국제학석사학위논문

The role of local Multinational Companies in enhancing the Competitiveness of the Chinese Industry

Case Study of *Huawei Technologies* and the Information and Communications Technology Industry

중국 산업의 경쟁력과 지역 다국적 기업 발전의 역할 분석

Huawei이 및 정보 통신 기술 산업 사례 연구

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Benjamin Cartier

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Academic Advisor: Professor Erik J. Mobrand

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Benjamin Cartier

Confirming the master's thesis written by Benjamin Cartier

February 2018

Chair Professor Moon Hwy-Chang (Seal)

Vice Chair Professor Jeong Jong-ho (Seal)

Examiner Professor Erik J. Mobrand (Seal)

Abstract:

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Benjamin Cartier
International Areas Studies Major
Graduate School of International Studies
Seoul National University

Over the past two decades, the Chinese economic development has received a lot of attention. From a planned and relatively poor economy, it has become the world's second largest and the world's first exporter. In the beginning, western Multinational Companies (MNC) have invested massively in China and was in integrant part of its development. Nevertheless, over the past few years, Chinese Multinational Companies started to emerge on the global stage and, more importantly, started to invest massively in developed markets such as Europe and North America. Previous research have already investigated this trend notably how it compares to traditional theories developed on Foreign Direct Investment. Based on Moon's imbalance theory, the thesis seeks to understand how these investments affect China's industrial competitiveness. The hypothesis therefore states: "Chinese MNCs through their

internationalization process contribute to the development of the Chinese Information and communications technology (ICT) industry". In order to investigate, the case of Huawei Technologies and its impact on the Chinese ICT is studied thoroughly. Huawei was chosen due to its prominence on the global stage and the position it has as a pioneer in outward FDI. This case can help to demonstrate how Chinese MNCs' global operations can upgrade the competitiveness of the Chinese industry and how investing in more developed market can be positive for both the company and the home country. It appears that it is the case through its activities within the Chinese ICT clusters and through the global sourcing of assets upgrading the firms' activities.

Keywords: China, Competitiveness, Multinational Companies, Emerging Market, Outward Foreign Direct Investment, Imbalance Theory.

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논문 초록

지난 20년 간 중국의 경제 발전은 많은 관심을 받아왔다. 비교적으로 가난한 계획경제에서 세계에서 두 번째로 큰 경제규모를 가지게 되고 세계 수출 1위 자리를 차지하게 되었다. 서구의 다국적 기업들은 중국 격동의 시작부터 중국에 대규모적으로 투자해왔으며 중국의 경제개발에 큰 역할을 해왔다고 평가된다. 그럼에도 불구하고 지난 몇 년 동안 중국 다국적 기업은 세계무대에 서기 시작했으며, 더 중요하게는 이러한 기업들이 유럽 및 북미와 같은 선진국 시장에 대규모적으로 투자하기 시작하였다. 이전의 연구는 대체로 이러한 경향을 전통적인 해외직접투자와 비교하였다. 본 논문은 문휘창의 불균형 이론에 근거하여 이러한 투자가 중국의 산업 경쟁력에 어떻게 영향을 미치는지 이해하려고 한다. 따라서 가설은 ‘중국의 다국적 기업은 국제화 과정을 통해 중국의 ICT 산업의 발전에 기여한다’고 설정되었다. Huawei이의 중국 ICT 산업에 대한 영향이라는 사례를 중심으로 연구가 진행되었다. 세계무대에서 Huawei이의 명성과 해외직접투자의 선구자로서의 위치를 고려하여 본 사례를 선정하였다. 사례를 통해 중국 다국적 기업의 글로벌 운영 방식이 어떻게 중국 산업의 경쟁력을 증진하는지, 그리고 선진국 시장에 투자를 하는 것이 어떻게 기업과 중국 본국 모두에 긍정적인 영향을 미칠 수 있는지 보여준다. 연구된 바에 의하면 중국 ICT 클러스터 내에서의 활동과 기업의 활동을 업그레이드하는 자산의 세계적 조달을 통해 이러한 영향을 미친다.

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List of Abbreviations:

DTF: Distance to Frontier (index)

EM: Emerging Market

EMNC: Emerging Market Multinational Company

FDI: Foreign Direct Investment

GDP: Gross Domestic Product

GVC: Global Value Chain

ICT: Information and communications technology

IT: Information Technology

MNC: Multinational Company

OFDI: Outward Foreign Direct Investment

US: United Stated of America

R&D: Research & Development

SEZ: Special Economic Zone

I. Introduction

The recent development of the Chinese economy is widely considered as a miracle. Indeed, within a couple of decades China has managed increased its gross domestic product (GDP) per capita from 220 US dollars in 1980 to around 8000 US dollars in 2016 (World Bank, 2017). The economic upheaval began in 1978 when the Chinese central government started passing reforms simplifying commercial activities for local and foreign companies. The success was immediate as foreign companies invested massively in China and local firms were benefitting and growing from the partnership forged with foreign firms. The development of this economic pattern led to China being qualified as "the world's manufacturer" as the country specialized itself in the exports of manufactured goods. The main factor behind these exceptional economic performances was the ability for the manufacturing sector to have a relatively easy access to capital and to a large labor pool (Li & Shi, 2013, p.358). This setting favored a concentration of activity in the low quality and relatively low-income segment of exported goods. Nevertheless, in recent years, the Chinese economic model showcased some limitations as its national economic growth was starting to slow down. Huang & al. (2013) argue that the current setting of the Chinese economy, focusing on low-value added production, does not allow further economic development. Consequently, to pursue further and sustainable growth and to enhance qualitatively their economic development, China must be more competitive in higher value-added sector (p.36).

One of China's main economic challenges in the current era is the transition from a manufacturing-based economy to a more knowledge-based and innovation-oriented economy. Innovation concentrates the economic production toward a higher-end, less labor intensive, and more value-added segment of the economy. It is an essential development for the Chinese economy as the labor supply is diminishing and, other less developed countries are beginning to strongly challenge the competitiveness of its manufacturing sector. As China ambitions to be among the most innovative countries, the focus on the knowledge output has been a main part of the economic planning from the central government. In a framework spanning from 2006-2020, it has emphasized on the general growth of research & development (R&D) activities. Moreover, it suggests that one of the main drivers for this growth has to be the private sector, more specifically the firms (Zhou, 2013, pp.125-126).

Chinese firms have evolved massively since the beginning of the economic reforms. The environment shifted from the dominance of large State-owned firms to the rise of privately owned firms. The importance of privately owned firms has continued to rise as they also started to invest massively outside the Chinese borders. Moreover, they are committing large resources toward research and development challenging the already globally established MNCs from the developed countries. Since the middle of the 1990s, large, successful, and technology intensive firms were encourage by the Chinese authorities to invest abroad. The objective was not only to expand their business activities in foreign markets and increase their respective profits, but it was

also to upgrade their technological resources and enhancing their image by operating in more competitive markets. Through this policy, Chinese Emerging Market Multinational Companies (EMNC) started to emerge and compete in the global market (Di Minin, 2012, p.190).

EMNCs are relatively new actors on the global economic stage. The term can straightforwardly be defined as multinational firms that have headquarters in what is considered an emerging country. Prior to their emergence in the 1980s, foreign investments was limited to firms from developed countries, traditional Multinational Companies (MNCs), as they were more advanced and could compete with the local competitions. EMNCs usually do not have that advantage, especially when investing in developing markets, but it does not restrained them from being present in such markets. The growing number of global actors that have risen from emerging countries can perceive this tendency. The world's largest MNCs used to be exclusively from the United States (US), Japan and Western Europe. Nevertheless, if we refer to the fortune 500 ranking, the emerging markets have a strong presence, around 40% of the world's 500 biggest firms, with China leading the way with 115 companies rising from less than 20% a decade ago (Casanova & Miro, 2016, pp.42-43). Emerging countries were the first destination for EMNCs, while the most successful were tentatively moving in more developed markets. Nevertheless, after the 2008 financial crisis, EMNCs started to expand their investment in emerging economies to invest massively in the more developed American and European markets. Between 2007 and 2016, the amount of

Chinese outward foreign direct investments (OFDI) has grown by 450% and during that same period of time investment in Europe and North America has risen by 570% (China Bureau of Statistics, 2016).

The role of the Chinese EMNCs in the economic development of China is the central problem of our research. Chinese firms have invested massively abroad, especially in more developed economies. As it is the case for Huawei, Chinese firms seek a position of global leader and create global networks to increase their competitiveness. However, how does the activity of these firms contribute to the national competitiveness? In order to investigate this research problem, the analysis will be focused on the Chinese Information and Communications Technology (ICT) industry and the role of Huawei. The company has always been a forerunner of the Chinese economic development. Indeed, the firm was one of the first privately owned firms originating from China and from its beginning stages had a strong orientation toward innovation instead of cheap manufacturing. As a result, it has become arguably the world's biggest actor in the ICT industry while remaining based in Shenzhen, China. Additionally, The ICT industry has developed massively since the year 2000s and has strategic implications, as it is seen as the source of the fourth industrial revolution. Huawei is at the core of this industry and it is the leading Chinese firm in the sector both domestically and internationally.

1.1 Hypothesis and Research Question

The main purpose of this study is to understand the role of Chinese MNCs in the country's transition toward a knowledge economy. This is mainly motivated by the importance, locally and globally, that these firms have acquired in recent year. More specifically, as one of the largest and most international-oriented company, the case of Huawei and its impact on the Chinese ICT industry is studied. In order to investigate this problem, the research will be guided by the following research questions:

- How globally competitive it the Chinese ICT industry?
- How Chinese MNCs contribute to the competitiveness of the Chinese ICT industry?

The research will seek to test the following hypothesis:

- Chinese MNCs through their internationalization process contribute to the development of the Chinese ICT industry.

1.2 Research Plan

In order to answer the research questions and to test the subsequent hypothesis, the research is divided into six comprehensive parts. Firstly, the development of the ICT industry in the world and in China is described as a background for our analysis. Secondly, a theoretical framework is established by examining the traditional theories, and their respective evolutions, on competitiveness and internationalization. Through

this breakdown, the adequate theories will be chosen in order to process the empirical data collected for the subsequent analysis. Thirdly, a review of the existing studies is done to demonstrate the current limitations in the field of research and to establish the uniqueness of our analysis. Fourthly. The data and the methodology utilized for our analysis is described. Fifthly, the industry-level analysis is conducted in ordered to assess the competitiveness of the Chinese ICT industry. It is followed by the firm-level analysis that mainly studies firm, Huawei, through its different development stages. Finally, the empirical data obtained from is assessed and analyzed in order to understand the implications of our research.

II. The development of China's ICT industry

2.1. The ICT industry

The emergence of the ICT industry in the global economy is relatively recent. ICT represent the convergence of the telecommunication industry and the information technology industry. Both of these industries have been developing relatively independently from each other. The telecommunication industry evolved from the first industrialization by integrating different technologies advances (telephones, mobile, etc.) and unifying its distribution channels to become a worldwide industry. The main actors of this industry consists of the providers of telecommunication services mainly telephone related companies and Internet service providers. The information technology (IT) industry had its breakthrough much later in the 1940s and 1950s through the invention and development of computer technologies. From a business perspective, IT industry can be defined as "the study, design, development, application, implementation, support or management of computer-based information systems" (Morabito, 2016), which usually represents computer technology and their operating networks (p.122). The role of this industry is to provide an efficient management of information in order to increase the competitiveness of its customers. This is mainly done through hardware and software development and upgrading to suit the demand.

