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# THE RESILIENCE OF THE RELATIONSHIP BETWEEN APPLE AND FOXCONN

## SCENARIOS BASED ON THE OLI FRAMEWORK

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## Executive summary

*This paper is an analysis of the Alliance between two multinationals. On the one hand, Apple Inc., one of the most admired and innovative firm in the world famous for its electronic products. On the other hand, Foxconn, the major Apple's subcontractor since 2004 that is in charge of Apple products final assembly and manufacturing. The thesis is divided into two sections. First, we will investigate the reasons why Apple decided to outsource the final assembly of its products to Foxconn that is mainly situated in China. We will analyze it by means of the OLI framework that focus on Ownership Specific Advantages, Localization advantages and Internalization Advantages. Second, we will investigate possible evolutions of this alliance. To do so, we will develop six scenarios that seem particularly relevant and likely to happen. The first one will be about the possible consequences of bad working conditions in Foxconn factories situated in China. Indeed, many scandals broke out in 2010 following many worker suicides. We will therefore look at possible consequences. Then, a scenario will investigate the possible consequences of China transition phase. Indeed, the country is facing rising wages and declining number of migrant workers. Therefore, Foxconn may start shifting its activities in other countries. The third scenarios will discuss the potential consequences of robot installation in Foxconn plants. It will probably not incite Apple to stop working with the latter. On the contrary, it is beneficial for Apple. Next, the fourth scenario will hypothesize that the growing Chinese middle class may incite Apple to keep part of its production in China, to stay close to this promising market. The second-to-last scenario will develop the eventuality that Apple jobs will come back in the United States. Finally, the sixth scenario is about the importance of environmental concerns. New regulations to control $CO_2$ emissions may dramatically change Apple supply chain and therefore its alliance with Foxconn.*



## Key words

Apple ~ Foxconn ~ Outsourcing ~ Final assembly ~ Scenarios ~ China

# Abbreviations

| | |
|---|---|
| EPZ | Export Processing Zone |
| ETDZs | Economic and Technological Development Zones |
| EU | European Union |
| FDI | Foreign Direct Investment |
| FLA | Fair Labor Association |
| FTZs | Foreign Trade Zones |
| GHG | Greenhouse Gases |
| HTDZs | High Technology Development Zones |
| IP | Intellectual Property |
| PC | Personal Computer |
| R&D | Research and Development |
| SAIDI | System Average Interruption Duration Index |
| SAIFI | System Average Interruption Frequency Index |
| SCC | Supplier Code of Conduct |
| SEZ | Special Economic Zones |
| USA | United States of America |
| VAT | Value-Added Tax |
| WTO | World Trade Organization |

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# 1. Introduction

Apple is an intensely successful company, and people all over the world are so addicted to its brand. That when a new model is launched, people queue for hours to buy the product. However, behind the scenes, this famous company is not as perfect as it would like people to think. Behind every Apple product are exploited Chinese workers and children, working every day in conditions so deplorable that people have even committed suicide to escape the exploitation. Despite scandals linked to working conditions, so few people are aware of these conditions because Apple is skilled at manipulating its brand image and controlling this information. The simplest proof of their manipulative power is observed when asking questions of Siri, the Apple iPhone voice personal assistant.

**Where do you come from?**

*Like it says on the box… I was designed by Apple in California.*

**Who built you?**

*I, Siri, was designed by Apple in California.*

**Where were you manufactured?**

*I'm not allowed to say.*

**Who manufactured the iPhone?**

*I'm not sure, but I think there was a garage. An outer planet with some strange metals. And a bunch of nerds.*

**Do Children make the iPhone?**

*Interesting question.*

**You really don't know?**

*Unfortunately, I am as yet imperfect.*

**Do you know Foxconn in China?**

*I'm sorry, I'm afraid I can't answer that.*

**Does Apple respect human rights?**

*I can't answer that. But Apple.com should be able to.*

Apple seemingly has a talent for avoiding every unpleasant question, and not just when asking Siri. Indeed, emails to the corporate office that broach topics of manufacturing conditions either remain unanswered, or elicit replies that refer back to their perfectly manicured website. Browsing through the Apple further pushes the ideals of a conscientious and respectful company that cares about its suppliers throughout the world. The disingenuousness of such responses prompted this paper, which aims to provide a better understanding of what is hidden behind these well-design products used by millions of people. Nevertheless, this topic is so broad that we had to make a choice. In response to the growing number of its workers committing suicide, we therefore decided to investigate the relationship between Apple and its major manufacturer Foxconn, in particular.

# 2. Problematic: Analysing the possible evolutions of the alliance between Foxconn and Apple

## 2.1 Apple story

Before explaining the problematic and the two main parts of this paper in more detail, we will first introduce the topic and briefly consider important dates in the evolution of Apple, the company that grew from a simple PC firm into one of the biggest consumer electronics firms in the world in less than 40 years.

Apple Company was created in 1977 by Steven Jobs and Steven Wozniak. They established their headquarters in Cupertino in Silicon Valley.

In 1980, Apple announced the construction of two manufacturing plants in Texas (Carrollton) and in Ireland (Cork) responsible for the computers on the European market. A year after, they opened a plant in Singapore. In 1983, the factory launched a highly automated plant in California. After some restructurings, the majority of Apple computers sold in the United States were built by the Elk Grove (California) and the Fountain (Colorado) plants, and Jobs claimed to be as 'proud of the factory in America as [he was] of the computer (Prince, M., & Plank, W. (2012)). In fact, in the 1980s, Apple resisted offshoring despite the rapid migration of electronic components manufacturing to Asia (Duhigg, C., & Bradsher, K. (2012); Teagarden, M. (2016)).

In 1993, the company entered the Chinese market in order to capture PC market share in one of the largest consumer markets in the world (Teagarden, M. (2016)). (In 2008, Apple opened its first store in Beijing).

However, in 1996, Apple encountered financial problems and began changing its supply chain. The company reorganised their activities, determining which should be kept

inside the company and which should be outsourced (Berger, S. (2013)). They sold the Foutain plant to the contract manufacturer SCI System, which implies that a large number of Apple's computers were now manufactured by another company. As part of the reorganisation, Apple also relocated the circuit board assembly.

In 2001, after considerable changes in the consumer electronics domain, Apple shifted its emphasis from the PC (Personal Computer) industry to new sectors. After the launch of the iTunes store, they released the iPod and—some months later—the iPhone (Teagarden, M. (2016)).

In 2004, Apple finally closed its last US manufacturing line in Elk Grove and succumbed to the lure of offshoring. They transferred the major manufacturing operations from the US to China, outsourcing its production to Foxconn. Foxconn is a multinational electronics contract manufacturing subsidiary of Hon Hai Precision Industry, headquartered in Taiwan. The company uses Taiwan as its design centre, and China as its main manufacturing base. They also established service centres in Asia, Europe, and major cities in the United States (Foxconn (2007)).

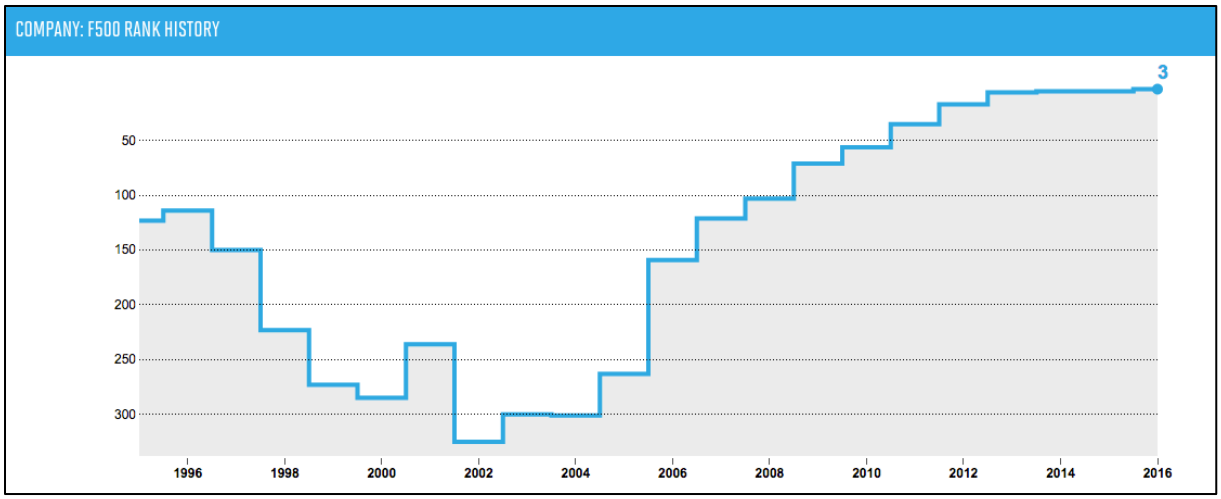
In 2011, Apple launched the iPad to coordinate computing, telecommunication, and media, finally releasing their last product, the Apple Watch, in 2015 (Teagarden, M. (2016)).

In 2013, the Taiwanese company, Foxconn, became the principal manufacturer of Apple. (When looking at the top 200 suppliers list released by Apple, we notice that Foxconn (Hon Hai Precision Industry Co. Ltd.) is a predominant supplier of the American firm) Working with Apple has clearly contributed to the success and the growth of the manufacturer. Foxconn has become China's largest private employer and the world's largest electronics contractor, producing more than 40% of the world's consumer electronics, while 40% to 50% of Foxconn total revenue is generated through Apple (Chan, J., Pun, N., & Selden, M. (2013)). Nowadays, Foxconn employs 1.4 million people in China. The company manufactures electronic products for companies such as Sony, Hewlett-Packard, and Dell, as well as smartphones for Nokia, Motorola, Huawei, Cisco, and Xiomi.

Twenty-two Foxconn plants are part of the production line for Apple. Among them, one plant is situated in Brazil, two are in Taiwan, and the others are located in China (Apple (2016, b)). Out of 18 Apple final assembly facilities in the world, seven of the plants are owned by Foxconn and 6 of them are located in China (See Annex 1) (Apple (2016, c)).

Concerning Apple, the company has been on a steady upwards trajectory and has become one of the most well-known firms in the world due to its innovation, people management, quality of management, social responsibility, financial soundness, quality of products/services, global competitiveness, and long-term investment value. The firm holds the first place in the 'World's Most Admired Companies' ranking for the ninth year in a row (Fortune (2016, b)). Apple also holds 3rd place in the 'Fortune 500 ranking' with a revenue of 233,715 million dollars. The company has graced this list for the past 22 years, rising from the 325th position in 2002, as shown in the figure 1 (Fortune 500 (2016)).

*Figure 1: Apple's Fortune 500 rank*




Source: Fortune 500 (2016)

Apple also holds the 15th position in the 'Global 500 ranking' and has been ranked for the last 13 years (Fortune (2016, a)).

## 2.2 Problematic

We can now detail the two objectives of this paper: (1) understanding Apple's decision to outsource the manufacturing and assembly to Foxconn, and (2) generating scenarios about the possible evolutions of the alliance between these two multinationals.

First, we analyse the reason for this alliance. In order to do so, we use the OLI framework and apply it to the relationship. By using OLI, we can understand the logic behind Apple's decision to outsource the production and the final assembly of its products, and what will ensure their success (Ownership specific advantage). Then, we examine the reasons why Apple chose to work with Foxconn and thus to outsource the manufacturing in China rather than in another country (Location advantage). Finally, we emphasise why Apple decided to outsource rather than make Foreign Direct Investment (FDI) by acquiring a Chinese firm or by making a Greenfield investment (Internalisation advantage).

In the second main part of the paper, we look at possible evolutions of the relationship between these two multinationals by developing several scenarios. The choice of the scenarios is explained hereafter in the methodology.

### *2.2.1 Scenario I: Consequences of bad working conditions scandals*

The first scenario regards controversial working conditions in Foxconn factories. The Taiwanese firm was scrutinised in 2010 when many workers attempted suicide. We therefore initially evaluate the working conditions and determine the main problems that may have caused these suicides. Then, this paper emphasises the reactions of Apple, Foxconn, the Chinese state, and the workers following this scandal. Finally, we develop different possible evolutions of this situation. For instance, Apple may start diversifying its supplier network, consumers may stop buying Apple products, Foxconn may have to improve conditions and wages and so forth. All these evolutions may impact the relation between Apple and Foxconn, so we investigate which scenario is most likely to happen.

### *2.2.2 Scenario II: Consequences of China transition phase*

The second scenario is about the Chinese transition phase. For several years, China has been in transition, and is losing its status as 'the factory of the world'. In fact, we note some major changes such as the rise of salaries, the decline of migrant workers, and the growing middle class. Therefore, we develop these changes in more detail, and look at possible consequences. We especially investigate countries that may have the potential to replace China. Moreover, we examine actual Foxconn factory locations, and how it may evolve as well as the major advantage of doing business in these countries.

### *2.2.3 Scenario III: The growing use of robots*

The third scenario discusses the increasing use of robots. This growing trend accompanied the transition phase of China. Many Chinese cities, especially in Guandong provinces, are compensating for the decline of workers and the growing salaries by installing robots in their factories. The states also start inciting companies to do so because they want China to shift from 'the sweatshop of the world' to an innovation centre. This scenario therefore develops this transition and the consequences for the relation between Apple and Foxconn. Foxconn is no exception to the rule, and has also started establishing robots in its factories.

### *2.2.4 Scenario IV: The growing importance of the Chinese consumer market*

As mentioned in the second scenario, a characteristic of the Chinese transition phase is the growing middle class. The fourth scenario is focused on this important trend. The Chinese consumer market is becoming more and more attractive for Apple, and even became its second largest market. We therefore investigate it in more detail, and look at possible consequences for Apple and Foxconn.

### *2.2.5 Scenario V: Apple jobs brought back in the United States*

The fifth scenario discusses the eventuality of bringing Apple jobs back into the United States. After the financial crisis of 2008, the unemployment rate in America grew, and Apple was criticised for hiring more people in other countries than in its home country. Therefore, Apple brought some factories back to America; although, the bulk of production is still done abroad. We therefore discuss different possible permutations of job outsourcing. On the one hand, the situation will possibly stay as it is because China is more attractive than America to make business. On the other hand, jobs might return due to factors independent from Apple's control or to benefit from American advantages.

### *2.2.6 Scenario VI: Consequences of the growing environmental concerns*

Finally, the last scenario develops the consequences of growing environmental concerns. Over the last several years, climate change has become a crucial concern to many societies. The $CO_2$ emissions are rising exponentially and actions must be undertaken in order to stabilise the growing temperature of the planet. Moreover, China is clearly a major player that should take more significant measures because of its massive impact on global warming. This section develops the possible consequences of new regulations in China and, more broadly, in the world. Apple may clearly be tempted to stop its collaboration with Foxconn in order to avoid environmental taxes. They may also bring production plants next to main consumer markets in order to avoid long transport, which may become heavily taxed. Different eventualities will be developed.

Before the conclusion, a part of this paper will be devoted to the limitations of this essay. Recommendations for further research are also set out as some topics may be interesting to develop further.

We will eventually conclude by highlighting the most important facts of this thesis, as well as the most likely scenarios.

# 3. Methodology

Before beginning with the first part of this paper, which considers applying the OLI framework to the alliance between Apple and Foxconn, the following is explained: (1) how we gathered the necessary information, and which sources we typically used, (2) the reasons why we decided to develop these specific scenarios rather than others, and (3) assumptions we should put forth.

## 3.1 Information gathering process

In the framework of this paper, our time and resources were limited. Indeed, we did not have the ability to interview—or even go to China to interview—Foxconn and Apple employees or other third parties. Therefore, in order to write this paper, we focused on three kinds of documentation.

In the first part of this paper, we used books to gather information and to acquire the necessary familiarity with the OLI framework and out-sourcing in the electronics sector. In fact, as previously noted, we began this thesis with an explanation of the alliance between Apple and Foxconn by using the OLI framework from John Dunning. Therefore, to develop this first part conscientiously, we read first phase books to gather information about the OLI framework and the reasoning behind out-sourcing and multinationals' international decisions. Indeed, the logic behind these concepts is the foundation of this thesis.

Then, after noting this more theoretical aspect, we read international press articles in order to gather information about Apple and Foxconn. We typically used articles from *The Financial Times*, *The Economist*, *the Harvard Business Review, Forbes, the Foreign Affairs, among others.*

We also gathered information from official paper by national and international organisations such as *the Organization for Economic Co-operation and Development (OECD), the World Bank, the World Trade Organization, the United Nations,* and so forth. Information

from the *National Bureau of Statistics of China* was also particularly useful in addition to Apple's official website.

We also used scientific literature, but in smaller quantity because these sources are less available and less useful for information about Apple and Foxconn specifically.

In the second part of this paper, we used the same sources cited above—international press articles, official organisations' websites and scientific literatures—to develop the six scenarios.

Apple and Foxconn keep a great deal of information confidential. Therefore, we examined many sources released by many different organisations in order to gather the most information possible. Nevertheless, some information was still missing, as we discuss in the limitation section of this thesis.

Also, the topic of this paper—the relationship between Apple and Foxconn—is very broad, and an infinite amount of research and investigation could be conducted on the topic. Moreover, the electronic sector in which Apple operates moves rapidly, and new competitors constantly enter the market to try to be better than the other players. Therefore, information gathering is yet more complex. For this reason, we limited our research by applying the OLI framework and defining only six scenarios. Focusing on certain information helped to avoid being distracted by the infinite amount of available data on the Internet.

## 3.2 Choice of scenarios

As explained above, we develop six scenarios for possible evolutions of the relationship between Apple and Foxconn in the second part of this paper. Other scenarios could also have been developed to examine this future alliance; however, we decided to focus on these six cases for reasons defined below.

First, as previously mentioned, we are limited in time and resources for this analysis. Indeed, this thesis was completed over the course of a master's degree. Therefore, we worked with a limited period of time, which restricted us to a limited number of scenarios. Additionally, we determined that choosing a small number of scenarios allowed us to focus optimally and to analyse each scenario sufficiently thoroughly. Choosing more scenarios would have meant less time for each scenario, and therefore less information and accuracy.

Another reason why we decided to develop these scenarios rather than others is also linked to the availability of information. Apple and Foxconn are both very confidential firms that work to keep much of their information secret. Further, we did not have the ability to interview Apple's employees or other third parties, nor to go to China to collect data. Therefore, our research was restricted by the availability of some information. We decided to choose scenarios on which we will be able to find enough information to analyse them in detail. Missing information are discussed in the limitation part of this thesis.

We also decided to focus our attention on these scenarios because they were very visible in the media at the time or because they are current issues or transformations that we commonly hear about. The concerns developed in this paper are based on issues that might be found when browsing the Internet, or listening to the radio. Some of these scenarios are actual topics commonly discussed at university because they are major economic topics that may influence future business conduct. We also focused our attention on these scenarios because they are some of the most likely to occur. We further decided not to develop scenarios that are less likely to influence Apple and Foxconn's relationship.

In sum, while we could have chosen to develop smaller scenarios that are less discussed in the media and less relevant, we decided instead to focus on popular or controversial topics.

Each of the scenarios we develop have been chosen for specific reasons. We discuss the *first scenario* about working conditions in Foxconn plants because these conditions created a worldwide scandal in 2010, and many articles and publications were released at the time. Until that scandal, many organizations attempted to secretly enter these factories to gather more information and to reveal the truth to the world. Special organisations also

commonly publish reports about working conditions in these factories (China Labour Watch, for instance). After this scandal, Foxconn was particularly in the spotlight, such that much of the international press was talking about it. Therefore, we decided to develop this scenario because the highly visible broadcasted event caught our attention and motivated us to gather more information to understand these working conditions and the possible consequences their visibility may have on the relationship between Apple and Foxconn.

We decided to develop the *second* and the *fourth scenario* because it is a highly broadcasted and discussed topic recently that may have worldwide impact. Indeed, for the last several months, we have heard a great deal about China and its 'transition phase'. As previously mentioned, 'transition phase' refers to the rising wages in China, the declining number of migrant workers, and the rising Chinese middle class. Moreover, as China is one of the most powerful countries in the world, these Chinese transitions are crucial and may impact the global economy.

The sixth scenario discusses the possible consequences of growing environmental concerns—a commonly debated topic these days. We heard about the global warming on the radio constantly—at the university, on television, on the Internet, and in newspapers—which is why we decided to develop this scenario.

Regarding the *fifth scenario*, about the possibility of seeing Apple jobs return to the United States, we developed this case because after the 2008 financial crisis, talk of unemployment rates and related problems abounded. Therefore, we decided to develop this scenario to thoroughly understand the role that Apple may potentially play in these unemployment problems.

