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Changes in leadership in the mobile phone industry: the case of Asian handset firms catching up

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Abstract

The aim of this paper is to understand the most important factors behind the so called “catching up” phenomenon (Lee & Malerba, 2014), responsible for the great part of the changes in leadership occurring in the industries. For the purpose, one of the most highly competitive and dynamic sector will be used as an example: the mobile phone industry, which has revolutionized many theories related to this process. The case of the mobile phone industry is emblematic, considering that since its birth, wars among handset brands have not stopped and leadership has been carrying on changing. However, an interesting trend has been affecting this industry lately: Western dominance over the sector has started to cease its power to latecomer Asia. Mindful that to be the factory of shoddy toys and low end shoes won’t last forever, this vast continent has made giant steps to slowly upgrade from its low cost manufacturer position; and now it is able to stand ground to the most developed countries in the world. Asian challenger firms have been capable of speeding up their catching up process, entering simultaneously countries from the developing and developed world, in order to offset their desire of increasing market shares with the necessity of building new competences. This has been particularly evident in the handset industry, where some firms have been engaged in a series of alliances and even acquisitions of Western brands, both as a way to enhance their penetration into foreign countries and to have instantly access to Western firms’ advanced technologies. Successful Asian mobile phone companies of today such as Lenovo, TCL, Foxconn, Bird, etc. have followed this pattern and are likely to rule the future of the industry. We have started to be aware of this catching up process only lately, since acquisitions of Western notorious labels by Asian counterparts occurring in the past years have upsided down the industry’s equilibria; as a matter of fact, this is only the last move of a strategy started more than two decades ago. The purpose of this dissertation is to show step by step that “much less visible process” which has helped Asian handset companies to raise, originating the mobile phone industry we are witnessing today, and has brought old notorious brands such as Blackberry, Alcatel, Philips and Motorola to cease their Western mark to Asia.

The first part will deal with the most prominent theories related to the catch up phenomenon (Lee & Malerba, 2014). In particular, the concepts of strategic aggressiveness (Ferrier, 2001), competency trap (Winter & Nelson, 1982) and windows of opportunity (Lee & Lim, 2001) will be analyzed as they represent, all together, critical

notions explaining the Asian success. Moreover, a brief introduction of the industry life cycle will be provided, as a sectorial point of view will be used over the entire course of the paper. Asian developing countries' firms, not only regarding the mobile phone industry, have been able to better off their indigenous R&D and upgrade their latecomer status by coupling investments in absorptive capacities with the acquisition of foreign advanced technology. Considerations regarding this topic will be provided in chapter 2, where the exact steps undertaken by Asian firms' innovation process will be shown, as well as the most important vehicles by which knowledge has been transferred.

The second part of the paper will provide an excursus over the mobile phone industry's evolution to explain in details how Asian firms have been capable of progressively inserting into the global handset industry and upgrading from their low cost manufacturers' position. Part of their successes has been due both to the scale advantages obtained from replicating their strategies in similar developing countries and to the new competences got from entering the developed world. In addition, as mentioned in the first part of this paragraph, Asian companies have demonstrated a great ability in exploiting their relations with Western labels both to expand toward foreign markets and to acquire new competences. The entire second part of the project has taken into account what these relationships have meant for some Asian handset companies: findings from chapter 3 and chapter 4 have provided new insights in relation to the literature of the catch up cycle (Lee & Malerba, 2014) and strategic aggressiveness (Smith, Ferrier, Grimm, 2001; Ferrier, Smith, 1999).

Research methodology

To the development of the project, and considering the difficulties of finding related information via traditional methods, the following sources have been used:

1) Business Source Complete and Lexis Nexis Academic's databases, which provided several companies' documents and business-related articles. In particular, these sources were fundamental to reconstruct international relationships established in the mobile phone industry as well as to furnish associated information in reference to the deals, which allowed to make further suggestions, too.