The late 1990s marked the convergence of both industries into the Information and Communications industry (ICT). The core of this industry is the Internet related activities. Many scholars have argued that the development and proliferation of Internet became the cornering stone for the development of a "new economy", or the "digital revolution" (Meng & Li, 2002, pp.278-279). The convergence of both telecommunication and IT industry has caused ICT to have a broad definition and be more of an umbrella term for an array of sub-sectors that are interconnected. Consequently, ICT can be defined as "technologies used by people and organizations for their information processing and communication purposes" (Zhang, Aikman & Sun, 2009, p.628). From an industry perspective, the ICT refers to the "the application of science to the processing of data according to programmed instructions in order to derive results", including all activities related to communication, information and supporting technology (Zuppo, 2012, p. 16). Overall, the development of the ICT industry to has allowed the communications to be more efficient, thus creating a global network where information is efficiently produced and dispersed around the world (Zuppo, 2012, p.17).

2.2. China's entry in the ICT industry

The rise of the Chinese ICT industry occurred with the opening up of the economy. During the Maoist era, the technological development was almost inexistent. The era was marked by two main political and economic reforms, the Great Leap Forward and the notorious Cultural Revolution. These initiatives had a negative impact for the economic development of the country as nationwide political unrest halted any forms of development. The end of the Maoist Era would leave place to a series of economic reform that would spur the future economic development. By 1978, Deng Xiaoping, Mao's successor, commenced the Four Modernizations reform. The aim of this policy was to introduce some element of the market economy within the socialist economy. The way was to be implemented such as "crossing the river by feeling the stones" entailing that the changes was to be gradual rather the radical (Perkins, 1994, p.24-26). The original plan was to modernize respectively the heavy industry than the light industry followed by the agriculture, the scientific and technology sector and, finally, the national defense. However, the Chinese economy had to be opened to foreign trade and Foreign Direct Investment (FDI) for these policies to function and to the development of manufacturing-based exports. (Yusuf & al., 2006, p.2-3). This context was favorable for the burgeoning of the ICT sector.

The development of the Chinese ICT sector was largely a top-down endeavor. From the beginning of the reforms, ICTs were perceived by the government as strategic and

highly beneficial to the economy. In the first phase of the economic opening, the development of ICTs was predominantly done for strategic and political reason. Consequently, the market was dominated by State-owned enterprise closely linked with the government and the technological advances had the main purposes to bring up to the date the state's public and military equipment. By the 1980s, the first success of the economic opening was showing its first slowdown. Consequently, the central government decided to further develop the potentially highly profitable ICT industry.

The first phase of this development was characterized by an "attracted in" policy. The strategy for having a strong and profitable ICT sector was for china to become the world's leading manufacturer. As the local economy was not developed enough to breakthrough in a capital-intensive industry such as the ICTs, the focus was set on attracting foreign direct investments (Ning, pp.68-69, 2009). The main outcome was the establishment of Special Economic Zones (SEZs) where, unlike the rest of the country, market institutions and a preferential regulatory system was introduced in order to favor foreign direct investment. The success of the SEZs pushed the government to extend further this policy in the country. As a consequence, the amount of ICT related FDI rose from 345 million US dollars in 1995, to 8.638 billion US dollars in 2004 (Ning, p.74, 2009). Moreover, during that period, China has also surpassed the US becoming the first exporter of ICT related goods. The strategy of "attracted in" would ultimately allow firms to acquire technological and financial capital contributing to the growth of the domestic ICT sector. The quality of FDI has

also improved over the year showing the qualitative evolution of the industry. This is illustrated by the multiplication of foreign MNCs establishing R&D centers. By 2006, over 750 centers were established (ibid).

The following phase of the development was a "walking out" strategy. As Chinese ICT firms acquired more technologies and more capital, the next step was to expand their activity outside their borders. This process was largely influence by public authorities as most major ICT firms remained State-owned mainly for strategic reforms. However, through privatization reforms SOE's were reorganized to more efficient market oriented organization and the less efficient ones were dismantled and privatized (Ning, 2009, p.69). The new private companies although a number small would for become large firms such as the computer giant Lenovo. Furthermore, China's accession to the WTO in 2002 incentivized market liberalization making it more diverse. Large firms private or state-owned were nevertheless still closely linked to the central government. Consequently, the largest ICT firms were encouraged by the central government to expand their activity globally. From the early 2000s, there was a massive rise in outward foreign direct investment by Chinese ICT firms, which, for a part of them, manage to be major global players.

2.3. The current situation and future challenges

The ICT sector has become a major part of the Chinese economy. Its contribution to the China's economy has been steadily increasing and in 2015, it represented around 15% of the country's GDP (IDC, 2017). Institutionally, the situation is less positive. The expansion of the industry has continued despite an unfavorable institutional setting. The major flaws are mainly observed in the strong State's control of information and the poor intellectual property regulations. Although China has become an integrant part of the global ICT production, its participation remain at the lower value-added end of the spectrum as these institutional shortcomings do not allow them to upgrade its activity. The exports are of ICT goods are still very high and have significant impact on the economy (International Trade Administration, 2017). The lack of evolution in the quality of the ICT production makes the industry vulnerable to foreign competition, which is starting to be more competitive in producing low-value added product.

Upgrading the quality of product has become a national stake, affecting as well the ICT sector. Upgrading from a manufacturing-based economy to a more knowledge-based and innovation-oriented economy has become key for the Chinese industry. Innovation concentrates the economic production toward a higher-end, less labor intensive, and more value-added, segment of the economy. It is an essential development for the Chinese economy as the supply in labor is diminishing and other less developed countries are challenging the competitiveness of its manufacturing sector. As China

ambitions to be among the most innovative countries, the focus on the knowledge output has been a main part of the economic planning from the central government. In a framework spanning from 2006-2020, it emphasized on the general growth of research & development (R&D) activities. Moreover, it suggests that one of the main drivers for this growth has to be the private sector, more specifically the firms (Zhou, 2013, pp.125-126). This is particularly acute for local Chinese firms as a large part of China's ICT export, 79% in 2012, are made foreign investment enterprise. The overall landscape, nevertheless, has been stabilized from the early 2000s. Prior, foreign firms did not implant firmly within the industry whereas now, the key actors ranging from local MNCs to Foreign MNCs and suppliers are consolidated in the industry (Sun & Grimes, 2016, pp.214-215.)

III. Theoretical Framework:

3.1. Evolution of the Cluster theory

3.1.1. The Traditional Cluster theories

Marshall (1890) first identified the formation of cluster for specific industries. By studying why industry specific firms would concentrate in one geographic area, he was able to establish three factors contributing to the geographical concentration of firms: labor market pooling, infrastructure sharing and spillovers, mainly learning from the competitions (Bruciuni & Pisano, 2015, p.15). This presents the formative work on cluster among which many scholars extended the study. Krugmann (1991) extended the work of the field of economic geography by linking introducing the concept of "agglomeration forces" which incorporates economies of scale, local demand and transportation cost in understanding the clustering of firms. It was concluded that for the above factors it was more beneficial for firms to locate themselves in bigger markets.

A cluster can be defined as a "geographic concentrations of interconnected companies and institutions in a particular field" (Porter, 2008). The Diamond Model developed by Porter established four elements that contribute to the competitiveness of a cluster. Firstly, the factor conditions indicate the determinant factors for production necessary to be productive such as the human resources and the infrastructure. Secondly, the

demand conditions evaluate the local market conditions for the industry in question. Then, the context for firm strategy and rivalry refers to the business environment and how firms can be created, operated and competes with each other within the cluster. Rivalry is the core concept in Porter's analysis as concentrated firm presence stimulates productivity hence increasing the economic output of the area. Finally, related and supporting industries indicate the presence of supplying firms that are also internationally competitive. Overall, they contribute to the competitiveness of the cluster as they contribute as well to the production process.

In the updated versions of his model, two external factors, chance and government determinant to the competitiveness were added. They are defined as external as the firms within the cluster do not determine them but they have an influence on its competitiveness. Chance includes unexpected factors that increase competitiveness such as wars, technological discoveries or natural elements. Government encompasses the different elements of industrial policies that affect the firms.

This model underlines the importance of the dynamic relations between these factors in creating a competitive ecosystem. Within this environment the firms rely on other economic actors and existing institutions to increase their competitiveness. The competitive environment along with the cooperation among firms and existing institution spur the innovation within the cluster (Porter, 2008). Consequently, a study

of the economic ecosystem is key in understanding the innovative capacities of companies within a geographical area.

3.1.2. From a domestic to an international perspective

The diamond model is limited by its domestic nature. According to Porter, the optimal setup for competitiveness on the global stage consist of concentrating activities within one location and**,** onwards, servicing other locations. This conclusion is based on the classical theory of trade and omits other developments in international trade mainly foreign direct investment. Thus, the determinant factors of competitiveness remained mainly local while foreign investments and partnerships were not taken into account.

The Generalized Double-Diamond Model developed by Moon & al (1998) extends Porter's analysis to the global stage. Practically, an international diamond is added to the model in order to take into account the MNCs activity within the cluster. It differentiates itself in two regards. First, a sustainable competitiveness can be the outcome of domestic firms and foreign firms operating within a cluster. Secondly, being implanting in different locations can be a source of sustainable competitiveness. Firm-specific and locational advantages can complement each other to gain more competitiveness (p.139). Hence, the cluster's boundaries should stretch beyond the domestic realm in order to increase competition and cooperation between firms increasing innovation in the process (Moon, 2015, p.32).

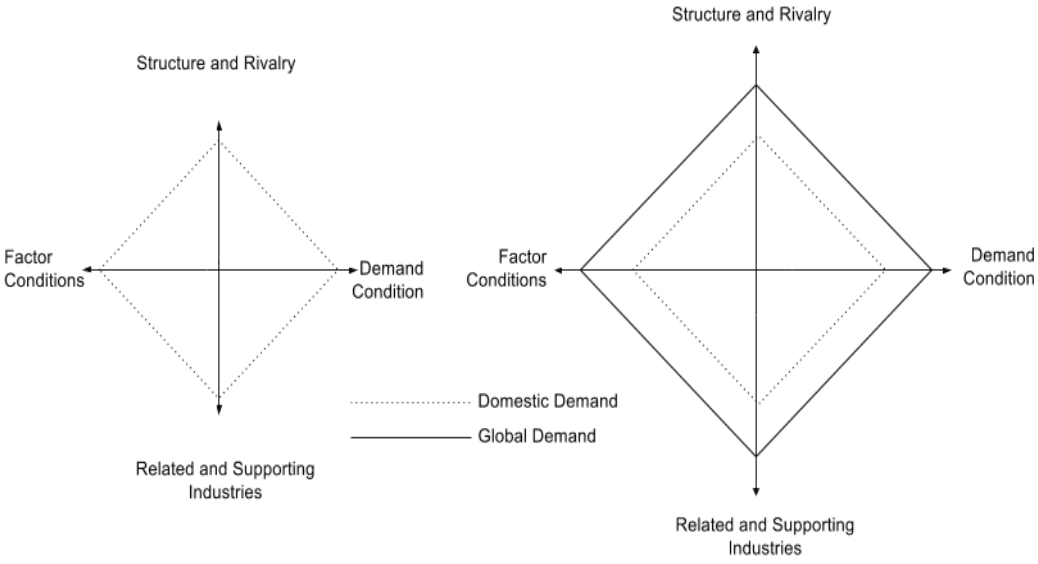

Figure1. The diamond model (left) and the Generalized Double Diamond Model (right)
Sources: Porter (1990) and Moon, Rugman & Verbeke (1998)

3.1.3. Static to dynamic analysis

Innovation is the core source of competitiveness of clusters. Traditionally, the agglomeration effect of cluster is based on basic factors such as economies of scale and lowest inputs. Porter updated this view by defining the competitive advantage of a cluster by its ability to produce innovative products and processes. This is essential in analyzing the competitive advantage of existing clusters. Porter argued that the emergence was mainly due to inherent factors within the location such the quality and exclusivity of the local demand, historical developments or even existing cluster on which new ones can base their developments (Porter, 1998b, pp.26-27).