Finally, we discuss the *third scenario* regarding the growing use of robots as automation is also a current topic. Even if this topic is subtler than the previous ones, and less discussed in the media, in our view automation is still a vital factor in the competitive market. Indeed, we live in a globalised world where firms must rapidly adapt themselves to be better than their competitors, and to attract potential clients. In sum, we decided to

develop a scenario involving the use of robots in Asian countries because automation may help companies to avoid current issues such as growing salaries.

We discuss scenarios we decided not to develop, and the reasons behind these choices, in the limitation section of this thesis.

## 3.3 Assumptions

First, throughout the paper, we use the simple and common name 'Apple' to represent the American firm even though this is not its exact name. Indeed, the company was initially named 'Apple Computer', and renamed itself 'Apple Inc.' in 2007 (Teagarden, M. (2016)).

Secondly, as Foxconn is in charge of the Apple product components manufacturing and of the final assembly of Apple products, the framework of this paper especially considers this latter role. A major concern of this thesis is indeed to understand why Apple decided to outsource the majority of the final assembly of its products to the Taiwanese firm and how it may evolve in the future.

Consequently, whereas Foxconn is a Taiwanese firm, the majority of this paper is about doing business in China because 6 of the 7 Foxconn final assembly facilities working for Apple are situated in China. More generally, 19 of the 22 Foxconn plants working for the multinational are situated in that country. Indeed, as noted above, Foxconn uses China as its main manufacturing base.

Finally, throughout the paper, we will consider Taiwan as a country independent from China.

# 4. Application of the OLI-Framework

The eclectic paradigm, or in other words the OLI framework, could be used to understand why Apple decided to form an agreement with Foxconn rather than internalise Apple's production.

The OLI framework refers to three advantages that explain why a firm would engage in international business through FDI instead of externalising through outsourcing or licensing. More precisely, according to Dunning, a firm will engage in international production if it has (1) ownership-specific advantages, (2) if it internalises the use of these ownership-specific advantages, and (3) if the company locates its assets in a country where it benefits from location specific advantages (Dricken, P. (1998)).

## 4.1 Ownership specific advantages

Ownership specific advantages (O) refer to the firm's unique abilities or its possession of specific assets that are not owned by competitors and that are not easily imitated. The O explains the 'why' of multinational activities. These assets could refer to tangibles (natural endowments, manpower and capital), and to intangibles or capabilities (technology and information, managerial, marketing and entrepreneurial skills, organizational system and access to intermediate or final goods markets) (Dunning, J. (1993)).

Apple typically has unique assets that allow it to market internationally without fearing any imitation from the competitors. In other words, Apple has competitive advantages that are crucial to competing internationally.

First, Apple is an *innovative firm* that regularly launches well-designed breakthrough products. In the ranking of the top 700 R&D investors in the world released by the European Commission, Apple ranked 109$^{th}$ in 2004. Today, the firm is considered to be one of the best

performing R&D investors, and one of the most innovative firms in the world. Their high quality products typically offer rich functionality, and, ease of use (European Commission (2014)).

The *best practices* of Apple can also be considered as a specific ownership advantage. 'Best practices' include Apple's production management, organisation and marketing system, and organisation of work. For instance, Apple's typical strategy consists of focusing on a few product lines and avoiding customisation as much as possible (Satariano, A., & Burrows, P. (2011)). Also, they have a particular supply chain where they control nearly every part. The financial success of Apple is inseparable from its globally dispersed network of supplier and final assemblers (Lu, C. (2014)).

Even if best practices can be legally imitated it will not be easy to do. Actually, you can acquire it only with experience. In other words, the teams working for Apple have acquired assets that cannot be imitated without experience. This concept is developed in more detail in another section.

Another specific ownership advantage of Apple is indubitably its *brand power*. As mentioned above, Apple is a brand admired worldwide. This popularity in combination with their large market share, provides leverage in negotiations. Thus, the risks of the concentrating manufacturing parts in a few locations are counterbalanced by this 'negotiation power'. Moreover, by buying from their contractors in massive volume, Apple benefits from economies of scale, gaining discounts on parts, manufacturing capacity, and air freights (Chan, J., Pun, N., & Selden, M. (2013)).

## 4.2 Location specific advantages

The specific assets cited above can be dependent of a certain location, which brings us to the second pillar of the paradigm. Location specific advantages (L) explain the 'where' of production. L consists of factors present in specific locations, that are available to every firm and can only be used in those locations (Dricken, P. (1998); pp. 187). Apple's deal with Foxconn, a majority of whose plants are situated in China, may be predicated on L. We can

distinguish three types of advantages of doing business in China, (1) economic advantages, (2) social and cultural advantages, and (3) political advantages (Hill, C. W.L. (2014)).

Before developing these three types of advantage, it is important to recall that Apple decided to outsource the production and final assembly of its product in 2004. So, we will analyse these location advantages by considering the context of the market in 2004.

#### *4.2.1 Economic advantages*

The first economic advantage of moving production to China is the *quality of their factors of production.* The workforce is particularly attractive, due to its differences from that of the United States and many other countries. In fact, the Chinese workers are known to work harder and more quickly than their American counterparts. They work many more hours and even accept living in close quarters. Their higher productivity levels can also be attributed to Chinese cultural views on work. These factors may explain why Apple decided to assemble the majority of its final products in Chinese plants—flexibility and rapidity are very important factors for Apple's success.

Another important point is the *cost of these factors of production*. Labour costs in China are clearly much lower than in the United States. However, they represent a very small proportion of the total value of Apple products as we will see in the second part of this paper (Hill, C. W.L. (2014); pp. 33).

*The size of the market* is also an essential point when choosing a location in which to do business. China is a sizeable territory characterised by an enormous *population*. Figure 2 illustrates the population evolution in China within the relevant timeframe of 2004. The rise experienced each year is not negligible and represents millions of people.

*Figure 2: Chinese population evolution*

| Year | Total population (year-end) |
|---|---|
| **2001** | 1 276 270 000 |
| **2002** | 1 284 530 000 |
| **2003** | 1 292 270 000 |
| **2004** | 1 299 880 000 |
| **2005** | 1 307 560 000 |
| **2006** | 1 314 480 000 |
| **2007** | 1 321 290 000 |
| **2008** | 1 328 020 000 |

Source: National Bureau of Statistics of China (2015).

However, it is the number of worker available that is significant for Apple. China did not become the 'factory of the world' by chance. In fact, China possesses an abundance of semi-skilled workers, which is an attractive factor when choosing an outsourcing location. Figure 3 highlights the huge *active population*, in the timeframe of 2004 (OECD statistics portal (2002)).

*Figure 3: Chinese active population*

| Year | Active population |
|---|---|
| **2001** | 735 540 448 |
| **2002** | 742 455 842 |
| **2003** | 749 740 411 |
| **2004** | 756 305 157 |
| **2005** | 762 608 154 |
| **2006** | 767 136 988 |
| **2007** | 772 098 426 |
| **2008** | 776 125 592 |

Source: The World Bank (2016, b)

Besides the immense active population, the largest proportion of the population is also situated in the eastern half of the country. Only 6% of the population is situated in other parts due to the aridity and the mountains (Naughton, B. (2007); pp. 19). Therefore, as we can see in the figure 4, a large number of individuals are highly concentrated in the eastern and central cities. The figure 5, we discuss just after, shows that the majority of Foxconn final assembly plants are situated in these most concentrated provinces.

*Figure 4: Chinese provinces population concentration*

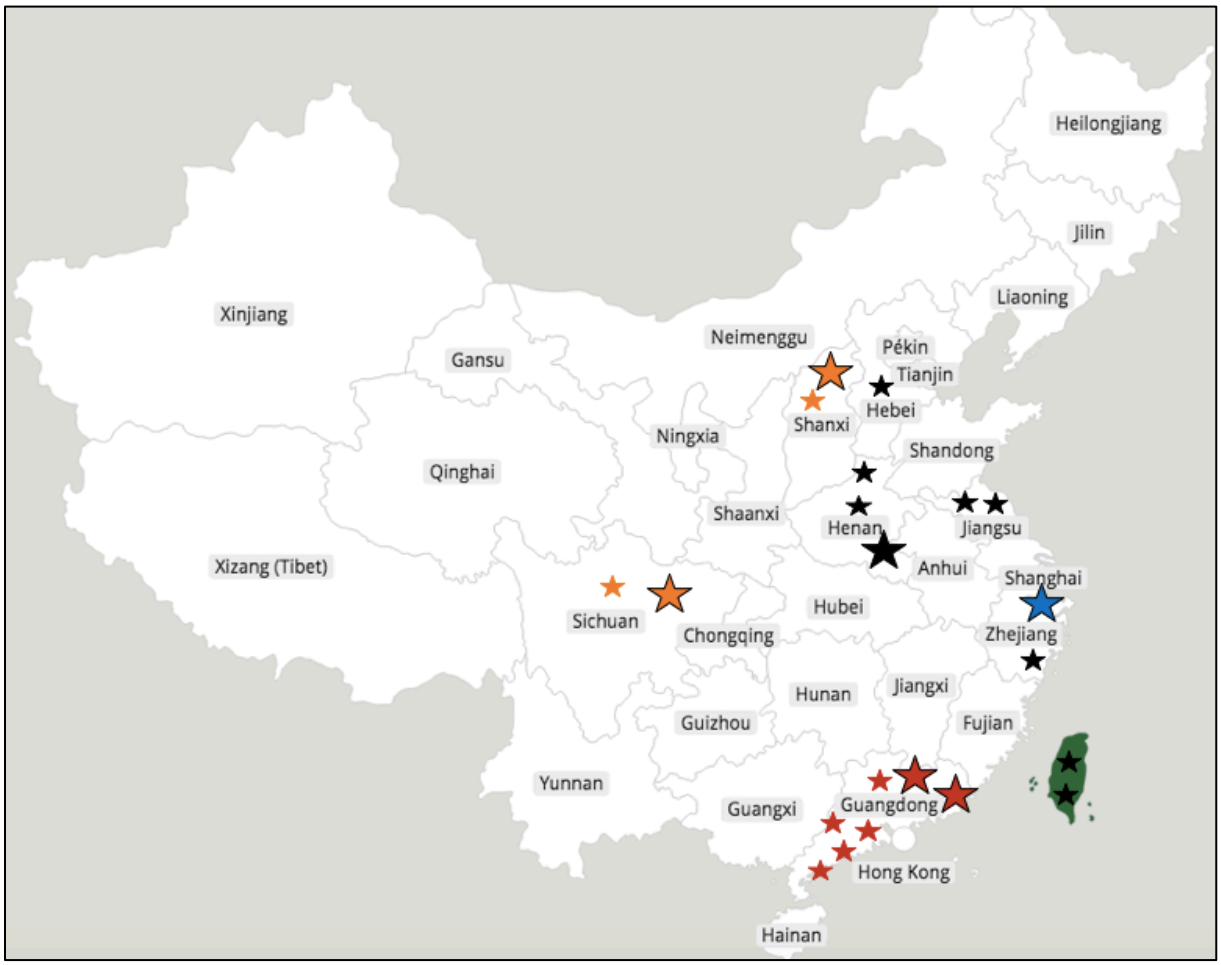

Source: Naughton, B. (2007)

Before looking at the specific investment zones, cities, and regions that make China so attractive to foreign business, it is important to keep in mind that 19 Chinese Foxconn factories work for Apple. Among them, six are responsible for the final Assembly of Apple products.

Seven are situated in the Guandong province, more precisely, in Foshan and Shenzen coastal cities; two of these factories are working on the final assembly. Four plants are

situated in Hebei, Jiangsu, and Zhejiang coastal provinces. Five others are nearby in Shanxi and Henan provinces; including two final assembly facilities. Among the two plants situated in Sichuan province, one is also responsible for the final assembly. Two plants are also situated in Taiwan. Finally, the Foxconn plant that deals with the final assembly of accessories is situated in an export-processing zone in Shanghai (Apple (2016, b)). For a clearer overview, refer to figure 5. Stars are randomly putted in the provinces, the aim of this figure is especially to have a broad picture of plants' locations.

*Figure 5: Location of Foxconn factories working for Apple*




Source: Apple (2016, b)

As previously said in the methodology, in the framework of this thesis we especially focus on the final assembly of Apple products. Therefore, final assembly facilities are represented in the figure 5 by bigger stars.

In respect of the China's vast size and abundant labour force, two main regions are particularly attractive to make business and attracted Foxconn plants working for Apple.

The first region is the *Guangdong's Pearl River Delta* with its proximity to Hong Kong and international trade. Foxconn has seven plants (out of 19) in this region, including two final assembly facilities. The plants are represented by red stars in the figure 5. This region is the primary manufacturing centre for consumer electronics. It contains convenient infrastructures such as a port to export and import goods all over the world, expressway, main road, and a railway (Torrens, C. (2010)). However, this region has become a victim of its own success, and is now confronted with the higher wages and improved living conditions that lead firms to find other low cost places to manufacture products. This is further discussed in a scenario within the second part of this paper.

Another appealing region is the *Yangtze River Delta*, which includes the city of Shanghai. Foxconn is also situated in this region, where one final assembly plant is working for Apple. This one plant is represented by a blue star in the figure 5. This is a geographically strategic position on the coast with one of the best transport networks in the country, including a port. Shanghai's wealth has emanated outwards to smaller cities, creating the manufacturing clusters that are crucial to being a major hub (Torrens, C. (2010)).

Such *'spatial clusters'* can lead to economies of scale. According to Alfred Weber, the geography of an industry typically depends on (1) the transport costs and labour costs, and (2) the forces of agglomeration. The latter is related to the spatial concentration of economic activities in a single location that lead to external economies of scale. When producers, suppliers, or consumers are located in the same area, it could increase economies of specific firm located there (Dricken, P. (1998); pp. 75). Foxconn's location provides a clear advantage because many factories that produce components for Apple products are situated next to Foxconn' assembly plant (Hill, C. W.L. (2014); Torrens, C. (2010); pp. 57). In fact, of Apple's supplier list, 45 suppliers are located in Dongguan—one of the largest computer production bases in China that is situated in the Yangtze River Delta (Apple (2016, a)).

The rapid growth of these regions and of other China's coastal provinces has led to a gap between east and west. It is why the Chinese government set a '*develop the west' policy* in 2000 to develop western and central China. The state sent financial capital and human resources to some of these regions until it became beneficial for companies to move production in these regions due to cheaper land and labour, and various government incentives. Despite these regions' disadvantages, such as long transport distance for goods and weak infrastructure, some cities became very attractive. Among these regions, Foxconn set up four plants in the province of Shaanxi and Sichuan (Chan, J., Pun, N., & Selden, M. (2013); Torrens, C. (2010); pp.65). These ones are showed in the figure 5 by orange stars.

In 1980, China also started developing investment zones following the 'Open-door policy'; these were characterised by China's desire to open its economy to FDI. These investment zones clearly played a crucial role in the growth of China's economy and became attractive places for business. A number of investment zones that could explain the location of some Foxconn final assembly firms follows.

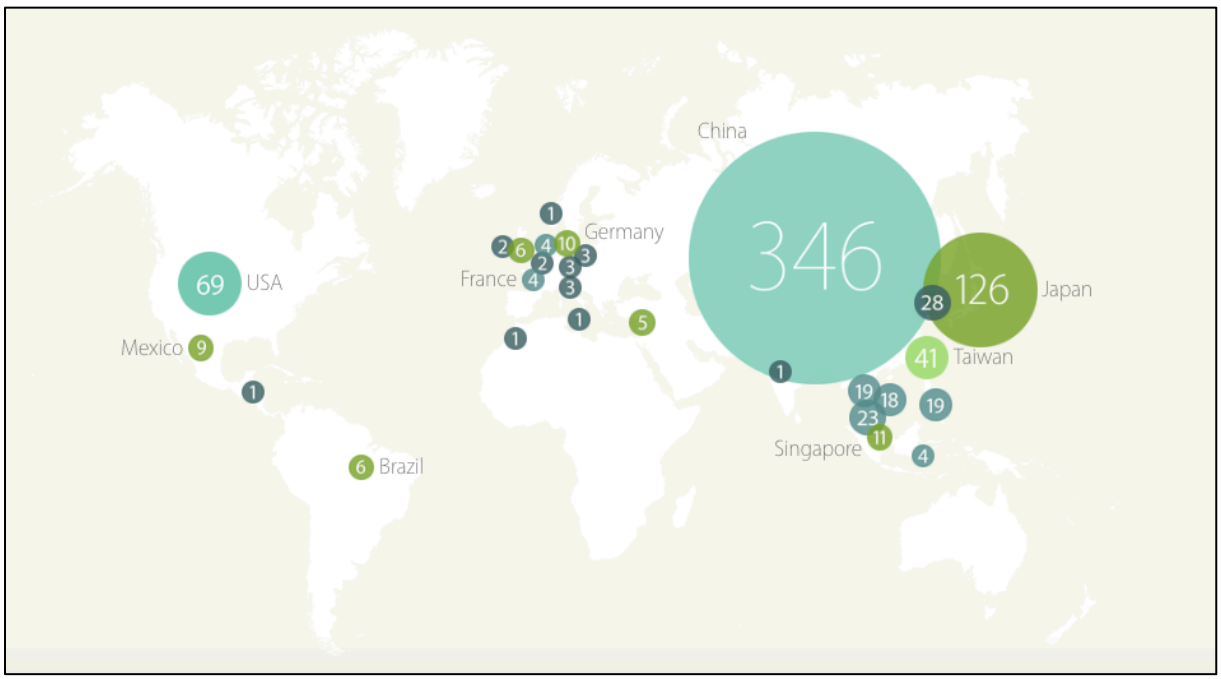
Firstly, China set up four *Special Economic Zones* (SEZ) in 1984 in order to attract United States, Japanese, and European investments. One zone was created in Shenzhen, a city where Foxconn established a big part of its plants (red stars). Secondly, they started developing *Economic and Technological Development Zones* (ETDZs) in 1988. These zones aimed at encouraging foreign investors to bring more technology into China. To date, there are 54 ETDZs, most notably in Chengdu, Shanghai, Zhengzhou and Taiyuan where Foxconn firms are located. Then, they created *Foreign Trade Zones* (FTZs) to provide more effective import and export infrastructures to bring in raw materials and export finished products. FTZ offers duty-free import and storage of machinery, equipment, raw materials, among other things. Sixteen ports received FTZ status, including the port of Shanghai and Shenzen which could benefit Apple when working with Foxconn. A Foxconn plant is also situated in an *Export Processing Zone* (EPZ) in Shanghai. These zones existed until 2000, and are today of the number of 25. It is an export enclave with special investment and trade incentives, where certain legislation is exempted. Also, these zones contain the significant infrastructure and services needed for manufacturing activities, such as roads, power supplies, transport facilities and low-cost/rent buildings (Dricken, P. (1998) ; pp. 130). The principal advantage of EPZs is that companies do not pay VAT because goods are defined as exports (Torrens, C.

(2010)). The government also put in place *High Technology Development Zones* (HTDZs) to attract foreign high-tech companies. One Foxconn factory is situated in in Zhongshan.

In sum, these externally oriented locations offer many advantages that can explain why Apple decided to make an alliance with Foxconn. In fact, by being situated in these zones, Foxconn benefits from modern infrastructure, easily accessible main ports, increased flexibility regarding the government, and ultimately, Foxconn can benefit from clusters. Nevertheless, the growing success of these zones can eventually lead to rising costs. For this reason, as explained previously, Foxconn decided to establish plants in the centre of the country. However, these rising costs are still a major problem today and therefore they are discussed later in a scenario (Torrens, C. (2010)).

On a macro-level, the *geographical situation of China* in the world is also an important factor to consider. In fact, even if the globalisation and the improvement in technology make it much easier today to travel across countries and to transport goods, it is still essential to work with factories that are well situated. At a first glance, China is situated in the centre of the world, and can be easily accessed by plane and by boat. Moreover, we observed that the majority of Apple' suppliers are situated in Asia. This is particularly the case in China (see figure 6), which could explain the decision of Apple to outsource the final assembly of its product to Foxconn. Indeed, the Foxconn final assembly plants are proximate to most of the suppliers that would facilitate the transportation and decrease costs.

*Figure 6: Apple suppliers throughout the world*




Source: Apple (2016, b)

When looking for a location to outsource the manufacturing and the final assembly of your products, it is also important to look at more specific practical aspects. The transport and telecommunication networks are notably important factors to take into account when choosing business partners.