2) A database, built by the graduand, representing more than 1600 handset models introduced in the Indian market from over 20 mobile phone vendors. From these data two tables were built, which allowed to see the number of devices introduced in India, their price ranges and features, and comprehend i) what segments of the market vendors wanted to attack, ii) if Asian foreign vendors were using similar strategies carried out in their home countries or other developing ones, or they were evolving toward a different pattern, iii) why Asian handset vendors coupled their expansions with Western acquired (or licensed) brands to penetrate India and if these ended up being a more effective strategy; in addition to that, several other considerations were made, in light of some unexpected results observed. Sources of these tables came from several Indian online distributors, such as digit.in, killerfeatures.com, gadgets.ndtv.com, etc.

3) Other online distributors, such as Amazon.us, kimovil.com, Pdevice.com, etc., two mobile phone databases, Imei.info and Gsmarena.com, provided prices, technologies and characteristics of the models introduced. These were employed on several occasions over the course of the project, in order to corroborate previous researches or to make additional suggestions.

3) business intelligence sources, such IDC, Gartner, Marketline, Canalys, Statista, Strategy Analytics, and others, which helped to provide information regarding market geography segmentations and successive changes in leadership over the mobile phone industry's evolution, as well as to forecast future scenarios in the industry.

4) several publications were used over the course of the project, in particular in the first

two chapters, where both the theoretical part of the thesis and several case studies were discussed.

5) other sources were: companies' annual reports and newsletters, available from firms' online web sites; articles from important newspapers, such as The Financial Times, Il Sole 24 Ore, Forbes, Business Insider, and others; newsrooms from online mobile phones-related blogs, such as Fiercewireless, CNET, Engadget.com, and others.

Chapter 1
Life cycle literature and competitive catching up

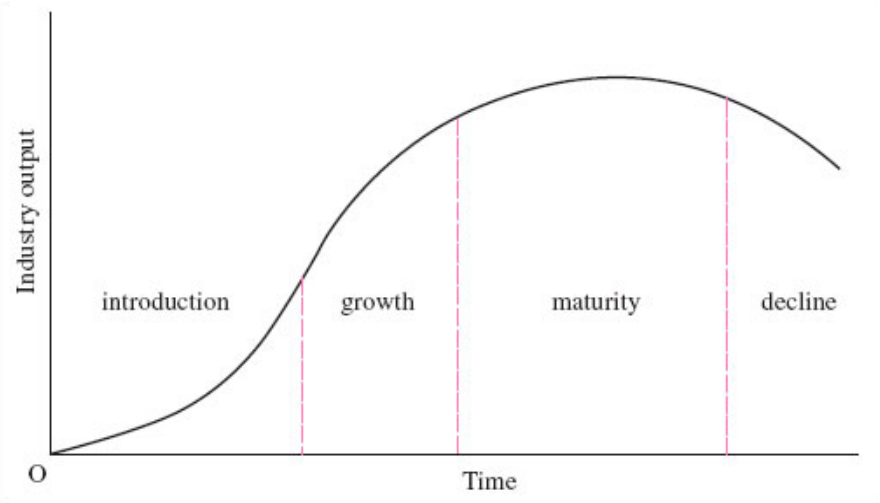
1.1 Introduction

Since the purpose of this work is to study the mobile phone industry, understanding the Industry life cycle (ILC) model represents the first critical step. Over the years few authors have been underlining how analyzing this industry from the ILC point of view helps to better understand the reason behind the strategies played by OEMs over the past decades (Giachetti & Marchi, 2010). As shown below, the industry life cycle represents a sequence of distinct stages, each one requiring different product strategies since the consumer attitude, the firm supply chain composition and the market concentration etc. change through the course of the industry evolution. Moreover, the mobile phone industry itself showed anomalies contrasting the traditional ILC model, corroborating previous suspects and even affecting research studies in other industries (Bonaccorsi & Giuri, 2000; Utterback, 1994). I will start by analyzing the basics of the Industry life cycle, since following developments in the course of my thesis will be based on this model.