This elements limits the analysis to developed countries are developing countries usually do not have such factors. Consequently, using the porter's cluster theory remains incomplete in explaining the cluster development in different phases of economic development (Moon & al, 2013, p.76). According to Porter, innovation is the main explanatory factor of cluster formation. In this case, innovation represents a disruptive development outside the usual economic cycle. It is thus limited to advanced economies, which have these disruptive capacities. To extend this limited view, Moon & al. (2013) extend the boundaries of clusters from an innovative entity to a more dynamic entity that "enhances corporations' productivity and their capacity to innovate which otherwise are hard to be acquired by firms elsewhere" (p.77). Consequently, firms within clusters are able to increase their innovative capacity but also their efficiency in other department making them more competitive. By expanding the analysis from innovation to performance, a more comprehensive approach is developed allowing analyzing clusters in different stages of development (Moon, 2015, p.102).

3.1.4. Four stage model for cluster evolution

	Domestic Cluster		International Cluster	
Stage	Regional Cluster	Regional-linking Cluster	International-linking Cluster	Global-Linking Cluster
Characteristics and examples	(Porter's Concept) Silicon Valley, Cambridge	Ex: Hollywood+ Disneyland+ Las Vegas	(Neighboring Countries) Indonesia-Malaysia-Singapore Growth Triangle Pearl River Delta	Silicon Valley + Bangalore Singapore business hub strategy
		Linking Clusters		

Table 1: The Cluster Stage Model
Source: (Moon and Jung, 2010)

The cluster analysis is limited in its geographical scope and static dynamic. In order to incorporate these shortages in a more comprehensive framework, introducing the Cluster Stage Model extended Porter's cluster theory (Moon & al., 2013, p.78). Geographical and dynamic evolutions are synthesized into four stages from which a

cluster can develop. The first stage of this evolution is the regional cluster. In that stage, similarly to Porter's cluster theory, where clusters developed independently from each other based on their domestic advantages. Then, the second stage consists of the appearance of regional-linking clusters. It represents the ability of clusters within a country to interact in order to gain a competitive advantage. The first two stages consist essentially of domestic evolutions within the clusters (ibid).

The next stages represent the development of international clusters. The third stage is the international-linking cluster. In this phase, the boundaries of the cluster are extended outside the national borders to neighboring countries. It allows geographically close clusters to enhance their competitiveness through facilitate cross-border interactions. The final stage, global-linking cluster, prioritize synergies over geographical proximity. Consequently, similarly oriented clusters around the globe are connected to mutually enhance their competitiveness (Moon & al., 2013, p.79)

3.2. Multinational Companies and Foreign Direct Investment

The rise of MNCs is contiguous with the development of Foreign Direct Investments (FDI). FDIs can be simply defined as activities done by the MNCs outside their home country. The theories on FDI are revolutionary in comparison to traditional theories as it assumed that world markets are imperfect as prices of goods and factors are not

equalized across borders, and competition is imperfect. Consequently, firms, in this case MNCs go beyond their national border to take advantage of the competitive assets in other countries. The efficient exploitation of national assets with missing resources present in foreign markets allow the firms to be more competitive. In that case, they are internalizing foreign markets by exploiting the market failure in different locations. All in all, the concept of FDI assumes that resources can be mobilized and exploited across markets.

3.2.1. Dunning's eclectic or OLI paradigm

The seminal theory on FDI is the eclectic or OLI paradigm developed by Dunning. The framework establishes different advantages, ownership (O), locational (L) and internalization (I), to which firm will assess to determine their ability adopt FDI as internationalization strategy. First, the ownership advantage implies that only firms with a significant competitive advantage would venture outside their borders and become successful MNCs. In practice, the superiority of the assets possessed by such firms allowed them to operate successfully in any location, as they have no viable competition. Second, the location advantage addresses where the MNCs decide to operate. This aspect of FDI was traditionally motivated by resources unique to a specific location such as labor cost, access to natural resources or large demand. MNCs are attracted to invest and exploit these advantages. Further studies demonstrated that firms were attracted to more intangible aspect notably by investing within industrial

clusters, as their network was a definite source of knowledge creation, increasing the value of their operations. The location advantage is thus the exploitation of tangible and intangible resources. Thirdly, the internalization advantage focuses on how a firm will invest abroad considering the previous variables by determining the level of control their foreign activities considering the environment. The lowest degree of control is licensing or externalization as firms are not involved in the foreign activities. Internalization represents operations where the firm has a varying amount of control ranging from joint ventures to wholly owned subsidiaries. The cost of FDI is thus also determined by the coordination of exploiting resources abroad.

The OLI paradigm gives a framework for MNCs on FDI. Although evolutions on the model were made, Dunning assumed that the Ownership factor is the primary incentive for FDIs. Nevertheless, as the model evolved from an economic to a business perspective, it becomes apparent that the three factors are not mutually exclusive. Finally, Dunning specified four motivations for FDI. Market-seeking (1), resource-seeking (2) and efficiency-seeking (3) FDIs consists mainly in exploiting the MNCs existing assets abroad. Strategic asset-seeking (4) FDI consist of protecting a firm's ownership advantage and/or adding to its value by acquiring knowledge from their experience.

3.2.2. The development of Emerging Markets Multinational Companies

Traditional theories on FDI limit its application on developed countries. Indeed, firms having a strong competitive advantage are usually present in developed countries. In that framework, developing countries are usually the recipient of resource-seeking FDI based on their locational advantage and their firms do not have a significant ownership advantage to invest abroad. However, since the 1980s, a contradictory phenomenon has occurred as more multinationals from developing countries are investing in developed countries, thus going against the flow of traditional FDI theories. These firms are identified as Emerging Market Multinational Companies (EMNC). Emerging Markets represent mainly countries that from the 1980s went under a liberalization phase focusing on strong low-value added exports. Their success was spurred by trade liberalization and the facilitated access to capital and technology. It also allowed the Emerging Markets to be operational in a multitude of industries as latecomers. Indeed, developed markets having always been liberalized economy were mainly operated in the most profitable and stable industries. Domestically, it increased consequently the demand for goods and services however the local institutions and infrastructures are relatively underdeveloped.

EMNC profited from this latecomer evolution of emerging markets to develop more rapidly. A first aspect is the easy access to technology. Unlike standard MNCs, EMNCs were capable to acquire technology without extensive R&D spending as they

could just copy and adapt existing products to existing markets. Then, as they were domestically in a monopolistic position they had a privileged access to their market and acquired valuable knowledge on the general functioning of emerging markets. Finally, in Emerging Markets, the political institutions and actors have a stronger impact on the economy. Consequently, fostering efficient relationships with the public authorities present a significant advantage. EMNC in operating in such countries have created and acquired methods to adapt to this irregular business environment. Consequently, EMNC became important actors within these emerging markets. Western MNCs had become accustomed to forming various types of partnerships when investing in EM, as they would reduce the cost of foreignness. All in all, EMNC have developed in satisfying the local demand in EM but also in facilitating FDI my traditional MNCs in these countries.

3.2.3. Unconventional FDI and the Imbalance Theory

FDI performed by EMNC represent a limitation of the traditional FDI theories. Over the years, a constant rise of Outward Foreign Direct Investment (OFDI) has been observed from Ems (UNCTAD). Moreover, large shares of these FDIs are progressively made toward developed economies. Moon and Roehl (2001) qualified these developments as unconventional FDIs as the home firm's competitive assets are not superior to the competing firms in the host country (p.199). This phenomenon remains unexplained by Dunning's OLI paradigm in which the Ownership advantage

is an essential requirement for a firm to invest abroad. Thus, traditional theories assume that foreign investment follows a pattern from developed markets to less developed market as it follows the logic that firms seek to exploit market failures. Unconventional FDIs are also representing "strategic investments" by MNCs of all kind. They are categorized by their purpose, mainly the weakening of the competition or the strengthening of the firm's assets, which are not motivated by the firms' current competitive advantage.

4In order to address these limitations, Moon and Roehl (2001) introduced the imbalance theory of FDI. The assumptions are extended from the traditional view of firms exploiting abroad their existing competitive advantage. Firms are also researching in FDI to complement their current asset portfolio. Consequently, the imbalance theory of FDI assumes that firms will behave to have a balance between "their optimal levels of outputs versus inputs". In regards to FDI, it results in a traditional aspect in which firms go abroad to complement their competitive advantage. The Imbalance theory extends this view by showcasing that firms with an insufficiency in exploitable assets will also have an incentive to invest abroad to these shortcomings and be more competitive. The motivation of FDI for firms, according to the imbalance theory, is to seek complementary assets but furthermore to augment the firms' existing competitive advantage and, create new assets. Consequently, the fundamental aspect of the theory is to go beyond the ownership advantage view of FDI and have a global

outlook analyzing both the ownership advantages but also the ownership disadvantage as motivations to resort to FDI.

IV. Literature Review

4.1 Government Perspective on FDIs

Foreign Direct Investment and its growth has become an important aspect of a country's economic development. Nevertheless, prior to understanding its impact, it is important to comprehend how this evolution is perceived in respective countries. Governmental policies are essential in the development of FDIs in one country and they are influenced by the views on FDI from the authorities and the society.

The views on FDIs are shaped by the political doctrines adopted in each country. A first extreme position on FDI is radical protectionism. This position follows the Marxist political and economic views. In that regards, FDI are mainly perceive negatively through the main actors of its development, the MNCs. They are considered as counterproductive for economic development and the development of welfare, as they are perceived as serving only their own benefits and the one of their home country by exploiting the local resources. FDI are perceived as negative as they would principally pool the host country's resources without having any positive inputs on the economic or the social level. In this view, the main opposition for FDI is mainly due to the fact that MNCs have a strict control over technology and management. Consequently, host countries cannot hope for significant transfers contributing to development and it leaves the high value added employment in the

home countries (McMillan, 1993, p.3-5). All in all, FDIs maintains an imbalance between developed and underdeveloped countries hindering development for less advanced nations.

On the opposite end of the spectrum, there is the free market view. FDI are perceived from a classic liberal point of view. Based on the classic economic and trade theories, it suggests that economies should specialize in order to make the international more efficient. In that regards, the MNCs have a more prominent role has they are the actors spreading the outputs into different locations. According to this view, MNCs are seeking the best location for production in order to have a cheaper final product. This view is therefore more prominent among countries pushing for the globalization of the economy notably by reducing the international commerce barriers hindering the spread of FDIs in the world (Moon, 2015, pp.81-82).

The two previous represent opposite but also very radical perceptions of FDIs. In practice, governments usually adopt a more comprehensive approach where FDI are used to comply with their multiple and diverse interests. FDI policies are thus in between the radical protectionist views and the free market view to comply with national interests. This can be defined as pragmatic nationalism as policymakers are finding a balance between the opportunities and the threats of FDI while still gathering the economic benefits. All in all, this view compromises a more cost and benefits approach to FDI for policymakers (Zhang & He, 2014, pp.7-8).

4.2. Traditional perspective: Inwards FDI and Economic Development

Inwards FDI has been considered as en essential too of development for economies. In less developed economies, the attraction of foreign firms allows to generate competitiveness in areas where resources are not developed. This is notably done through a country's participation in a firm's value chain and how it can move up that value chain. Michael Porter's development of the value chain analysis represents the foundational component of the Global Value Chain (GVC) analysis. The main impact of Porter's work was sectioning the firm's operations in primary and secondary activities where companies can improve their competitiveness and improve their margins. Hence, it contributed to subdividing the firm's production process (Ensign, 2001). As the result of more efficient management of value chains activities and firms' specialization in certain production activities, the value chain evolved from being firm exclusive to an intra-firm system mainly due to outsourcing. This contributed to more significant relations between the company and its suppliers in the production and distribution process (Moon, 2010, pp. 14-15). The concept of GVC extends the analysis on international scale. The production and distribution process is divided among a multitude firms that are spread out through different locations.

The proliferation of FDI and the prominence of MNCs on global trade have contributed in increasing internationalization but it has also diversified the supply chains, the trade between firms and the trade of intermediate goods (Moon, 2013,

p158). The GVC framework explores four basic dimensions. First, an input-output dimension analysing the value added at each stage of the production. Second, the location aspect is also taken into account followed by the governance structure. The fourth and final dimension consists of the integration of the institutional context in which the value chain is operating (Gereffi & Fernandez-Stark, 2016, p.4).

