthropology and international management at University of Limburg at Maastricht, has conducted one of the most important studies over cultural differences between countries and how values in the workplace get influenced. Among the six dimensions of national culture identified, Confucian dynamism is the uniquely eastern dimension and it refers to long-term versus short-term orientation in life. China positions itself on the long-term orientation because Confucian values emphasize persistence, diligence and thrift that are all entrepreneurs' peculiarities. Persistence refers to the determination of entrepreneurs to reach a certain goal, diligence is the way to organize the business and thrift refers to how entrepreneurs manage the financial resources available. Moreover countries positioned on long-term orientation are positively associated to economic growth and an example of this is the release of the Chinese' five year plan that put development as the first priority emphasizing reforms and ways to overcome existing problems.

*Guanxi* and trust draw also upon financing decision-making in new ventures. One of the most important aspects that characterize an entrepreneur is his ability to search for funding and Western scholarship has largely explored over this topic. But, unlike American and European entrepreneurs that highly rely on laws, regulations and contracts when it comes to look for funding, scholars have done little research over Confucian-based belief Chinese entrepreneurs and their financial borrowing decisions (Keister L. 2004). Considering one of the numerous modern forms of funding available to entrepreneurs as the venture capital, Bruton G, Ahlstrom D. (2003) addresses the cultural barriers venture

capitalists found in entering the Chinese market. The result is that venture capitalists adjusted over time their strategies according to the different Chinese's view that, at the beginning, was reluctant to allow venture capitalists to participate in financing and strategic venture' decisions. Zhang Y. (2014) enriches the existing literature too stating that entrepreneurs' social resources and level of trust affect the effectiveness of their financial borrowing decisions.

### **2.3.3 Access to capital**

During economic transition in China, the state slowly decreased its influence over firms and the financial system in order to liberalize the internal market. For the first time ventures started to search for alternative sources of funding and to take independent decisions over investment and growth strategies. But their use of financial resources has always been heavily constrained by various individual, organizational and institutional conditions (Zhang Y. 2014).

Since a developed financial market encourages innovation and entrepreneurship (Dalzell 1987, Lamoreaux 1994) and financing decisions are among the most critical ones entrepreneurs make, ventures' access to capital is fundamental to our research.

Economic and institutional reforms introduced by Deng in 1978 made huge changes in the Chinese internal economy, prior wholly regulated by a central state responsible for the allocation of resources and for the monetary policy of the country. Before 1978 China didn't have a financial market nor a system of banks depending from a central bank. Institutions similar to banks were agencies responsible for enacting and enforcing government monetary policy without the power of accepting deposits and without the possibility to lend capital; the government was in fact responsible for all financial activities. In 1984 the People's bank of China (PBOC) was separated from the Ministry of Finance and it became the Chinese central bank. A network of banks was created too, starting with four specialized banks: the industrial and commercial bank, the agriculture bank, the people's bank and the construction bank, that gradually assumed more power and the characteristics of a real bank, accepting deposits

and giving loans without the intervention or instruction of the government. Gradually firms, also the ones that were performing well financially, began to shift from an uncertain source of funding as the state was, to domestic bank loans, that did not depend from any bargain power for special treatments (Keister L. 2004) nor political decisions or necessary ties with high-rank officials. However the process of creating a network of independent banks around the country required time, banks continued to depend from the state, to be influenced by the political sphere and domestic banks' loans were considered less risky compared to other new external sources of funding because of the government that remained the ultimate guarantee from survival. Moreover other non - state financial resources, that characterize Western developed financial markets, were at a very early stage of development and until then were considered more risky than bank loans. The system was not efficient yet and even though a financial market was created, suppliers, customers and other business players found it hard to access and benefit to it. But, later on, with the increasing demand of capital by native ventures, new financial sources developed overtime and became one the main drivers of government policies. A recent example is given by China's State Council quote about the announcement of a new massive 6.5\$ billion Venture Capital Fund: "The establishment of the state venture capital investment guidance fund, with the focus to support fledgling startups in emerging industries, is a significant step for the combination of technology and the market, innovations and manufacturing"<sup>2</sup>. China's private equity industry is nowadays the largest one in all Asia, despite many institutional and governmental barriers that characterized the Chinese financial market (Batjargal B, Liu M. 2004) but little research has been done over of private equity and venture capital in emerging countries (Bruton G, Ahlstrom D. 2003). Bruton G, Ahlstrom D. (2003) work underlines the differences in venture capital' actions between Western and Eastern societies and shows the difficulties venture capitalists face in entering the Chinese market. In the West, venture capitalists' approach in identifying the right venture

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<sup>2</sup> "China Just Announced A Massive New \$6.5 Billion Venture Capital Fund", Business Insider UK 2015.

to be funded and the process of making it to grow, is almost the same with every firm they pick up. In China different aspects affect VC decisions', mainly because of the weak regulatory and institutional system. For instance, the process of initial screening of the funding potential firm differs in the sense that VC tend to invest in a firm within specific local regions because these firms may have developed close link with local authorities overtime that can be turn helpful in order to better understand the regulatory context. They also tend to invest in firms with established financials since it is easier to validate the information needed to take the investing decision. Moreover western VCs enter the board of directors of the funding ventures because of the need of active monitoring of the business. Being Chinese' culture and trust adverse to the presence of people outside familiar contexts or networks, it was not easy for VCs to participate in financial and strategic decisions of the venture making it difficult to add value to the firm. The goals are different too, US venture capitalists' goal is the maximization of wealth and the growth of profit, while Chinese companies' main goals are the maximization of employment and production, easily amenable to the still presence of social instability in China. Despite the cultural differences between China and the West and institutional local barriers, the government is playing an active role in promoting access to funding for entrepreneurs encouraging both venture funds and private equity. The availability of funding is indeed crucial for survival and success of entrepreneurial ventures (Zhang Y. 2014).

The literature review so far has provided a list of the most influential determinants for entrepreneurial development in emerging countries from a theoretical point of view, relating entrepreneurship and innovation on different basis. In the next sections I will introduce and analyse the present economic and financial situation that led me develop my research question along with potential challenges that China is facing in this historical momentum.

### **3. The Chinese economic and financial context**

#### **3.1. The data**

Our data span the period 2000 – 2014 and they are secondary data mainly from the World Bank's 2015 World Development Indicators, Bloomberg Terminal system and *China Statistical Yearbooks* of China's National Bureau of Statistics (NBS).

#### **3.2. Chinese economic context**

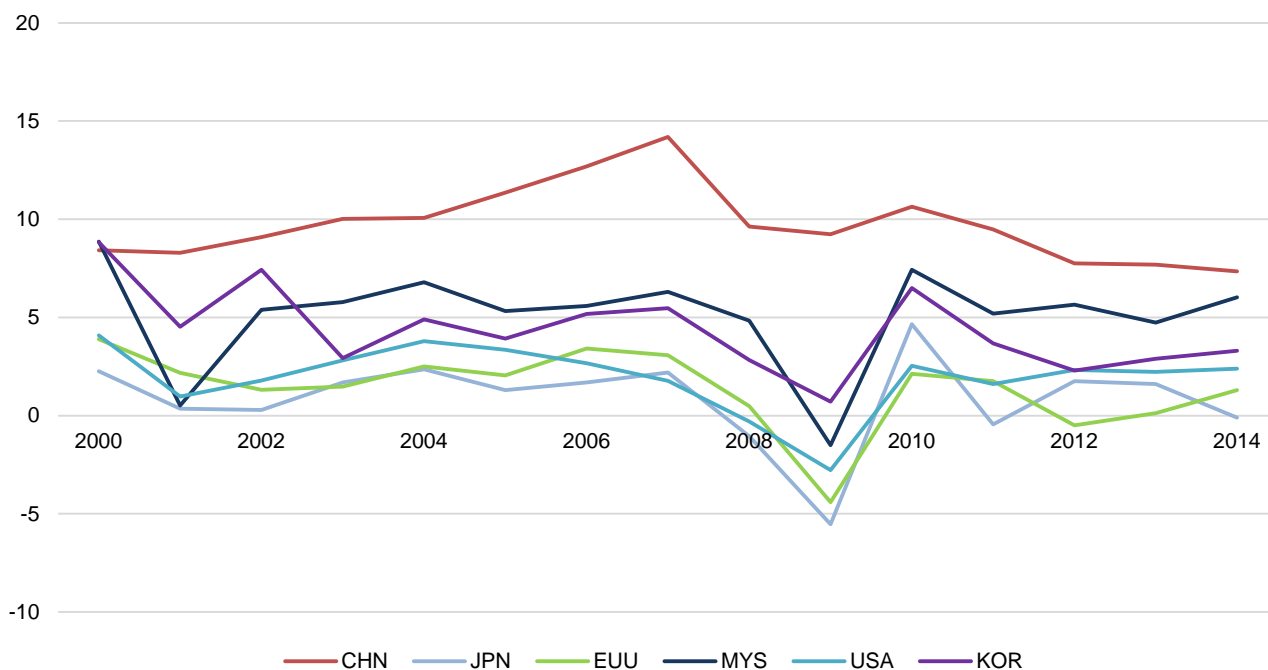
According to the International Monetary Fund (IMF), today China is the world's largest economy, overtaking for the first time The United States in 2014.

After the failure of the centrally planned economy that caused China to fall far behind the industrialized nations, the "open door" policy, a major set of reforms that involved both agriculture and urban industry, was announced in 1978 by Deng Xiaoping to foster the country's economic growth and productivity. Because China had a strong need of Western technology and investments, economic boundaries fell down and special economic zones with relatively freedom of regulations and state intervention, were created to attract multinational firms to invest and establish in China. Openness to international trade and foreign direct investments (FDIs) turned China into the so-called "workshop of the world" and into the world's main export site for manufacturer goods. In the last 30 years, China has dramatically changed its entire economic and social system culminating with China's accession to the World Trade Organization (WTO) in 2001, starting with agriculture and industry to more recently to the service sector.

Since the early 1980s China has grown dramatically, passing from a central planned economy into a market-driven economy and it has been defined in years of extraordinary performance. China has recorded one of the fastest economic development path in the world history, experiencing a double-digit

GDP growth averaging about 10% a year from 1978 to 2013 and reaching a GDP of US\$10 trillion dollars in 2014 (The World Bank, 2015).

**Figure 1. GDP Growth (annual %)**



Source: The World Bank - World Development Indicators, China (2000 - 2014)

As the chart above shows (Figure 1) there have been some steep inclines and drops in China's GDP growth rate with the effect of the global recession occurred in 2008 when the annual rate dropped to 9.6% compared to 14.2% during the previous year. Years of double-digit growth seem have come to an end, in fact in the last years China's GDP growth rate has started to slowdown, in 2014 it dropped to an annual growth rate of 7.4% and it is expected to reach the official targeted growth rate of about 7% at the end of this year<sup>3</sup>.

Even in slowdown, China's GDP growth rate still remains one of the highest in the world and continues to grow at a higher pace than other major developed countries and developing economies. In Figure 1. Japan, United States, South

<sup>3</sup> "China Economic Growth Falls Below 7% for First Time Since 2009", The Wall Street Journal 18<sup>th</sup> Oct. 2015

Korea, Malaysia and Europe as an aggregate are taken as examples to provide a global comparison.

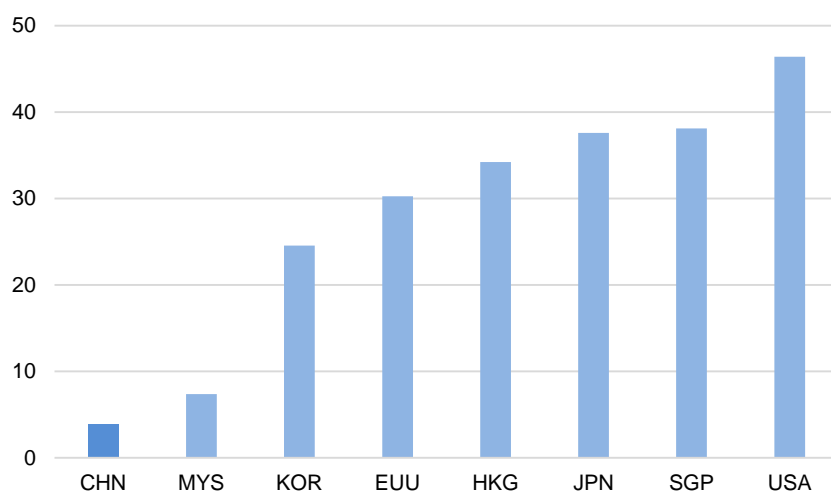
The deceleration has been faster than expected by the Chinese leadership, as it tries to restructure the economy to rely more on consumer spending and services.