1.1.1 The industry life cycle (ILC)

The industry life cycle (ILC) model attempts to combine technological, firm and industry evolution in terms of trajectories and outcomes that can be exogenously observed (Klepper, 1997; Suarez & Utterback, 1995). Before converging into one theory, over the years the ILC framework has been treated by several (and even very different) studies covering the field of economics, engineering and biology. In management, the model has been mostly used to support decisions in particular in relation to entry and exit strategies of firms (Geroski, 1995; Fotopupoulos & Spence, 1998). The ILC presents many similarities with the Product life cycle (PLC), so that the latter is sometimes considered part of the ILC framework. “Product strategy” deals with how the product is produced, designed, distributed, promoted and innovated over time (Pessemier, 1982; Wind, 1982). Since the ILC regards how industry emerges and develops over time, the model can’t be untied from its underlying products (Taylor & Taylor, 2012): as industry dynamics evolve over time, product strategy needs to change.

Figure 1: Stages of the Industry life cycle



Source: Hayashi (2012)

Figure 1 catches the four stages characterizing the ILC framework. The first stage is the Introduction stage and is common to both the ILC and PLC. This phase is characterized by a market still uncertain: no dominant design has been set, products are manufactured in low volumes with unspecialized machineries and marketed through exploratory techniques (Audretsch & Feldman, 1996). Entry barriers are generally low and profit margins, compared to following stages, are higher, so many firms are entering the market. The competition is high and based on the product innovation while the process innovation will be a matter of later stages, since innovating at both levels and continuous reconfigurations between the former and the latter would be extremely expensive.

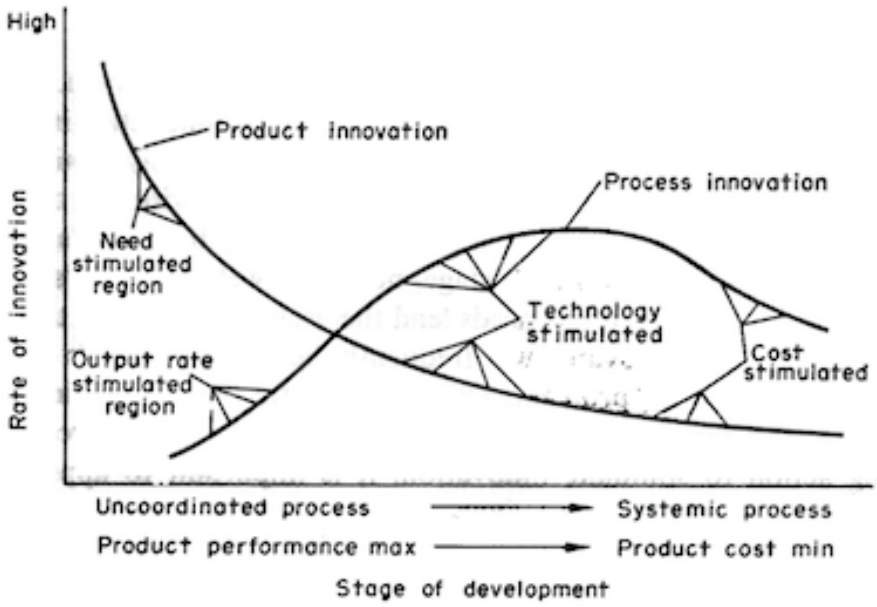
The second stage is called Growth stage. During this phase, the product design stabilizes and the pace of the product innovation slowly decreases. The increasing level of specialization of firms involves a refinement of production facilities, with the process innovation becoming more important. At this stage large firms start to benefit from scale advantages: since the product innovation decreases respectively to the previous stage, products become more standardized, and contractions of profit margins are offset by increasing volumes of manufactured products. This process happens at the expenses of smaller firms which do not succeed in gaining economies of scale and exit the market as well as new entrants which cannot get high profit margins (Klepper, 1996). Compared to the previous stage, the market consists on fewer and bigger firms. The consolidation experienced at the end of this stage is known as Shakeout, which is not uncommon especially in highly growing market (Scott, 1998). This stage experiences also an increasing segmentation of the market (Hambrick, 1982) (in addition to increased

volumes), attracting more and diverse consumers, and contributing in explaining why the industry at this stage is growing faster than in other stages.