For firms operating within newly emerging economies such as China, the global value chain represents an opportunity for economic development. By integrating the global value chain of an industry, the local firms will be able to generate an economic activity. The development stages are defined by the movement upward the GVC, mainly referred as "economic upgrading", is done by a country's ability to transition toward higher value activities. Fernandez-stark & al (2012) established the lower stage of upgrading as the entry into the value chain. The intermediary stage consists of acquiring and internalizing technologies within the global value chain and afterward moving toward a higher value added activity. The final stage occurs when the knowledge acquired allow the company have an activity that is transversal to a multitude of value chains. To a higher degree this evolution leads to the control of its distinctive value chain. Overall, the transition from a new entrant in the GVC to being at the governance position follows a six-stage evolution (p.7).

4.3. Next step: Outwards FDI and Economic Development.

A country shifting from inward FDIs to outward FDI is relatively logic development. As the local economic actors are more resilient and become more competitive internationally it is normal that they would seek market shares in other countries. The link between economic development and increasing OFDI had been established by Dunning's (1981) development path hypothesis, in line with the OLI paradigm. It suggests that a first phase of development will attract FDI and when sustainable and high growth appears, OFDI will rise and surpass the FDI, as local actors are more competitive to invest abroad while still profiting of their local advantages. In terms, the ratio between FDI and OFDI is set to equalize showcasing that a country reached a developed stage limiting itself to high value investments (Fonseca & al, pp.3-4, 2007). Dunning's perspective on OFDI remains limited, as it does not include the role of the government. This is particularly important when the evolution of investments made by EMNCs, as we saw previously, do not always follows the framework set by dunning's OLI paradigm. By investing massively in developed countries despite having a significant competitive advantage to exploit abroad, it is important to specify the role that the governments have encouraging these OFDI and how they contribute to the economic development (Lio & al, 2005, pp.104-106).

The role between governments and firms has been debated among scholars. Indeed, their complex and evolving relationships establishes a framework in which

governments establishes the institutional framework for firms to operate. Moreover, they also regulate and administrate the private sector through different forms of legislation that shapes the competitive environment and the usage of resources by firms. Governments have the main objective of increasing welfare and the compliance of businesses to the regulations is essential. Nevertheless, governments are not just regulating the economy but it is also a part of it. The private sector, thus, also shapes the business environments. A strong economic sector can lobby the policymakers as their economic performances is a strong bargaining power notably in the State's quest to create a strong and competitive economy (Rugman & Verbeke, 1998). As EMNCs become more prominent internationally, firms adopt a prominent role in developing the countries by contributing to the economic growth, upgrading the infrastructure and increasing the competitiveness.

With the importance that firms have to the local economy, governments have an important interest in supporting their foreign ventures and globalization. The public support of OFDI can have different time of forms. First, it can reduce the supports FDI for MNEs by providing securities such as loans or insurance, and setting up government agencies supporting the ventures. Then, governments have an active role in shaping the international economic environment and facilitating FDIs notably through bilateral or multilateral agreements and treaties with other nations. These policies allow the reduction of the economic cost and the institutional risk that face EMNCs (Luo & al, 2010, p.69). All in all, the expansion of OFDI by emerging

countries contributed to their development by enhancing their experience on international markets and the cost and benefit associated with FDIs.

The effects of OFDI on the local economy are mainly positive but depend on the type of investment. On the one hand, OFDI can have a substituting, more negative, effect mainly when the investments proceed in outsourcing part of the production abroad. On the other hand, it can have complementary, more positive, effects when the firms utilize the location advantage to increase the quality of its exports. In general, the latter effects are predominant, however, it is almost exclusive for emerging countries as they have a strong locational advantage (Moon, 2015, p.85). OFDI produces effect for the local economy in a multitude of areas. First, it can produce changes in capital as income for investments can be repatriated to the home country through various sources of incomes such as licensing, royalties or repatriation of profits from their subsidiaries. Outsourcing mainly results in capital outflow. Secondly, Trade follows the same path as it depends on the type of OFDI. However, the setting up of GVCs boost are impacting positively the home country as Intra-firm trade increases and as a result OFDI are more complementary rather than substitutive (ibid). Secondly, the effects are also positive on employment. Employment is the most sensitive issues concerning the perception of FDIs as different workers are affected differently by OFDIs. However, for developing countries, it allows their workforces to increase its quality as the global activities of the EMNCs concentrate more qualified employment in their headquarters and can source talent worldwide, Finally, OFDI allows developing countries to acquire

new technology by acquiring assets abroad and by operating in more sophisticated markets, developing countries can acquire new, more advanced, management techniques (Moon, 2015, pp.86-87). All in all, the return of OFDI for the developed mainly consists of a qualitative input in the national competitiveness by acquiring competences abroad.

V. Existing Studies and Extension

5.1. China's National Competitiveness

The analysis of China's competitiveness mainly revolves around its capacity to innovate. Chinese innovation has usually been associated with a certain copycat culture or the local adaptation of foreign technological advances. Consequently, in analyzing the recent competitiveness a particular focus is set on innovation as an essential element to ensure positive growth perspective. A first study by Zhou (2013) focused on the willingness of Chinese firms to engage in R&D. It is argued that the institutional reforms have a positive impact on the firms' willingness to engage in R&D expenditure. The findings exhibited that provinces with more favorable regulations toward business activities were inciting more the firms in engaging in R&D. However, the institutional factor was found to be limited when firms are already engaged into R&D. Consequently, the governmental factor is important for inciting innovation, nevertheless, other factors are also essential in developing the innovative capacities in order to compete with more developed economies. Boeing and Mueller (2016) investigated the quality of the Chinese firms' investments in R&D. The main finding was that the good R&D performance recently observed does not directly result in competitiveness. Although China is now the leading nation in R&D spending, registered patents and university graduates, these result represented a rise of quantity

over quality concerning R&D activities. Furthermore, the multiplication of registered patents did not produce a significant economic impact.

Aburaki (2013) introduces more variables in explaining the Chinese industrial competitiveness. Innovation is also assessed in the perspective of an evolving Chinese economy. The national innovation system is considered substandard, as it is not translating into an increasing advantage. It is also a major challenge as new competitors are arriving in the segment and returns are constantly diminishing. The study analyses success factors as well. The Chinese market is an advantage by its size but also through its ongoing sophistication. Moreover, Chinese firms have been able to cater to international demand by becoming the world's first exporter. Nevertheless, some challenges remain in the reputability of Chinese products, limiting the development of higher value added exports.

5.2. The Chinese ICT industry

At the industry level, existing studies mainly focus on the set up of the ICT industry in China. Lin & al (2010) studied the dynamics of the industry in three distinctive clusters: the Beijing area, the Shanghai-Suzhou and the Shenzhen-Dongguan regions. Firms operating within these clusters are gaining a competitive advantage through the economies of scales acquired due to their relative proximity. Technological and

strategic developments are done at a firm level and not at the industry-level. It is explained by the situation of the Chinese ICT in the global market. The industry is situated at the lower spectrum of the global value chain. The core competencies of the Chinese firms to operate in the global value chain require cost-saving strategies rather than technological development. Takala & Liu (2010) analyses the strategy development of firms in the Chinese ICT sector. First, Chinese ICT firms differ in terms of operational competitiveness there is a separation between technological firms and manufacturing firms. The institutional context does not allow these two types of firms to create synergies. Moreover, the business customs prioritize ownership over cooperation as collaborative method. All in all, it introduces a pattern of development for firms unique to the Chinese ICT industry.

5.3. Chinese ICT firms

At the firm level, the literature on the Chinese ICT industry focuses mainly on the interaction between different types of firms. The main aim is to understand the geographical and institutional setup that allowed the industry to grow rapidly and how it affects its future development. Overall, the existing literature focuses on two types of firms as unit of analysis, the foreign multinationals and the large local firms. Sun & Du (2010) analyzed the relationship between the foreign firms and local firms within the ICT industry. The purpose of the research was to explore the extent of these

relationships and how effective were synergy in increasing the competitiveness of Chinese firms. It was demonstrated that the relationship between foreign multinational companies and Chinese firms did not increase the competitiveness of the latter. Firstly, only a small number of foreign firms are engaging with foreign MNCs. Then, most of the exchanges did not result in increasing capacities for local firms. The relationships are mainly limited to cost-saving interest by the foreign MNCs, limiting the sharing of technological and operational knowledge. Furthermore, this type of relationship is also limited by the weak intellectual property regulations discouraging firms to cooperate among each other. Clusters are the only area where the limited synergies between foreign MNC and Chinese firms are formed.

The dynamic of clusters are also studied at a local level. Wang & Lin (2012) establishes that there is a country-specific aspect in the ICT clusters' dynamic. The aim of the analysis is to understand the development of the firms' core competencies by operating within a cluster. It was found that innovation, unlike traditional clusters, was not done from a bottom-up perspective. Small Chinese firms do not possess high innovation capacities mainly due to a poor institutional framework, a lack in qualified personnel and relatively hard access to capital. Consequently, the competitiveness of clusters is developed from a top-down perspective, mainly by large firms.

5.4. Limitations and extension

5.4.1. Integrating factors of competitiveness

The majority of the research revolves around the innovation capacity of the ICT sector in China. Innovation is particularly relevant to the ICT as it represents the main source of competitiveness for the industry. Innovation is also a national stake for China to evolve from a manufacturing-based economy to a knowledge-based economy. Nevertheless, the assessments of the industries competitiveness are dominated by the firms' ability to interact and generate an innovative competitiveness advantage. Although the strategic aspect remains essential factors in developing the competitiveness of an industry, it represents a limited point of view in analyzing the functioning of an ecosystem such the ICT industry. In order to assess the competitiveness of a company or an industry, Porter (1985), introduced the diamond model. It introduces four dynamics of competitiveness that explains the competitiveness: Factor conditions, demand conditions, related and support industry and Firm Strategy, structure and rivalry. If we refer to table 2 below integrating the existing studies into the diamond framework, it can be observed that all factors are analyzed individually. Moreover, it can be seen that most of the research analyzing the competitiveness of the Industry concentrates around the local firms' strategies and their interactions with the environment. Consequently, the research is extended to analyze more comprehensively the competitiveness of the Chinese ICT industry. The core of

the analysis consists in analyzing these factors in a global aspect and understanding the competitive advantage of the ICT industry.

5.2.2. Internationalization

Internationalization is the principal limitation of the existing studies. The majority of the literature on the Chinese ICT industry analyses it through a single spectrum, the role of foreign MNCs in the industry. This point of view is relevant as the initial development of the industry was spurred by massive foreign direct investments; thus, its relative impact is an important aspect to analyze. However, in the ICT industry, the outwards relationships have evolved oppositely as now Chinese firms invest massively abroad. Consequently, the role of internationalization in analyzing the competitiveness of the ICT firms can be explored through different perspectives. A growing number of large Chinese firms are extending their foreign activities evolving into emerging market multinational companies (EMNC). This new type of firm structure has not been extensively analyzed notably on the establishment of their global networks. Although Takala & Liu (2009), include them in his analysis, however, it is only limited to their local development. Consequently, an extension of the existing studies consists in understanding the linkages and network developed by the Chinese EMNCs to increase their competitive advantage. Furthermore, the respective strategies to profit from different locations and how it impacts the development of the industry in China are

also a source for further studies. All in all, the analysis of the integration of the Chinese industry into the global ICT industry is extended to include the participation of Chinese companies outside their borders.