The Chinese economy is broadly contributed by three sectors: primary industry (agriculture), secondary industry (construction and manufacturing) and tertiary industry (the service sector). China's economic transformation has changed the composition of the GDP in terms of decreasing importance of agriculture by increasing investments in infrastructure, urbanization and more recently developing the service sector. In 2014 the primary industry in China accounted for the 9.2% of GDP (agriculture, value added % of GDP, The World Bank 2015), while secondary and tertiary sectors accounted for the 42.6% and the 48.2% respectively (industry and services, value added % of GDP, The World Bank 2015). The percentage of agriculture in China is still much higher than other developed countries even though de-collectivization and other improvements in productivity were introduced with the initial reforms on 1980, the United States' primary sector in 2013 makes up to 1% of GDP (agriculture, value added % of GDP, The World Bank 2015). Secondary sector including mining, manufacturing, electricity, water and gas, accounted for the 42.6% of total GDP in China in 2014, where industry is the bigger contributor. United States' industry share over GDP was 20.5% in 2013, where the tertiary sector has the major role with the 78% of GDP. China's service sector has doubled in size over the last two decades and in 2013 it surpassed for the first time the secondary sector, but it remains lower compared to other developed countries; in 2014 it accounted for the 48.2% of GDP.

Structural changes in the Chinese economy have contributed to the shift from agriculture (in 1983 agriculture accounted for around 30% of GDP) to services, which still lag behind the major economies. The service sector's growth trend is upward and the government is strengthen it through policies and ad-hoc interventions.

Economic growth has led to a significant increase in income per capita and an impressive reduction of poverty levels, but despite the impressive achievements both in GDP growth and GDP structure, China's per capita real GDP still remains far below that of other developed economies as The United States, Singapore, Japan, Hong Kong, Europe, South Korea and Malaysia as examples.

**Figure 1.1 GDP per capita (constant 2005 US\$), thousand 2014**



Source: The World Bank - World Development Indicators, China (2014)

The chart (Figure 1.1) above shows that China has a long way to go compared to Malaysia too, a more recent Asian developing country. China's real GDP per capita in 2014 is US\$ 3,866 (constant: 2005) and it has grown at an impressive average annual pace of 9% since 2000. Over the same period of time (2000 - 2014), countries as Malaysia, Singapore, South Korea and Hong Kong have been growing at an average annual pace of 3 - 3.5% while western developed countries with Japan stick to an average 0.9% annual growth having already reached a high income level.

Poverty reduction is another result of the impressive Chinese' economic growth. The percentage of population living on less than \$3.10 at 2011 international prices has dropped considerably over the years. In 1999 the poverty headcount ratio at \$3.10 in China was around the 67% of total population, dropping to the



27% in 2010 (last data available, The World Bank, 2015). Nobody in the developed world comes remotely close to the poverty level of \$3.10 a day represents; the America's poverty line is \$63 a day for a family of four<sup>4</sup>.

Higher levels of income per capita led to increasing consumption levels in products and services in China. In the first 10 months of 2015, investments grew of 10.2%, overcome by retail sales value that grew of 11% in the same period (Bloomberg, Appendix A). The McKinsey China report (2013) estimates that private consumption will grow up to the 51% of GDP in the period 2020 – 2030 (it was 27% in 2010), while investments will drop to the 34% of GDP. An expansion of new service businesses, especially in the financial sector, as well as further expansion of demand for consumer products, is expecting to take place in the next years across China's huge growing market.

China's "open door" policy adopted in 1978 has resulted in a progressive opening to foreign trade and investments that fostered the country's integration into the global economy. China became a major destination for multinational enterprises, mainly attracted by low wages and tax incentives, and an export platform in particular for manufacturer goods ("workshop of the world"). Trade and foreign direct investments (FDIs) has expanded rapidly over the past decades and have been particularly dynamic in recent years. In 2013 China became the world's largest trading nation overtaking the United States reaching an annual total trade of \$4.16tn<sup>5</sup>.

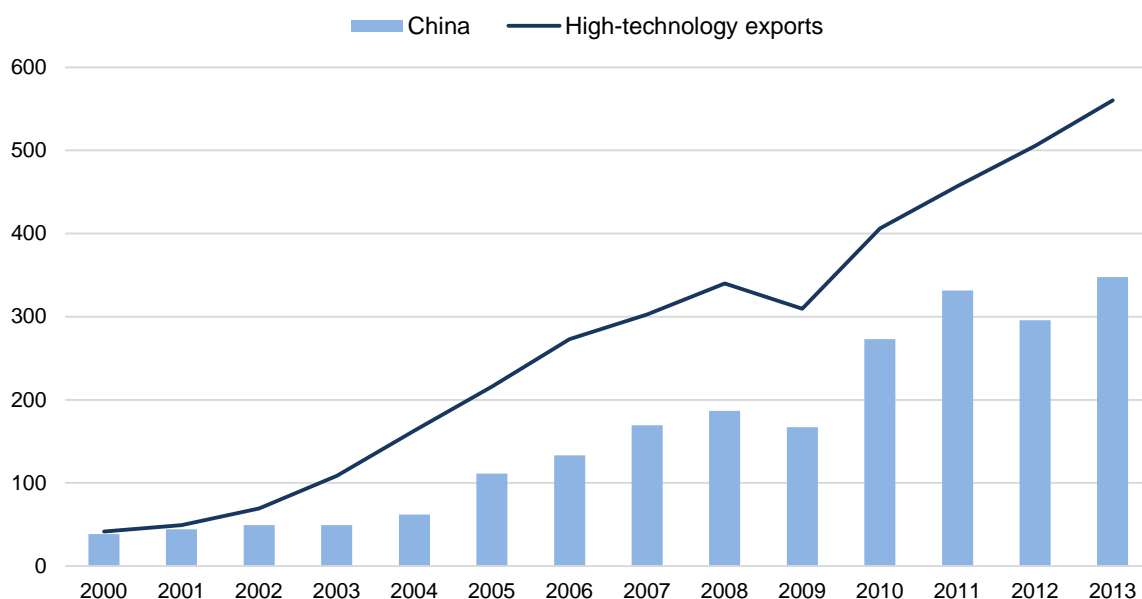
Foreign direct investments have been considered by researchers as the main vehicle for new technology, know-how and skills into China, making the country's international openness a cornerstone of its development strategy. Through knowledge spillovers, FDIs were able to affect the innovation capability of the Chinese south-east provinces, were FDI were mainly directed, considering patents activities (Table 3.2) and high-technology exports as results.

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<sup>4</sup> "Towards the end of poverty", The Economist, Jun 1<sup>st</sup> 2015

<sup>5</sup> "China surpasses US as world's largest trading nation", The Guardian, 10th Jan 2014

**Figure 1.2 FDI and High technology exports in China, billion (US\$)**



Source: The World Bank - World Development Indicators, China (2000 - 2013)

The chart above (Figure 1.2) shows the spectacular rise in high-tech exports along with the raise in foreign direct investments in China from 2000 until now. High technology exports are products with high R&D intensity, such as in aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery that in 2013 reached US\$ 560 billion. They grew at an incredible pace reaching up to the 27% of total manufacturer exports in 2013 from the 19% of 2000. Foreign direct investments grew considerably over the same period of time too, reaching US\$ 348 billion in 2013.

China is also the world's largest exporter of ICT goods (Information and communication technology service exports include computer and communications services and information services), with its US\$ 74 billion in 2013<sup>6</sup>, even though its exports volume have begun to experience a slowdown after years of incredible expansion.

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<sup>6</sup> "Doing business in China: China trade and export guide", UK Trade & Investment, 27<sup>th</sup> March 2015

### 3.3 Chinese financial context

As we previously state, China is the world's largest economy and the largest trading nation. Yet despite the country's economic might, its integration into global capital markets is less advanced than one might expect. Its banks still play a modest international role, China's currency, the renminbi, is hardly used outside the country and China's capital markets have historically been relatively inaccessible to foreigners.

In the last years China's stock market is currently attracting attention among international investors interested both in the corporates growth rates and, more generally, in long-term investments over an economy that "promises" to become one of the future global leaders. The market has slowly been liberalizing, the currency has been allowed to be traded outside the country, Chinese companies started to borrow overseas and to move cash in and out of the country. There are still some concern in investing in China, since companies' have been subjected to accounting scandals and there is a lack of clarity in areas like capital-gains taxes and other areas.

China's stock market has remained closed to foreign capitals, apart from those investors "licensed" defined as Qualified Foreign Institutional Investors (QFII). The QFII program represents China's intent to allow foreign professional investors to invest and to trade in its RMB capital market on a selective basis. By June 2012, 172 foreign institutions were granted the QFII licenses with a total investment quota of USD 27.363 billion<sup>7</sup>.

China's stock market is represented by companies quoted on three different financial centres: Shanghai, Shenzhen and Hong Kong. These financial negotiation centres have distinctive peculiarities, as the issue of different types of stocks.

Shares listed in Mainland China:

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<sup>7</sup> Qualified Foreign Institutional Investors (QFII) Brochure, Special Edition, Pwc 2012

*A-shares*: standard form of common stock issued by companies incorporated in mainland China and quoted on Shanghai and Shenzhen stock exchanges in Renminbi (RMB);

*B-shares*: “special purpose” shares of companies incorporated in mainland China quoted on Shanghai and Shenzhen stock exchanges, but denominated in foreign currencies (typically in Hong Kong dollars, HKD).

Shares listed outside the Mainland China:

*Red Chips*: shares of companies incorporated outside mainland China (Hong Kong) with businesses located mainly in mainland China and owned or substantially controlled by Chinese state-owned companies or Chinese government. Red Chips are listed on Hong Kong stock exchange in the local currency (HKD);

*H-shares*: shares of mainland-incorporated companies listed on Hong Kong stock exchange denominated in HKD.

Until 2014, when China further opened the door to foreign stock investors, international investors could buy only the “Red Chips” and “H-Shares”. The first ones were companies with businesses in China listed on Hong Kong stock exchange, an already developed financial centre present in many portfolio investments, the second ones were more direct vehicles to invest in the Chinese financial growth, betting on its entry into the global markets and global stock exchanges. Indeed investment funds, SICAV or Exchange Traded Fund have been concentrated for a long time on H-Shares, with the purpose of diversifying their portfolio also in the Chinese’ sector.

The 2014 was also a year of great changes for the accession to the Chinese markets: thanks to the Stock-Trading Link between Hong Kong and Shanghai, global investors were allowed to invest in a wide range of companies that in the past had been largely cut off from the international investments. The Shanghai – Hong Kong Stock Connect program allowed global investors to access to

around 500 A-shares, a number six times higher than the one of the past. The program got recently approval and it opens also to the internationalization of the yuan, a fundamental passage for the financial development of Mainland China.

In 2002 global investors could buy Chinese shares only through the Qualified Foreign Institutional Investors (QFII) Program. This program had several regulatory barriers, for instance it was subordinated to a memorandum signing agreement between China and the financial investor's home country and had investments limits too. However in 2012, the Beijing's supervisory authorities announced the creation of a new program, the renminbi Qualified Foreign Institutional Investors (RQFII) that crossed the Asian borders involving more countries in trade and financial investments expressed in renminbi.

The Shanghai index, before the door's opening to foreign stock investors, was subjected to rise and fall phases. The highest peak was registered on October the 1st of 2007, when the main Shanghai index (SSE Composite Index) reached the all-time high of 5954 points.