The following stage is called Maturity stage. At this point, a dominant design has already been set, the market is almost saturated and firms are mostly focused on the process: the competition shifts from innovation to price. High margins and volumes are guaranteed thanks to scale advantages already started in the previous stage, which lead market shares to stabilize and the number of entrants to decrease even more (Klepper, 1997). The market may grow, but it does so in a more predictable way (Audretsch & Feldman, 1996). The industry output, as shown in figure 1, while was rapidly increasing during the Growth stage, remains stable in the following one.

The last stage of the process is called Decline stage. This stage is generally associated to the PLC, even if part of the literature mentions it in the ILC, too, due to the similarities between the two cycles, as discussed above. As in the PLC, at this stage new technological superior substitutes are emerging, the product is obsolete and firms are evaluating if it is necessary to implement a strategy to relaunch their products or to abandon them from their portfolios (Wong & Ellis, 2008; M. Taylor & A. Taylor, 2012). Since consumers are leaving, the market's size decreases as well as the sales associated. Some firms enter market niches in order to recoup their profits and to escape new shakeouts (Kepler, 1996).

Figure 2: Innovation and stage of development



Source: Abernathy & Utterback (1975)

Figure 2 shows a sketch made by Abernathy and Utterback (1975), which shows how innovation progresses along the different stages of development. The graph resumes the innovation patterns pointed out when describing the ILC model above. The product innovation line decreases gradually along the process, starting from its highest peak in the introduction stage. During this phase innovation by product reaches its highest level because a dominant design has not emerged yet, and still remains high during the growth stage, starting to relay more on advanced technologies instead of basic product innovations. Figure 2 shows also the process innovation line, which follows a U-shape. It slowly increases during the first part of the growth stage since the market is still oriented to the maximization of the product performance, while it reaches its highest level in the maturity stage, and then declines. Firms in the maturity stage search for cost minimization, so the technology-based process innovation becomes a priority.

Despite the importance that the model has always represented, evidences from previous researches (Taylor & Taylor, 2012) showed some uncertainties in predicting the pertaining phase of the cycle at any time. This reason leads managers not to position correctly their firms in the industry and, as a consequence, they do not implement the right strategy. Since each phase represents its peculiarities, the strategies to enter or exit the market or even the kind of innovation a firm should be focus to, differ extremely.

1.1.2 The industry life cycle in highly competitive markets

As it was pointed out in the introduction, my work started by analyzing the ILC framework since it represents the basis to understand the mobile phone industry evolution. Actually, the mobile phone industry is considered a highly competitive market and, as such, its ILC presents some peculiarities that deserve to be mentioned.

As seen in the previous paragraph, following the traditional ILC framework, in both introduction and growth stages, innovation by product reaches its highest levels, then it decreases steadily to give space to the process innovation. In highly competitive market, instead, it carries on growing also in the maturity stage, so that sometimes it is even more intense than in the shakeout phase. The reason is that in such industries product technologies become quickly obsolete, so continuous development of new and different products becomes a necessity (Barczak, 1995). That is what happened in the mid 2000s, when the mobile phone industry was going through its maturity stage: since saturation was reached, demand for replacement was enhanced by adding many new features even belonging to different technological domains, proving the role that the product innovation

still has as element of differentiation (such that a new generation of devices was born: the smartphone) (Giachetti & Marchi, 2010).