Table 2: Existing studies and factors of competitiveness

Existing Studies	Diamond Model				Internationalization
	Demand conditions	Factor conditions	Related & support ind..	Firm strategy, riv. & stru.	
Zhou (2013)		**X**			
Boeing & Mueller (2016)		**X**			
Aburaki (2013)	**X**		**X**		
Lin & al (2010)			**X**		
Takala & Liu (2009)			**X**	**X**	**X**
Sun & Du (2011)				**X**	
Wang & Lin (2012)			**X**	**X**	

VI. Data and Methodology

6.1 Methodology:

The main aim of this research is to assess the competitiveness of the Chinese ICT and explore the influence of the internationalization of Chinese firms. The primary phase of the research was done inductively. Literature and data were collected and analyzed in order to extract the most relevant and important information on the topic. The purpose of the inductive approach is principally to elaborate a research question and hypothesis that guides the direction of our research.

The analysis will mainly adopt a deductive approach. First, theories are on competitiveness is assessed and analyzed in order to select the most fitting to answer the research question. The research is constituted of a combination of quantitative and qualitative analysis. The first part of the analysis is mainly based on quantitative research methodology. Indeed, the competitiveness of the Chinese ICT industry is assessed through the analysis of different economic and social indicators resulting in a global evaluation. Moreover, the results of this analysis are put in perspective with the United States' ICT industry. The United States, in that case, is a control case in the analysis of China's competitiveness. The case selection was motivated by the US being in a leading position in the industry. China, on the other hand, is perceived as being on

the rise in the sector. Consequently, the US is a prime case to put into perspective the development of the Chinese ICT sector on a global scale (Zhou & al., 2010p.129).

The second part of the analysis consists in analyzing the role of internationalization in the development of the Chinese ICT industry. A qualitative approach is adopted, as the analysis is mainly the result of a case study. This is mainly done at firm level through the analysis of the development of Huawei. Huawei was chosen mainly for its prominent position within the Chinese industry. Indeed, by being one the first primary private company to operate in that sector and also among the first Chinese firm to venture successfully abroad, Huawei is perceived as frontrunner in the development of the industry (Nakai & Tanaka, 2010, p.651). The sources of analysis is Huawei's internationalization strategy. More precisely, the transactions made by the firm when in investing in other countries are the main unit of analysis mainly through a qualitative approach analyzing the destination of the firms' FDI and how they contribute to its development and strategy.

6.2 Data Collection

The data collection for the industry level analysis principally consists of primary sources. The data consists mainly of economic and social indicators that form an inclusive source of information on the industry. The data collected are analyzed according to the theory used for assessing the industry competitiveness. At a firm level,

the data collection mostly revolves around secondary sources. In this part of the analysis will principally be done through an extensive document analysis. Data will be mainly obtained through secondary sources such as academic journal articles, newspaper articles, and firms' publications.

At the industry-level, data mainly consists of proxy variables in order to conduct a diamond analysis. Consequently, hard and soft data will be used to illustrate the different variables constructing the Generalized Double Diamond to assess the competitiveness of the ICT industry. The proxy variables mainly consist of national statistical indicators taken from the following databases: Chinese National Bureau of Statistics, the Bureau of Labor Statistics and the World Bank. Other databases are used to a lesser extent to find more specific statistics. Concerning soft data mainly measuring more social indicators such as the business or institutional environment are collected mainly through associated composite indexes. Statistics and Indexes are prioritized in our data collection, however, the data that cannot be retrieved through this medium is collected through document analysis mainly reports on the ICT industry in the respective countries.

VII. Industry Level analysis:

7.1. Domestic Diamond

7.1.1. Domestic Factor Conditions

Domestic Factor Conditions				
Domestic Variables	**Weight**	**Proxy Variables**	**China**	**USA**
Basic Factors	1.5	Wages in the ICT sector (in US dollars)	17,989	105400
		Score	**8.79**	**1.5**
	2	Number of workers %	4,52%	5,7%
		Score	**1.59**	**2**
	1.5	Value added per employee in US dollars	7314	706,627
		Score	**0.01**	**1.5**
Advanced Factors	2.5	R&D % in GDP (2015)	2,066	2,794
		Score	**1,8**	**2.5**
	2.5	% Employee in R&D in ICT sector	1,21%	25,43
		Score	**0.12**	**2.5**
Total	10		**12.31**	**10**

Overall, the domestic factor conditions of the Chinese ICT have a more competitive score than the US's ICT sector. However, when analyzed more in detail, it can be seen that the competitiveness is not equal among factors. Although being overall more

competitive, the Chinese factor conditions surpasses the US's in only one aspect, the wages of the sector. The difference is relatively high as the Chinese wages are more than 5 times lower than the US's. Among the other basic factor conditions, the numbers of workers is higher in the US but not by a significant margin. However, the gap in the productivity calculated by the value added by employee is substantial as it is 96 times higher in the US than in China. The advanced factor conditions focused on the part of Research & Development (R&D) in the ICT industry. The part of the GDP allocated to R&D is higher in the US than in China by a little more than 7% point from 2.8% to 2.06%. However, the main difference between the two economies is the number of employee respectively allocated in the R&D. In the US, 25.43% of the employees are in R&D, while in China, only 1.21% of the employees work in that field. This explains partially the substantial productivity gaps observed in the basic factors as a large amount of domestic employees in the US industry are allocated to higher-value added activities. All in all, the factor conditions of the Chinese ICT industry are characterized by the availability of a cheap labor pool. However, quality-wise, the productivity and the involvement in R&D suggest that the competitiveness of the domestic factor conditions remain in the manufacturing sector.

7.1.2. Domestic Demand Conditions

Domestic Demand Conditions				
Domestic Variable	**Weight**	**Proxy variables**	**China**	**USA**
Basic Factors	1.5	Population size in million	1,379	323,1
		Score	**6,4**	**1,5**
	1.5	GDP in billions of US dollars	11,065	18,037
		Score	**0,92**	**1.5**
	1,5	Employment rate	85	68.7
		Score	**1,85**	**1,5**
Advanced Factors	1.5	GDP per capita (US dollars	8069	56207
		Score	**0,2**	**1,5**
	2	ICT development index - equipment	5.19	8.17
		Score	**1,27**	**2**
	2	Education index	0.610	0.890
		Score	**1,37**	**2**
Total	10		**12.01**	**10**

The domestic demand conditions suggest than there is a prevalence of quantity over quality. The basic Demand conditions are substantially higher in China than in the US. China is the most populous country in the world; consequently it represents a large potential market for the domestic industry. Although its GDP is lower than US's, as the world's second economy, it stills generates a lot of economic activity. This is also supported by the employment rate that is 23% higher. However, the analysis of the

advanced factors, suggest that large market size should be relativized with its sophistication. The GDP per capita is very low compared to the United States. Furthermore, in more ICT specific variables, the same tendencies can be observed. The equipment in ICT products of the country measured by the ICT index showcases the difference of ICT development between the two economies. China with a score 5.19 is considered as a middle-range country in term of ICT equipment while the US as one of the world's highest score with 8.17 (World Bank, 2016). Finally, the education index was calculated for the domestic demand. The difference in the demand sophistication is also observed with the level of education, which is higher in the US than in China. Thus, the Chinese domestic demand conditions are considered competitive mainly based on the massive size of its internal market. However, the advanced domestic factors suggest that is relatively unsophisticated in comparison to the United States

7.1.3. Domestic Related and Support Industries

Domestic Related and Support Industries				
Local Variables	Weight	Proxy Variables	China	USA
Infrastructure	5	Secure Internet servers (per 1 million people)	10.117	1652.5
		Score	**0.02**	**5**
	1	Freight transport Road, (Million tonne-kilometres)	5 795 570	2 990 197
		Score	1.94	1
Supporting Industries	4	Number of science parks	80	72
		Score	4.44	4
Total	**10**		**6.36**	**10**

The related and supporting industries competitiveness is slightly lower in China than in the United States. This variable is measured by the infrastructure and the supporting industries linked with the ICT industry in the respective countries. China is lacking infrastructure in the main aspect of the ICT industry, the communications. Here it is calculated as the access to secure Internet servers. It is an essential component for the development of ICT related firms. The access of to secure Internet servers is very low in China (10.1 servers per 1 million people). Additionally, the traditional infrastructure needed for industry is also represented by the road freight transport. China's road transport is substantially higher than the US's suggesting a strong

development of internal transportation links. At a domestic level, the higher number of science parks in China established showcases the development of supporting and related industries for the ICT sector. Moreover, it also demonstrated the desire for proximity between the industries involved in the industry. This shows the development of ICT specific clusters in different areas of China enhancing the links between the different actors of the industry. The overall score of the Chinese ICT industry in for this factor of competitiveness is relatively similar than the US's. However, when analyzing the infrastructure development, it can be seen that transport infrastructure appear to be more developed than telecommunication infrastructures. Thus, the Chinese industry seems to be more oriented in favoring manufacturing over knowledge creation.

7.1.4. Domestic Firms' Rivalry, Strategy and Structure

Domestic Firms' Rivalry, Strategy and Structure				
Variables	**Weight**	**Proxy Variables**	**China**	**USA**
Rivalry	5	Intensity of local competition index	5,41	5,98
		Score	4.53	5
Business context	5	Distance to frontier index	64.89	82.55
		Score	3.93	5
Total	10		**8.46**	**10**

The final factor in assessing the domestic competitiveness of the Chinese ICT industry is the domestic rivalry and strategy. Firstly, the rivalry of firms was measured through the intensity of local competition index. It can be observed that the concentration of firms is lower in China than in the US, thus deducting that competition is fiercer in the US. The competition in China is also weaker in terms of innovation. Firms in Chinese ICT clusters where the concentration is higher do not foster more innovation. The combination of a large number of illegitimate rivals such unregistered companies or copycats and the low levels of intellectual property discourage firms to cooperate thus limiting the effect on local competition on competitiveness (Wang & Lin, 2008,pp.183-184). Concerning the business context, the distance to frontier index indicated us that China is further away from the best practice than the USA. On a global scale, it places itself just behind in the DTF index than the

developed economies. Consequently, overall the score is not much lower than the US's. However, it does confirm certain challenges facing the Chinese business context notably the low regulatory aspect and the prevalence of social relationships in bridging these institutional flaws. This analysis was especially prevalent for the ICT sector has additional requirement and permission are needed to operate (Sheng &al., 2011, p.11-12).

7.1.5. Summary of the findings

Overall, the domestic competitiveness of the Chinese ICT industry is lower than the US's. The competitive advantage in the sector is not equally share among the different factors of the diamond model. The demand and factor conditions are the most competitive due to respectively the large population and the relatively low-wages. Nevertheless, these developments overshadow the poor performance in the respective advanced factors of these two categories. The other two factors of competitiveness of the domestic, the related and support industry and the Firms rivalry and strategy, perform poorly for both the basic and advanced factors.

7.2. International Diamond

7.2.1. International Factor Conditions

International Factor Conditions				
Variables	**Weight**	**Proxy variables**	**China**	**USA**
Basic Factors	5	-Inward FDI in billions US dollars	20.92752	190.033
		Score	0.55	5
Advanced	5	ICT related Outward FDI in billions US dollars	3.83556	1.7481
		Score	10.97	5
Total	10		11.52	10

China appears to have competitive factor conditions on the international level as well. The difference in competitiveness between the two industries is not as pronounced on the international level than on the domestic level. However, the sources of the competitiveness of the China's factor condition are skewed toward specific variables. In this case, the ability of the Chinese companies to engage in FDI largely surpasses the FDI attracted in the country concerning the ICT sector. Indeed, the inward Chinese FDIs are close to 10 times fewer than the US's (table1). On the contrary Chinese ICT firms invest almost two times more abroad than their US counterparts. This observation tends to confirm the analysis on the rise of Emerging Market Multinational Companies (EMNC) and their strategy of investing massively abroad. Moreover, it

was established in the domestic analysis that the Chinese ICT sector was less competitive than the US, nevertheless, despite the apparent missing competitiveness; emerging countries are engaging massively in FDIs. Recent developments showcased that these investment were not only made in less developed countries following the traditional theories on FDI, but that Chinese were also investing massively in western markets such as North America. In the US alone, in 2015, Chinese FDI represented 27 projects for an amount 1.237 billion US dollars (Rhodium Group, 2017).