In 2008, lack of liquidity, drop in companies' profitability and the credit crisis in the United States created a deep chaos on the stock exchange markets, that started to fall reaching a minimum of 1728 points the first days of October of the same year, a drop of more the 70%. However after the announcement of the "Stock Connect", the stock exchange market started to rise again, reaching 5000 points in June 2015. During the last summer, the Shanghai index experienced another fall, reaching 3000 points, despite the numerous the stabilization measures implemented by the Chinese' regulator and monetary authorities. It is interesting to look at the comparison between the three Chinese Stock Markets performances of the last 10 years and 3 years available in Appendix B and C.

The fall, again linked to the fears of the Chinese economy slowdown and the related impacts on the Chinese' companies profitability, triggered a higher volatility on all the global financial centres. This vicious cycle had as a first consequence of the slowdown of Chinese economy the weakening of commodities, oil in the first place. In the last phase it seems that the quotations

show more stability, even though the analysts are waiting for the latest macro-indicators, in particular related to the China's growth potentialities.

### 3.4 Challenges

The Chinese growth model outlined in the previous sections have produce impressive results in a very short time, but as Figure 1.1 shows, the GDP per capita remains low. The current pattern of growth seems to not be sustainable, the rapid economic ascendance has brought on many challenges to the government's agenda as high inequality, demographic pressure and environmental sustainability. High inequality has been increasing due to an unevenly distributed GDP across the country, particularly between the less developed western parts of China and the wealthier coastal provinces. China is also facing demographic pressure deriving from a rapidly ageing of population and internal migration of labour. A recent news is a result of this, where the Communist Party leadership ended its decades-old "one child" policy announcing that all married couple are now allowed to have two children. The National Health and Family Planning Commission stated that "this measure is expected to increase labour supply and to ease pressure from an aging population"<sup>8</sup>. Rapid industrialization and internal migrations from rural parts of China led to an impressive increase in urbanization that put more challenges to the environmental sustainability of the country. Ecological issues may eventually limit China's further economic development, moreover more than 80% of Chinese people are estimated to be regularly exposed to exceed levels in pollution, according to the U.S. Environmental Protection Agency<sup>9</sup>.

The devaluation of China's currency<sup>10</sup>, the yuan, to support exporters, along with new market policies adjustments showed the willingness of China to combat the slowdown of its economy and to pursue a more sustainable growth

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<sup>8</sup> "China Ends One-Child Policy, Allowing Families Two Children", The New York Times, 29<sup>th</sup> Oct. 2015

<sup>9</sup> "China air pollution far worse than thought: Study", CNBC, 18<sup>TH</sup> Aug. 2015

<sup>10</sup> "China Rattles Markets With Yuan Devaluation", Bloomberg News, 11<sup>th</sup> Aug. 2015

model. Still, the deceleration has been faster than expected by the Chinese leadership and the latest events in the financial sector are a proof of that. The old manufacturing, investment and export model is expecting to shift versus a new service, consumption and innovation based one also due to declining returns on massive fixed investments. China is finding ways to raise productivity and innovation is the key to sustainable growth.

## **4. Analysis**

With the theoretical and empirical findings presented, I will introduce and set five framework conditions conducive to innovation in emerging countries and stress their important role in creating an entrepreneurial friendly environment in China. An analysis of the main governmental efforts and Chinese social factors affecting entrepreneurship will follow by underlying the main changes and improvements occurred in the last 15 years.

The data and evidences of the next sections are mainly from The Organisation for Economic Co-operation and Development (OECD) reports, institutional reviews and relevant newspapers and journal articles about China. A discussion part along with limitations and conclusions to this research will follow.

### **4.1 Government and innovation policies**

Over the past decades, China has adopted a set of reforms and policies that changed the economic structure of the country and boosted key industry sectors. Those policies led to huge economic development and growth, especially regarding the science and technology (S&T) field. As Baark (2001) argues, support in those sectors is based on “the recognition of the crucial role which governmental support and public organizations have in a national innovation system”.

Deng Xiaoping, heavily mentioned along my thesis' parts, is a revolutionary statesman and leader of China from 1978 to 1992, responsible for the initial

economic measures over science, technology and education sectors damaged by the Cultural Revolution that took place in China from the 1966 to 1976.

Deng's speech at the 1978 Science Conference put for the first time the modernisation of sectors like science and technology as priorities of the government and the initial policy plans were directed to strengthen those sectors. The first reform framework outlined the most urgent areas of intervention and consisted of specific policy's objectives, related guidelines and directions to pursue. The draft also pointed out the importance of a less participation of the government in the financial market and in the R&D activities and expenditures of its public research institutes (PRIs). The result was a reduction of funding there was available for the coverage of their operational costs and the boost of acquiring funding from external sources by selling their researches and knowledge outside. The reform's aim was to develop a technology market characterized by private R&D institutes, universities as innovation centres and by establishing special economic zones (SEZs) with tax incentives and monetary grants to act as catalysts of international resources.

The formulation of the initial policy had been affected by both external and internal factors (Baark, 2001). The international context and the raise of the importance of science and technology on a global sphere as the industries' main competitive advantage pointed out the wide technology gap between China and the western countries. The need to fill up the technology gap pushed China to foster internal research with two desired outcomes, the first one was to being able to achieve a basic level of knowledge needed to understand and acquire external technology, the second one was to build internal competences and skills that would led China to sell those knowledge globally through innovative technological products on a future basis. On the other hand internal factors affecting the structure of the initial policy are related to the structural deficiencies of a centrally planned economy. A linkage exists between S&T and market-oriented reforms since the aim of the policy is to liberate those productive forces, limiting public interventions. To do so China needed to overcome its shortcomings related to the separation of the R&D function from the production processes (factories, private R&D institutes) that were



exclusively of PRIs, the absence of a technology market that inhibited the incentives to transfer researchers' results for commercial usage, the rigid personnel management that hindered knowledge exchanges among researchers and scientists and lastly the presence of a net gap between universities and R&D centres.

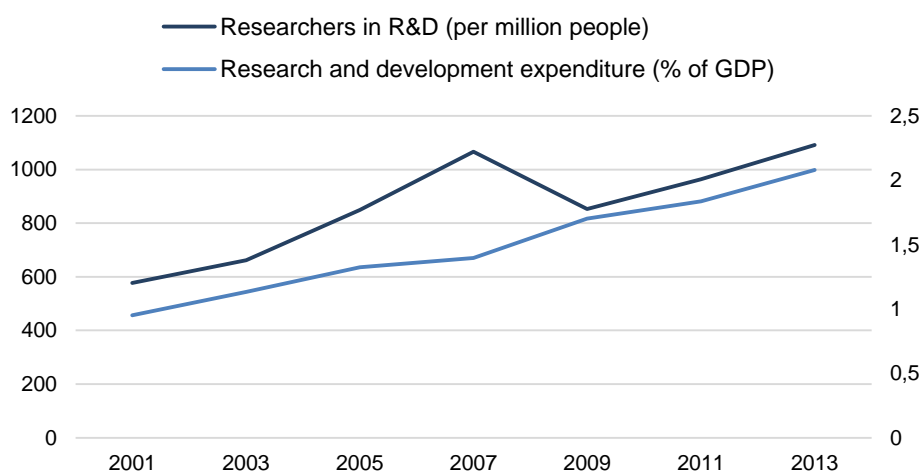
After the Conference of 1978, years of systemic reforms followed until 1994, where the Chinese Communist Party Central Committee (CCPCC) issued the decisions on the economic system in 1984, the reform of S&T and education system in 1985. But, the establishment of a real market system in China waited until the 1990s when the 14<sup>th</sup> Congress of the CCPCC was held and two policy reforms documents were issued: the 1995 Decision on Accelerating Scientific and Technological Progress and the 1999 Decision on Strengthening Technological Innovation and Developing High Technology and Realising its Industrialisation. As the strategies were implemented under the then Premier Zhu Rongji, the ratio of gross expenditure on R&D to GDP increased quickly from 0.75% of 1996 to 0.90% of 2000<sup>11</sup> and many PRIs were privatized and turned into intermediaries services institutions or S&T based companies. Furthermore, in recent years, the establishment of SEZs contributed to the 22% of China's GDP, 45% of total national foreign direct investment and it is estimated that they have created over 30 million jobs besides accelerating industrialization, agriculture and modernization. Although the Chinese economy grew at a very rapid pace from 1990s and on thanks to the implementation of the reforms above, the country still continued to suffer of many internal social and institutional problems, as low labour productivity, poor technological improvements, inadequate industrial and public health infrastructures. Disparities and income inequalities among different regions, clearly seen comparing the urban areas to the rural areas or the coastal regions with the west regions, severe industries' negative externalities, a manufacturing sector based on low-added value products and economic growth that doesn't necessary turn into new job opportunities, are all barriers that China had to face to secure itself a sustainable development. The shift in the China's economic

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<sup>11</sup> <http://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS?page=3>

growth model happened at the beginning of the 21<sup>st</sup> century at the national conference on S&T when China adopted the first real innovation – driven development model. It has been outlined in two main reports: The Medium- and Long term Strategic Plan for the Development of Science and Technology (2006-2020) and the Decision on Implementing the Medium- and Long- term Strategic Plan for the Development of Science and Technology and Improving Indigenous Innovation Capability which objectives and directives were revealed by The General Secretary of CCPCC Hu Jintao in 2006. China will turn into an innovation-driven nation if the many challenging objectives outlined in the documents will be realised by 2020. The scope of the 2006 economic plan is referred to a strong improvement in indigenous innovation (zizhu chuangxin) capability with the creation of 20 state-driven megaprojects to develop nanotechnology, biotechnology, high-end generic microchips, aircrafts and so on. The ratio of gross expenditure on R&D to GDP continued to increase as a result of the reforms, passing from the 1.07% in 2002 to 2.08% in 2013 (Figure 2). The reforms' guidelines took also inspiration from the Silicon Valley (USA), a highly innovative area with a close link between education centres (universities), industries, start-ups and venture capitals.

**Figure 2. Research and Development Indicators in China**



Source: The World Bank - World Development Indicators, China (2000 - 2013)

Researches in R&D is an important indicator that explains the attractiveness and growth of the R&D sector in China and it includes all professionals and postgraduate Phd students, engaged in the conception of creation of new knowledge, products, processes, methods, or systems and in the management of the projects concerned (The World Bank, 2015). As it is shown in Figure 2. the trend is positive (2000-2013) and correlated to the growth of R&D expenditure over GDP; at the beginning of the 21<sup>st</sup> century there were 439 researchers per million people, growing up to 1019 in 2012.

Along with the main Decisions taken by The Chinese Council and CCPCC, the country's policy activities and guidelines are also outlined in the several five-year plans (FYP) issued, a typical characteristic of centralized and communist economies. The FYP is drafted by the National Development and Reform Commission (NDRC) and it sets targets and directions to meet within the period of time indicated and they run from GDP growth rate to social, economic and education goals. The 12<sup>th</sup> FYP (2011-2015) marks a turning point from all the previous FYPs because it emphasises a "high quality growth" with attention to the environmental protection, renewable energies, disparities, domestic consumption and sustainable development. GDP growth is no more seen as the only measure to matter, indeed forecasts for the period 2011-2015 lowered it to a 7% annual target, 0.5% less than the previous five years. Other important goals appeared, as the improvement of social indicators (first national housing plan and education targets), environmental indicators (new pollution targets) and innovation indicators (3.3 number of patents per 10,000 people). The 13<sup>th</sup> FYP (2016-2020) is the last document available that will make China to achieve those goals outlined in The Medium- and Long term Strategic Plan for the Development of Science and Technology (2006) and although no numerical targets are already offered, President Xi Jinping states that: "an annual growth of 6.5 percent would be required for China to build a moderately prosperous society by 2020". Having analysed the most important historical and present milestones of China's policies and reforms path and its impacts on the economic and non-economic national targets, we can prove they made an important role in fostering the country's growth and innovation performance. In

fact, as argued before, in the last 40 years the Chinese government has been using its wealth to promote and stimulate innovation issuing ad-hoc policies and creating SEZs to further stimulate regional innovation capabilities. But, still nowadays China is not considered an innovative country yet and continues to face internal social and institutional barriers that hinder the achievements of its goals set. Stating the importance of a top-down S&T policy approach, and effective patents' protection laws and a developed human resources management are also aspects to take into account and to analyse when developing innovation-driven strategies to apply to emerging countries.