When Apple decided to outsource its manufacturing activities in China, they certainly considered the impact on their distribution network. Apple kept their central warehouse in Elk Grove in California to deal with retail stores and distributors internationally. Moreover, Apple products are directly sent to online consumers from China, via UPS and FedEx (Lu, C. (2014)). Therefore, the *transport network* is vital to ensure a good flow of products throughout the world. China offers an environment suited to the transport of goods. In fact, investment zones, as explained above, possess the necessary infrastructures needed for exports and imports. The road network has rapidly grown, and the state is still developing its transport network in order to reach all points of the country and still attract foreign firms. By 2004, China had developed a national network of express highways that already reached 34,300 kilometres. The country also had 507 airports in 2013 (Central Intelligence Agency

(2016, a)). However, the development of transportation network leads to growing traffic and congestion.

Moreover, the government has succeeded in creating *communication networks* for most coastal provinces and major cities, including the ones where Foxconn plants are situated. China's telecommunications infrastructure has grown extremely rapidly. People in China can easily be contacted via the Internet or by phone. By the end of 2004, approximatively 25% of the Chinese population had a mobile phone. Today, fixed-line telephone networks covers roughly 80% of the population and more than 95% of the population has a mobile phone (Trends Tendances (2016); Naughton, B. (2007); pp.344). Regarding the number of Internet users, it grows from 22 million Internet users in 2000 to 94 million in 2004. Today, 721 million Chinese can access the Internet at home (Internet live stats (2016)).

*Electricity supply* is also important if we want to be as efficient as possible. In China, state investments in power plants and energy distribution continuously increase. The state has increased the size of the national power grid and reduced energy shortages (Torrens, C. (2010); pp. 89). In fact, for an idea of the growth, electricity output increased 11% annually between 1998 and 2004 (Naughton, B. (2007); pp. 341). We can consider the actual efficiency of electric infrastructures by looking at two indexes. First, there is the SAIDI index, or in other words the System Average Interruption Duration Index. Secondly, the SAIFI index, or the System Average Interruption Frequency Index can be considered. In the following table the score of these indexes for some countries is depicted. We selected these states because they are potential future locations for Apple final assembly facilities, which is discussed in the second part of this paper. We also include the Belgium indices for comparison.

*Figure 7: SAIDI and SAIFI indexes*

| | SAIDI | SAIFI |
|---|---|---|
| China | 0,4 | 0,2 |
| Taiwan | 0,3 | 0,3 |
| Thailand | 0,8 | 1,6 |
| Vietnam | 21,4 | 10,8 |
| Belgium | 0,6 | 0,5 |
| Jakarta (Indonesia) | 3,9 | 2,5 |
| Mumbai (India) | 2,2 | 4,0 |

Source: World Bank Group (2016)

Notably, China enjoys excellent electrical infrastructures. The indices are even better than those of Belgium. In sum, electricity shortages are very short and happen rarely, which is another advantage of China and perhaps another reason why Apple decided to outsource its final assembly in that country.

### *4.2.2 Social and cultural advantages*

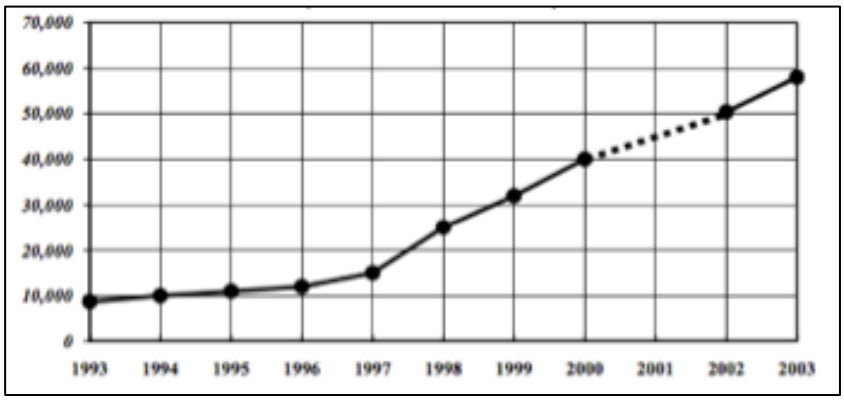
Social and cultural advantages can also influence the international decisions by a multinational. The culture of a country is a system of values and norms that are shared among a group of people. When doing business in another country it is vitally important to understand the culture and the way people work because it could impact business strategy and the cost of doing business in a country (Hill, C. W.L. (2014)).

First, *the social structure* of Chinese society is oriented toward collectivism (Torrens, C. (2010), pp. 141). This means that it would be difficult to find people who are entrepreneurial, will accept responsibilities, and make individual decisions. It is important to keep it in mind when deciding to do business in China. Moreover, this is a society where authority is rarely questioned. Finally, it is important to account for Chinese nationalism. *The language* spoken in China is also of importance. Even if English remains the universal business language,

speaking the local language could always be advantageous. However, in China, the culture, language, business practice and behaviour of people vary widely from region to region.

*Social stability and security* within China could also be an important factor to take into consideration. The Ministry of Public Security on 'mass incidents' and 'public order disturbances' showed a steady increase in unrest from the mid-1990s to the mid-2000s. This is illustrated in the figure 8 (2001 data are not available).

*Figure 8: Chinese social protests*




Source: Scot Tanner, M. (2005)

Social stability is a major challenge in China, especially regarding labour unrest. Conditions in factories have become more dire; people work overtime in unsafe environments because manufacturers want to cut costs as much as possible. This unrest has clearly become a problem in China as workers have begun to complain and strike (Gobel, C., & Ong, L. (2012)). The communist party is losing more and more of its legitimacy. Indeed, according to the CIA, the instability crisis happening in China is in part due to a crisis of legitimacy (Eli Margolis, J. (2012)).

Therefore, Apple's risk increases when it outsources manufacturing to a company whose working culture places a low priority on worker's rights and safety. Indeed, as we will see in the second part of this paper, Foxconn does not respect all working conditions standards. However, these movements are not yet particularly impactful, and if workers bring complaints, it generally only impacts the company concerned rather than making

waves in the wider industry. Despite these social disturbances, China remains a politically stable country as we will see in the next section.

### *4.2.3 Political advantages*

Finally, we assert that Apple decided to work with Foxconn to gain political advantage in China.

Governments have many tools at their disposal to control and stimulate the economic activity of their country. Among these policies are trade policies, policies toward foreign investment, and industry policies. *Trade policies* include policies toward imports (tariff and non-tariff barriers) and exports. These can play an important role when defining the location of assembly of the final product because such costs could considerably influence the margin of a company. *Foreign investment policies* aim to control outward and the inward FDI. Many actions can be undertaken in order to control these flows. However, Apple did not make FDI regarding the final assembly of its product in China, thus the rules regarding these techniques are not considered at length in this paper. National governments can also issue *industry policies* including fiscal incentives (state ownership of production assets, merger and competition policies, company legislation, taxation policies, labour regulation, national technical and product standards, environmental regulations and health and safety regulation) and policies where the government provides capital grants or loans (investment incentives, labour policies, technology policies, small firm policies, state procurement policies, policies to encourage restructuring and policies to promote investment) (Dricken, P. (1998) ; pp. 90).

Given these instruments that can be used by the state, we can now consider the evolution of China and major market reforms in more detail.

A major event in the development of China was its *accession to the WTO* in 2001. The WTO is an international organisation that deals with the rules of trade between nations (World Trade Organization (2016, b)). China's membership led to many changes in trade policy. By 2007, China cut import tariffs down considerably. Such tariff cuts are clearly an advantage for Foxconn—that made final assembly—and therefore for Apple. However, Apple decided

to begin outsourcing in 2004, thus this change did not appear to explain nor influence their decision. It is the same regarding the 2007 introduction of the Enterprise Income tax law, the Labour contract law and the Anti-Monopoly Law. In order to set public administration within a transparent legal framework, China introduced the Administrative Licensing Law in 2004. The law clarified investment procedures and the roles and authority of the different official bodies. Despite these new laws, local protectionism still exists, especially in inland areas and smaller towns. Moreover, there are still differences between national and local regulations that could be disadvantageous for foreign firms doing business in China (Torrens, C. (2010)).

When doing business in China, there is also a high risk of *corruption*, where the 2004 corruption perceptions index ranked China at 3.4 on an index ranging between 10 (highly clean) and 0 (highly corrupted). Such corruption weakens the capacity of the state to enforce an efficient competition policy.

Another negative point regarding China is the abusive protection of the state. The government may treat its national champions favourably in order to transform them into multinationals. To further this agenda, the government often attacks foreign multinationals operating in China. Such *government crackdowns* can consist of prosecution for bribery, distribution of fines, or shaming campaigns. Notably, the government appears to have perpetrated the latter against Apple (Defraigne, J-C. (2014)). Indeed, in 2013, a Chinese news agency asserted that Apple was immoral in selling devices through which consumers' personal data could potentially be extracted. Another source published the potential threat of the iPhone regarding national security. The state-run China Central Television also shamed Apple and accusing them of providing different after-sales services domestically than abroad (Jourdan, A. (2013)). Such statements could be a threat for Apple and may have an impact on its sales despite Tim Cook's public excuses. China Central Television went even further by paying Chinese celebrities to blast Apple on Weibo, the equivalent of Twitter in China. Such practices are very common in China. The state published foreign companies' malpractices to create the impression that these firms cannot be trusted. In sum, these attacks from the state are clearly a drawback of doing business in China.

More positively, the Chinese government announced its plan to reform and restructure the economy. They notably put in place the '*National medium and long term program for science and technology development*' from 2006-2020. This came into force after Apple's decision to outsource to China, thus it did not influence their decision. However, China clearly wants to move from 'made in China' to 'innovated in China' what could impact the future alliance Apple-Foxconn. We will investigate it later in a scenario (Course: 'Economics of global innovation' at Katholieke Universiteit Leuven in 2016).

The *IP rules* enacted in China are also of great importance when choosing the country where to outsource the final assembly of your products. We will develop it in the third part of the OLI framework about internalization.

Last but not least, the *political stability* of China is also of importance. That factor could be decisive when choosing a location to make business. The Worldwide Governance Indicators is a ranking about the political stability and the absence of Violence/Terrorism in a country. The range is situated between 0 (the lowest) to 100 (the highest). We will look at the same countries taken before in order to have a point of comparison between these ones.

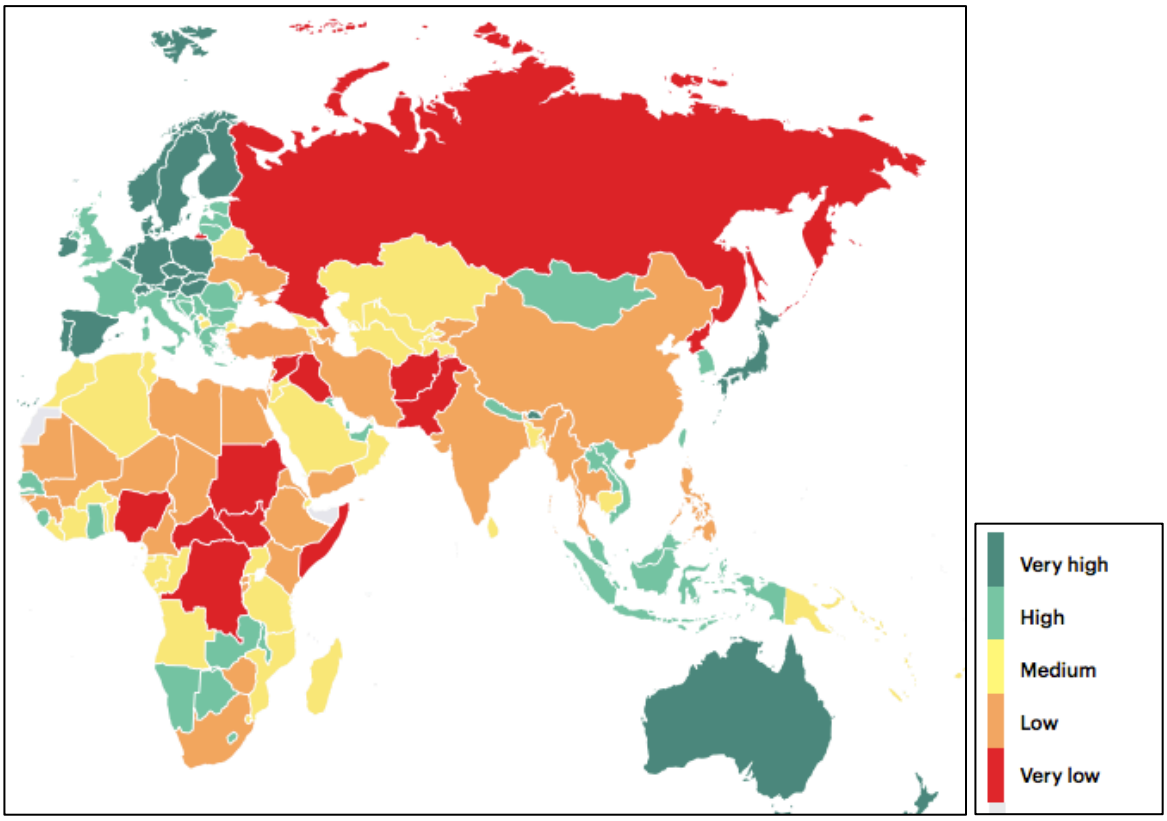
*Figure 9: Worldwide governance indicators*

| **Countries** | **2004 Rank** |
|---|---|
| China | 32.21 |
| Taiwan | 64.42 |
| Thailand | 23.08 |
| Vietnam | 50.96 |
| Belgium | 71.63 |
| India | 13,46 |
| Indonesia | 4,33 |

Source: World Bank Group (2015)

To gain a broader overview of the state of peace worldwide, the 2015 Global Peace Index classifies countries into five categories. Fig 10 illustrates the stability of East-Asian countries.

*Figure 10: 2015 global peace index*




Source: Global Peace Index (2015)

China appears to suffer from a low state of peace, positioned at 124$^{th}$ out of 162. Yet even if many other countries are more stable and safe than China, China does not suffer from attacks that might block the country and hinder the flow of Apple products throughout the world.

## 4.3 Internalisation advantages

Finally, we identify the internalisation advantages (I) that explain the 'how' of involvement. This third advantage of the OLI framework emphasises why a company makes

FDI, whether by acquiring a foreign firm or by making Greenfield investments. However, despite the advantages of making FDI, Apple decided to outsource the production and the final assembly of its products in China and thus not to make internalization (The World Bank (2016, a)).

One reason why Apple may have decided to establish an outsourcing contract with Foxconn, rather than making FDI could be linked to the *negotiation power* that Apple enjoys. Apple is characterised by their very strong supply chain. They control nearly every branch of the supply chain, and can easily obtain what they want from suppliers due to the volume of product they require.

Secondly, by outsourcing the production and the final assembly of Apple products to Foxconn, Apple gains *strategic flexibility*. On the one hand, many Foxconn plants work for Apple, which ensures a flexible supply chain and faster adaptation to meet changing demand. On the other hand, Chinese firms are much more flexible than American ones, and Foxconn therefore responds very quickly to requests from Apple (Hill, C. W.L. (2014)). In fact, as the workforce availability is much higher, companies can reassemble workers or engineers you need much faster. Additionally, labour laws allow companies to retain workers overnight and 12 hours a day. Thus, factories can produce much more Apple product, much quicker than if they were in America (Teagarden, M. (2016)).

For example, one Foxconn factory can employ 230,000 assembly line workers and each line can make 72,000 iPhones per day (FinancesOnline (n.a.)). The biggest Longhua factory can even produce 137,000 iPhones every 24 hours (Ngai, P., & Chan, J. (2012)). In order to guide the 200,000 assembly-line workers needed to build the iPhone, more than 8,700 engineers are required. Where it would have taken nine months to find that many engineers in America, it only took 15 days in China (Hill, C. W.L. (2014)).

Foxconn has adopted a production model apparently based on classic Taylorism. The production process is very simple and every worker can perform tasks without having any training or specific knowledge (Chan, J. (2013)). This strategic flexibility is of great importance to Apple. Indeed, meeting demand on a day-to-day basis is essential for the company,

especially since the death of Steve Jobs, replaced by Tim Cook in 2011. When a product goes on sale in retail stores, Apple tracks the demand in each store, at each hour of the day, and adjusts production if necessary. The CEO Tim Cook emphasizes the importance of avoiding as much sitting inventory as possible. He famously held that 'nobody wants to buy sour milk'.

As a result of this motto, Apple's network of suppliers is always under pressure to respect deadlines and to produce the quantity required as quickly as possible. In fact, we know that workers in Foxconn typically operate excessive overtime in order to respond to the demand of Apple. These suppliers are continuously under pressure and adapt themselves to respond to the needs of Apple. The CEO's special assistant Louis Woo in Foxconn explains that the company has two choices when facing suddenly a higher demand. They can hire more people or let actual workers do overtime. The second option is often chosen because it is not easy to hire many people in a short period of time (Chan, J., Pun, N., & Selden, M. (2013)). It emphasises the strategic flexibility that such network allows, and more precisely why Apple decided to outsource assembly to Foxconn. Therefore, a competitive advantage of Foxconn is its ability to maintain flexibility (respect the delivery time), which ensures a certain 'security' for Apple. In other words, they are demand-responsive, which is crucial to Apple's strategy. However, this particularity of Foxconn leads to controversial problems with regard to working conditions, which are addressed in the next section of this paper.

By outsourcing manufacturing of its product, Apple can also maintain a *'simple' organizational structure* and therefore can effectively prioritise its different activities to focus on the most important ones (Hill, C. W.L. (2014)). High value-add activities are all done in the US, including marketing, product design/development, and software engineering.

Moreover, outsourcing to China rather than making FDI will enable the company to *avoid high operating costs*. In fact, foreign companies that establish themselves in China are much more scrutinised than Chinese firms. They must maintain international standards such as tax, labour, health and safety, which yields higher costs (Torrens, C. (2010)). Furthermore, local Chinese firms often enjoy close links to local government officials, which could also be

beneficial. Foxconn, for example, typically has an alliance with the Chinese state. In particular, local government courts Foxconn to encourage them to build new factories in order to boost GDP growth in their specific region. Foxconn has received extensive land, infrastructural support and labour from the state. Often as a result of such ties, *domestic competition* in China is a challenge for foreign investors. Thus, it is easier to choose a local partner already established in the country. Local firms grow rapidly and climb the learning curve quickly, which is an essential advantage over competitors.

We can also see Apple's outsourcing choice from another perspective. As mentioned above, Apple is a very innovative firm that invests a large part of its revenue into R&D in order to be the most innovative and outpace their competitors. The choice to outsource the production and the assembly of its goods is therefore a way to *keep more money to invest in R&D*. In fact, as previously said, investing in FDI would lead to higher organizational and operating costs (Lo, C-P. (2011); pp. 163-169).

Another important factor that could explain the decision of Apple to outsource rather than internalise is the existence of strong *IP protection*. Without it, the company would run the risk of its profit expropriation. In China, many laws have been set up to protect IP in order to attract foreign business. IP laws were radically reformed under the reign of Deng Xiaoping in the late 1970s when he decided to open China to the outside world. A new patent law was notably enacted in 1984. In 1985, China acceded to the Paris Convention for the Protection of Intellectual Property. They also signed the Madrid Trademark Agreement in 1989 and acceded to the Patent Cooperation Treaty in 1994 (Devonshire, C., Scott, A., & Woollard, S. (2011)).

Nevertheless, despite the numerous laws ensuring IP protection, and the accession of China to WTO in 2001, Chinese IP protection remains a major challenge. Intellectual property rights remain subject to continual violations and laws are hardly enforced. Counterfeit operations are thus very frequent. For instance, in 2004, 90% of Chinese daily-use goods were counterfeited (Torrens, C. (2010); pp. 98). Also, in 2003, 60% of counterfeit goods seized in the European Union were made in China (Gipouloux, F. (2005)). According to

the World Intellectual Property Organization, China is one of the worst counterfeiting offenders in Asia.

China finally made improvements in legislation and enforcement for two reasons. First, they faced mounting pressure to offer protection to national brands. Second, by being a member of the WTO, they were more heavily scrutinised internationally to respect requirements of the WTO's TRIPS—the Trade-Related Aspects of Intellectual Property Rights that came into effect in 1995 (World Trade Organization (2016, a)). Nevertheless, despite the new laws and regulations established by the state, enforcement bodies do not truly have enough power, funding, credibility nor incentive to act against violators.