7.2.2. International Demand Condition

International Demand Conditions				
Variables	**Weight**	**Proxy variables**	**China**	**USA**
Basic Factors	5	ICT goods exports in billions of US dollars	570,003	142,332
		Score	20	5
Sophistication	5	ICT services exports in billions	82.952	170.543
		Score	2,43	5
Total	10		22,43	10

The international demand conditions of the Chinese ICT industry are higher than the US's. The major source this factor's to the competitiveness of the Chinese ICT industry comes from the international demand of manufactured goods. Chinese Goods exports are overwhelmingly higher, around four times higher than the US's exports.

This represents the lower tier of the ICT sector as manufacture good generally represent lower added-value exports. The sophistication of the international demand condition is measured by the ICT services exports. In that regard, the Chinese industry is less competitive as its services exports represent around half of the US's. Overall, the international demand for Chinese ICT sector is the world's highest. Nevertheless, it can be seen that the competitiveness of the Chinese ICT is still massively fueled by the demand for less sophisticated and less value-added products.

7.2.3. International Related and Support Industry

International Related and Support Industry				
Variables	**Weight**	**Proxy variables**	**China**	**USA**
Infrastructure	5	Average Internet Speed (mb/s)	3,7	12.6
		Score	**1.46**	**5**
	1	Container port traffic (TEU: 20 foot equivalent units)	181,635,245	46,488,523
		Score	**3,90**	**1**
Subtotal	**6**		**5,36**	**6**
Supporting Industries	4	Number of ICT related clusters	5	20
		Score	**1**	**4**
Total	**10**		**6.36**	**10**

At the international level, the development of the related and supporting industries are not a strong source of competitiveness. Infrastructure-wise, it is observed that the Internet average speed is substantially lower than the one observed in the US. On the other hand, the transport infrastructures for international trade, here represented by the Container port traffic, is more developed in China as the traffic is almost four times higher. Overall, the infrastructure level is lower in China than in the US. The competitiveness of infrastructures is more oriented toward the exports of manufactures goods. However, the infrastructure for more sophisticated and higher value-added

business relations appear to be relatively less developed in comparison to the US. The number of clusters present in each country assessed the international competiveness of the supporting industries. Clusters are representative of existing competitive ecosystem of related economic actors attracting international firms. In that case, China counts 5 ICT clusters in comparison to 20 in the US. All in all, the international related and support industry factor is relatively not competitive in comparison to the US. The infrastructures are not developed to the specificity of the ICT sector, especially for the most advanced type of business operations. Moreover, there is a limited amount of existing ecosystems, notably clusters, where the competitive supporting industries can contribute to the development of ICT industry.

7.2.4. International Firms' Rivalry, Strategy and Structure

International Firms' Rivalry, Strategy and Structure				
Variable	**Weight**	**Proxy variables**	**China**	**USA**
Rivalry	5	Shares of the global market	13,5% (436,4 b. US$)	27,36% (896 b. US$)
		Score	2.47	5
Business context	5	Companies in the Global 500	7	14
		Score	2.5	5
Total	10		4.97	10

The performance of the firm structure, rivalry and strategy aspect at the international level is relatively low in China comparison to the US. In order to assess the rivalry variable of the ICT industry, the respective share of the global market of each country were compared. Globally, the Chinese ICT sector represent 13.5% of the ICT market. This represent only around half of the US's share of the ICT market. Consequently, US firms appear to have more resilient strategies in regards to international competition. The business context in the US also appears to favor the creation of globally competitive firms. To measure the international competitiveness of the business context, the number of ICT firms among the biggest companies in the world was measured. It was observed that the US has 14 companies ranked among the

world's 500 biggest firms while China has only seven companies. The Chinese firms' strategy and rivalry factor is the less competitive within the international diamond in comparison to US's. Consequently, it can be observed that the resilience of the Chinese ICT industry in the international context is second-rate especially compare to American firms. Nevertheless, it must be noted that the international presence of the Chinese ICT sector has been evolving positively in recent years, however, its competitiveness in this specific factor is still lacking in comparison to the United States.

7.2.5. Summary of the International Diamond

The Chinese ICT industry appears to be similar competitive at the international as in the local level. Indeed, the main sources of competitiveness remain the factor conditions and the demand conditions. The international demand as the local demand is large but not very sophisticated. It is mainly driven by the world's demand for low-value manufactured good in which the Chinese economy is specialize. Concerning the factor condition the trend is different. The sophisticated factor is driving the competitiveness. In that case, Chinese firms are investing more abroad than their US counterparts. This can be explained by the rise of EMNCs and their high capacity to invest abroad. The related and support industries for the ICT cluster are still developed for the manufacturing sector rather than more advanced type of business operation.

Finally, The International Rivalry and Strategy factor demonstrate the relatively low presence of Chinese ICT industry on the global stage

VIII. Firm Level Analysis: Huawei Technologies

8.1. Stage 1: Regional Cluster (1988-89)

The first stage of cluster development is the regional. For developing countries it consist mainly of the firms' initial operations and the start of indigenous synergies enhancing the local competitiveness. Huawei's initial development is strongly linked with the development of Shenzhen as a Special Economic Zone (SEZ). In the beginning of the economic reform, these areas were designated to attract FDIs notably through location-specific regulations that are more market-oriented. From a small fishing village, Shenzhen developed into a competitive cluster. The first phase of its development consisted mainly in attracting Hong Kong's entrepreneurs that could profit from cheaper labor and land. The lack of infrastructure and favorable regulation failed to attract massive and technology oriented FDI. However, it proved to be a favorable environment for local firms to operate. By 1984, most departments and ministries of the Central Government had setup a State-Owned enterprise in Shenzhen. By 1995, more than 2000 public firms, regional or state-owned, were established in the SEZ (Wang & al, 2010). Consequently, it was a large concentration of domestic firms in a variety of sectors that caused the initial formation of the Shenzhen cluster.

The following stage was focused on export-related industries and the development of the high tech sector. The local government initiated this policy as a way to sustain the economic growth from initial phase. The Shenzhen's Seventh Five-Year Plan (1986-1990) set the institutional basis for this expansion. Its main guidelines were the overseas promotion of the Shenzhen SEZ in order to attract FDIs, a selection limiting the access of the cluster to firms exporting at least 70% of their production, and attracting large foreign MNCs operating in the High tech sector. Infrastructure were developed to higher standards due to incoming FDIs and the firm landscape changed as 90% of firms operating were foreign, mainly from Hong Kong (Ng &, 2002, pp.196-198).

Huawei initial development was incited in the development of the Shenzhen SEZ. The company was founded during the development of the high tech industry. The firm took advantage of the local agglomeration of firms to get away from the import of telecommunications product in order developing their own products, more precisely, telephone exchange systems. Foreign telecommunication firms already saturated the local urban market. Consequently, the firm adopted an "encircling the cities from the countryside" (Low, 2007) strategy consisting of starting their expansion by the rural communities that did not have a developed telecom infrastructure or market and then entering the more competitive but also more profitable urban areas (p.137). Huawei's strategy was not following path with the central government's plan for local firms to develop in cooperation with the foreign MNCs investing in China, particularly the ones

operating through Hong Kong. The singularity of their strategy allows Huawei to utilize the resources gained from the growing Shenzhen cluster to develop and market domestic-oriented products instead of export-based products.

8.2 Stage 2: Regional-linking cluster (1990-1996)

At the beginning 1990s, the telecommunication industry was still dominated by foreign firms and still relatively poorly developed in China. The central government had decided that the development of telecommunications was an essential part of its economic reform. Subsequently, the telecom industry received a strong public support mainly through encouraging industrial policies and relative easy access to capital for local firms to invest. Additional public funds were allocated to research development specific to the telecom industry and infrastructure. The outcome of these measures was an extraordinary development and expansion of the telecommunication sector in China. During that decade (1991-1999), the revenues generated by the industry in the country grew by an exceptional 2050%. (DeWoskin, 2001)

Huawei took advantage of the local conjuncture to grow and expand nationally. Having established dominance and brand awareness in the countryside, the situation was advantageous for Huawei to expand to metropolitan areas. In order to develop its product complying the more sophisticated urban demand, the company started to expand its operation outside the Shenzhen Special Economic Zone. The firm continued

to expand its R&D activities in its Shenzhen Headquarters. Nevertheless, it expanded its innovative activities through other clusters in China. These clusters were mainly developed by the central government in their interest of developing the telecommunication industry notably by creating a multitude and publicly funded research institutes. Huawei also opened R&D centers in Shanghai, Beijing, Nanjing, Xi'an, Chengdu, and Wuhan in China (Li Sun, 2009, p.139). In these locations, the company has benefitted from the public support to implant itself there but also profits from partnerships with the established research institutions to stimulate innovation.

In 1996, Huawei became the first telecommunications equipment firms in China with a revenue of 2.6 billion RMB. The source of its competitiveness was the low prices of its product combined with its relative technologic advancement and flexibility. Huawei managed to compete with foreign firms who were forming the majority of the industry by providing equivalent products at a lower cost. In that regard, the development of Huawei is relatively distinctive as it managed to be up to the local standards through indigenous development and not through cooperation with foreign MNCs.

8.3. Stage 3: International-linking clusters (1996-2001)

Having achieved a local dominance in China, Huawei's next step is to expand its activities abroad. Although the Chinese domestic market was still expanding, the local outlook for the expansion of Huawei is relatively low. The main factors are the rising competition in the local telecommunication markets and the decreasing need in basic infrastructure in the country. Moreover, Huawei was in a contradictory situation as it was the local leader in the telecommunication industry but the quality of its product was not up to the international standards in term of quality. As the local demand in this industry was constantly evolving through innovative breakthrough, the need to enhance the quality was essential for Huawei.

In this stage of cluster development, firms seek linkages with neighboring clusters profiting from competitive advantages of locations with different level of development (Moon, 2015, p.104). The first stage of Huawei's internationalization follows this logic as it first expanded to the neighboring Hong Kong. This international cluster known as the Pearl River Delta where Hong Kong has the role of the core economy, as it is the most advanced while Shenzhen, more generally the Guangdong province is considered the less advanced periphery. The motivation for the international agglomeration of firm in that case is the creation of synergies between the innovative capacities of the Hong Kong area and the cheap labor from the Shenzhen cluster. Consequently,

linkages produced make the Shenzhen cluster more innovative by the foreign input, while core firms become more price-competitive.

In 1996, Huawei first venture abroad in Hong Kong by partnering with the firm, Hutchinson-Whampoa. At that time, Huawei offered the adequate equipment to provide the telecom needs of businesses in Hong Kong, much cheaper. The cooperation between the two firms allowed Hutchinson-Whampoa to gain a competitive advantage by offering new products at a cheaper price in the Hong Kong market. On the other hand, the specifications of the agreement were made up to the Hong Kong quality standards. This allowed Huawei to upgrade their production to standards more up to date with international one and allowed them to be more competitive on the global scale.

This period is also marked by the failure of Huawei to conquer other regional markets. After the Hong Kong experience, the internationalization strategy aimed to invest in similarly or less developed country. In that case, Huawei would have less difficulty in being competitive as they have a superior technology. Despite a tentative entry into Laos and Yemen through infrastructure, Huawei had a hard time convincing customers and gaining market shares in the country they venture. Indeed, the foreign market development suffered from the reputation of the Chinese High Technology industry, which was perceived as low-cost and sub-standard.

Huawei's first significant expansion abroad was mainly done through the "New Silk Road" initiative. Launched in 1999, it was a marketing strategy with the objective of changing the brand image of Huawei. The company was in a prime position to taper the developing and emerging countries markets by offering competitive and cheap telecommunications equipment. However, the low reputation of Chinese high tech products hindered that development. The marketing plan consisted of increasing the presence in industry-related events and opening the headquarters to foreign customers (Liu, 2010). The plan was undoubtedly successful. By the end 1999, Huawei was present in forty locations and expanded to major emerging markets most notably Thailand, Singapore, Saudi Arabia, South Africa and Egypt. Furthermore, it setup its first R&D center outside of China in Bangalore, India for developing its software activities.