## **4.2 The Research and Development context**

The Global Innovation Index (GII) is an aggregate of 79 indicators across a range of themes that covers 141 economies around the world. It identifies and analyse the global innovation trends. The Global Innovation Index 2015 has ranked China at the 29<sup>th</sup> place worldwide, 7<sup>th</sup> in the South East Asia and Oceania regions and 1<sup>st</sup> among upper-middle-income countries. In just two years, China was able to grow up to the 29<sup>th</sup> place from a 35<sup>th</sup> rank position in 2013. The trend is upward and is the result of a strong government commitment on narrowing the innovation gap quality, which China is leading among the middle-income economies followed by Brazil and India.

Prior to reforms, China's R&D and innovation context was characterized by several PRIs mainly involved in basic research and coordinated by the central government. Universities were little involved in R&D and companies were mostly manufacturing plants with a residual internal R&D useful to conducting specific projects' requests. The system was overall inefficient, PRIs innovation output did not meet companies' requests and companies accessed to new technology by importing it from abroad (Liu and White, 2001). Many reforms were issued to support and to strengthen the S&T field by decreasing PRIs governmental dependence and encouraging enterprises, private research institutes and universities to develop internal knowledge and to commercialize

it. In 1987 research institutes accounted for more than half of the total R&D in China, while enterprises and universities accounted for 29.7% and 15.9% respectively.

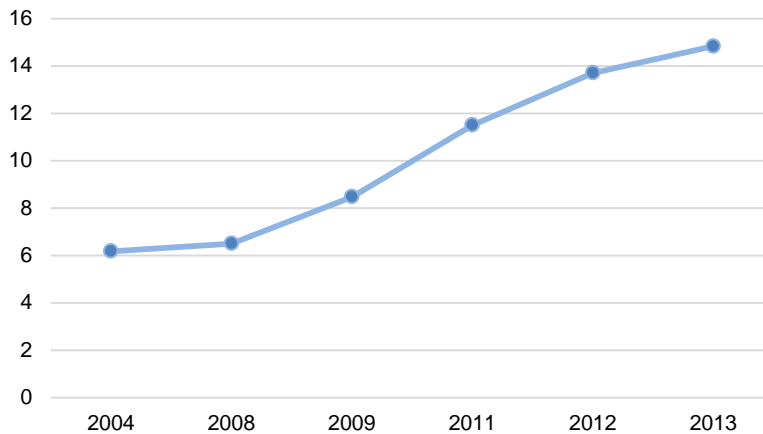
**Table 3. Percentage of total R&D expenditure**

	1987	1990	1996	1997	1999	2000	2001	2002	2003	2004	2005	2006
<b>Research institutes</b>	54.4	50.1	42.8	40.6	38.5	28.8	27.7	27.3	25.9	22.0	21.0	18.9
<b>Universities</b>	15.9	12.1	11.8	11.3	9.3	8.6	9.8	10.1	10.5	10.2	9.9	9.2
<b>Enterprises</b>	29.7	27.4	43.3	46.1	49.6	60.0	60.4	61.2	62.4	66.8	68.4	71.1
<b>Other</b>			2.1	2.0	2.6	2.7	2.1	1.4	1.2	1.0	0.8	0.8

*Source:* Ministry of Science and Technology of People's Republic of China, Indicators (2007).

In the period 1978 - 1986 enterprises were mostly state-owned and inserted in a low competitive environment with no discretion on investments, production or prices. There were no incentives at all in developing creativity, production efficiency, internal knowledge and intellectual property rights (IPR). Universities and research institutes were public too with low incentives to achieve high research standards and their little R&D outcomes was related almost exclusively to the industries' requests (military and product shortages issues). Years after the introduction of the open-door policy in 1978 and the numerous S&T reforms, research institutes in 1990 continued to account for the most of the national R&D expenditure (Table 3). Later on, when SOE's started to achieve autonomy in the decision-making process and to being transformed in equity or liability companies, a shift in the percentage of total R&D expenditures among all players in the country occurred. In 2000 the 60% of total R&D was performed by enterprises with a slight decreasing of the research institutes' role. Privatization and competition brought companies to add new product development and innovation as priorities for the economic performance and survival's of the venture.

**Figure 3.1 Percentage of industrial enterprises having R&D activities**



Source: China Science and Technology Statistical Yearbook, 2004 - 2014

Chinese industrial enterprises' R&D grew considerably in the last 10 years, reflecting the relevance it gained overtime stimulated by policies, internal demand and raise of competition (Figure 3.1). In 2013 the 14.8% of total industrial enterprises had an internal R&D with a total expenditure of R&D of 8318 (100 million of yuan, China Statistical Yearbook 2014).

Along with research institutes and enterprises, universities are potentially innovation centres too. Chinese universities have historically been mainly public and influenced by the centralized Soviet education and the informal Chinese education model. As industrialization and economic growth started to require a higher education system and more skilled people, private higher education institutions began to emerge. According to Xue (2006), in the half of the 20<sup>th</sup> century, structural changes were implemented in China's higher education system. Before the structural policies that began in 1978, from 1949 to 1955 the few private universities in the country were transformed into public universities to match the centralized economic planning system. The first major structural change was the recombination of the education institutions according to the different disciplines, such as polytechnic institutes, normal universities and so on. The government also provided almost all geographical regions to have different types of universities available for the local population. A hierarchical

structure characterized the education system but some universities started to being administrate not only by government ministries but also by local governments. The second big structural change happened after the opening up reform and the education sector policy. From 1985 universities began to assume more autonomy through decentralization, depoliticization and diversities (Yue, 2004) processes. It was a remarkable step forward for China's education system, universities were no longer seen as institutions for ideological indoctrination, alternative and channels for financing appeared (i.e. commercialization of R&D outcomes, tuition fees) and many private universities have been set up. Institutions began to collaborate with local government, supporting the local social and economic development and the top research universities started to compete in order to search for funding or donations for delivering an always higher level of education among their students and to being able to attract external talents.

As it is shown in Table 3, universities' expenditure on total R&D has been decreasing from 1978 until now, remaining stable around the 10% in the last 10 years. Universities and college (U.C.) expenditure on total R&D in the United States, one of the highest innovative countries in the world, is around the 15% (2011) and it is the fastest growing R&D sector. Unfortunately no later data in this field are available yet, but there is for sure room for improving and for strengthening universities participation in R&D<sup>12</sup>.

Foreign direct investments (FDIs) are also a very important way for Chinese companies to access to knowledge and foreign technology and they are positive associated to innovation efficiency in the host region. As Fu (2008) argues, foreign direct investment contributes to regional innovation in four ways: first they enhance multinational enterprises (MNEs) to create R&D labs which increase the innovation output of the host region directly, secondly they emanate spillovers through knowledge transfer across the supply chain, skilled labour turnover and demonstration effects, third they enhance competition needed to raise the innovation's bar and lastly they bring to the region

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<sup>12</sup> <http://www.nsf.gov/statistics/seind14/index.cfm/chapter-4/c4s1.html>

advanced practices and experiences to make the innovation process more efficient (i.e. quality decision-making, coordination management, marketing skills and so on). The huge inflows of FDI started with the open-door policy of 1978 and it was mainly directed and concentrated to the south-east coastal provinces (Shanghai, Fujian and Guangdong) where the SEZs were located. Indeed in 2013, the total accepted patents (inventions, design and utility models) of the coastal provinces of China accounted for the 74% of the total patent applications. The innovation activity resulted in the total number of patent applications is further concentrated in the provinces of Beijing, Shandong, Jiangsu, Fujian and Guangdong (Table 3.2) and those are the top regions to have received an high concentration of FDI over the years.

**Table 3.2 National total accepted patents by provinces (2013)**

Beijing*	123336	Hunan	41336
Tianjin*	60915	Guangdong*	264265
Hebei	27619	Guangxi*	23251
Shanxi	18859	Hainan	2359
Inner Mongolia	6388	Chongqing	49036
Liaoning*	45996	Sichuan	82453
Jilin*	10751	Guizhou	17405
Heilongjiang*	32264	Yunnan	11512
Shanghai*	86450	Tibet	203
Jiangsu*	504500	Shaanxi	57287
Zhejiang*	294014	Gansu	10976
Anhui	93353	Qinghai	1099
Fujian*	53701	Ningxia	3230
Jiangxi	16938	Xinjiang	8224
Shandong*	155170	Hong Kong	3322
Henan	55920	Macao	147
Hubei	50816	Taiwan	21465

(\*) Coastal provinces.

Source: China Science and Technology Statistical Yearbook, 2014

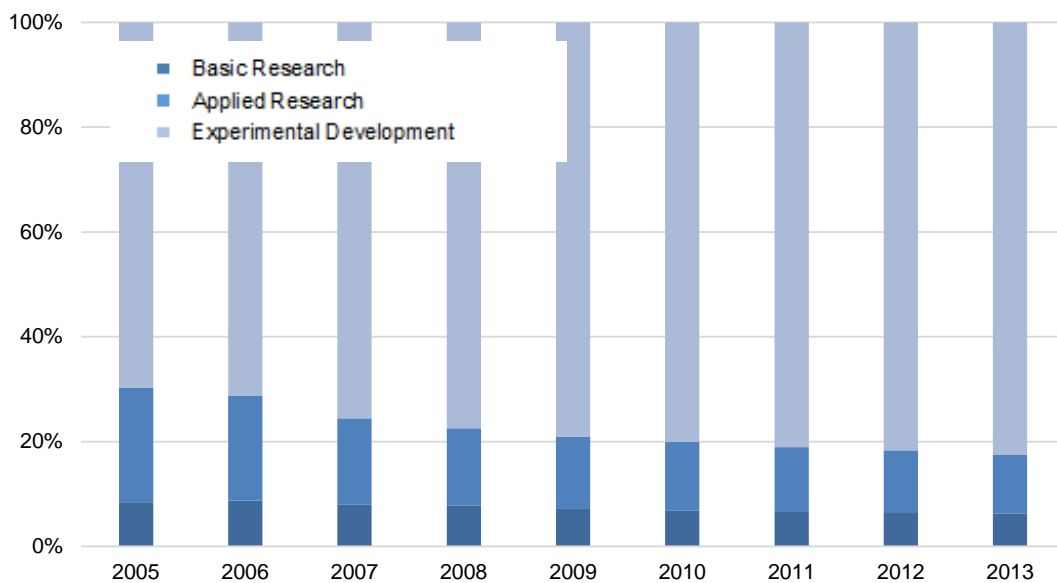
Even though the expenditure on R&D to GDP increased from 2000 to 2013 (Figure 2), investment in basic and applied research is still low. Basic research is scientific research needed to formulate or improve scientific theories or



understanding of phenomena. Applied research, fuelled by basic research, is responsible to the development of new technologies or techniques that contribute to innovation. Basic and applied research accounted on average for the 7% and 15% of the total annual research in the period 2005 – 2013, slightly decreasing their importance over the period of time considered.

On the other hand, experimental development (R&D investment by the industrial sector) which is defined as the process of using and combining technology or scientific applications to arrange, improve, new products, processes or services, increased steadily at an average pace of 15% a year over the period 2005 – 2013 and reached a contribution of the 82% on total research in 2013 (70% in 2005) (Figure 3.3).

**Figure 3.3 Statistics on R&D output**



Source: China Science and Technology Statistical Yearbook, 2005 - 2014

The Chinese innovation and R&D context has undergone many great changes in the last 10 years and it continues to grow at rapid pace. On the other hand, China continues to face some challenges: China’s innovative output includes only a few radical innovations while several incremental innovations, resulting from little investment in basic and applied research (Figure 3.3). Enterprises

with universities and research institutes require incentives to invest in those weak research areas, a way to achieve this result can be the development of stricter intellectual property rights along with a more effective human resources in science and technology management.