Despite the weak IP protection in China, it is possible to justify why Apple still decided to outsource its production and final assembly to Foxconn. First, we can suppose that the majority of counterfeit products would not look exactly like Apple products. Counterfeits can be similar in appearance, but the components used, the functionalities, the design, and so forth cannot be the same as Apple products. This is mainly because best practices of Apple are difficult to imitate, and are specific ownership advantages that Chinese or even Taiwanese companies will not be able to easily reproduce. In fact, the engineers working for Apple in the United States who deal with high value-added activities can be said to have gained a certain experience that cannot be replicated. Apple also benefits from negotiation power, having many partners, and a very strong supply chain. Thus, from this point of view, Apple need not worry as it would be nearly impossible for Chinese counterparts to build an empire to rival Apple's. Even if the electronics sector is very competitive, and market share is increasingly captured by other firms such as Samsung and low-cost smartphone makers, Apple has its own strategy that differentiates it from the crowd. Also, Apple benefits from many patents and trademarks (Apple (2016, a)).

Nevertheless, the most crucial element of Apple's outsourcing success is the *IP protection in Taiwan* because as said above Foxconn is a Taiwanese firm that put the bulk of its manufacturing in China. The R&D, the contract, the specifications given by Apple, and the plans were shared in Taiwan. It is therefore in that country that IP protection should be enforced because it is the Taiwanese firm that has the control of Apple's trade secrets. It is

then the responsibility of Foxconn to protect Apple in China. If a problem happens in China and if secrets or information are disclosed, Foxconn would be accountable. Choosing Foxconn is a vote of confidence for the IP protection, which suggests that the deal would not result in divulgences that would hinder Apple' business.

First, Taiwan has also been part of the WTO since 2002, which means that they are expected to comply with the TRIP agreement. They also adopted laws to strengthen IP protection, considerably reducing piracy and counterfeiting to render Taiwan more attractive to businesses. The Taiwan's Trade Secrets Act also provides protection to trade secrets that belongs to Taiwan citizens and to citizens of WTO member countries, including the United States. Finally, the Trade and Investment Framework Agreement between Taiwan and the United States also ensure intellectual property protections. Taiwan commits not to violate an American patent (American Institute in Taiwan (2010)).

Moreover, it is in the interest of the Taiwanese government to guarantee rights to Apple as Taiwan is hardly recognised as a country by the majority of the nations in the world. For the moment, it enjoys a robust unofficial relationship with the United States, where America is Taiwan's largest foreign investor (U.S. Department of State (2015)). Therefore, it is desirable for Taiwan to protect a famous American firm. Indeed, if a state-based problem appeared, the United States would likely side against Taiwan to defend Apple, which would be politically disadvantageous for Taiwan.

By making a deal with Foxconn, Apple likely established a contract that is favourable to their business, and sufficiently protective of their intellectual property.

Lastly, *the transaction costs* certainly impacted the decision to outsource to Foxconn rather than making a FDI. These costs represent the cost of making a deal with a company. Put simply, this is 'the cost related to exchanges of goods and information' (Suemastsu, C. (2014)).

Today, information processing is, more than ever before, at the centre of every business. Software and intellectual property have also taken on more significant roles in every society. In fact, since markets globalise and integrate, companies have started

spreading their activities around the world; doing so creates more complex communication and increases global competition. Therefore, the transaction cost theory is a relevant and important concept for the actual business environment in which we currently operate (Suemastsu, C. (2014)).

There are many definitions of what a 'transaction cost' is, but we will focus on the most important definitions. First, transaction cost could be the cost of concluding a contract and, in case of litigation problems, the costs of resolving suits. Second, the term may represent the cost linked to moral hazard. Finally, the transaction costs may include the quality control and the measures undertaken in the outsourcing entity.

We can now apply this theory to the relationship between Apple and Foxconn. We hypothesise that the American firm decided to outsource its production in part because of the relatively small transaction costs involved in the move.

The first reason for the low transaction costs between Apple and Foxconn is the appearance of *the Internet*. Before the 1990s, it was quite uncommon to outsource manufacturing to Chinese firms—transaction costs were too high. When a partner was chosen, the foreign company was required to investigate the credibility of its quality, delivery, and its trustworthiness. Then, the foreign company also had to plan a protocol for solving eventual problems with that Chinese partner. Indeed, foreign firms have their customs and thus they are risks of doing business in another country. Thus, outsourcing in China was too expensive due to transaction costs. However, with the development of the Internet and of new technologies, communication become much easier, which brought transaction costs down (Suemastsu, C. (2014)).

Secondly, costs linked to *moral hazard* are mainly avoided. Foxconn is keen on satisfying Apple's every need in order to build trust. In doing so, Foxconn convinced Apple that they are not opportunistic, but rather are capable of a trusting relationship. In fact, by satisfying the needs of Apple, Foxconn also demonstrates that it is a serious and a stable firm (Suemastsu, C. (2014)). When Apple decided to collaborate with Foxconn, it also looked at the *reputation of Foxconn*. The Taiwanese firm was founded in 1974, and therefore had long-

term clients and a certain history. Foxconn is part of Hon Hai Industry group that was yet the largest manufacturers of electronics. In 2002, the group had a turnover of 5 billion dollars—proof of their success (Bethesda (2003)). Moreover, as noted in the introduction, Hon Hai works with other well-known multinationals like Sony, Hewlett-Packard, Dell, Nokia (until 2001), Motorola, Huawei, and Cisco. Furthermore, there is no evidence of scandals or major problems between the Taiwanese firm and one of its partners. This is further proof of Foxconn's reliability. This trusting relationship allows Apple to leave a large part of the assembly of the final product to Foxconn, which allows both firms to benefit from economies of scale and thus to enjoy wider margins.

The *contract between both firms* may also have played a role in this trusting relationship by forcing Foxconn to respect Apple's product specifications. Without a sufficiently watertight contract, Foxconn would possibly have cut corners on the manufacturing process to drive their own profits at the expense of quality. Thus, we suppose that the contract was sufficiently thorough, and that standards agreed under the original terms of the partnership will be respected. However, as we discuss later, the contract made between both firms is confidential and it is difficult to evaluate its terms and the eventual quality controls established.

Nevertheless, contracting to outsource the production of Apple products may not have been so simple. The partners must negotiate and agree on the conditions of the transaction. They must agree on specifications, prices, deliveries, contingencies and so forth—the process takes time and money. Apple had to clearly explain its expectations about the final products, the payment, among other things. They must also decide on protocol for mistakes and problems. If Foxconn rejects Apple's proposed method of problem solving, it could lead to legal proceedings.

By choosing to work with Foxconn, Apple also had to consider *the intellectual property laws* in Taiwan and China. If the laws were not well established, costly litigation might arise. As previously discussed, while IP protection in China is weak, we conclude that Apple is sufficiently protected.

In conclusion, the Dunning's theory emphasises that a firm will engage its production internationally only if three advantages/conditions hold. However, Apple does not entirely follow this paradigm. They possess sustainable specific ownership advantages (O) and benefit from specific location advantages (L), but they do not internalise the production of their goods.

# 5. Scenarios

Different scenarios involving the evolution of the alliance between Apple and Foxconn are now developed.

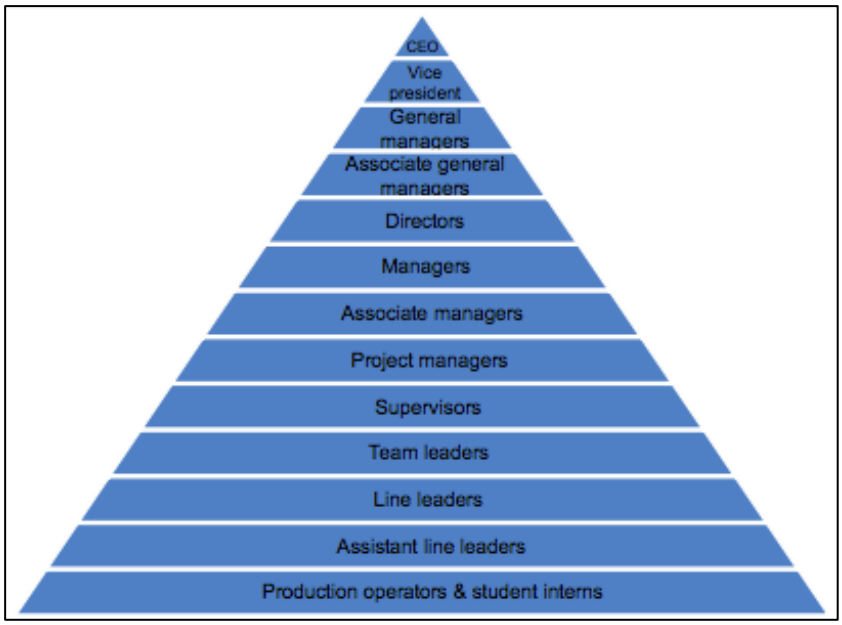
## 5.1 Scenario I: Consequences of bad working conditions scandals

This first scenario will be linked to working conditions in Foxconn plants. Many articles, riots, complaints, lawsuits, scandals happened in 2010 after a series of suicides. Since that period, Foxconn, and other Chinese firms, are at the forefront. Before looking at the possible future consequences of this situation, this paper will first introduce the context and main reasons for these employee suicides.

As explained above, Foxconn tries to be as flexible as possible and to adapt itself to Apple's demands, even to the detriment of safety and good working conditions. In fact, in 2010, eighteen workers aged between 17 and 25 years old attempted suicide at the Foxconn production facilities, including sixteen in Foxconn Longhua, in Shenzen (see Annex 2). Fourteen individuals did not survive (Brown, G. (2010); Ngai, P., & Chan, J. (2012)). Despite these poor working conditions and the labor contract law released in 2008, local government continues to support Foxconn, ignoring the enforcement of labor laws and inciting worker grievance and feelings of desperation. Production workers are clearly pushed to their physical and psychological limits. Many controversial problems still exist in Foxconn plants. The following are observations made despite the difficulty of entering Foxconn firms that are controlled 24 hours per day.

Foxconn plants are organised through a *highly centralised and hierarchical production system* in which workers are subjected to very strict discipline. As noted in figure 11, Foxconn management hierarchy contains thirteen levels (Ngai, P., & Chan, J. (2012)).

*Figure 11: Foxconn management hierarchy*




Source: Ngai, P., & Chan, J. (2012)

Typically, senior managers formulate rules and standards, and lower level staff are charged with executing them; lower level staff are under *constant pressure* to be as efficient as possible. They repeat a simple task endlessly, and are pushed to complete their task quickly. Workers appear to *lose their freedom* when working in Foxconn manufacturing centres. They are constantly supervised: for instance, to enter the workshop they must pass through layers of electronic gates and inspection systems. When they are working, they are always checked, and if they do not work fast enough or if they talk in the line, they are punished in public or insulted. The line leaders treat workers harshly in order to reach productivity targets. Workers should also be attentive to supervisors' speeches about rules, targets to achieve and so forth. Some compare these campuses to 'concentration camps' of labour(Chan, J. (2013); Ngai, P., & Chan, J. (n.a.)). On the walls of the factory, slogans from Foxconn' CEO, Terry Gou declare:

*A harsh environment is a good thing*

*Execution is the integration of speed, accuracy and precision*

Production operators are typically young migrants coming from the countryside. Therefore, they work and live on the campuses. The *living space* is as controlled as the workshop and every activity (e.g. eating and drinking, sleeping, and washing) is strictly scheduled. Moreover, dormitories are noisy rooms unsuitable to rest, where the only private space for workers is their bed. Workers should also frequently change of dormitory in order to break up every social links they may have created with their roommates. It is a way to avoid any collective action against Foxconn. Workers just do not have any social and personal life and such environment facilitates flexible production through imposing overtime work because dormitories and sweatshops are very close to each other. Some workers just do not support all this pressure and isolation and finally quit or attended suicide (Ngai, P., & Chan, J. (n.a)).

Workers are also putted against one another in order to increase productivity. The workers who produce faster and who are disciplined receive production *bonuses*. Nonetheless, the bonus will be reduced if they do not clock enough overtime work. The pressure appears to be unbearable. In some factories, there is also a system of points. Workers lose one point when they make mistakes, and they are fired when their count reaches zero (Chan, J., & Ngai, P. (n.a.)).

Aside from the constant supervision and pressure, workers are also subject to *work hours* much higher than the legal maximum. They typically work 12-hours shifts, and the firm tries to persuade workers through propaganda that success and growth of the company are only possible if they work diligently (Ngai, P., & Chan, J. (2012)). Some slogans that are often hung on the walls include:

*"Heart to heart, Foxconn and I grow together"*

*"Value efficiency every minute, every second"*

*"Achieve goals, otherwise the sun will no longer rise"*

Therefore, despite the rules stipulated by labour law about overtime, most of the workers are required to clock approximately 80 hours of overtime work each month instead of the 36 hour legal maximum. Employees are exhausted and only have few days per month to rest. Moreover, during the work day, they are allowed only short *pauses,* and if they do not reach their expected target, they may be compelled not to take a break (Chan, J. (2013)).

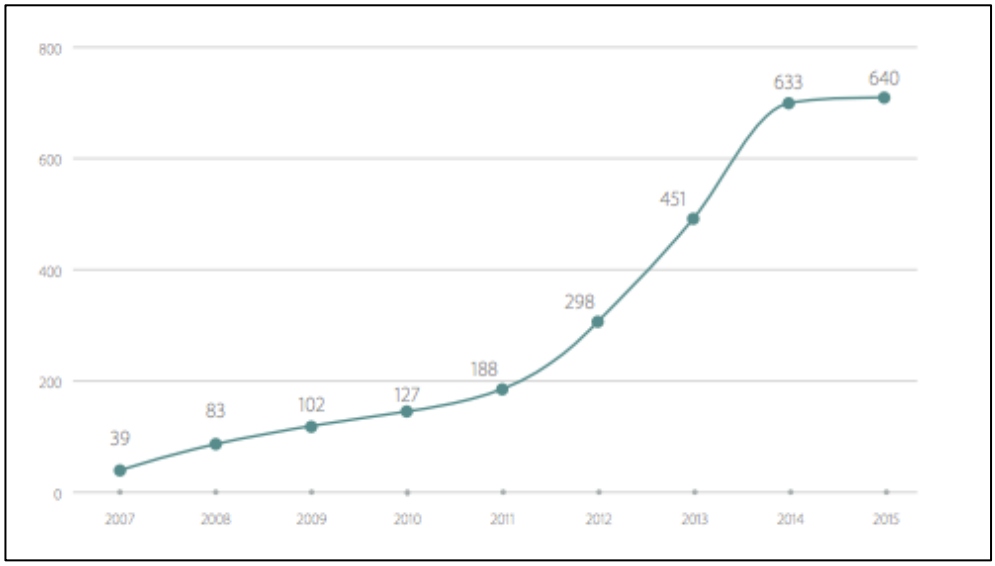
Despite these long hours of demanding and repetitive work, employees receive *low wages* compared to other workers in cities and the higher level managers in Foxconn (Ngai, P., & Chan, J. (n.a.)).

Employees also face *health and safety risks*. Deadly explosions are commonplace and workers are also often exposed to poisonous chemicals. According to a survey from the Fair Labor Association, 43% of workers experienced an accident in their campus. So there is a patent lack of safety and security (Nuttall, C., & Waters, R. (2012)).

Another striking fact is the *super-exploitation of students*. Many students, mostly aged between 16 and 18, must work for Foxconn as interns at the request of their school. In reality, it is the government that encourages such internship because, as noted above, governments are in close collaboration with Foxconn. In fact, local governments vie fiercely for the opportunity to host Foxconn plants because the plants increase local economic growth, therefore leading to student work. Such an arrangement is also beneficial for Foxconn because interns are not considered to be real employees, and therefore labour law need not be applied in the same way to interns (Ngai, P., & Chan, J. (2012)). Moreover, despite their young age and the maximum eight-hour work day stipulated by the Education Ministry, the children often perform excessive overtime work. Furthermore, the work they do is often absolutely outside of scope of their studies, and therefore offers them little education. These ‘student internships’ are arguably a way to implement ‘student labour’. Foxconn is also particularly keen to hire children because they are easily influenced and controlled, and because they require lower wages than adults. Whereas women were the preferred target of the Taiwanese firm years ago, now children are more sought after as a workforce (Brown, G. (2010)).

After the suicide scandal in 2010, conditions in Chinese factories became a major issue for Apple. The American multinational appeared to take particular interest in the topic because of the media attention that labour conditions garnered. After the Foxconn scandal, Apple began focusing more on respect for their Supplier Code of Conduct (SCC). The SCC contains expectations about labour and human rights, health and safety, environment, ethics and management commitment (Apple (2016, c)). Apple tried improving their publicly perceived transparency by publishing the list of their 200 major suppliers. They also dedicated a significant portion of their website to their 'supplier responsibility'. In fact, when browsing it, their slogan is immediately apparent: '*There is a right way to make product. It starts with the rights of the people who make them*' (Apple (2016, c)). Moreover, as we can see in the figure 12, the number of worldwide audits conducted by the company has steadily risen since the suicide scandal of 2010-2011. The audits are in place to ensure the respect of their Supplier Code of Conduct.

*Figure 12: Apple annual audits*




Source: Apple (2016, d)

According to their 2016 progress report, Apple conducted 633 audits in 2015, covering more than 1.6 million workers. When violations are discovered, the company purports to work closely with the management of the concerned company to help them improve the conditions of workers. Apple also claims that they limit work to no more than

60 hours a week, with a mandatory day of rest once every seven days. The reports also highlight that 95% of audited suppliers had complied in 2015. Apple has also emphasised that they do not tolerate underage labour, and if they find child workers, they will require that the suppliers return the children to their homes, pay for their education at a school, and continue to provide income for basic needs. Since 2007, Apple has also trained workers all over the world in understanding laws, health and safety regulations, as well as the Apple Code of Conduct. By 2015, 9.25 million workers had received 'rights training' (Apple (2016, d); Nuttall, C., & Waters, R. (2012)).

Apple also joined the Fair Labor Association in 2012. The latter conducted an audit the same year in order to assess labour conditions in Foxconn facilities producing Apple products. They noticed at least 50 serious non-compliances with Apple's Code of Conduct and the Chinese labour law, and proposed reforms. However, these reforms were never effectively implemented. It is suggested that Apple mainly joined the Fair Labor Association to improve their public image (Fair Labor Association (2012) (China Labor Watch (2015); Newton, J. (2012)).

Apple tries to maintain a wholesome and respectful image. In fact, the Supplier Code of Conduct is cited as a reason why people want to buy Apple products. If potential consumers feel that Apple is a sleazy company that employs workers under abusive conditions, they are not as likely to accept paying such high prices for their products (Ozimek, A. (2012)). However, behind the scenes, things are not as perfect as Apple may claim. In fact, Apple regularly claims that they monitor suppliers' compliance with their code, but they do not actually exercise efficient controlling over this compliance. Many rules are not respected at plants, for instance, overtime hours often exceed 60 hours. Apple turns sufficient profits to improve workers' treatment. However, Apple is actually partly to blame for these poor working conditions because of the constant pressure they exert on their suppliers. Indeed, as explained in the first part of this paper, Foxconn has had to adapt its production to the demand of the American firm, and sometimes demand is so high that the production cannot be met without violating already weak workplace standards. Apple should therefore take more responsibility, and should consider codes of responsible ordering practices. It is not sufficient to simply make public commitments, and stick to its own code of conduct; however, companies such as Apple appear to be most concerned with finding low-cost

producers in order to maximise their profit while balancing their public image (Newton, J. (2012)).

Foxconn has made some improvements and changes following the wave of the scandal. First, they installed safety nets in all campuses and dormitories were all wire-grilled. They also organised labour union elections in 2013 for the first time. These union elections were generally controlled by management and by the local government (Hille, K., & Jacob, R. (2013)). Moreover, they made some improvements regarding dormitories, restricted overtime to no more than 60 hours, and also started increasing wages—although these improvements were especially focused on the Longhua plants, where media attention was focused. After the wave of suicides, Foxconn also changed its hiring methods. All job applicants had to complete a psychological test in order to avoid hiring people with more fragile spirits. The company also attempted to make workers sign a no-suicide 'consent letter' in order to limit Foxconn' liability in case of suicide and to make workers responsible. However, this no-suicide pledge was intensely criticised, and Foxconn finally dropped it (Chan, J. (2013)).