8.3.1. Exploiting its competitive advantage: Conventional FDI

The international linking cluster stage of Huawei's internationalization followed the traditional for of Foreign Direct Investment. Indeed, the motivation for Huawei to invest abroad is to exploit their competitive advantage in a foreign location. In this section, the internationalization of Huawei is analyzed with through dunning's OLI paradigm to understand the motivation of the company when investing abroad.

8.3.1.1. Initial Ownership advantage:

The initial competitive advantage of Huawei revolves mainly around cost, and differentiation. The two dimensions represent the core of a firms' competitive advantage. The main source of competitiveness is the cost (Porter, 1980). This is determinant in emerging markets as the sophistication of the demand in less developed. In that regard, the company was able to offer competitive products to emerging economies, on average for two third of the cost of developed countries firm. This competitive advantage comes from the orientation of the firms toward R&D that allows it to develop technologically competitive product for such markets at a fraction of the cost.

The cost saving observed in the R&D department can also be interpreted as a differentiation factor. The cheapness of R&D employees in comparison to developed markets allows Huawei to be more reactive and attentive to the customer request, allowing a larger flexibility. This represents a strategic break from other telecom companies, which large development cost does not allow them to tailor the product to the customer. The strategy adopted by Huawei was a low-cost and high efficiency strategy. Nevertheless, the core advantage of ICT firms remains the technological development. The cost-saving strategy was thus limited in the international markets and the cost-advantage of China's ICT industry is diminishing due to the rise of other emerging markets.

8.3.1.2 Location advantage

Huawei's approach to internationalization was gradual accessing similar market first. In the phase of developing a international-linking cluster, Huawei opted to emerging markets that had a similar technological development and a low level of local competitors as the respective markets were not fully developed. The first phase of internationalization was thus focused on emerging economies such as Brazil, India, Thailand, etc. In that regard, these countries formed a locational advantage for Huawei's FDI for distinct reasons. Firstly, the development of the telecommunications industry was not very high and Huawei would have a technological advantage when investing in these countries. It would therefore exploit their core advantage abroad. Secondly, the low development industry combined with the large population of these countries forms a massive potential market. Thirdly, implantation is these countries allow setting a regional base for further development and investment.

Finally, the emerging markets have abundant tangible and intangible resources. Tangible resources are usually referring to natural resources or low-cost labor. Emerging markets also have innovative capacities notably with existing clusters with the advantage of having a lower cost. As an example, India is a leading country in term of software development, mainly through the Bangalore cluster, and Huawei through it R&D centers is tapping into that location resources. The emerging markets are,

therefore, attractive to Huawei's for market-seeking, cost-saving and technology-seeking motivations.

8.3.1.3. Internalization

According to Dunning, the internalization aspect of FDIs determines the degree to which firms integrate in the host country market. The cost of internalization defined by the cost needed for the firm to integrate within the existing framework determines the firm's degree in the foreign market. Technological companies usually opt for a higher degree of entry as their core competences, technology, is highly profitable and thus is not as strongly affected by the transaction cost. Moreover, the complexity of the processes used makes the externalization of the products more difficult than internalizing the whole activity abroad. ICT firms, in order to protect and maximize their technological ownership advantage, are more incentivized to opt for vertical integration in the foreign market not cooperating with local actors. (Franco & al., 2008, p.13). It implies that the firms would prioritize the setup of a wholly owned subsidiary in opposition to a horizontal form of integration such as joint ventures or other forms of cooperation with local firms.

Huawei followed, to a degree this logic, when establishing its international-linking cluster. In less developed countries, Huawei usually proceeded in establishing their wholly owned subsidiaries controlling the entirety of the supply chain. The company

was thus setting up their own local branches, distribution channels and training centers when investing abroad. This can be interpreted as the highest level of internalization as the firm is an exception in noted for the expansion in Russia. Huawei had a competitive advantage to exploit in the Russian market. However, the cost of internalization was higher as Huawei did not have good brand recognition. In 2000, the firm formed a successful joint venture with the Russian company Umberto Konzern Russia. The "New Silk Road" market strategy allowed Huawei to opt for the highest level of internalization when firms expanded to other emerging markets mainly throughout Asia (Godinho & Ferrera, 2013, p.1048).

8.4. Stage 4: Global-Linking Cluster (2001- now)

From the year 2000, the international expansion of Huawei accelerated and went toward Europe and North America. In that same period, the company has also expanded its activities from a telecommunication company to an ICT firms with product mainly consisting of infrastructure, business solutions and now consumer electronics. The first step in creating a global cluster was the expansion into the untapped markets, more specifically the developed countries.

Europe was the first expansion into the developed markets. Huawei set up its regional headquarter in the United Kingdom in 2004. However, since 2000 it has been forming joint ventures with European ICT firms and setting up a vast network of research centers exploiting the location's asset. The implementation in North America was more difficult. Actually, the company has a regional headquarter and it is implemented in the main ICT clusters. However, the firms started out timidly due to its perceived proximity with the Chinese Central Government. Apart from market-seeking activities, Huawei is mainly focused in asset-seeking activities while expanding in developed countries. For the European case, it is illustrated by the multiplication of R&D centers on the continent. In 2015, Huawei had set up 18 research centers in 9 different countries.

The last stage of the firm's cluster development focuses on the connections of operations into a global one. A global-linking cluster creates synergies between all the world's operations in order to maximize the firms' performance. In that case, Huawei managed to organize its worldwide operation into an efficient sharing of resources in order to gain more competitiveness. The sources of this competitiveness are undeniably its research network. Huawei is operating research in the world's most competitive cluster linked to the ICT industry. The company has notably research centers in the Bangalore cluster, the Silicon Valley and in its headquarter in Shenzhen, but also in other innovative ICT related cluster around the world. Huawei's Headquarter located in the Shenzhen is the operating hub of this network of research centers and it serves as "center of excellence" processing the innovative capacity of the linked-clusters to be more competitive on the global stage.

8.4.1. Huawei FDI strategy: Rise of unconventional FDIs

In this phase of development, Huawei sought to enter the markets of the developed economies. Unlike the previous stage of internationalization, the company did not have a superior competitive advantage when investing abroad. Indeed, the firms operating in developed markets usually have superior ownership assets than Huawei. Moreover, the company evolved from a telecommunications specific firms to a more global ICT firm by developing more activities such as consumer electronics and data

management. In these new fields the company was relatively novice. If we refer to Dunning's eclectic paradigm, the lack of a strong ownership asset is a deterrent to FDI. Consequently, how can we explain Huawei's FDI in developed countries? The imbalance theory explains the motivations for EMNC to venture abroad. According to Moon (2013), firms that have a disadvantage in term of ownership can also venture abroad in order to complement its lack of resources. The motivations for the FDI of Huawei can thus be interpreted as market seeking due to the fact that developed countries concentrate the majority of the ICT industry but also asset-seeking as Huawei is motivated by acquiring its missing resources. What are these resources?

Technological resources

The key imbalance of resources between Huawei and its developed market counterparts is the access to technology. EMNCs usually import existing technologies from the developed countries and modify them to local specificities. In that case, firms do not enjoy the full advantage of technology as it can be easily modified by the competition diminishing the competitive advantage. Indigenous technology development, however, is at the core of Huawei's strategy. 10% of the yearly budget is allocated to it and more than half of its employees are in this sector. It is also part of its internationalization strategy. In order to exploit the technologies of developed countries, R&D centers were established in developed economies in industry specific clusters. Huawei created a global network of sixteen R&D centers throughout the most

innovative cluster. This also allows the existing clusters in developing countries such as China and India to upgrade their facilities and research to global standards.

Reputation and Branding

EMNCs usually have a modest image and brand reputation abroad in comparison to developed countries. EMNCs are relatively new firms in comparison to some western companies that have been operated for decades. This is also the case for Huawei. As a Chinese company, it has suffered from the reputations of the country for producing low quality and cheap copycat products. Moreover, the proximity between Huawei and the Chinese central government is not ideal especially in the telecommunications sector. Huawei's good reputation in the telecommunications industry is already well spread around the globe. In developed countries, especially in the European region, successful joint ventures in the Netherlands with the phone company Telfort and the development of a 3G mobile networks with Vodafone in United Kingdom ensured a good publicity for the firm. Huawei has strived in nurturing its good relations between operators and other telecom giants.

However, in the rest of its ICT operations the firms had hardly any brand recognition. In the consumer electronic industry, Huawei is a newcomer and has only been releasing devises under its brand name for under a decade. This marks a shifts as Huawei aimed to be a general public brand for general consumers or businesses. This allowed Huawei to begin its shift from a global company to a global brand (Haveman

& Vochteloo 2006, p83). In that regard the marketing strategy of Huawei shifted from acquiring global recognition from the industry to prioritizing the customer experience.

The European headquarters was key in developing the consumer relations. Huawei disposes of eighteen R&D related facilities (only two are research centers) focused on "customer-centric innovation" and improving the quality of the customer support. Partnerships with firms and organizations outside the ICT industry have also grown massively (Huawei Europe, 2016). They range from partnerships with iconic firms such as the prestigious camera manufacturer, Leica, in enhancing the quality of their products to sponsorships that increase the brand awareness (Looper, 2016). The result appears to have arrived as, in 2017, Huawei was nominated as the 70th biggest global brand. However, issues still remains in North America, especially in the US as it fails to distinguish itself from the Chinese political activities and of the general stereotype on Chinese firms (Interbrand, 2007).

Management efficiency

Huawei's global expansion motivated an upgrade in managing its network. Global networks and value chains are usually reserved to developed market MNCs as they are used to manage complex management systems. This was an obstacle in the initial stage of internationalization as the management efficiency was low and caused redundancies and capital waste in multiplying operations. Today, Huawei's global management is more structured and efficient. It is composed of the Headquarter in Shenzhen steering

the global strategy and 8 relatively independent regional headquarters managing local operations. To develop, this network Huawei partnered with western firms to increase the management efficiency. In terms of human resources and financial management, it partnered with the American companies Hay Group and PricewaterhouseCoopers (Kase & al., 2011, pp.230-231). In order to increase the efficiency of its operations and notably its supply chain management, Huawei notably partnered with IBM (Nakai & Tanaka, 2010, p.651).

IX. Implications

9.1. Demand Conditions

At the industry level, the demand conditions are a strong contributor to the sector's competitiveness. From our analysis, it was showcased that the large internal market contributed strongly to the high demand conditions. However, at the local level it was demonstrated that consumers' sophistication did not allow the development of higher-end products. At the international level, the demand was also spurred by the exports of low-cost manufactured goods. The higher end services contribute insignificantly to the international demand conditions.

In the initial stage of its development, Huawei's profited from the Chinese ICT demand conditions. The large market allowed its strategy to tap the large demand from the countryside before accessing to the more sophisticated urban areas. Locally, the demand of Huawei was limited and the segment tapered was subjected to competition from other emerging markets. Internationally, the technological evolution of the industry urged the firm to seek other markets.

Huawei's internationalization allowed the ICT industry allowed the sophistication of its demand. By operating globally, Huawei's market expanded from the Chinese

market to the global one. The first stage of internationalization allowed increasing the size of the demand to similar developing markets. However, to have access to a more sophisticated demand notably by diversifying its range in the ICT sector and having more activities outside its borders. Huawei is the only Chinese company to have more activities abroad than home. The initial carrier business represent 60% of the firm's activity while the newer consumer and business activities represent respectively 33% and 7%. The largest market for Huawei remains the local market with 42% of its activities followed by respectively the EMEA (Europe, the Middle East, and Africa) market, the Asia pacific and the Americas market respectively at 32%, 13% and 10%. Overall, the internationalization process allowed Huawei to extend the competitive advantage of the Chinese ICT sector by acquiring a more diverse and sophisticated markets, enhancing the demand conditions. (Huawei, 2016, p.22)

9.2. Factor Conditions:

The factors conditions of China's ICT industry are relatively strong. The main cause of this performance is explained by the relatively low wages in the ICT industry. Locally, the more advanced factors analyzed which focused on the R&D related factors demonstrated a relative backwardness is that domain. The main shortcomings were the resources allocated to the R&D effort in the industry. At the international level, the

factors conditions of the Chinese ICT were encouraged by the rise of outward foreign direct investment by Chinese firms.