### 4.3 Intellectual property rights

*“IPR protection can promote innovation and economic development by attracting FDI and strengthening incentives to innovate among domestic firms. Enhancement of IPR systems is associated with the strategic shift from static competition to dynamic competition (i.e. based on innovation). At the same time, IPR policy needs to strike the right balance between protection of innovation and facilitation of technology diffusion”.*

The statement above is the main message of the OECD-SIPO-DRC Workshop on Intellectual Property Rights and Economic Development in China (2013), which summarizes the importance of IPR in promoting innovation.

In many western countries, the transition to a knowledge-based economy, characterized by high level of technological output, has fostered IPR policies, regulations and laws to protect the new knowledge and applications born.

Improving the protection of intellectual property rights (IPR) has always been a big challenge for the Chinese government. From the end of 1970s many policies have been issued to develop a comprehensive IPR system and to progressively accept the international obligations for the protection of IPR.

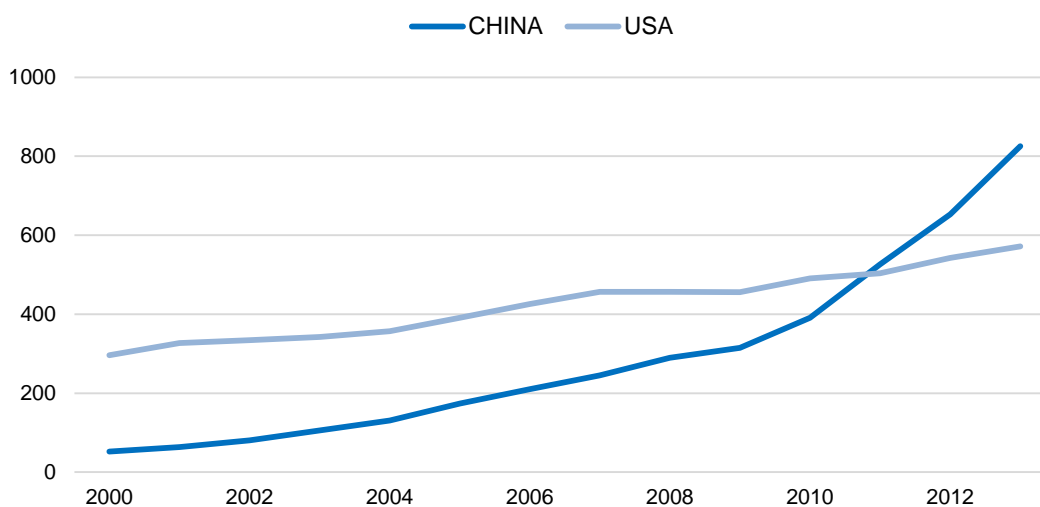
China’s currently IP legal framework consists of three laws: the Trademark law (1982, revised 1993 and 2001), The Patent Law (1984, revised 1992 and 2000) and the Copyright law (1990 revised 2001). Moreover in 1993 the Anti-unfair Competition Law was enacted to provide obligation of not infringing business secrets and know-how of others.

In 1980 China joined the World Intellectual Property Organization (WIPO), ratified the Paris Convention for the Protection of Industrial Property in 1985, the Madrid Agreement concerning the International Registration of Marks in

1989 and signed the Integrated Treaty. Later, in the 1990s, China adhered to Geneva Convention, to the Patent Co-operation Treaty (PCT) and to the Budapest Treaty. Lastly, with the entry of China into the WTO, the country accepted to adhere to the Trade Related Aspects of Intellectual Property Rights (TRIPS) Agreement and both revised and issued laws and regulations to conform its IP system to the TRIPS standards.

China is still working on strengthening and adapting its internal IPR system, principally in the following directions: expansion of coverage to growing new technology areas, raise of incentives for patenting (many companies offer incentives to their employees if they come up with patentable ideas)<sup>13</sup>, increase flexibility, reduction of patent filing costs and reinforcement of patent holder rights by the creation of special IP courts.

**Figure 4. Total Patent Applications (direct and PCT National phase entries), thousand**



Source: World Intellectual Property Organization (WIPO), 2000 - 2013

China's patent office is now the largest in the world, as measured by the number of patent applications received<sup>14</sup>, overtaking the Japan Patent Office

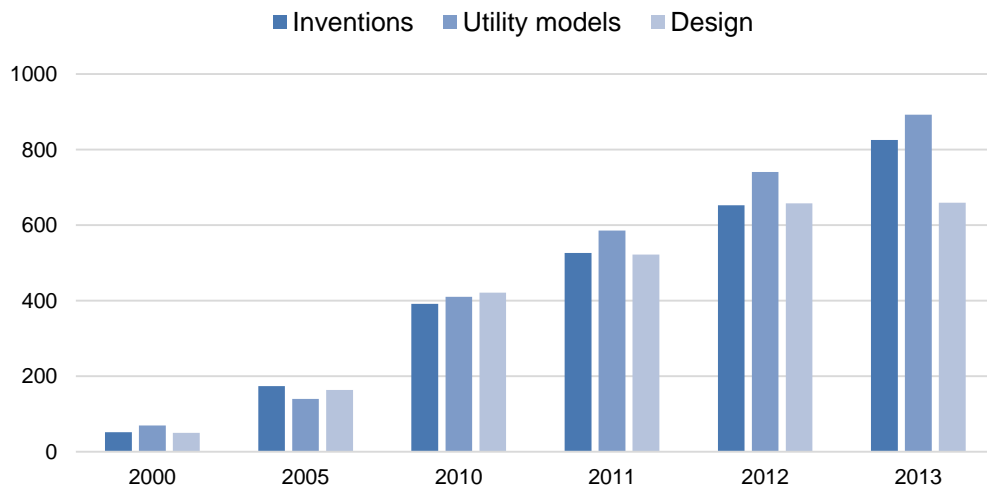
<sup>13</sup> "Patents, yes; ideas, maybe, Innovation in China", The Economist, 14th Oct 2010

<sup>14</sup> "Global IP Filings Continue to Grow, China Tops Global Patent Filings", WIPO, 11<sup>th</sup> December 2012

(JPO) in 2010 and the United States Patent and Trademark Office (USPTO) in 2011. The chart above (Figure 4) shows the upward trend in patent applications from 2000 to 2013 of China and the US. China is experiencing a double-digit growth in patent filling over the years and managed to reach 825.136 patent applications in 2013, 253.524 more than The United States in the same year.

There are three kinds of patent protection in China: inventions, utility and design patents. Invention patents have a term of 20 years and may be granted for new technical solutions or improvements to a product or process with a practical applicability. They are also subjected to search and examination similar to those conducted in the major patent offices of other countries and they take approximately 3 to 5 years to complete prosecution. Utility patents have a term of 10 years and protect products with new shape or structural physical features. Lastly, design patents have a term of 10 years too and protect new designs, shapes, patterns, or colors, and aesthetic features that fit for industrial application.

**Figure 4.1 Three kinds of accepted patents, thousand**

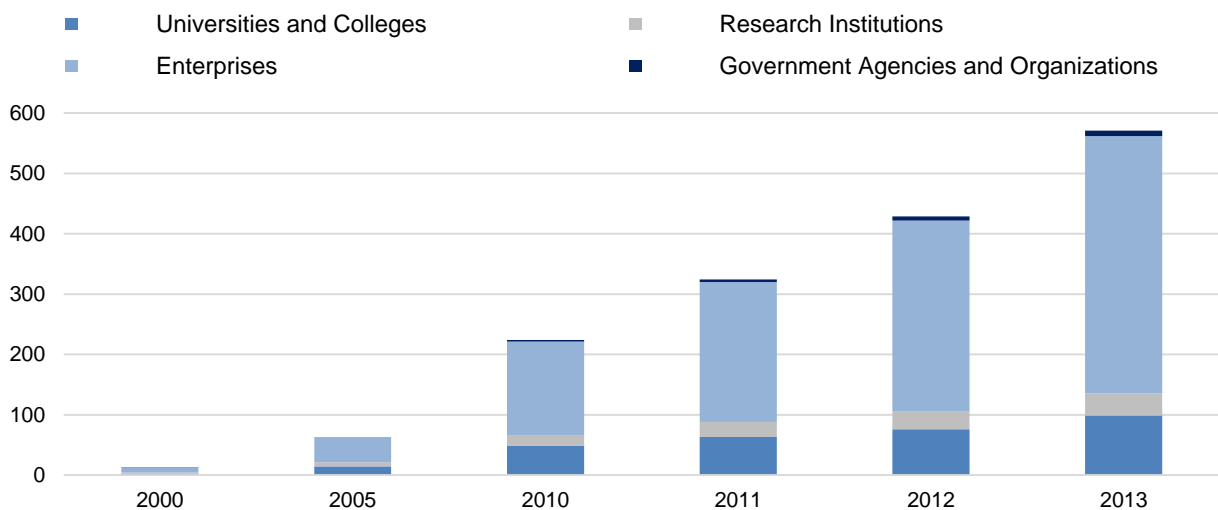


*Source:* China Science and Technology Statistical Yearbook, 2000 - 2013

The chart above shows the trend in domestic patent applications' acceptance in China from 2000 to 2013 by kind of patent. There has been a raise of all kinds of patent, especially inventions and utility ones. Inventions patent are

substantially responsible for radical innovation in a country and they grew considerably overtaking all other countries in the last four years. In 2014 the number of invention patent applications filed to the State Intellectual Property Office (SIPO) reached a total of 928.000, up to the 12.5% from the previous year and positioned China as the top country in the world in inventions patent filling<sup>15</sup>. But, where do inventions come from? It is interesting to look at the different sources of R&D in China (Universities and Colleges, Enterprises, Research Institute, Government Agencies and Organizations) and their relevance in patent activity regarding inventions exclusively.

**Figure 4.2 Number of domestic inventions by R&D actors, thousand**



Source: China Science and Technology Statistical Yearbook, 2000 - 2013

The chart above (Figure 4.2) shows the astonishing growth in domestic inventions in China from 2000 to 2013. In 2000 patenting was a new practice for Chinese R&D actors, resulting in a total number of inventions around 2500. 13 years later, along with new innovation policies and the improvement of intellectual property rights, only Chinese enterprises reached an impressive number of 400.000 inventions and universities and colleges positioned at the second place in domestic inventions filling by reaching around 99.000 inventions. Research Institute and Government Agencies and Organization still

<sup>15</sup> “China tops patent applications list in 2014”, China Daily.com.cn, 23<sup>rd</sup> Feb. 2015

play a residual role in this context.

Although improvements in IPR protection in China driven by the willingness to move forward a more innovative-based economy, the context still need to be substantially improved. First of all, a weak IPR context can hinder foreign firms to transfer, produce or export property technology into China, researchers and inventors can be less motivated to apply for protection or to commercialize their results in R&D and it can affect the international reputation of Chinese firms when a poor quality of IPR affects products, health and safety of customers. Moreover, the rapid increase in patent filling in China is not the result of local researchers that suddenly started to apply for inventions, but it is the result of specific government policies, such as the 12<sup>th</sup> Five-Year Plan, that includes for instance annual patent targets. In such context the the quality of patents issued is in doubt and some experts say that they still lack of competitive edge<sup>16</sup>.

#### **4.4 Entrepreneurial environment and social cultural factors**

Entrepreneurs need to have the ability to give legal form and to operate in a friendly environment to start a business. The World Bank identifies specific areas conducive to entrepreneurship in its Ease of doing business annual report. The report ranks economies from 1 to 189 from the best entrepreneurial context to the weaker one (low numerical rank means that the regulatory environment is conducive to business operation), China is ranked 84<sup>th</sup> in the Doing Business 2016 report worldwide (see Appendix D). Only two years earlier, in 2014, it was ranked 90<sup>th</sup> (The World Bank, 2015).

An economy with the aim to grow and to innovate has to develop and improve specific factors supportive to entrepreneurship, as the following:

- low time to start a business,
- inexpensively procedures,
- certainty of limited liability,

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<sup>16</sup> “Patent fiction, Intellectual Property Rights in China”, The Economist, 11<sup>th</sup> Dec 2014

- certainty of a well designed insolvency system in case the idea fails to work out,
- availability and ease in hiring skilled people,
- ease of obtaining financing (equity and credit),
- ease of payment of taxes.