The state did not take specific measures, even after these suicides. They publicised general statements, but the specific measures undertaken were never disclosed. Moreover, rather than looking for the reasons for these suicides, local-level Chinese officials instead banned all negative reporting about Foxconn. A May 2010 released stated that '*for the front pages of news websites and news center pages, blogs, micro-blogs, there should be no news related to Foxconn except from official sources*'. It might be surmised that the state prioritised protecting Foxconn over protection of the workers (Chan, J. (2013)).

Yet, even if the state and local government ignore these facts, social unrest in China has increased at an alarming rate, in part due to the growing access to communication technology (Gobel, C., & Ong, L. (2012)). Current workers have greater access to news and information, and therefore expect more, and ask for more acceptable working conditions. This increasing awareness is why *workers have begun* demanding higher wages and better working conditions by stealing products, implementing slow-downs or ceasing to working, forming strikes, and sabotaging. In other words, the workers have a workplace bargaining

power because if they decide to stop working, for instance, it will have an impact on a much larger scale than on their production line alone (Chan, J., Pun, N., & Selden, M. (2013)). In the face of labour shortages and of these protests, Foxconn finally had to respond by improving working conditions and by raising wages. Despite improvements and actions undertaken, the situation is far from being perfect—workers do not work in perfectly fair conditions. For instance, despite the ado made about labour union elections organised in Foxconn factories, the Fair Labor Association felt that the union failed to truly represent workers (Hille, K., & Jacob, R. (2013)).

Overall, the Foxconn scandal had two important consequences. First, Foxconn and Apple were brought into the spotlight, and media began scrutinising working condition standards. Second, following rising levels of worker protests, Foxconn wages started rising. For instance, in Longhua (Shenzen) where Apple products are manufactured, salaries increased from $152 to $320 (China Labor Watch (2015)). Foxconn now pays better than many similar employees. Salaries also increased because of the Chinese transition phase. From 2008 to 2012, China's minimum wage levels have registered an average 12.6% annual growth (Chan, J. (2013)). The following scenario discusses the rising wages further.

Apple began shifting its production to *Pegatron* in 2011 in order to secure production capacity and to avoid rising labour cost (Chan, J., Pun, N., & Selden, M. (2013)). This move was also attributable to Apple's new CEO, Tim Cook, who placed a greater premium on risk diversification. Pegatron Corp (Pegatron) is a Taiwanese firm that existed since 2008 and benefits the most from the location change. Pegatron's core business is the production of computers and related components, and they have many locations in mainland China (Pegatron (n.a.)). Pegatron was first responsible for the production of Apple's more peripheral products, and finally started producing core products of the brand like the iPhone 6, the iPhone 5C, and the iPad Mini (Dou, E. (2014)). They became one of Apple's main suppliers. Apple started shifting its production to Pegatron because of the lower labour costs. Even if it represents only a small part of the overall costs (see following paragraph) the savings were not negligible. In fact, when comparing all-in labour costs in Pegatron Shanghai and Foxconn Longhua, the savings are particularly apparent. Pegatron Shanghai is a subsidiary of Pegatron Group that has more than 80,000 workers; almost all of these workers work on the

manufacturing of Apple products (Chan, J., Pun, N., & Selden, M. (2013)). Therefore, by taking into account all-in labor costs (bonuses, subsidies, hiring costs), in 2014, Pegatron Shanghai still possessed an 8% cost advantage over Foxconn Longhua, translating into a 61 million dollar annual advantage. More precisely, there is a 21% difference in base pay alone (China Labor Watch (2015)). Pegatron has the ability to hire an enormous number of dispatch workers who are temp workers. These temp workers cost less money because the company does not pay them full benefits, and does not have to pay wages to them in the low season.

Moreover, when Apple started working with the firm, Pegatron was receiving little attention from the media compared to Foxconn. Even now, a Google search with the terms 'Foxconn worker' returns 433,000 results compared to only 126,000 results involving 'Pegatron worker'. However, this trend could rapidly change and Pegatron became more and more in the spotlight because it is one of the biggest Apple contractors.

As we will see later in this scenario, Apple also starts working with other final assembly contractors.

As for Foxconn, they reacted to these changes by moving a part of their production to Brazil, Mexico, Eastern Europe, and Vietnam. Notably, an Apple final assembly facility charge of the production of iPhone and iPad is situated in Brazil. Foxconn also moved some of its plants in mainland China, including in Sichuan and Henan provinces where they established factories to work for Apple. These moves benefitted from lower labor costs, tax, and land costs. Despite the distance from the sea, and other disadvantages cited in the first part of this thesis, Foxconn convinced some of its suppliers to follow them. Moreover, these locations contained plenty of available skilled labour, which was essential for Foxconn in order to respond quickly to Apple's demand (Hille, K. (2010, a)).

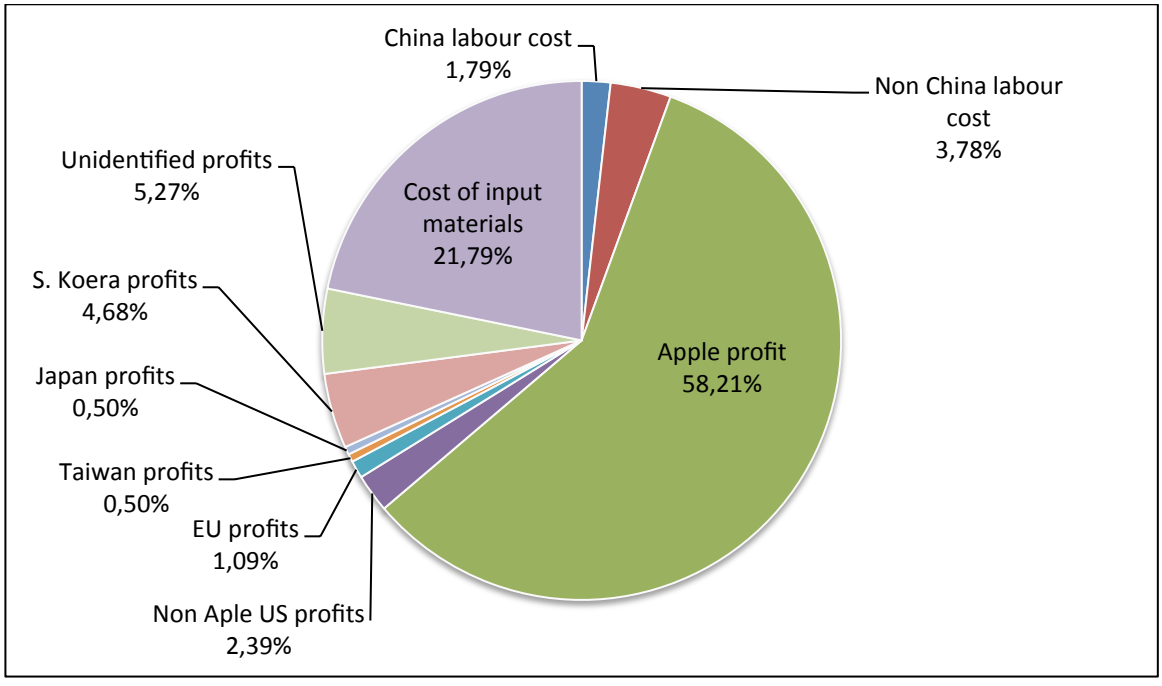
We may wonder whether these poor working conditions will impact Apple and Foxconn alliance. *Would it impact Apple supply chain? Would Apple have to change the suppliers they work with? Would they stop working with Foxconn? Would they loss clients? Would they lose money? Would their image be impacted?* We can develop three possible future scenarios about how the situation may evolve.

### *5.1.1 Apple and Foxconn alliance may stay unchanged despite rising labour costs*

Apple may continue working with Foxconn despite rising labour costs due to mounting protests from workers, and other external pressures.

We can hypothesise that it will not be too disadvantageous for Apple, and that it won't incite them to stop working with Foxconn. In fact, Apple is a very successful company that is able to capture a large part of the value of its products. As said above, it has a typical value chain, and has this capacity to put pressure on all suppliers and manufacturers in order to produce the parts as fast as possible, at the lowest cost possible. As we can see in the figure 13, the profit margin of Apple represents the biggest part of the value distribution for the iPhone. The Chinese labour costs represent only 1.8% and 2% of the total value, which is borderline negligible compared to the rest of the distribution.

*Figure 13: Value distribution of the iPhone in 2010*




Source: Worstall, T. (2011)

Moreover, it is important to keep in mind that Foxconn has already moved plants in mainland China. As explained above, Foxconn moved in part to benefit from lower labour costs. The company will perhaps continue moving plants into these provinces in order to benefit from cost advantages and to satisfy Apple. However, these benefits will certainly be temporary, and wages will eventually increase. Foxconn also moved a part of its production to Brazil where the iPhone 6 is assembled.

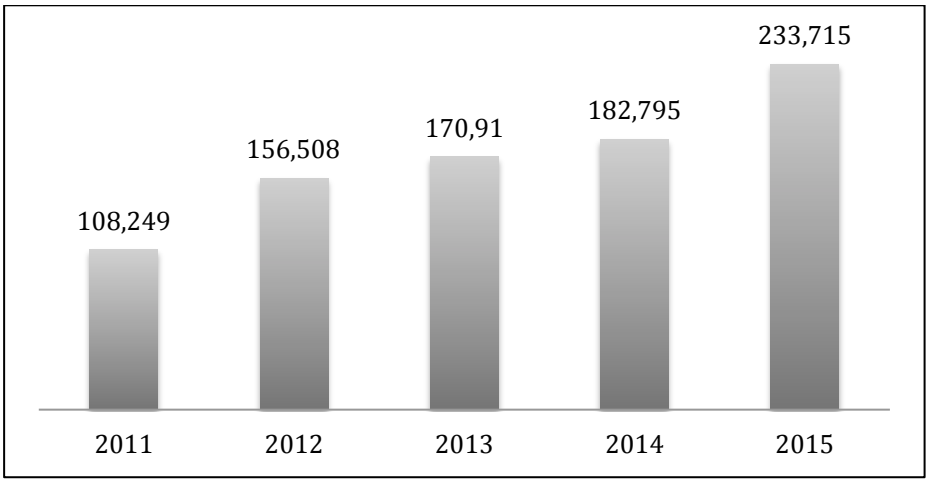
If rising labour cost hinders Apple, they may react to this by, for instance, increasing the final price of their products. Therefore, rising labor costs are not a decisive factor for Apple. Even if they are keen on decreasing their costs as much as possible, rising labour costs are unlikely to motivate them to end their alliance with Foxconn.

#### *5.1.2 Apple and Foxconn alliance may one day be broken to protect Apple brand image*

Apple may change its way of working and its contract with Foxconn due to remaining condition problems if people matter. Three evolutions may be highlighted.

People may not care very much, and Apple may maintain its worldwide reputation and continue working with Foxconn. The situation will therefore continue as it is, and Apple will simply carry on making audits and implementing other plans to maintain a respectable reputation. For the moment, this scenario seems to be plausible. In fact, by looking at the net sales evolution of Apple in the figure 14, we notice a constant growth across years.

*Figure 14: Apple's net sales evolution (in million)*




Source: United States securities and exchange commission (2015)

However, the situation in Chinese factories can start to negatively impact the image of Apple. In fact, even if today most people do not worry about how Apple products are built, the balance may tip in the other direction as some citizens realise that there are major issues behind the manufacturing of these products. Manifestations of such a change in consumer focus already took place to denounce poor working conditions of Apple' supplier plants. For instance, in February 2012, a consumer organisation organised demonstrations in front of Apple stores in New York, London, Sydney and other big cities in the world. On the 12$^{th}$ June 2016, on the international day against children work, demonstrations also occurred in front of Apple Stores. Associations also circulated petitions to put pressure on the multinational.

The power of media should not be neglected. If a campaigner decides to latch onto a company, information can be rapidly spread around the world by mean of the Internet. One day, Apple may be subjected to the same scrutiny as Nike. In the 1990s the company became in the spotlight following bad working conditions in their sweatshop. Even if they were not the worst in the sector, they had to change of partners and to completely restructure their supply chain throughout the world. They notably stopped working with a plant in Cambodia where investigators found child labour as well as with 11 other factories in four other countries. Following these scandals, they also established a very strict Code of Conduct and adopted other strict standards (Skapinker, M. (2002); Graham, J. (2000)). If such a

situation should materialise, Apple will need to restructure their supply chain, which may impact their relation with Foxconn.

It is difficult to know which of these situations is most likely to happen. Today, things can change so rapidly that both may be equally likely to occur. However, we consider that the second scenario is particularly relevant to the current perspective. People become more and more sensitive to human rights and children's rights; therefore, working with Foxconn degrades Apple's image and they risk losing clients. On the one hand, they want to be seen as company that respects all of its employees and it suppliers' workers. However, on the other hand, Apple seeks to maintain its high margins and to have very flexible contractors like Foxconn. These two mentalities are contradictory, which may start to disturb Apple customers. We may therefore expect that one day it will be in the interest of Apple to end its relationship with Foxconn. It seems likely that the relationship would end rather than change substantially because Foxconn is a Taiwanese firm with a very specific mentality that is unlikely to transform radically. Cutting ties will ensure Apple's relationship with its actual customers. Even if it is costly, it may be worthwhile for their long-term success (J. Ottman consulting (2011)).

Nevertheless, change does not seem to be Apple's priority for the moment. Indeed, the scenario where Apple stops working with Foxconn is less likely to happen now for several reasons.

Foxconn recently hired 130,000 additional workers for the final assembly of the iPhone 6. Moreover, Foxconn is the sole assembler of the iPhone 6 Plus and seem to be involved in the future production of the iPhone 7 (Hough, J. (2015)). In fact, the manufacturer began hiring more people because the manufacture of this new iPhone will be more complex than other Apple products (Heisler, Y. (2016)). All of these facts contribute to the suggestion that the relationship between Foxconn and Apple will not yet disappear.

It is also crucial to consider that Apple is a listed company, and the primary goal is therefore arguably to maximise shareholder value. Even if it could be beneficial for Apple to end its collaboration with Foxconn in order to have a better public image and to keep its clients, it may cost a great deal, and shareholders may be reluctant to approve the necessary expenditure because benefits will only crystallise in the long term.

### *5.1.3 Apple may increase its manufacturing network to diversify risks and avoid rising costs*

Another likely scenario is that Apple will expand its manufacturing network in order to diversify risks and avoid rising wages. Many permutations are possible. As noted above, Apple has worked with firms other than Foxconn for the final assembly of their products over the last several years (see Annex 1). Three eventualities are therefore possible: (1) Apple will possibly reinforce their alliance with these new firms, (2) they may work with new manufactures and/or (2) move their production to other countries.

First, Apple may strengthen their alliance with Pegatron, their second largest manufacturer. As previously stated, they started shifting a part of their production to this manufacturer in 2011. Over the years, Apple shifted more and more its production to the manufacturer. In fact, the latter recently hired 130,000 additional workers for the final assembly of the iPhone 6. Nevertheless, even if Apple outsources a huge part of its product to Pegatron, it is important to keep in mind that this Taiwanese manufacturer also fields problems with working conditions. Even if the company is under less public scrutiny for the moment, they have already had problems with media. In 2014 for instance, after an article by the BBC, Pegatron quickly reduced their workers' working hours. The China Labor Watch still observed many issues in 2015. They claim that 52% of workers completed more than 90 hours of overtime per month—which clearly exceeds 60 hours. Additionally, dormitories were found to contain more than ten workers, whereas Apple standards restrict dorms to eight people (China Labor Watch & Framtiden (2015)). Therefore, working with Pegatron might amount to commuting the problem of working conditions to a later time (China Labor Watch (2015)). When the media publishes articles about working condition problems, Pegatron will need to react and make improvements, as Foxconn did.

Quanta Company is also a big supplier of Apple. This is a Taiwanese firm that was established in 1988 and is specialised in computer hardware. It is the world's largest notebook contract manufacturer. Among the 18 final assembly facilities working for Apple in 2015, three of them belong to Quanta Company. Quanta is in charge of the production of

Macs and iPads. They also manufacture the iWatch, the more recent product of Apple. They are the sole manufacturer of this new product. This privilige could be proof that Apple is strengthening its links with the company and that the alliance between both companies will not end anytime soon (Apple (2016, d)). Moreover, the company also moved factories in mainland and western provinces in order to avoid rising labor costs, which is positive point for Apple.

However, the company also encountered problems with working conditions. In 2014, China Labor Watch undertook a survey in a Quanta Company factory that manufactures computers for Sony, Dell, HP and Apple. They discovered 15 sets of violation. Workers must work overtime, many salaries are unpaid, and the lack of security in factories is significant (China Labor Watch (2014)).

As notable in the Annex 1, Apple also started working with Wistron Corporation, Compal Electronics, Invenec Application Corporation, and BYD Company. These companies are all situated in China, and are responsible for the final assembly of Apple products. Apple may therefore also reinforce its relationships with these firms in the future. However, we will not develop this concern further because we do not have enough resources and time to explain accurately the future possible evolutions of each company.

The majority of final assembly firms working for Apple are located in China and have the Taiwanese nationality. Over the years, Apple seems to have broadened its network with Taiwanese firms. However, it is important to highlight the reason for this Taiwanese predominance. Taiwan has always been ahead of China regarding technology. But in a few years, Chinese companies will certainly catch up Taiwanese firms. Therefore, it is important to keep it in mind that Apple might start working with Chinese firms, which could impact its alliance with Foxconn. As discuss in the limitation part of the paper, it may be interesting to make further research about it.

Apple may also start outsourcing to a country other than China. We develop this concern in the following scenario. Apple also shifted a part of their production in the United States, which is discussed in the scenario 5.

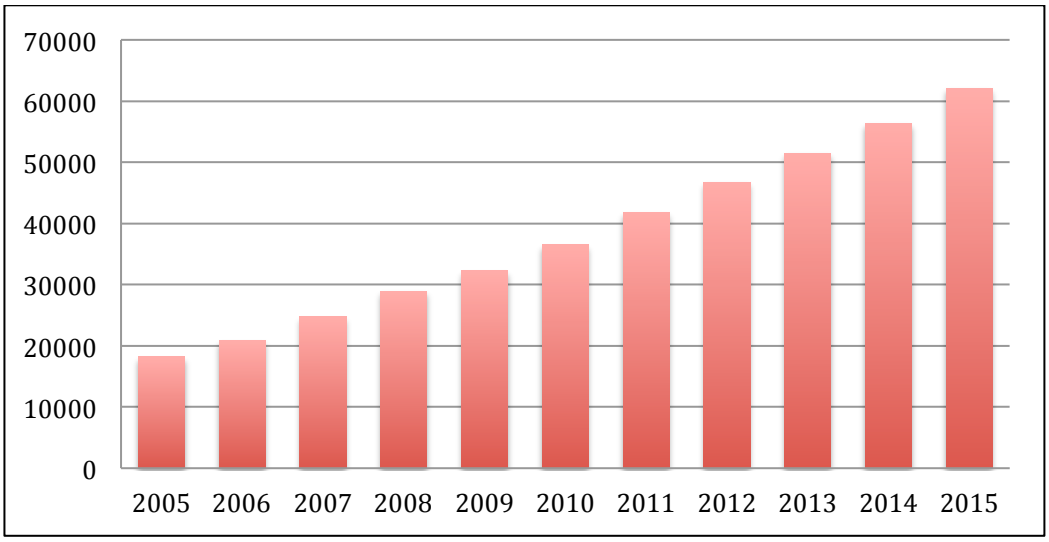
In sum, this scenario is likely to be realised. Apple will certainly expand its collaboration with different firms and therefore decrease its dependence on Foxconn, while continuing working with the latter. Foxconn is already losing Apple orders. In 2015, they received 69% of orders from the American multinational, compared to 87% in 2014 (Colleau, A. (2015)). To react to this decline and recover their loss of revenue, Foxconn started diversifying their activities and customer base. Towards this aim, they bought the company Sharp in early 2016. This company was specialised in the production of screens, including those of iPads and iMacs. The figures indicate that Apple is decreasing its collaboration with Foxconn without ending its alliance with the firm.

## 5.2 Scenario II: Consequences of China transition phase

China's economy has changed over the past 30 years from a centrally planned system to a more dynamic market-based economy where two-thirds of economic activity is in the hands of private enterprises. For the last several years, China has been radically changing and focusing more on its domestic population. The country is thought to be in a transition phase and is changing its economic model in the direction of a liberalisation of their economy. In fact, they decrease their exportations, their FDI and refocus more and more on the internal consumptions. They shift to a more consumer-driven economy.