Huawei's development has always been oriented toward innovation. It was a precursor in the Chinese ICT industry in developing indigenous product. The local factor conditions, mainly the low wages, allowed Huawei to obtain a competitive advantage. However, in expanding their activities the firm could not keep their competitive advantage with the local factor conditions. In order to compete on the global stage, Huawei benchmarked the leading firms in the sector. Locally, allocating it 10% of its revenue and assigning half of its 150000 employees expanded the focus on R&D (Huawei, 2016, p.42).

Internationally, Huawei focused the Chinese industry trend by also massively investing abroad. A large part of the investment was allocated to the R&D effort by setting up a network of R&D centers in the most productive clusters. It allowed the workforce to be diversified and enhanced by globally sourcing talents. The effect was an enhancing of the R&D activities in China but also a strong R&D activity outside China. The enhancement of the factors conditions also affect the production and operation activities as Huawei cooperated to enhance its value chain activities. Consequently, Huawei's internationalization gave access to more factor conditions while enhancing the existing ones at home.

9.3. Related and Support Industries

Being a telecom infrastructure company, Huawei is not affected much by the quality of the telecommunications infrastructures. Moreover, the quality of the transport infrastructure in China allowed Huawei to keep a large part of it's manufacturing in China. Concerning the most advanced factors, clusters and technological cluster, the industry competitiveness was relatively undeveloped. Huawei is present in all of five ICT clusters in China forming an efficient local network of innovative network. However, by forming a global-linking cluster have managed to be present in sixteen clusters globally among the most innovative in the sector. The network of the clusters has also contributed to the Chinese economy has the research centers are developed to the global standard notably the firm's Shenzhen headquarters. Moreover, the network is operated from the firm's headquarter serving as a commanding and receiving hub for the global innovative activities of Huawei.

9.4. Firms' Rivalry, Strategy and Structure

This factor is the weakest of the ICT industry competitiveness. It was established that the regulatory environment and local practices did not for an optimal business environment for enhancing competitiveness. Moreover, the concentration of firms in the ICT sector does not spur competitiveness due to shadowy business practices.

By establishing itself into developed markets, Huawei was confronted to a stronger competition from bigger competitors. Indeed, locally Huawei and ZTE mainly control the market. Consequently, evolutions in that domain remain marginal (Zhang, 2009, p.11). By acceding to the global markets, Huawei faced fiercer competition from developed market MNCs and was able to develop its competitive advantage to international competition. The diversification of Huawei into consumer and business oriented activities, the international competition was more intense. Nevertheless, the more favorable business contexts of developed economic encourage firms to cooperate among them (DTF). Consequently, enhance its competitive advantage by forming alliances with international actors. Huawei has set up joint R&D centers with some industry giants such as Texas Instrument, IBM, Intel or Motorola (ibid).

Finally, the international presence of Huawei contributes to the international development of the Chinese ICT sector. By being competitive on global markets and in a variety of ICT sectors, Huawei managed to build a global image. By constructing a consumer friendly image as a strategic asset, the firm enhances its competitive resources. This was a critical imbalance at the beginning of Huawei's internationalization as it suffers from the Chinese High tech reputation. However, by being such a global brand forming partnerships with large firms, Huawei also improved the image of Chinese firms abroad.

9.5. From converging to diverging interests: future outlook

The research showcased how Chinese MNCs were contributing to the competitiveness of the ICT industry. The government has harnessed this opportunity by promoting through various forms FDI by Chinese MNCs in more developed country to learn and expand their respective resources. Consequently, it appears that the relation between Huawei and the State appears to be optimal as they both serve each other interest. Huawei is become a global player and it upgrades qualitatively the Chinese economy. Nevertheless, a question can be asked upon the sustainability of this relationship. According to Reich (1990), firms operate exclusively out of their own interest. Chinese MNCs, apart from state-owned enterprise, do not behave to enhance the national agenda. Indeed, on the global marketplace, acting out of national interest rather than competitiveness would represent a major disadvantage. Huawei, unlike most big Chinese companies, has been a private company from its beginning, thus has been behaving upon its own interest which are aligning with the State's interest in developing the economy.

Through their development, EMNCs are bound to switch from national companies to global companies without nationalities. Huawei, although being a global company, can still be considered as a Chinese MNCs as they are headquartered in Shenzhen and have an exclusively Chinese ownership. Nevertheless, its interest remains company-oriented and it has a global outlook. As it develops and competes with other global ICT giants

this interest will be more assertive and will take less into account national allegiance. What are the implications for China? Reich (1991) argues that the national interest must be geared by favorable policies for business to attract FDI but also to keep local champions to leave for more competitive environments. In our analysis, the factors linked to business environments were performing relatively poorly and most of the competitiveness were the result of more basic factors.

All in all, the relationship between the firms' development and the national economic development appears to be more fruitful in the beginning stage. Indeed, EMNCs and the government would support each other in their development. As EMNCs develop they will tend to act more like other global companies as their resources and competitiveness will be more their qualitative development and the impact of national support would diminish. The government must develop through his policies a more competitive environment and attract FDIs while its EMNCs are developing otherwise they could also leave. Thus as they developed, both EMNCs and government will be subjected to more competition from more advanced markets.

X. Conclusion

The aim of the research was to understand the relation between the internationalization of EMNCs and national competitiveness. In order to investigate this problem, the focus was set on the case of Huawei and the Chinese ICT industry. In order to conduct our research two distinctive research questions were elaborated.

The first questioning of the research was to assess the competitiveness of the Chinese ICT industry. After the exploration of the theoretical framework for determining the national competitiveness, it was established that the Generalized Double Diamond Model was most appropriate to synthetize our findings. In order to give some perspective to our outcomes, the results of the analysis were compared to the United States'. The main information retrieved from the data was the predominant role that the size of the local market was playing in the Chinese industrial competitiveness. The large demand combined with the large labor supply spurred the local competitiveness. Internationally, the main sources of competitiveness were the large external demand notably for manufactured goods, but also the increasing number of outward foreign direct investments. Overall, the competitiveness of the Chinese ICT cluster is lower than the US's. The main explanation for this result is the lack of sophistication of the Chinese factors of competitiveness notably in the areas connected to R&D, the relatively poor relationships developed among Chinese firms and, the low global

presence. Thus, it can be concluded that the competitiveness of the Chinese ICT sector is lower than the one of a developed country industry, in our case the United States.

In order to understand the role of Huawei in the development of the ICT industry, the global ecosystem of the company needed to be analyzed. It was established that by gradually creating synergies from the regional level to the global level, Huawei had managed to establish a network linking all the most innovative clusters to its Shenzhen headquarters. In first stage of internationalization, it was demonstrated that the firm was exploiting its home advantage abroad as it was investing in less or similarly developed countries. This corroborates with Dunning's eclectic paradigm that indicates that firm will venture abroad to exploit their existing assets. In the second phase of internationalization, Huawei ventured in more developed markets. The main objective of this expansion was to acquire-resources that are not available to EMNCs like Huawei. This is explained by Moon's Imbalance theory, which suggests that EMNCs will invest abroad to reduce the imbalance in resources.

The final part of the analysis consisted in integrating the global activities with the performance of the Chinese ICT industry. It was demonstrated internationalization was diversifying the consumer base of the industry. Huawei's commitment to R&D had an effect on the industry has it allowed to update the local R&D centers to global standards and to source innovative assets globally notably employees. Finally, internationalization allowed Huawei to compete in a better and more competitive

business environment allowing synergies with market leaders and enhancing their competitive advantage. The diversification of the firms' operation to large public products allowed Huawei to create a powerful brand. *In fine*, it relatively overshadows the bad reputation usually associated with Chinese ICT firms.

All in all, it can be seen that EMNCs do contribute to the development of the ICT sector. Firstly, as prominent actors of local clusters, they do have an impact on the development of the industry. The firms' Internationalization has a prevalent role in developing the cluster. The globally sourced assets are used to upgrade the firms' global networks. As part of this network, the local ICT industry is also affect by this upgrade. This research demarcates itself by studying the effect of Chinese investment on the Chinese competitiveness whereas current literature usually focuses on the impact of inwards FDI. Nevertheless, the debate about the Chinese investment in more developed countries especially in Europe and North America has seen some fierce debate in political and social sphere. In that regard, it would be interesting to apply a similar analysis to the impact of the Chinese FDI on the competitiveness of the developed countries. Furthermore, it would be interesting to research how developed societies perceive the rise of FDI coming from Emerging Markets and how they assess the cost and the benefits of these new investors.

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Annexes

Annex 1: Diamond Model Variables

International Variables	Proxy Variables	Sources (China/US)
Factor Conditions		
Basic Factors	ICT related FDI in billions us$	National Bureau of Statistics of China (5) / Bureau of Economic Analysis (2)(US department of commerce)
Advanced factors	ICT related Outward FDI in billions us$	National Bureau of Statistics of China (6) / U.S. Cluster Mapping Project
Demand Conditions		
Basic Factors	ICT goods exports in billions of $	World Bank Data (7)
Sophistication	ICT services exports in billions	World Bank Data (8)
Related and Support Industries		
Infrastructure	Average Internet Speed (mb/s)	Akamai report - *akamai's [state of the internet]*
	Container port traffic (TEU: 20 foot equivalent units)	World Bank Data (9)
Supporting Industries	Number of ICT clusters	EUSME (Report: The ICT Market in China) / U.S. Cluster Mapping Project
Domestic Rivalry and Strategy		
Rivalry	Shares of the global market	TCdata360 (World Bank)
Business context	# Companies in the Global 500	Fortune Magazine

Domestic Variables	Proxy Variables	Sources (China/US)
Factor Conditions		
Basic Factors	Wages in the ICT sector	National Bureau of Statistics of China (1)/ US Bureau of Labour Statistics (1)
	Number of workers in the ICT sector%	National Bureau of Statistics of China (2)/ US Bureau of Labour Statistics (1)
	Value added per employee in us$ in the ICT sector	Calculated
Advanced Factors	R&D % in GDP (2015)	World Bank Data (1)
	% Employee in R&D in ICT sector	National Bureau of Statistics of China (3)
Demand Conditions		
Basic Factors	Population size in million	World Bank Data (2)
	GDP in billion of $	World Bank Data (3)
	Employment rate	National Bureau of Statistics of China (4)/OECD
Advanced Factors	GDP per capita	World Bank Data (4)
	ICT development index - equipment	International Telecommunication Union (ITU)
	Education index	United Nations Development Programme (UNDP)
Related and Support Industries		
Infrastructure	Secure Internet servers (per 1 million people)	World Bank Data (5)
	Freight transport Road, (Million tonne-kilometres)	OECD data
Supporting Industries	Number of Technological parks (2010)	National Research Council – Report : *Understanding Research, Science and Technology parks: Global Best Practice*
Domestic Rivalry and Strategy		
Rivalry	Intensity of local competition index	TCdata360 (World Bank)
Business context	Distance to frontier index	World Bank Data (6)

Annex 2: Diamond Model Scores:

Variables	Score	
	China	United States
Factor conditions		
Domestic	12.31	/
International	11.52	/
Total	**23.83**	**20**
Demand Conditions		
Domestic	12.01	/
International	22.43	/
Total	**34.44**	**20**
Related and Supporting Industry		
Domestic	6.36	/
International	6.36	/
Total	**12.72**	**20**
Firm's Strategy & Rivalry		
Domestic	8.46	/
International	4.97	.
Total	**13.43**	**20**