In the last years China has implemented reforms to promote and developed entrepreneurship, since innovation and growth is mainly driven by private entrepreneurs that are the most suitable to think out-of-the-box because of their history and hostile path they had to face in order to survive (Tan J. 2001). The government is taking the next steps in its market-oriented economic, opening its economy further, attracting foreign talent to start businesses by the removal of external and internal labor market restrictions to encourage entrepreneurship in the technology and service industries<sup>17</sup> and issuing reforms and laws to create a more friendly entrepreneurial context.

Business regulations have a major role in outlining a friendly business context conducive to entrepreneurship, on the other hand bad and ineffective regulations can inhibit it by making it difficult to start and to operate. The most noticeable reforms adopted in China from 2008 until now ranging from resolving insolvency, getting credit, enforcing contracts, paying taxes to start a business<sup>18</sup>. In 2008 China introduced a new enterprise bankruptcy law implementing reorganized procedures, allowing the formation of creditors' committees, granting rights to secured creditors and establishing a role for professional bankruptcy administrators. Moreover regarding the getting credit sphere, in 2008 China issued a new law that strengthened its secured transaction system, entitling secured creditors to priority in payments, revised in 2009 and 2014 by expanding first the range of assets that can be used as collateral (accounts receivable and change pool of assets) and then introducing for the first time credit information industry regulations, which guarantee

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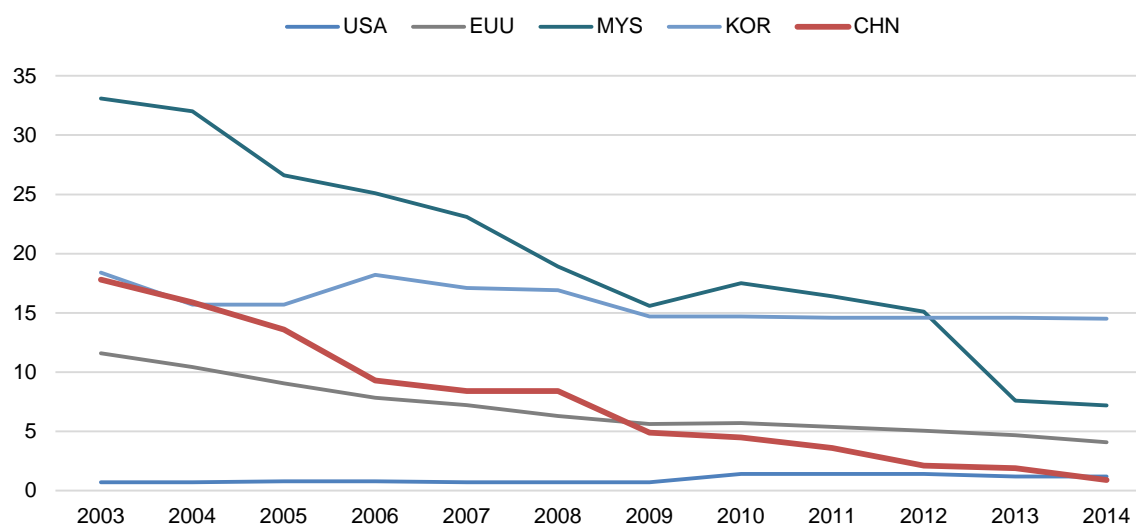
<sup>17</sup> "China opens up Shanghai to global tech entrepreneurs and talents", Tech in Asia, 16th Jun 2015

<sup>18</sup> "Business Reforms in China", Doing Business The World Bank, 2015

borrowers' right to inspect their data. Contracts were enforced in 2009 by tightening the rules on enforcement of judgments as to limit the ways in which debtors can hide assets and escape enforcement and in the same year China made paying taxes easier and less costly for companies, reducing the company index tax rate and adding new tax deductions. In 2011 and 2015 domestic and foreign enterprises were unified under the same tax law and China enhanced the electronic system for filling and paying taxes both in Beijing and Shanghai. Another law made companies in Shanghai to pay taxes less costly by reducing the social security contribution rate. Lastly, regarding starting a business, China exempted micro and small companies from paying several administrative fees from January 2012 to December 2014.

The above reforms are in brief the major changes in the entrepreneurial context happened in China in the last 7 years. Two specific World Bank indicators, *Cost of start-up procedures* and *Time required to start a business* give us more insights over the topic, by showing also the effectiveness of the regulations that have been implemented so far.

**Figure 5. Cost of start-up procedures (% of GNI per capita)**



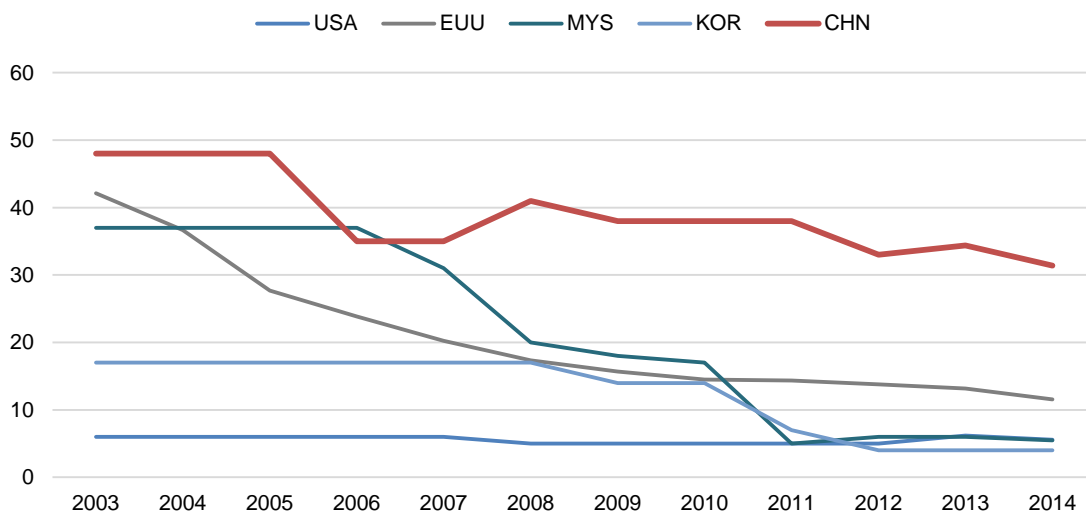
Source: The World Bank - World Development Indicators, (2003 - 2014)



The above chart (Figure 5) shows the trend in cost of start-up procedures expressed as the percentage of GNI per capita by different countries. China's downward trend dropped considerably in the period of time considered; in 2003 the cost of start-up procedures accounted for the 17.8% of GNI per capita, in 2014 it dropped to the 0.9%, by reaching the United States level.

On the other hand, considering the time required to start a business, expressed in the number of calendar days needed to complete the procedures to legally operate a business, where if a procedure can be speeded up at additional cost, the fastest procedure, independent of cost, is chosen, China is far behind the other economies. The chart below (Figure 5.1) shows that the trend is downward but less steep than the cost of start-up procedures one. In 2003 an entrepreneur used to take 48 days to start a business in China, while in 2014 the indicator dropped to 31.4 days. The United States, South Korea and Malaysia have been stable around 5 and 6 days in the last 3 years, while an entrepreneur in Europe as an aggregate takes around 12 days to start a business.

**Figure 5.1 Time required to start a business (days)**



Source: The World Bank - World Development Indicators (2003 - 2014)

In February 2014 China simplified the process of registering businesses and since then there has been a huge leap in the number of new registrations.

Moreover in 2015 Starting a business in China became easier thanks to a new recent reform that eliminates the minimum capital requirement and the requirement to obtain a capital verification report from an auditing firm. The last reform applies to both Beijing and Shanghai. As a consequence, there has been an increase in new registrations of 46% in 2014, according to the State Administration for Industry and Commerce. The private sector now accounts for at least three-quarters of the Chinese economy<sup>19</sup>.

Most of entrepreneurship in China happens inside the so called “Science parks”, established back in the 1980. A science park is an area designed and managed to promote innovation. Friendly conditions to start and run a business characterize these areas and multiple collaborations among different institutions, such as university-industry, government-industry are involved. The scope of science parks is to create new knowledge and high technology outcomes. The most famous science and high-tech park in China is Zhongguancun in Haidan District in Beijing, first established in 1988 with the name of “New Technology Industrial Development Trial Zone”<sup>20</sup>. During the past decades Zhongguancun has gathered nearly 20,000 high-tech industrial clusters in various sectors, as electronic, information, energy and environmental protection, new materials, advanced manufacturing, aerospace, R&D and service. The most renowned companies are Lenovo and Baidu.

Other science parks exist in other provinces of China, proving that a friendly business environment foster entrepreneurship on a large scale. In 2010 the gross income of enterprises in Zhongguancun achieved 1.59 trillion yuan, by contributing to the 23.5% of Beijing economic growth and attracting every year about a third of the country’s total venture capitalists investment<sup>21</sup>.

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<sup>19</sup> “Six things China can do to become the world’s most entrepreneurial economy”, The Conversation, 17<sup>th</sup> February 2015

<sup>20</sup> Zhongguancun Science Park website, Profile section.  
[http://en.zhongguancun.gov.cn/2013-12/04/content\\_17148863.htm](http://en.zhongguancun.gov.cn/2013-12/04/content_17148863.htm)

<sup>21</sup> Zhongguancun Science Park website, Profile section.  
[http://en.zhongguancun.gov.cn/2013-12/04/content\\_17148863.htm](http://en.zhongguancun.gov.cn/2013-12/04/content_17148863.htm)

Yet entrepreneurship education remains a relatively new concept and practice in China, particularly in the university sector<sup>22</sup>. This does not come as a surprise, since the education sector has remain closed for a long time and the first MBA programme in China was introduced at Tsinghua University in 1991 and exchanges programs with US and European colleges began to emerge around the mid-1990s. Traditional Chinese culture, still influenced by Confucianism, is somehow against entrepreneurial values. Confucianism values as “obedience” and “respect for authority” that derive from a strong hierarchical society, and “trust” as a barrier for conducive business, inhibit the propensity to start businesses in China. The Chinese education system is also in contrast with effective entrepreneurship education since it does not motive students in developing creative solutions and new thinking approaches. Thus entrepreneurship is more likely to occur among students who have returned to their home country after having studied years abroad in western colleges, because they may have developed advanced knowledge and skills compared to their local counterparts. Though also in the last years a surge in students interested in running their own companies, as it happens in the US and Europe, is taking place in Chinese universities too, along with new entrepreneurial courses and involvements of successful entrepreneurs<sup>23</sup>.

Lastly, the doing business rank does not capture some important aspects as security, market size, macroeconomic stability, prevalence of bribery and corruption. Corruption is a relevant aspect that continues to negatively influence the business environment of China, for instance hindering the implementation of new projects or facilitating economic processes (payments) thanks to *guanxi*. The actual General Secretary of the Communist Party, Xi Jinping, launched in 2012 an Anti-corruption campaign that addressed corruption throughout the country. The initial numbers show that the campaign has been a success, since 414,000 CPC (Communist Party of China) officials were disciplined for

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<sup>22</sup> “Entrepreneurship education needed in China”, The Financial Times, 31st Jan 2014

<sup>23</sup> “The rise of China’s entrepreneurial spirit”, The Financial times, 7<sup>th</sup> Dec. 2014

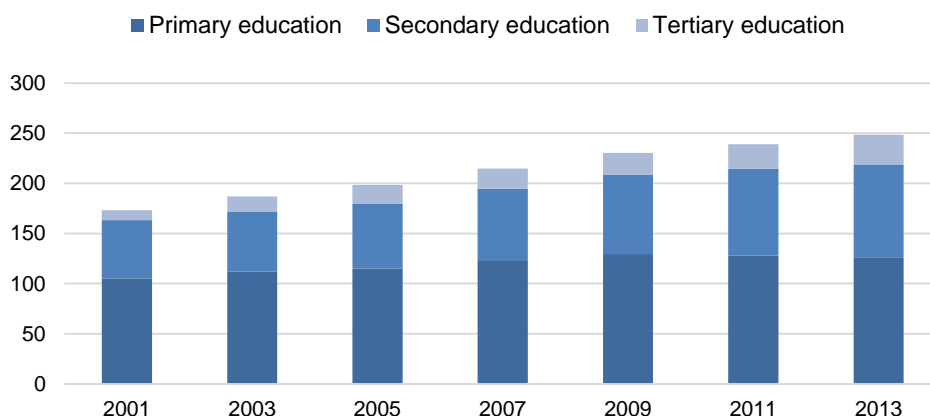
corruption and nearly half were actually being prosecuted in court<sup>24</sup>. However there is still the need to intensify anti-corruption actions, with the aim to create the best possible place for the flourishing of entrepreneurship and innovation.