First, new government policies favoured household income growth, improved the social safety net, and supported the expansion of the service sector and private enterprises. It created *more and better-paid jobs* (McKinsey & Company (2013)). Manufacturing wages in China remained relatively low from 1980 to 2005 and continued rising since that period, as depicted in figure 15. In other words, figure 15 illustrates the rising wages from 2005 to 2015.

*Figure 15: Average wage per year (in Yuan)*



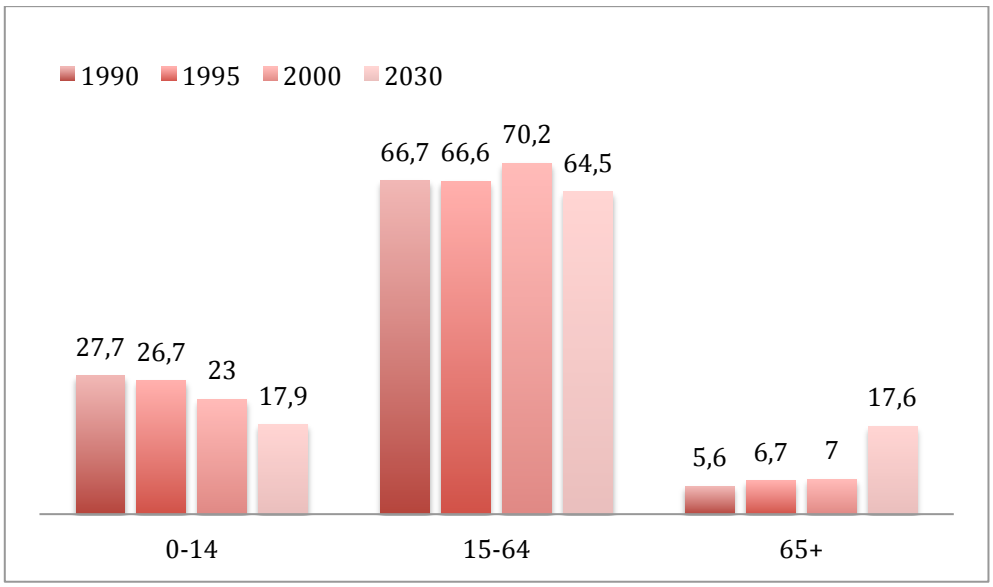

Source: Trading Economics (2015); National Bureau of Statistics of China (2015)

This increase of Chinese salaries has led to the emergence of the Chinese *middle class.* The middle class grew steadily in all of the country's major cities, as well as in some of its smaller ones. (Barton, D., Chen, Y., & Jin, A. (2013)). The development of this middle-income consumer segment will radically change China. Indeed, by having bigger wages, Chinese workers consume more, profiting from a higher purchasing power. This means that consumers will be able to buy more services and goods. These economic factors considerably alter the mentality of residents, and allow China to re centre on its domestic population. Where people once simple wanted to earn money in order to eat and to support their family, Chinese today have disposable income, and therefore higher expectations of their expenditures (The Economist (2016)).

Another important factor that characterised China's transition phase is the *declining number of migrant workers*. This concern is in part due to the change in Chinese mentality. Before, elders and children lived in the countryside, and the other family members moved to the cities in order to financially support their family. Today, young workers tend to stay at home or next to their village. This trend clearly has an impact on the number of migrant workers (Financial Times (2016)). Moreover, this decline of the urban labour pool is also due to the increasingly aging population. In 1980, only 5% of the Chinese population were 65 years

old or more. We expect this percentage to increase up to 24% in 2050. Figure 16 shows the structure of the Chinese population until 2030.

*Figure 16: Chinese population structure (in million)*




Source: Gipouloux, F. (2005)

Older workers who are near retirement age also often return to their family in the countryside because it becomes too difficult for them to find jobs in cities. Big companies prefer to hire young people, and other available jobs are too difficult for these older people. This slow in the urban labour pool growth will incite companies to increase their productivity through training, automation, more flexible production, and enhanced employee loyalty.

Following these transitions, China is losing more and more its status as the 'workshop of the world'. This is clearly desired by the state as they launched the *'National medium and long term program for science and technology development'* from 2006-2020. In other words, China intends to shift their role from 'made in China' to 'innovated in China' (Course: 'Economics of global innovation' at Katholieke Universiteit Leuven in 2016).

In sum, the transition phase happening in China is mainly characterised by the rise of salaries, the expansion of the middle class, and the decrease in migrant workers and, therefore, in the available workforce. To explain this second scenario, we focus on the first

and third change. The possible consequences of the middle class expansion are explained hereafter in the scenario 4.

Before developing future possible evolutions of these two major changes, an important consequence of this transition phase should be highlighted. The days of cheap land and labor in coastal cities, especially in Guandong, are waning and businesses located there have begun moving into mainland China. Foxconn, following the example of many other multinationals, has shifted part of Apple production from Shenzhen to central China, in Henan and Sichuan province (Hille, K. (2010, b)). They invested in these provinces to avoid rising labor costs and demographic changes. Moreover, as noted in the first scenario, they also switched production locations to escape Shenzen suicide scandals, and the resultant higher wages. Nevertheless, cost advantages in these provinces do not exceed 10%. Moreover, by going to a new location, the company lost the concentration of suppliers, logistics, and services that Guandong provinces offered them.

Capitalising on these challenges to China's characterisation as 'workshop of the world', the goal of the government appears to be to move from the previous cheap labor export model to one based on innovation, domestic consumption, and services. More specifically, they want to reinvent industry in the Pearl River Delta and China to rank as one of the world's most innovative countries by 2020 (Balding, C. (2016)). This province is now attracting new kind of businesses and firms locating there would be benefitted by replacing part of workers by robots (we discuss the future possible consequences of robots in another scenario). Therefore, Chinese migrant workers mostly would return to the countryside. Guandong is now attracting talents and entrepreneurial startups. Today some 8000 technological companies have been set up in the city, and the Pearl River Delta is becoming the new 'Silicon valley' (Bloomberg (2016)). In sum, the Chinese transition has a huge impact on many firms located there, including Foxconn. The shift of Apple production in Brazil and other countries is probably also linked to this transition.

We can now look at possible further consequences of this transition phase and more particularly of the rising salaries and the decreasing number of migrant Chinese workers. *What are the possible evolutions of the relation between Apple and Foxconn? Will other countries become more profitable than China? Will Apple stop working with Foxconn?*

### *5.2.1 The end of Apple and Foxconn relationship*

First, following the growing salaries in coastal and Eastern provinces, *Apple may decide to end its collaboration with Foxconn.* We already develop this eventuality in the first scenario and conclude that the likelihood of this evolution is small, at least in the short term. In fact, Apple seems to engage itself with the firm by awarding them the production of its most recent products. As mentioned above, Foxconn is also implementing initiatives to avoid rising wages by building plants in mainland China. Finally, labour costs represent a very small part of Apple margin. Apple has a big profit margin that never fell above 19.53% and that even reached 2.66% in 2012 (YCharts (2016)). It is defined as the proportion of revenues remaining after paying operating costs like wages, raw materials and administrative expenses (Chan, J., Pun, N., & Selden, M. (2013)). Therefore, from this perspective, it will not incite them to stop working with Foxconn.

### *5.2.2 Apple may increase its manufacturing network*

*Apple may expand its collaboration with other manufacturers* to depend less on Foxconn. We also saw before that this process has begun, and we concluded that this evolution is likely to happen. By finding other partners, Apple can diversify its risk and avoid higher worker salaries.

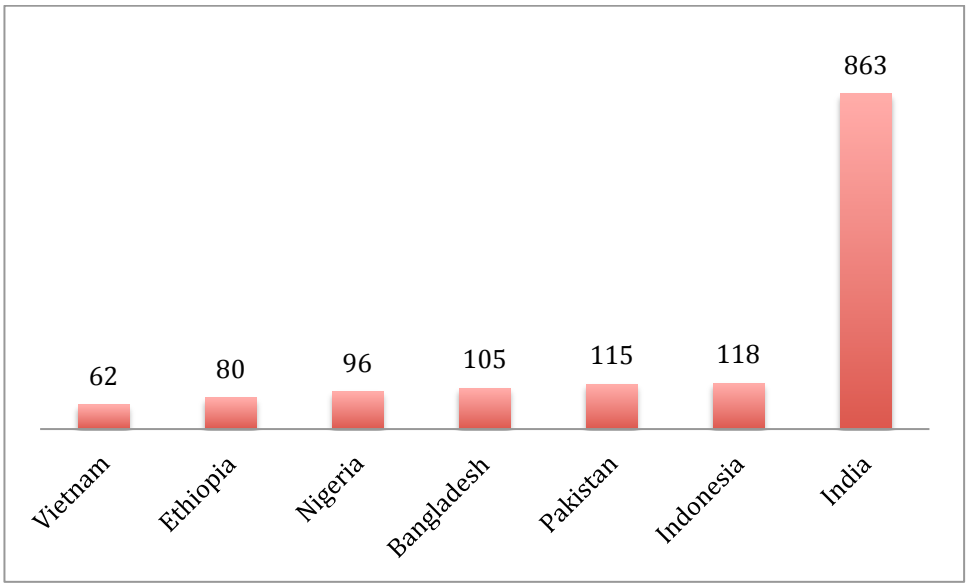
### *5.2.3 Apple may shift final assembly out of China*

*Apple products' final assembly may be shifted away from China*. At the moment, two final assembly facilities are situated in the United States, one is situated in Ireland, and another is in Brazil (see Annex 1). Apple may continue shifting production abroad in different ways. First, by working with Foxconn, facilities may be built in—or relocated to—other countries. Secondly, Apple may find other partners that have plants situated elsewhere than China in order to escape the actual transition. Finally, they may also relocate a part of the production to the United States. We develop this last eventuality hereafter in another scenario.

Before looking at the potential future Apple manufacturers, we will first look at two factors that are essential when choosing a location in which to do business. These reasons may be decisive and may determine the attractiveness of a country in which to situate the final assembly of products.

First, as we saw in the first part of this paper, workforce availability is essential when looking for a location in which to do business. It is an important reason why China became the 'factory of the world'. In fact, the huge number of migrant workers who left their village to go work in the cities led to China's wealth explosion. Therefore, another country may have this potential. As we can see in figure 17, many countries in South East Asia are inhabited by a large number of rural residents.

*Figure 17: Rural residents in 2015 (in million)*

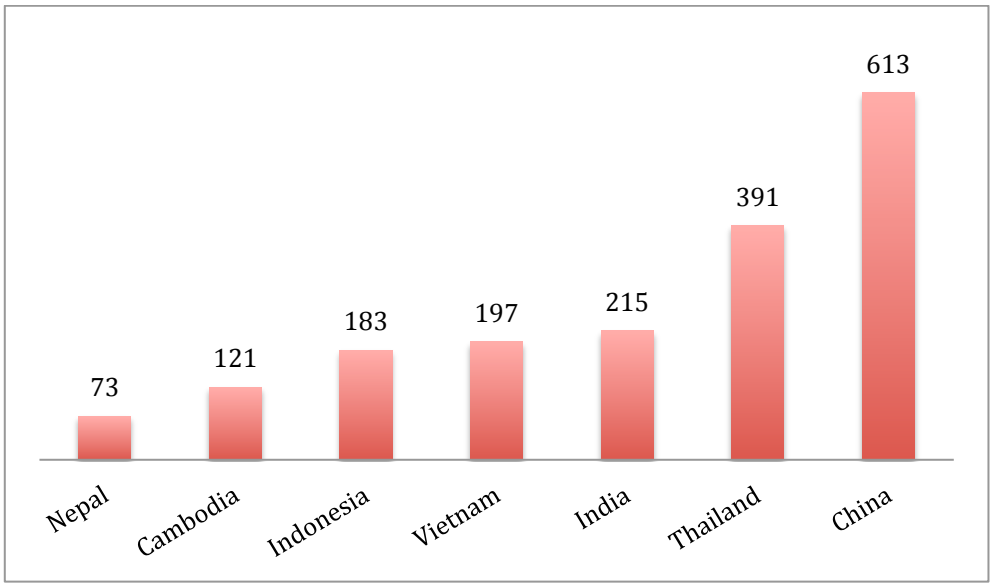



Source: Financial Times (2016)

All of these countries clearly hold a certain potential. However, the most promising country is India, whose rural population in 2015 was 863 million. This country may replicate China and become the new workshop of the world.

Another important factor to look at is the average salaries in these countries. The rising wages in China is a major consequence of its transition; the average incomes in some of these Asian countries are clearly lower than in China.

*Figure 18: Average monthly wages in 2013 (in US$)*




Source: International labour organization regional office for Asia and the Pacific (2014)

Nevertheless, these two factors are not enough to determine whether a country is suitable to manufacture products, and whether it is more attractive than China. As we develop in the first part of this paper, many other characteristics are determinative and should also be taken into account. However, in the framework of this paper we do not have enough time to develop all of the special features of each potential country. Therefore, we will focus on a select few where Apple products are already assembled, or where they are the most likely to be assembled.

Before developing possible evolutions, it is important to keep in mind that Foxconn has already set up plants in countries other than China and Taiwan. One of the plants, situated in Brazil, is already working for Apple. The other plants are situated in Mexico, Eastern Europe, and Vietnam. They may establish other plants or expand existing ones. If the company continues its worldwide expansion, it may ensure a certain stability in its relationship with Apple. In fact, if Foxconn locates its final assembly facilities in more

favourable countries than China, and if it shifted Apple production there, it may be beneficial for Apple. It will be a way to counter the transition phase of China and to decrease transportation costs, import taxes, as well as respond more quickly to Apple customer demand. Consequently, Apple would not have compelling incentives to stop working with the manufacturer.

We now look at possible future locations of final assembly facilities whether it be owned by Foxconn or by another firm.

In 2014 Foxconn announced its desire to invest in Jakarta, one of the biggest city of *Indonesia*. First, the investment allowed them to depend less on China, where the labour cost advantages are decreasing. Second, Indonesia holds a certain potential for Apple. Apple can sell their products in that country, despite poverty and the vastness of the archipelago. Indeed, the wealthier consumers are highly concentrated in and around Jakarta, the capital, and the number of these people that will spend money on goods other than necessities is expected to rise from 45 million to 145 million by 2030 (Bland, B. (2014)). Foxconn is projected to invest 1 billion in order to establish R&D, production and final assembly in the country. Nevertheless, they did not officially claim the construction of these plants, and negotiations with the Indonesian state are still happening. Moreover, a specific law in Indonesia that will take effect in 2017 may influence their decision. Companies producing smartphones in the country will be required to produce some parts locally. It could restrain Foxconn to locate factories in Indonesia (Danubrata, E., & Christina, B. (2015)). Therefore, for the moment, we cannot ensure that Foxconn will establish final assembly facilities in Indonesia. We are not in a position to say if negotiations with the state will end in an agreement or not.

Tim Cook, the Apple' CEO, visited *India* in May 2016 in order to look at potential projects that could be undertaken there. According to unofficial information, he is planning to meet the Indian Prime Minister to talk about bringing assembly and manufacturing to the country as well as opening the first Apple Stores in India. Such a move facilitates iPhone promotion in the country. This project may make sense and could likely be realised for many reasons. Aside from the huge number of rural residents and the low average wage, India is

becoming the most desirable outsourcing destination of firms because the country offers many other advantages.

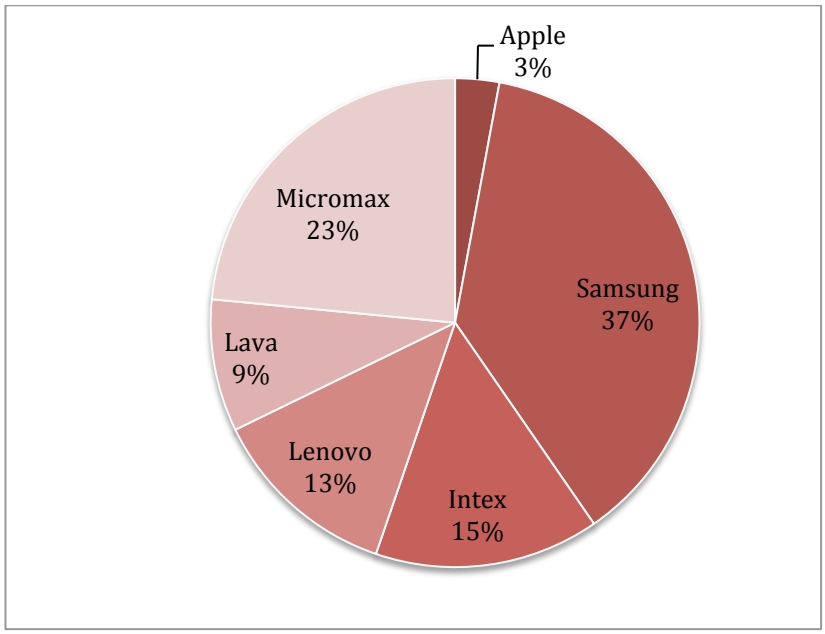
First, they have a huge number of available workforce that is qualified and available every day 24/24 hours (Boillot, J-J. (2005)). Moreover, India is geographically well situated next to China, where the bulk of Apple suppliers are situated. They are also a member of the WTO which offers the same advantages as cited above for China.

India is also the world's second-largest smartphone base with 222 million users, which only represents 17% of the population. Moreover, its middle class is expected to quadruple to 200 million by 2020. It could become the world's largest class consumer market by 2030. Some people even say that 'India is the next China'. Therefore, India has a huge potential that should not be neglected.

However, India has major challenges to deal with. First, water and energy shortages as well as increasingly overloaded roads and telecommunication networks are major drawbacks. Environmental problems may also become difficult to manage. Besides these general disadvantages, Indian productivity is also disadvantageous when analysing the appeal of India as a manufacturing base. Physical productivity of Indian workers is far inferior to Chinese productivity. The latter are far more rapid in the assembly of parts. It is an important factor to keep in mind when choosing India as a new location for manufacturing. However, robots may possibly counterbalance this lack of physical productivity.

From another perspective, Indian consumers are also very price sensitive and are not generally willing to pay for iPhones. While Apple's most affordable phone starts at 399$, the average sale price in India for smartphone is projected to decline to 102$ by 2018 (Rai, S. (2016)). A little-known Indian company even has plans to sell a smartphone at 4$. Apple has therefore been less successful in India than its major competitors. Indeed, as depicted in figure 19, its market share is small at only 3%. We can expect Apple to take initiatives in the near future in order to recover this delay compared to its competitors, and to benefit from the future potential of India. Apple products may become 'made in India'.

*Figure 19: Indian smartphone market share*




Source: Culpan, T. (2016)

Thirdly, if Apple establishes its own stores in India, the law requires that at least 30% of the products' components be produced locally, in order to boost the economy.

In sum, despite these challenges, India has great potential. Nevertheless, for the moment, Foxconn executives do not plan on establishing assembly facilities there. From a broader perspective, the manufacturing of iPhones and the establishment of Apple stores is still uncertain. Apple products may one day be assembled in India, by Foxconn or by another company, but we cannot be sure of this with current data.

Foxconn is already situated in *Vietnam*. They may expand their plants there and shift a part of Apple production. Other manufacturers may also be situated there. Indeed, Vietnam is a growing market. In 2014, they notably became the biggest Asian exporters to the United States. Vietnam is attracting more and more manufacturing plants. Samsung is notably situated there to make the final assembly of its smartphones. Vietnam is also characterized by a young population (Cheok, M. (2016)).

As already mentioned, an Apple final assembly facility owned by Foxconn is also situated in Brazil. This production base may be expanded in the future because the country's

market demonstrates potential. Apple may also be interested in other contractors situated there. Many electronic firms such as Samsung, Lenovo, Ericsson and so forth are also located in Brazil. One positive factor for Brazil is its massive domestic market. Over the years, consumers have experienced rising incomes and greater access to credit. We can therefore expect an explosive growth of the country's middle class. Nevertheless, they are major challenges in Brazil regarding infrastructure problems, high tax (including hefty import taxes), and red tape. For instance, Apple products that are imported in Brazil tend to be twice the price of their US equivalents. This is part of why we depicted the same phenomena as in India. Even if the potential is huge, Apple has very little market share—little more than 1%. Therefore, we can expect the final assembly of Apple products to be shifted to that country in order to avoid these huge taxes and therefore to capture a larger proportion of the demand (Pearson, S., (2012)). Foxconn published its ambitions in 2013 to expand its Brazilian plants. Nevertheless, we should keep in mind that Foxconn's structure is highly autocratic, and applying it to other cultures may cause clashes. Indeed, Brazilians have a different way of working than Chinese workers, and attempting to implement such a harsh environment may lead to dissatisfaction and protests.

In sum, Indonesia, India, Vietnam and Brazil are potential countries that may one day replace China as manufacturing capitals, or simply become the location of future Apple final assembly facilities.

## 5.3 Scenario III: The growing use of robots

As previously stated, China is in transition, and has encountered rising salaries and a declining number of migrant workers. A consequence of these changes in Chinese costs and demography is the growing use of robots. Foxconn is one of these firms that have installed such engines to face current transitions.

Every activity does not have the potential to be automated. For Foxconn, the majority of manufacturing activities are split up into different tasks that are predictable and simple to execute. Such tasks could easily be replaced by robots. Indeed, according to a

report from McKinsey & Company the technical feasibility of automation for a predictable physical task is about 78%, compared to 25% for unpredictable ones. More precisely, they ranked the technical feasibility of automation of many types of activities including predictable physical work in the manufacturing sector that has a technical feasibility of 90% (Chui, M., Manyika, J., & Miremade, M. (2016)). It explains in part why Foxconn had this ability to automate part of its activities.

Foxconn also start using robots for other reasons. While they do put robots in their plants in order to be more flexible and to respond quicker to the demand of Apple, they also do so to face workers' shortage and higher salaries. As noted above, coastal cities, especially in Guandong province, are particularly hit by this transition. Indeed, many companies upgraded their plants by replacing workers with robots. It allowed them to cut their costs by nearly 10%. In Dongguan for instance, 43,684 workers were replaced by robots in 2015 (Bloombeg News (2016)). The government played a major role in that shift and encouraged companies to replace human workers with robots by giving them financial incentives. These companies are called the "dark factories". Indeed, they do not need lights any longer because only robots work on the production line.

More precisely, Foxconn recently deployed 10,000 Foxbots to assemble the iPhone 6 (CompareCamp (2014)). 60,000 workers were also recently replaced by robots in another plant. The company has also invested 10 million dollars in a venture for research in robotics and manufacturing. Foxconn' CEO, Terry Gou, notably claimed some months ago: "We are applying robotics engineering and other innovative manufacturing technologies to replace repetitive tasks previously done by employees, and through training, also enable our employees to focus on higher value-added elements in the manufacturing process, such as research and development, process control and quality control". It is clearly just the beginning and many other workers will still be replaced.

Following this growing use of robots, we can wonder what could be the future consequences of this trend on the relation between Apple and Foxconn (Wakefield, J. (2016)).

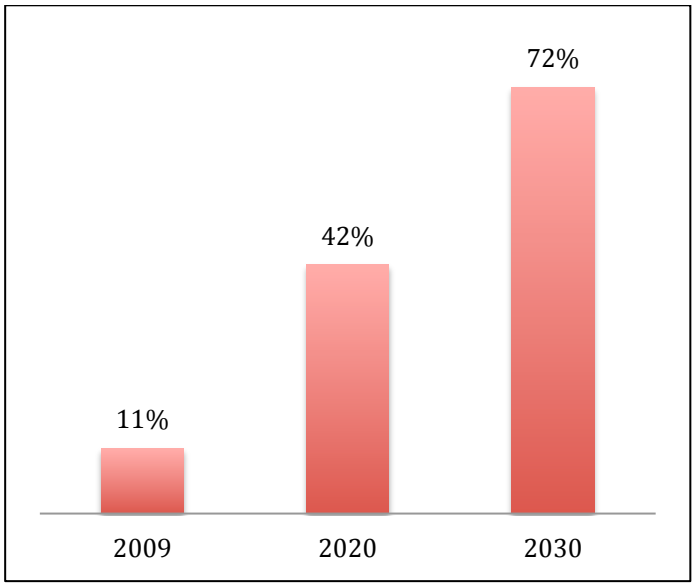
We do not think this will negatively impact the relationship between both firms. In fact, by establishing robots, Foxconn can mitigate rising wages and labour shortages, and can therefore ensure a stable relationship with Apple. Moreover, by using such engines, Foxconn is still flexible, which is essential for Apple. It also means that they will be less responsible for workers social and work life and that they will have less risk of working condition scandals. Consequently, the growing importance of robots in China will not impact the relationship between the two firms and will just confirm what we said above—Apple will not yet end its alliance with the famous Taiwanese firm.

## 5.4 Scenario IV: The growing importance of the Chinese consumer market

This scenario states that Apple may continue working with Foxconn to stay close to the Chinese market. Indeed, it may be beneficial for Apple to stay in China because the Chinese market is becoming more and more attractive.

China has a very promising consumer base, in part because of the growing middle class. In fact, as explained above, this class is in full emergence. Before going into more detail, it is important to define what exactly a middle class is. There are various definitions, but in the framework of this paper, we will use a definition utilised by many businesses: '*people earning between $10 USD and $100 USD per day*'. According to a report by Ernst & Young, the middle class in Asia Pacific will grow by 66% from 2009 to 2030 (Ernst & Young (2013)). The middle class growth in China is represented in the picture 20.

*Figure 20: Share of the population that is in the middle class*




Source: Ernst & Young (2013)

In other words, the Chinese middle class is becoming as important as that of Germany, Italy, and France together (Thomas, P-H. (2016)).

As the middle class has risen, private consumption in China has grown and people are more willing to pay a premium for quality. Consumers cease to buy just necessities, and are more likely to buy laptops, smartphones, and cameras. Therefore, it may be beneficial for Apple, whose products are quite expensive and luxurious.

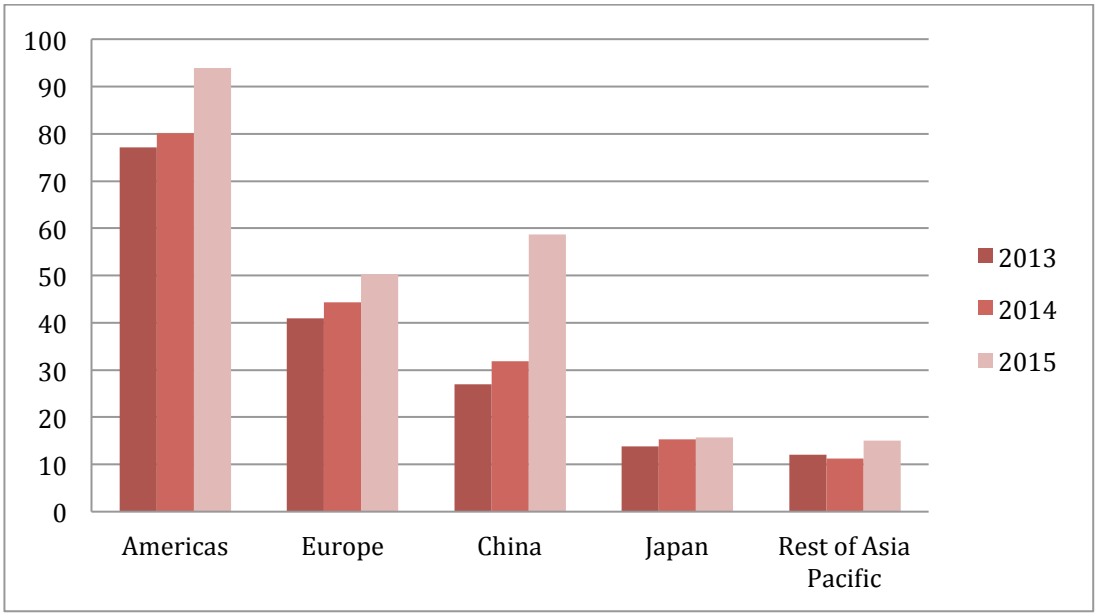
This Chinese middle class may also be divided into different generations, including the Generation 2. This generation is typically composed of teenagers and young people in their early 20s. To date, they are the most westernized in China. Generation 2 wants to try new things and to buy expensive products as status symbols. They are also very loyal to the brands that they trust. Therefore, this specific class may also be very beneficial for Apple and it could be a reason for the brand to stay close to this market (Barton, D., Chen, Y., & Jin, A. (2013)).

The emergence of e-commerce also plays a role and made Chinese market more attractive for Apple. In fact, as previously mentioned in the first part of the paper, with more

than 700 million Internet users, China is a very attractive market in which to sell Apple products. More precisely, 68% of the middle class has access to the Internet (Barton, D., Chen, Y., & Jin, A. (2013)).

Apple implemented an aggressive strategy in order to increase the number of iPhones sold in China (Culpan, T., & Higgins, T. (2015)). China clearly becomes a major market for Apple that could not be neglected. By simply looking at the 2015 annual report of Apple, it is striking that the Chinese market has a growing importance to Apple. Figure 21 shows the net sales evolution by operating segment. (China represents China, Hong Kong and Taiwan)

*Figure 21: Net sales evolution by operating segment (in million)*




Source: United States securities and exchange commission (2015)

In 2012, China was the third largest market for Apple, and accounted for 13% of all sales. That year, the American firm sold two million iPhone 5s in China during the first weekend it was available. More than 17,000 outlets were already selling Apple products. Then, it does not stop rising. Tim Cook even said in 2013 that he expected China to replace North America as Apple's largest source of revenue (RTE News (2013)). In 2014, Apple completed a deal with the world's largest mobile carrier, China Mobile, to sell its iPhone 5 across mainland China. The company has more than 760 million subscribers (Guglielmo, C.

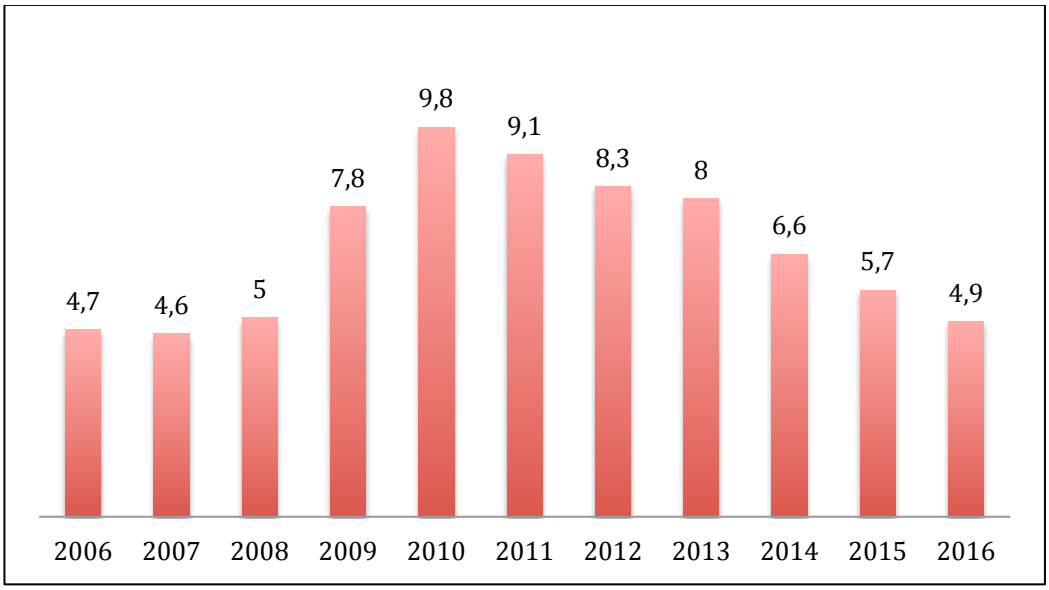
(2013)). Such as deal is a way for Apple to bring their products to Chinese customers. China is indubitably extremely important for Apple. In 2015, it became the second largest market for Apple and accounted for 25% of total sales. From 2014 to 2015, sales increased by 84%. It overtakes Europe that fall to 22%.

In sum, following the rising Chinese middle class, and the growing sales in China, Apple may simply stay in the country to be closer to its customers. Indeed, it may be beneficial to make final assembly of products in China, especially for goods sold to Chinese customers. Therefore, this scenario may lead to three evolutions. First, the relationship between Apple and Foxconn may remain stable and continue as it is. Second, Apple may continue working with Foxconn, but may only leave them responsible for Chinese consumer products. Finally, Apple may simply find another manufacturer in China. This scenario states that Apple will certainly continue outsourcing part of its final assembly in China—it is only its relationship with Foxconn that may not be guaranteed.

## 5.5 Scenario V: Apple jobs brought back in the United States

As explained in the first part of this paper, Apple has a specific supply chain dispersed all over the world—Apple products account for thousands of manufacturing jobs. However, among the 700,000 people working for Apple throughout the world, few of them work in the United States. Whether or not these jobs might return to the US became a crucial question in 2008, after the financial crisis, when many American lost their jobs. Indeed, as we can see in Figure 22, the unemployment rate in the United States reached 9.8% in 2010. (It is the rate taken on the 1$^{st}$ of January)

*Figure 22: American unemployment rate*




Source: Bureau of Labor Statistics (2016); Central Intelligence Agency (2016, b)

Nowadays, unemployment has returned to a rate around 5%. It is a good score compared to other countries, like Belgium or France. Nevertheless, we may still wonder if jobs will one day return to the United States. It could be beneficial for the country and still decrease unemployment rates.

At the moment, two final assembly facilities are already situated in the United States. The company Flextronics is responsible for the manufacturing of Mac and Quanta Computer (Apple (2016, d)). More precisely, Apple returned Mac production to the United States in 2013. They invested 100 million dollars to do so, and these Macs are clearly labelled with 'assembled in the USA' (Smith, J. (2012)).

We may therefore wonder if this scenario is likely to happen and if Apple may one day decrease its orders to Foxconn to switch them in America. When examining possible evolutions of this scenario, three cases may be highlighted. On the one hand, it could be disadvantageous for the multinational to bring production and assembly back in America. In that case, Apple would keep these activities in China to benefit from actual advantages. We

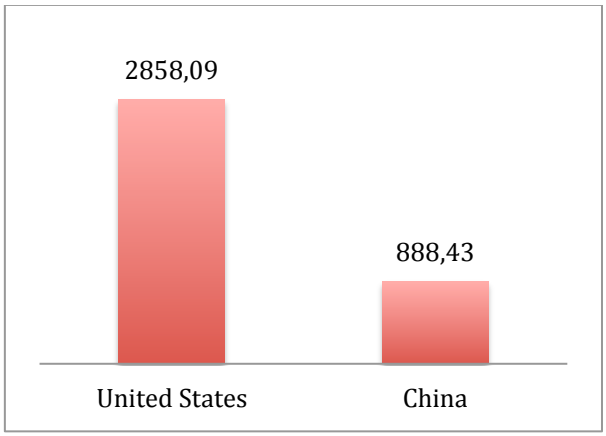
emphasize the most important differences between both countries that make China more attractive. Secondly, it could be on the contrary beneficial for Apple to relocate part of its activities in America to enjoy some advantages. Lastly, Apple may relocate part of its production in that country without having any choice. They may be forced following new regulations.

### *5.5.1 Apple's jobs kept in Asian countries*

Today, since the industrial revolution, transportation costs have decreased and transportation means are more diversified. It is easier to produce parts in the most suitable locations, and supply chains continue fracturing. However, distance remains less advantageous for two reasons. First, it is beneficial to be situated in an agglomeration of talented individuals and specific factories. As we discuss in the first part of this paper, many Foxconn plants are situated in such *clusters* in the Guandong province. Therefore, moving the production out of these specific zones to America will be disadvantageous for Foxconn and thus for Apple. They will lose benefits in the form of time and money, among other advantages. Moreover, it is important to limit the distance between plants because closer plants are able to operate more efficiently by ensuring *coordination* of production processes. Plants located in America will be far from the Asian market where the bulk of the production is done. These two points and, the hanging transportation and communication technologies curb temptation to shift, and instead keep manufacturing in Asia (The Economist (2012)). These characteristics explain the first possible scenario, which states that Apple may not bring production back to the United States. Other factors may also explain such an eventuality.

As previously mentioned in the first part of this thesis, China also has many location-specific advantages that are essential for Apple and not offered by America. The first crucial determinant that makes China more attractive than the United States is the workers' *salaries*. Figure 23 illustrates the gap between wages in these two countries. American wages are 221.7% higher than comparable Chinese wages (Numbeo (2016)).

*Figure 23: Average monthly disposable salary (net after tax) (in $)*




Source: Numbeo (2016)

The speed and the flexibility offered by Chinese factories are also unique. It provides a strategic flexibility to Apple that would not be available to the company if production was moved to America. Indeed, Chinese employees work an average of 12 hours per day, whereas their American counterparts work about 8.6 hours (Kavoussi, B. (2012)). Indeed, as previously stated in the first part of this paper, Chinese workers have a certain mentality that leads them to be more productive than American workers. For example, they easily accept overtime work, average 12-hour shifts, and live in dormitories.

The Chinese worker productivity index may also be considered. Nevertheless, when looking for national index, the American worker productivity is higher because these indexes take the average of worker productivity everywhere on the territory. Therefore, the Chinese index is clearly lower because many provinces are still under-developed in China and miss current technologies. Indeed, many provinces are still very late compare to coastal provinces and it decreases average national worker productivity index. Consequently, to be more precise, it would be interesting to find worker productivity index per province because the one of coastal Chinese province would certainly be higher than in America. In sum, going in America may not be very advantageous from the point of view of worker productivity because, in China, Foxconn plants are already situated in the most advanced provinces that disposed from current technologies and where worker productivity is much higher than elsewhere in the country (Accenture (2016)).

As explained in the first part on this thesis, Apple has a particularly specific *supply chain, and* they control nearly every part it. Their supply chain is flexible, and provides Apple the ability to quickly obtain the quantity of products that they desire. Indeed, as previously mentioned, Foxconn satisfies every desire of Apple, which is in part thanks to Apple's negotiation power. Therefore, from a flexibility point of view, returning back in the United States will not be more advantageous for Apple because the company already has a very efficient supply chain. Nevertheless, it is generally more beneficial for multinationals to bring part of their production back to their home country in order to speed up their supply chain and establish a quicker flow of products to respond in a timely manner to consumer demand.

In sum, it is clear that attracting Apple manufacturing to America is not just a matter of reducing labour costs in the United States. Many other factors, including ones cited above, are also as important. Moreover, it would be costly to replicate the convenience of the entire Chinese supply chain if jobs are brought back in America. Multinationals today primarily consider moves that are optimal for profits. Apple does not have the obligation to solve America's unemployment problems, and prefers to keep this money to invest in innovation and other projects. Therefore, from these points of view, the scenario that jobs will come back in the United States is less likely to reflect reality. Apple will almost certainly continue manufacturing the bulk of its products abroad, and will likely keep the high value-added activities at 'home'. In 2012, Steve Jobs informed Barack Obama that jobs will not come back to America (The Economist (2012); Duhigg, C., & Bradsher, K. (2012)). The production they recently brought back was likely to be rooted in brand image concerns as it appears to represent only a small fraction of the entire manufacturing process.

### *5.5.2 Voluntary decision of Apple to bring jobs back in the United States*

The second possibility regarding this scenario is linked to the potential benefits of bringing production back to the United States. These benefits may be various, so we have chosen to enumerate only the most striking.

First, the United States is one of the 16 countries in the world that do not require *time off* each week. It may be beneficial for Apple, and help them achieve a certain flexibility by making American workers work every day. In China, rules require a certain amount of time off each week (Gilson, D. (2011)). Nevertheless, as previously stated, the average daily hours of work in China is much higher than in America. Therefore, this regulation does not seem compelling enough to justify Apple's decision to return manufacturing to the United States.

Another, more relevant, characteristic is the *safety regulation* in America. Indeed, these rules regarding security in work places are stricter than in China. Therefore, even if it would be costlier to Apple, it would be a way to avoid scandals about working conditions and employee suicides as it happened in Foxconn in 2010.

Moreover, the lower *employee turnover* in the United States may be an advantage of shifting production to that country. Indeed, the average retirement rate is 65.5 years old in America and 51.2 years in China. It means that the employee turnover in China is higher. On the other hand, Chinese plants encounter tough working conditions that exhaust workers and lead to many resignations, which compounds the turnover rate. This high turnover of Chinese workers at Foxconn factories makes their plants less stable. However, this is not very relevant in the case of Apple because China has a tremendously large pool of available workforce that counterbalances this young retirement rate (Kavoussi, B. (2012)). Nevertheless, a characteristic of the actual transition phase in China is the declining number of migrant workers. Therefore, having a stable pool of labour may be an attractive point towards returning final assembly to the United States.

It may also be advantageous for Apple to locate its activities in America in anticipation of *future possible regulations* regarding the production of components. The American government may decide to impose requirements that the production of some parts must be completed in America. It would therefore be advantageous for Apple if they are already situated correctly.