#### 4.5 Human capital

Innovative countries are associated with a high education level among their citizens. High skilled people are a very important resource for a country, because they contribute to the creation and diffusion of innovation while transmitting their knowledge and expertise to the other people in a society. China has been investing on and promoting education since the issue of the first reforms in key sectors as science and technology.

The Medium- and Long- term National Plan for Science and Technology Talent Development (2010 - 2020) has been adopted to promote highly skilled mobility, to implement innovative platforms for S&T talent and to establish national research centres for high-level R&D personnel. Moreover measures in other key areas as living allowances, funding for postdoctoral research in enterprises and tax incentives for firms that invest in education and training programmes were taken too. School enrolment increased year over year, promoting education all across the country and in all three sectors.

**Figure 6. School enrolment, primary, secondary and tertiary in China (% gross)**



Source: The World Bank - World Development Indicators, (2000 - 2014)

<sup>24</sup> “Forecasting China’s anti-corruption campaign”, Global Risk Insights, 30th August 2015

The Chart above (Figure 6) shows the increasing level of education in China of the last 15 years divided by the three main sectors: primary, secondary and tertiary<sup>25</sup>. The sector that is growing the most within the period considered is the tertiary one, with an average annual growth rate of around 9.6%, even though it remains the lowest in students' volume if compared to the primary and secondary sectors. In 2000 only the 7.7% of total population in China enrolled in the tertiary sector, while in 2013 the percentage grew up to the 27%.

The increasing level of education, especially in the tertiary education system, is playing an important role in developing highly skilled human resources that are necessary in an innovative country to the contribution of the creation and diffusion of new knowledge.

The ministry of Education (MEO) in China is responsible for the regulation, government and the main financing of China's tertiary sector, which is under control of the State Council. China's tertiary education system is progressively moving towards new forms of financing: local (institutions administrated by local governments), private through fees of various nature and endowments and in addition others coming from enterprises, associations, organizations, individuals and external services with potential additional revenue. However the central government remains as the main supervisor and source of finding through its central allocation system of most of the educational institutions.

Over the years the tertiary sector has undergone many changes, in 1993 the Outlines of China Education Reform and Development policy reformed its governance structure, while in 1998 the Higher Education Law fostered private institutions, enterprises and social organizations to enhance and contribute to the tertiary system. Despite the increasing government influence in developing and supporting the tertiary sector, as we seen in the previous chart (Figure 6), the share of population with a tertiary education level remains relatively low in China. The United State and Korea have one of the highest percentage of

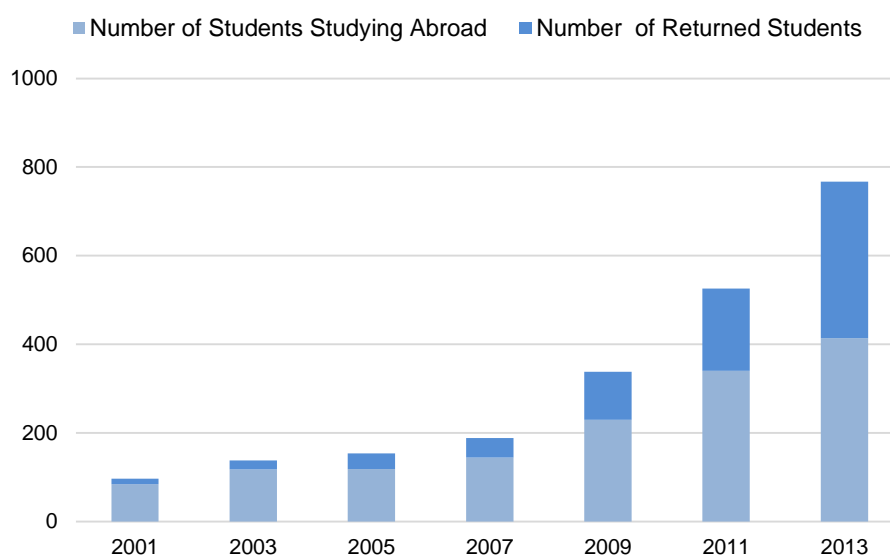
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<sup>25</sup> Gross enrolment ratio. Primary/Secondary/Tertiary. Total is the total enrolment in tertiary education, regardless of age, expressed as a percentage of the total population of the five-year age group following on from secondary school leaving. The indicator can exceed 100% due to the inclusion of over-aged and under-aged students because of early or late school entrance and grade repetition, The World Bank 2015.

student enrolled in the tertiary education level, respectively the 94% and the 99% of total population following on from secondary school in 2012 (The World Bank 2015).

Moreover since the implementations of the reforms, the Chinese Government has promoted study abroad for its students recognizing the importance of the internationalization of tertiary sector. Exchange programmes along with education co-operation were established with more than 170 countries. In 2006, The Ministry of Education prioritized government scholarships for students willing to study abroad in all academic path from science to humanities.

**Figure 6.1 Statistics on Postgraduates and Students Studying Abroad, thousand**



Source: China Science and Technology Statistical Yearbook, 2000 - 2013

The number of students studying abroad in all levels is impressive and it is growing year over year. From the initial reforms of 1978, almost 3 million Chinese students went abroad to study and nearly half have returned to China (Ministry of Education, Chinese Statistical Yearbook 2014). The rate has remained approximately 30% for decades<sup>26</sup>, while from 2009 it has increased dramatically also due to the great economic expansion of China of the last

<sup>26</sup> “Luring Back the Chinese Who Study Abroad”, David Zweig, The New York Times, 21<sup>st</sup> Jan 2013

years. China's economic growth has provided overseas students more opportunities for job places, has created new ways to utilize their new expertise once they come back home and, as Xi Jinping stated in the 100th anniversary of the Western Returned Scholars Association, students have the freedom of coming and going<sup>27</sup>.

During their experiences abroad, returnees have gained both human and social capital, expressed as new knowledge and important networks in the host country. As a survey reveals, more than half of returnees recognize the value of studying abroad, the developing of an international experience (78.8%), the language skills (78.3%), the independent thinking (71.3%) and the adaptive capacity (68.9%)<sup>28</sup>, skills that non- returnees may lack. Moreover according to X. Liu et al. (2010) returnees are more willing to start an entrepreneurial activity and their firms result to be more innovative and performed better than non-returnee in term of innovation.

The Chinese ministry of education has accordingly promoted measures to attract and create more friendly environment for returnees, for instance giving them the possibility to start businesses benefiting of special funding promoted by the government. Indeed, so far the government has allocated more than 365 million yuan to support the returnees' start-ups<sup>29</sup> in key sectors as high technology, biomedicine and electronic information.

Science parks have also a special role in attracting returnees since incubators are strongly present in those areas to support and coach entrepreneurs along their stages of development.

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<sup>27</sup> "China sees a growing number of returnees", China Daily, 9<sup>th</sup> Jun 2014

<sup>28</sup> "Returnees more willing to go it alone", China Daily, 21<sup>st</sup> August 2015

<sup>29</sup> "Talented returning Chinese look to startup companies", China Daily, 30<sup>th</sup> Sept 2015

## 5. Discussion

This work has examined the main determinants in fostering entrepreneurship and innovation in emerging countries, considering the case of China. Specifically the author has implemented a top-down approach throughout the analysis, defining first what are the main areas that influence entrepreneurship and innovation in emerging countries and then describing how those have been applied in the Chinese environment and with what results.

Beginning with the analysis of the present Chinese economic and financial context, we prove that recently China has accelerated its shift from a manufacturing base to a knowledge base economy due to the raising pressures over the economic and financial stability of the country. The slowdown of China's GDP and the recent turbulence on the financial markets have resulted in the government decision to devalue the national currency, the yuan, by nearly 2% against the US dollar a few months ago, with the aim to spur growth and to boost exports. Along with the slowdown of GDP, the ageing of population (that pushed the government to allow Chinese families to have a maximum of two children at the end of October 2015 to increase labour supply), the declining of returns on massive fixed investments undertaken in the last years and the increasing debt, stimulated China to find new ways to raise productivity and to begin to pursue a more sustainable future growth model. Moreover these recent events occurred gave an important signal to the global economic environment, China needs to change its growth model fast and it needs to do it now.

Our result supports the hypothesis that determinants as government and innovation policies, the research and development context, intellectual property rights, entrepreneurial environment, social cultural factors and human capital positively affect entrepreneurship and innovation activities in a country as China. The picture resulting from the analysis is positive and has profoundly contributed to the creation of a solid base on which China can expect to grow in



the next decades. Growth triggered by innovation is possible for many reasons and, as Baark (2001) argues, the first step in developing key sectors conducive to innovation is the recognition of their crucial role by the central government and public organizations. In the last years, the Chinese government have issued the first real innovation – driven developing model, The Medium- and Long term Strategic Plan for the Development of Science and Technology (2006 – 2020) along with the 12<sup>th</sup> Five Year Plan (2011 – 2015) that resulted in a rapid increase in the national expenditure in research and development over GDP that reached the 2.08% in 2013 and in a impressive expansions of the number of patent applications. China’s patent office is now the largest in the world and most importantly China is now the top country in inventions patents filling. Moreover the government has been able to stimulate indigenous innovation within its regions, by creating special economic zones that take inspiration from the Silicon Valley in the United States. These special zones or also called “science parks” are characterized by a strong link between universities, industries, private and public research institutions and since their establishment they have highly contributed to the innovation capabilities of the host region offering special treatments to entrepreneurs. It is important to underline that the most famous Chinese start-ups happened to born within this friendly areas. Shenzhen Special Economic Zone is one of the most famous SEZs in China that have invested up to the 4% of its local GDP in R&D while the average R&D expenditure on the national level was 2.08% in 2013 and globally is 2.5%<sup>30</sup>. As an example, Dji is a Chinese start-up founded by recent graduates in Shenzhen in 2006 that in just 8 years was able to become one of the world leader companies in the drones industrial sector, by also reaching one of the most rapid growth rates in the world. The MIT media lab students along with the director Joi Ito and LinkedIn founder Reid Hoffman visited Shenzhen in 2013 and have defined the trip as “exciting” founding an environment that stimulates creativity<sup>31</sup>.

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<sup>30</sup> “The Future passes through from Shenzhen”, Liu, Zhang e Wu, Shidai Zhoubao, China 2015

<sup>31</sup> <https://www.linkedin.com/pulse/20140817060936-1391-shenzhen-trip-report-visiting-the-world-s-manufacturing-ecosystem>

China has also investing in developing skilled human resources, fostering the tertiary sector with ad-hoc policies and reforms that contributed also to the internationalization of it. Scholarships and new form of funding became available for Chinese education institutions, with the aim to raise competitiveness among universities and to offer always better study plans and courses for students. Entrepreneurship education was needed in China and it has remained a relatively new concept and practice for the university sector. The first MBA programmes have been launched, being the government aware of the significant impact that these studies may have on the entrepreneurial promotion and success in building an entrepreneurial oriented culture in China. The number of students studying abroad has increased dramatically over the years and around half of them have returned to their home country bringing new skills, experiences and capabilities. China's aim is not limited to create a friendly context for its returnees, but it is trying to attract talents within its companies from all around the world. An interesting article written by Harold Thibault for "Le Monde" over the Start-ups in China, addressed this aspect saying that managers and inventors are leaving the Silicon Valley to move to China and to work for Chinese start-ups with great growth potentialities. Andrew Ng, Phd at Berkeley, manager of a research laboratory on artificial intelligence at Stanford University and founder of Google Brain project at Google is now the Chief Scientist at Baidu, the most famous research engine in China, along with the ex researcher at Facebook Xu Wei and the Director of the research department of Microsoft Asia, Zhang Yaquin. Xiaomi, another example of a technology start-up in China, has recently hired the Android Development Manager Hugo Barra.