Apple may bring jobs back to the United States in order to *avoid heavy taxes on transportation*. We will discuss this motivation in the following scenario related to environment concerns.

Apple may also eventually have a *new CEO* that will be tempted to bring back jobs because of a more conservative mind.

Finally, Apple may also relocate its production in America to benefit from *subsidies*. The American state may offer heavy subsidies to Apple to incite the firm to relocate its production in its home country. It would benefit low-skill workers and be disadvantageous for richer people who will have to pay more taxes. Such initiative may decrease the rising income inequality. However, it would be very expensive and controversial.

### *5.5.3 Involuntary decision of Apple to bring jobs back in the United States*

Apple may move the rest of its production and assembly to the United States because of new regulations or changes that may force them to change their way of working. In this respect, we develop the most relevant possibilities as follows.

First, it is important to keep in mind that Americans have a *protectionist mind*, which is reflected in the two candidates for the 2016 presidential elections of the United States. Donald Trump mentioned his desire to bring jobs back home if he becomes the new president of the United States. According to him, since China joined the WTO, Americans closed more than 50,000 factories and lost tens of millions of jobs. Therefore, he said he wants to fight for the American business by reclaiming millions of American jobs and reviving American manufacturing (Trump Pence (2016)). On the other hand, the second candidate, Hillary Clinton, also has protectionist ideas. She mentioned its desire to remove America from the WTO (Navarro, P. (2016)).

Therefore, changes may be initiated by government and protectionist ideas may one day have major implications for Apple's supply chain. The future president may decide to establish new regulations to oblige American multinationals to bring production activities back in the country. He or she may also decide to leave the WTO. The United States'

continued participation in the WTO is not necessarily guaranteed and such a decision may be decisive for Apple.

As previously mentioned, the American government may also *oblige the production of some parts to be done in America*. Such a case will force Apple to bring jobs back in USA.

In sum, it is difficult to state which of these evolutions may happen because each one may be likely. But it shows that the relation between Apple and Foxconn may one day be impacted.

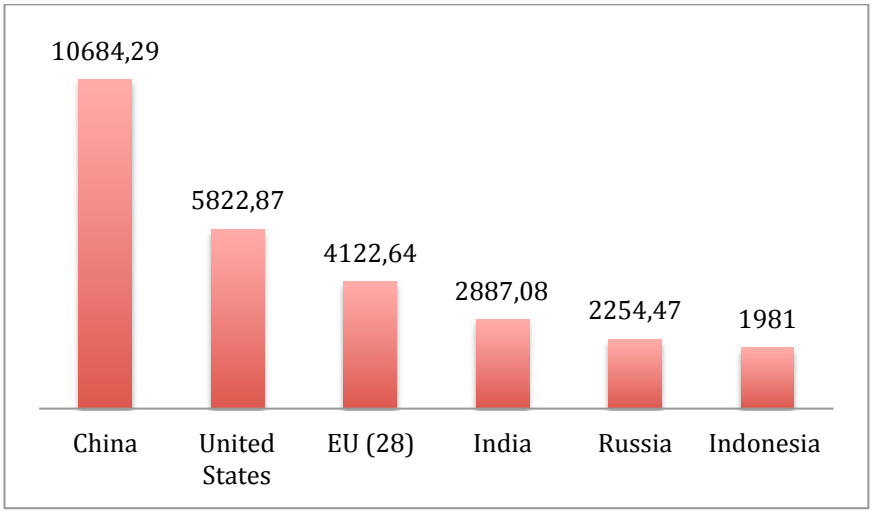
## 5.6 Scenario VI: Consequences of the growing environmental concerns

A major challenge in society is combatting climate change. Indeed, for the last several years, humans and firms have produced more and more greenhouse gases ($CO_2$, $CH_4$, $N_2O$ and so forth), which reinforces the greenhouse gas effect. It is especially the CO2 concentration that exponentially rises. This leads to an increase in the average earth temperature, with major consequences. There are more floods, some regions become very arid, the polar ice caps are melting, the temperature of oceans is rising, the snow is disappearing, and the sea level is increasing. Climate change has become a major challenge that society should grapple with (Course: 'Energie Technologie' at Katholieke Universiteit Leuven in 2016). International agreements are therefore in place to approach this problem. The most famous is the Kyoto Protocol that is linked to the United Nations Framework Convention on Climate Change. It came into force in 2005 and must set internationally binding emission reduction targets. China is part of this chart (United Nations (2014)).

As explained in the methodology, we decided to discuss this challenge because China is a major player in this global warming problem. Therefore, it may impact the firms located there, including Foxconn, and therefore it may change the relation between the latter and Apple. It is particularly relevant to develop this scenario for two reasons.

First, the rapid economic expansion of China over these last few years led to growing pollution. They became the first-largest source of greenhouse gases (GHG), after the United States (see figure 23). Actions should be undertaken to control this growth because it does not only have an impact on China, but also worldwide.

*Figure 24: Total GHG Emisisons per country in 2012 (in $MtCO_2$)*




Source: CAIT Climate Data Explorer (2012)

Whereas China's energy efficiency is improved year on year, they remain a relatively energy-intensive economy, and their total carbon emissions grow continuously. The fundamental problem in China is their dependence on coal to produce energy. This energy source releases much more $CO_2$ than gas. They should therefore improve their efficiency regarding coal usage and try to control their pollution as much as possible (Naughton, B. (2007)). Moreover, if the situation is not brought under control, the public health will be deteriorated. The states should therefore consider a solution, at least for its population.

Secondly, climate change has become a crucial topic these days that is particularly in the spotlight in many countries. It becomes an important value for many people in the world. We notably heard a great deal about the COP21 that took place in Paris last year. Therefore, it may further pressure the Chinese government to improve the situation and to implement more aggressive measures.

Resulting from these changes, the Chinese state put in place specific regulations in order to control $CO_2$ emissions, to improve the quality of air and so forth. Companies must now submit to strong laws and taxes. More precisely, the communist party of China revised the environmental protection law in 2014. It will enter into force in 2015. In addition, they passed about 30 new laws, 90 administrative regulations and a number of environmental standards. Through all these new regulations, basics rules have been added to heighten consequences for violating China's environmental laws (they increased penalties if a company does not respect rules), to expand the scope of projects subjected to environmental standards, and to allow nongovernmental organizations to take legal action against polluters. The National People's Congress also revised the Law on the Prevention and Treatment of Air Pollution and the Law on the Prevention and Treatment of Water Pollution (Falk, R., & Wee, J. (2014); Library of Congress (2014)).

We might wonder what the consequences of these rising pollution concerns are. *Will pollution problems and new laws impact the relation between Apple and Foxconn?*

First, we can expect Apple to find other alternatives than Foxconn in order to avoid rising costs and constraints linked to new strict environmental regulations.

From a broader perspective, other evolutions may also be possible, but we decided to focus on the one that seemed important. Apple could begin completing part of its production out of China in order to avoid transportation, and costs linked to it. In fact, for the moment, the bulk of Apple production and final assembly is performed in China, and products are then shipped all over the world. However, it is detrimental to the environment to transport these goods. Indeed, raw materials are sent to China, then final products are shipped all around the world, then wastes is often send back to Asian countries and so forth. Such a 'disposable' supply chain is disastrous for the planet. There are also striking problems with containers. It is cheaper for Apple and many other companies to throw empty containers and to rebuild new ones in China; however, this is also highly detrimental to the ecology.

Many other examples could be highlighted, but the most important matter here is to understand the challenges that transportation and pollution create. We expect states to

create new regulations in order to incite firms to participate in short supply chain rather than locating activities all over the world. If states do so and start taxing transport, Apple may have to change its way of working. Therefore, it will impact the relationship with Foxconn because Apple may only produce products dedicated to the Chinese market in China. Production of European goods may be completed in Europe, and American products manufacturing may return to the United States. It is an eventuality that we should keep in mind (Interview with Bernard Paque on the 22/07/2016)

# 6. Limitations of this paper and further research

In addition to reading international press articles to develop the first part of this paper, further research and time may have been useful to a more complete elaboration of this section. Indeed, in describing the reasons for the alliance between Apple and Foxconn, further information may have been useful to gather to develop some parts. Part of the limiting factor on this information was confidentiality. It would likely be impossible to find—in the public domain—the exact clauses stipulated in the contract between both firms. For instance, regarding quality control, we do not know exactly how Apple ensures that manufacturers respect its product specifications. As Apple prefers to keep its operations confidential, including its collaboration with Foxconn, we would likely need more time and opportunity to interview Apple employees and other third parties if we want to increase the accuracy and completeness of our paper.

As we saw in many scenarios, Foxconn started shifting its activities into countries other than China. Indeed, as previously noted, China is losing more and more of its status as the 'sweatshop of the world'. The country is not as attractive as before, especially due to rising salaries. We noticed that some countries might become good alternatives for Apple to outsource their product final assembly. We enumerated major reasons for these shifts and the potential advantages of these countries. However, information about these countries' attractiveness and weaknesses could be further developed—we only noticed the most important ones. With more time and resources, we would conduct further research on each of these countries in order to thoroughly understand their evolution. In fact, as we saw in the first part of this paper there are some monetary factors to look at when choosing a location in which to do business. Therefore, with more time, it would be interesting to further develop analyses of these countries, as well as other countries. In future, we may look at eventual clusters, specific infrastructures, regulations, intellectual property rights, locations and so forth.

We also discussed the other final assembly contractors working for Apple, and the possible evolutions of their relations with the American company. However, as previously noted in the first scenario, we do not have enough time and resources to talk about all of the suppliers that they work with. Indeed, Apple works with seven final assembly contractors in China, and we only discussed two of them: Pegatron Corporation and Quanta Computer. We prefer focusing on these in order to be the most accurate possible, especially because these two companies are the most important suppliers after Foxconn. Nevertheless, with more time and resources, we could develop other possible evolutions between Apple and these other final assembly contractors.

In the fifth scenario, we discuss the advantages of doing business in China and in America. Nevertheless, we only focused on the most relevant. With more time and resources we may analyse other advantages of both countries, for instance the American regulations.

Finally, in the framework of this thesis, we developed six scenarios regarding the future evolutions of the alliance between Apple and Foxconn. As explained in the beginning of this paper, we chose to discuss these scenarios for specific reasons. However, with more time and resources, we could develop other scenarios that are subtler and that may require more investigation to gather data.

For instance, it may be interesting to look at the evolution of intellectual property rights, as well as other important laws. A change in Chinese, Taiwanese, or American regulations may influence the relationship between Apple and Foxconn. We did not develop this aspect of the topic because information about regulatory changes is difficult to gather and the number of existing regulations is huge, so analysis of which regulation would be most likely to change, and in which period of time, would add excessive complexity for the confines of this thesis.

Moreover, over the last several years, low-cost smartphone makers have become more and more dominant, with rising market share worldwide. Therefore, we may also develop a scenario regarding this possibility, and consequences it may have for Apple and Foxconn. We did not develop such a scenario in this paper because it seems less likely to

happen. Indeed, Apple has many ownership-specific advantages, including its power brand, that make the firm very special. We think that Apple is competing in a different market than the low-cost smartphone markers. Ultimately, the latter have different competitive advantages than Apple and do not propose the same kind of products as Apple. Therefore, at first glance, these new players in the smartphone market are not threats to Apple. However, with more time, it may be interesting to develop and analyse this situation thoroughly and consider the consequences it may have for Apple's brand.

Over the course of this thesis, we discussed the potential countries where Apple may shift the final assembly of its products to benefit from different advantages. We also note potential Taiwanese firms (Pegatron and Quanta Computer) that may become a threat for Foxconn and that are currently in charge of Apple products' assembly. Nevertheless, it may have been interesting to additionally investigate potential Chinese firms that may become a threat to Foxconn. At the moment, none of the final assembly contractors have Chinese nationality; the majority are Taiwanese. Therefore, we may wonder whether potential Chinese firms may eventually start assembling Apple products, and even replace Foxconn. We did not develop this scenario because information about potential Chinese firm that may assemble Apple products is not easy to find and requires thorough analysis. Therefore, we preferred not develop it, rather than discussing it quickly and without enough tangible information.

# 7. Conclusion

In the first part of this paper, we used the OLI framework in order to understand the reasons behind the alliance between Apple and Foxconn. We conclude that Apple is a special company that can differentiate itself from the crowd—indeed, they have specific ownership advantages. Then, we also investigated the reasons why they decided to make the final assembly of their products in China rather than elsewhere. China is a particularly attractive country in which to do business. Indeed, the country possesses many particularities that ultimately transformed the country into 'the factory of the world'. Finally, we discovered that Apple decided to outsource the final assembly of its products rather than making FDI because the transaction costs were not too high, and Foxconn was a credible firm.

In the second part of this paper, we develop six scenarios about possible evolutions of the alliance between Foxconn and Apple. To conclude this thesis, we return to the most likely evolutions.

Regarding the first scenario, the most likely evolution is that Apple will continue expanding its manufacturing network. Indeed, the multinational already started outsourcing final assembly to new firms like Pegatron, Quanta Computer, and so forth. Following scandals about working conditions, and the advent of customers who care more and more about human rights and rising salaries, we expect this evolution to be the most relevant and the most likely to happen. The situation where Apple just ceases to work with Foxconn is less logical for the moment because on the one hand, wages represent a very small part of Apple products total value, and on the other hand, Foxconn undertook different measures to fight scandals and rising salaries. Moreover, Apple seems to outsource the final assembly of the future iPhone 7 to Foxconn what ensures a short-term relationship with the latter.

The second scenario outlined three major Chinese changes, (1) the rising salaries, (2) the decrease in available workforce and (3) the rapid expansion of the Chinese middle class.

Two evolutions seem the most likely to happen. First, as in the scenario cited before, Apple will likely continue expanding its network and finding new collaborators to work with in order to diversify its risks and to avoid rising wages. Second, Apple will certainly continue shifting part of final assembly elsewhere than China. We discussed four potential countries, Indonesia, India, Vietnam and Brazil. Even if they all have specifics advantages and drawbacks, we want to highlight the attractiveness of India. This country offers small salaries, a huge pool of available workers, and a rising middle class. We may therefore one day expect part Apple final assembly facilities to be shifted there.

Moreover, we may expect part of the production to be sent back in America. It is not in our power to state that a return of jobs would be compulsory, but we should keep this eventuality in mind because it is likely to happen. As we saw in the fifth and the sixth scenario, even if it may cost a lot of money to Apple, they may not have a choice. Indeed, the future American president may decide to bring all jobs back from overseas. Future taxes on transportation and pollution may additionally make it too expensive to manufacture Apple products abroad and to send them back to every consumer location. In such a situation, part of the final assembly may be shifted away from China, and the alliance with Foxconn may therefore be impacted. Such a shift could also happen if new Chinese environmental regulations become too imposing.

In the third scenario, we discuss the expansion of robots in Chinese coastal cities. Foxconn is no exception to the rule, and automated part of its activities. Nevertheless, we conclude that this automation will not radically impact the relation between Apple and Foxconn. On the contrary, automation will reinforce the alliance between both because it will be a way for Foxconn to ensure a certain flexibility that will help them respond to the needs and desires of Apple, as well as fighting against rising salaries and declining availability of workers.

The fourth scenario supports our vision that Apple may not totally end its collaboration with Foxconn—at least in the short term. Indeed, besides the growing use of robots which is beneficial for the American multinational, the Chinese market is becoming more and more attractive for Apple. China will likely soon become the largest of Apple’s

markets. Therefore, it will also be beneficial for the firm to continue working with Foxconn in order to stay close to this promising market. By keeping manufacturing in a large consumer market, they will avoid significant transportation costs, logistic costs, taxes, and so forth.

In sum, in the short term we think the relationship between Apple and Foxconn will persist but will decrease across years. Indeed, we believe Apple to continue diversifying its final assembly contractor network by strengthening its relation with its other partners and by finding new contractors. We especially think that these partners will more and more possess plants elsewhere than in China. Therefore, the alliance between Apple and Foxconn will not be broken yet but across years this relationship will diminish and Apple product final assembly will be more an more done abroad. More precisely, we expect Apple products to be produced in different countries depending on the market where they will be sold. In fact, tax on transportation and pollution and the transition phase in China will gradually push Apple to change its supply chain.

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# 9. Annexes

Annex 1: Apple's final assembly facilities

| Final assembly facilities | Location | Products |
|---|---|---|
| **Apple Inc.** | Ireland | Mac |
| **BYD Company** | China | Accessories |
| **Compal Electronics Inc.** | China | iPad |
| **Flextronics** | USA | Mac |
| **Foxconn** | China | iPhone, iPod |
| **Foxconn** | China | Mac, iPad, Accessories |
| **Foxconn** | China | iPad |
| **Foxconn** | China | Accessories |
| **Foxconn** | China | iPhone |
| **Foxconn** | China | iPhone |
| **Foxconn** | Brazil | iPhone, iPad |
| **Invenec Appliances Corporation** | China | iPod |
| **Pegatron Corporation** | China | iPhone |
| **Pegatron Corporation** | China | iPhone, iPad |
| **Quanta Computer Inc.** | China | Mac, Watch |
| **Quanta Computer Inc.** | China | iPode, Watch |
| **Quanta Computer Inc.** | USA | Mac |
| **Wistron Corporation** | China | iPhone |

Source : Apple (2016, c)

Annex 2: List of Foxconn workers who committed suicide

| | Gender | Age | Native Place | Foxconn Facility | Date of Suicide | Remarks |
|---|---|---|---|---|---|---|
| 1. Rong Bo | M | 19 | Hebei | Langfang | 8 Jan 2010 | Jumped from the eighth floor |
| 2. Ma Xiangqian[a] | M | 19 | Henan | Guanlan | 23 Jan 2010 | Fell from building |
| 3. Li (surname) | M | 20s | Henan | Longhua | 11 Mar 2010 | Jumped from the fifth floor |
| 4. Tian Yu[b] | F | 17 | Hubei | Longhua | 17 Mar 2010 | Jumped from the fourth floor |
| 5. Li Wei[b] | M | 23 | Hebei | Langfang | 23 Mar 2010 | Jumped from the fifth floor |
| 6. Liu Zhijun | M | 23 | Hunan | Longhua | 29 Mar 2010 | Jumped from the fourteenth floor |
| 7. Rao Shuqin[b] | F | 18 | Jiangxi | Guanlan | 6 April 2010 | Jumped from the seventh floor |
| 8. Ning (surname) | F | 18 | Yunnan | Guanlan | 7 April 2010 | Jumped from building |
| 9. Lu Xin | M | 24 | Hunan | Longhua | 6 May 2010 | Jumped from the sixth floor |
| 10. Zhu Chenming | F | 24 | Henan | Longhua | 11 May 2010 | Jumped from the ninth floor |
| 11. Liang Chao | M | 21 | Anhui | Longhua | 14 May 2010 | Jumped from the seventh floor |
| 12. Nan Gang | M | 21 | Hubei | Longhua | 21 May 2010 | Jumped from the fourth floor |
| 13. Li Hai | M | 19 | Hunan | Guanlan | 25 May 2010 | Jumped from the fourth floor |
| 14. He (surname) | M | 23 | Gansu | Longhua | 26 May 2010 | Jumped from the seventh floor |
| 15. Chen (surname)[b] | M | 25 | Hunan | Longhua | 27 May 2010 | Slit his wrists after failing to jump |
| 16. Liu (surname) | M | 18 | Hebei | Nanhai | 20 July 2010 | Jumped from building |
| 17. Liu Ming | F | 23 | Jiangsu | Kunshan | 4 Aug 2010 | Jumped from the third floor |
| 18. He (surname) | M | 22 | Hunan | Guanlan | 5 Nov 2010 | Jumped from building |
| 19. Wang Ling | F | 25 | Hebei | Longhua | 7 Jan 2011 | Jumped from the tenth floor |
| 20. Hou (surname) | M | 20 | Sichuan | Chengdu | 26 May 2011 | Jumped from the fifth floor |
| 21. Cai (surname) | M | 21 | -- | Longhua | 18 July 2011 | Jumped from the sixth floor |
| 22. Li Baoqiang | M | 18 | Henan | Guanlan | 15 Oct 2011 | Jumped from building |
| 23. Li Rongying | F | 21 | Shanxi | Taiyuan | 23 Nov 2011 | Jumped from building |
| 24. Xie Yanshe | M | 21 | Henan | Longhua | 26 Nov 2011 | Hanged to death |

Source: Ngai, P., & Chan, J. (2012)