Importantly however we have found that China is still facing institutional and social barriers and obstacles that may hinder the country to shift from a manufacturing base to a knowledge base economy. Despite the improvements in almost all economic sectors, institutional and cultural barriers along with corruption characterize the present situation. First of all there is still a legal and political uncertainty in China, especially related to the business sector. Even though the government has implemented new policies and reforms to foster

entrepreneurship, entrepreneurs still struggle against bureaucracy mostly when they want to apply for permits and licenses. In fact, according to the World Bank indicator, time required to start a business in China, expressed in the number of calendar days needed to complete the procedures to legally operate a business, remains around 31.4 days, way higher than countries as Malaysia, Korea, United States and Europe as an aggregate. Secondly, the Chinese government sometimes lacks of transparency within its procedures that not only hinder the entrepreneurial spirit of citizens that find it difficult to access to all information needed to start a business, for instance regarding the payment of taxes' issue, but also the lack of transparency may develop concerns at the foreigners' eyes when they want to establish their ventures in China. Competition is another issue to address when considering barriers to doing business in China, since governmental presence in the business or industry sector is still relevant. Competition is unfair when public companies or state-owned enterprises have easier access to funding or to the market, compared to private ventures.

Thirdly, even though some Confucian values are supporting factors of entrepreneurship as persistence and diligence, Chinese' culture highly emphasizes conformity to existing norms and rigid hierarchy in social and business life. Entrepreneurs in western societies are people that take risks in order to achieve a desirable outcome, while Chinese entrepreneurs having a high respect of the existing norms rarely take risks and "think out of the box" in order to exploit a new business opportunity. Indeed Chinese entrepreneurs are mostly considered hard-workers, social leaders, role models instead of pioneers and risk-takers.

Moreover Confucianism still influences the current Chinese education system that promotes values as "obedience" and "respect for authority" that leave little space for students to develop creativity, independent thinking and revolutionary ideas. Thus the overall education system, from schools to universities, is weak in promoting values conducive to entrepreneurship, even though some changes are taking place, as the internationalization of the tertiary sector and the introduction of entrepreneurial courses and MBAs. Trust or *guanxi* is another

important aspect embedded in China's cultural environment and it has always been positively correlated to the success of entrepreneurial activities. Thanks to the exchange of favours or connections, parties involved in a business can benefit from each other and minimize the presence of natural obstacles and barriers. On the other hand, trust is difficult to obtain in China and it is usually restricted to the familiar context or close networks. It can negatively affect entrepreneurs' access for funding for both main reasons, first lack of connections can for instance hinder the ability to get loans or to establish tight relationships with local suppliers, secondly venture capitalists could not have the possibility to add value to the firms since it is hard for them to participate in the financial and strategic decisions of the company or even to actively monitor the business from the inside.

Lastly, intellectual property rights are another big issue for China, even though also in this sector the country has introduced a lot of improvements. In order to create a friendly environment for companies and researchers, the legal and commercial frameworks need to be detailed and respected. Severe infringements need to be established and punishments for violations need to be addressed by courts. This does not happen very often in China, since fear of patent's protection is still present for both local and foreigners applicants. The quality of patents is in doubt too, especially considering the inventions one that contain a higher level of innovativeness. Some researchers and scholars in fact say that the overall level of innovation embedded in Chinese patents is less than the one of the advanced economies, also because it does not come from indigenous innovation driven by researchers' discoveries, but it is mostly triggered by government targets.

School is the main effective vehicle to promote a new culture along with values to transmit to the new generations, so China needs to revolutionize it if wants to become an innovative country. Measures against corruption need to be strengthened and transparency over business related issues have to be embedded in the normal business life. Furthermore incentives to invest in R&D are essential but the government does not have to pretend too much from

research institutions for instance in terms of patents' targets, since the outcome can be weaker than the one expected.

If China will encounter difficulties in fostering entrepreneurship and innovation through the above framework presented, the Chinese economy will probably set to stall with hard possibilities to leverage wages that remain still low than other major economies. This occurs when low-income countries that, after having achieved middle-income status, stagnate there unable to move to high-income status. The past growth determinants become weaker as the country grows and reaches higher levels of output and wages. If innovation will not foster productivity needed to continue to grow at high paces, China will no longer being able to compete with low-cost regions or labour-intensive industries of other countries and the overall Chinese industry sector will lose competitiveness on the international level. Moreover the internal demand expressed as household consumption will put pressure over imports, while exports are slowly decreasing.

## **6. Limitations**

The research is restricted to a limited study of certain determinants to innovation and entrepreneurship that of course do not involve all factors that influence the entrepreneurial context and development of a country. The most important ones have been taken into account and analysed along with the final discussion presented.

The second main limitation to this research is the availability of official and reliable data of China. China has remained closed to the external world for a long time and there have been occasions where the government manipulated data in order to meet or underestimate certain economic results, analysts say. Indeed scepticisms argues that during the impressive growth of the Chinese economy, the government used to adjust its macroeconomic indicators depending on which message it wanted to give to the international world, so its data cannot be trusted. But, along with the internationalization of the Chinese

economy and the opening to the global market, its data have come under closer scrutiny by analysts and research institutions of all around the world. Chinese data were incorporated in the main social and development indicators by The World Bank, even though still now just a few of them are available to the public. For instance, it would have been interesting and relevant to the research to access more data over the number of private ventures and start-ups in China or their growth rate, but no reliable data and quantitative information were available. Accordingly the author of the thesis had to rely on the available both official and “less official” data to develop the research, analysis and conclusion.

## 7. Conclusion

The purpose of this study was to analyze the main determinants in fostering entrepreneurship and innovation in China and to develop a comprehensive framework that can be useful and applicable to all emerging countries willing to shift from manufacturing base to knowledge base economies. Thus the framework presented can also be a valuable tool for further research over this topic. As resulted, China was able to develop an overall entrepreneurial friendly environment that will act as a basis for future sustainable growth so, in connection to the above findings and the very latest news about the introduction of the Chinese’s official currency, the Renminbi, in the International Monetary Fund’s basket of reserve currencies next to the advanced countries (U.S., Europe and Japan)<sup>32</sup>, this research concludes that China does have the potential to become a future global innovation leader.

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<sup>32</sup> “IMF Approves Reserve-Currency Status for China’s Yuan”, BloombergBusiness, 30<sup>th</sup> Nov 2015

# **Appendix A-E**

## **Appendix A**

A comparison between China retail sales and China Fixed Asset Investment  
(2010 – 2015)

## **Appendix B**

Chinese Stock Markets comparison (2006 - 2015)

## **Appendix C**

Chinese Stock Markets comparison (2012 - 2015)

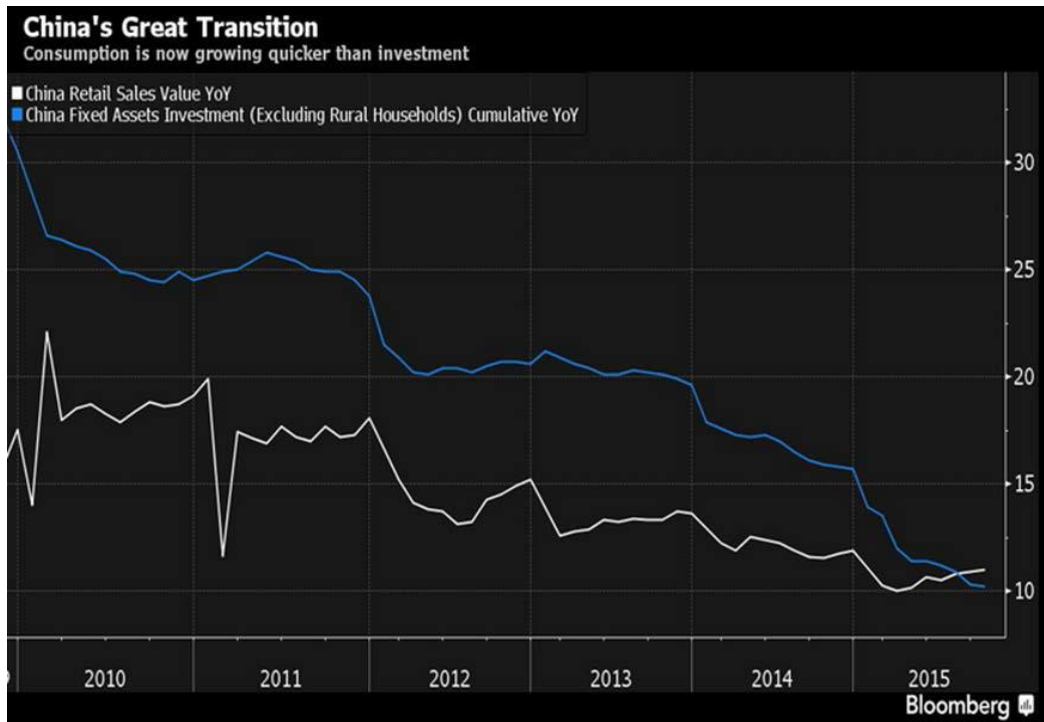
## **Appendix D**

How China and comparator economies rank on the ease of doing business

## **Appendix E**

Bibliography

**Appendix A: A comparison between China retail sales and China Fixed Asset Investment**



Source: Bloomberg

**Appendix B: Chinese Stock Markets comparison (last 10 years)**



Source: Bloomberg

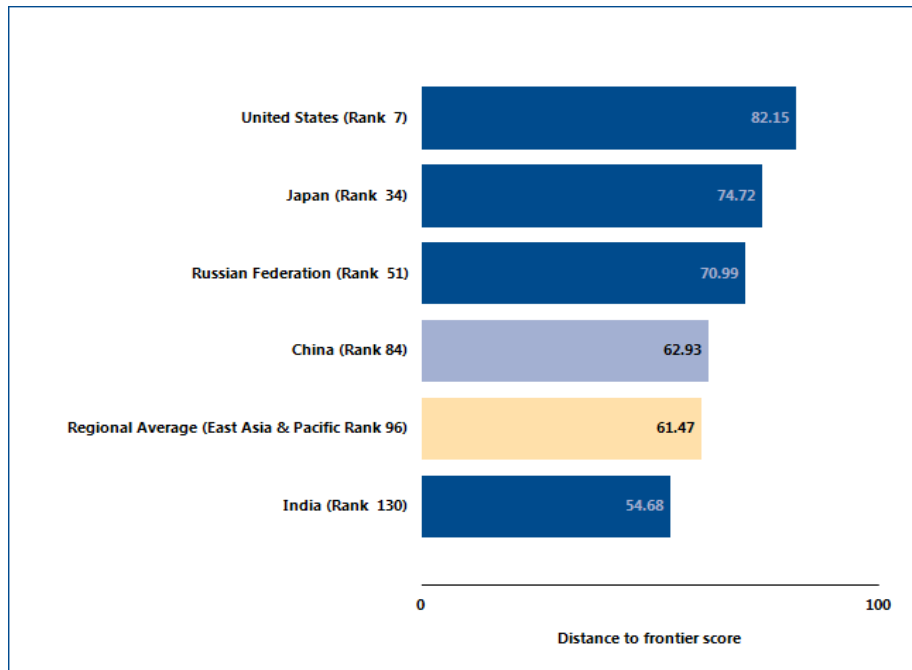


### Appendix C: Chinese Stock Markets comparison (last 3 years)



Source: Bloomberg

### Appendix D: How China and comparator economies rank on the ease of doing business



Source: Doing Business 2016 - China Report

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