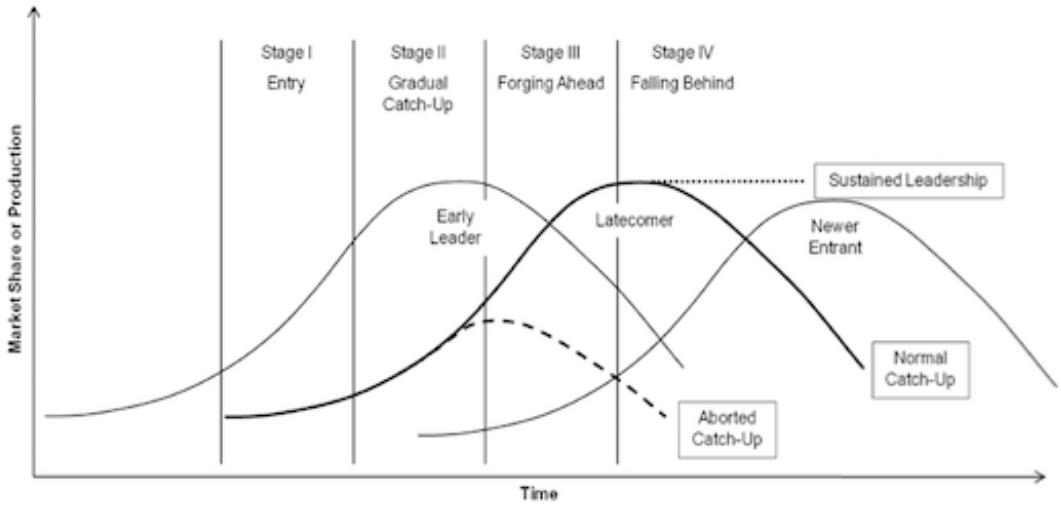
1.2 Introduction to the catch up cycle

The aim of the following paragraphs is to introduce the concept of catch up cycle. This notion has been defined as those successive changes in the industry leadership, where new challengers succeed in narrowing the gap in the market share with industrial leaders (Malerba & Lee, 2014). Over the years we have been witnessing many catches up in different industries: among these, the ones occurred in the mobile phone industry (Giachetti & Marchi 2013) have been among the most interesting, and they will be shown later on in chapter 3. In all these cases, industrial leaders (incumbents) started losing their dominance in the industry when a radical change occurred or a new firm entered (latecomers): leaders are dethroned by new latecomers, whose supremacy is later on questioned by new challengers entering the industry, and the process starts again. For this reason, this phenomenon is described as a cycle. But behind this leadership changes, there are deeper reasons than simple victories and defeats. In the next paragraphs the stages and the main determinants characterizing this process will be discussed in details. It will be shown as the success of latecomers in catching up incumbent firms hinges on the combination of three elements, considered by the literature as critical steps to allow the process to occur: the advent of discontinuities, the windows of opportunity and action aggressiveness. Besides, to better explain this topic, an industry level approach should be considered to include a larger amount of variables (technology, demand conditions, institutions) rather than a simple product life approach (Malerba, 2011).

1.2.1 Catch up stages: a general view

In this paragraph, I will start with a simpler view of the four stages characterizing the catch up cycle: entry stage, gradual catch up, forging ahead and falling behind (Abramovitz, 1986).

Figure 3: Stages of the catch up cycle



Source: Lee & Malerba (2014)

Figure 3 gives a basic view of the process, comparing market shares of current incumbent and late entrants with time. The first stage is the entry stage, which describes latecomers entering the industry. The entry stage is followed by an initial growth and a gradual catch up with the incumbent, generally thanks to cost advantages, learning, accumulation of capabilities or other investments. The third stage is the forging ahead stage. At this phase, latecomers are able to exploit opportunities presented, due to “radical changes” that occur in the industry, and increase their shares at the expenses of the incumbent, as could be seen in the picture. During the last stage, latecomers after having become new leaders in the previous one, are later surpassed by new emerging challengers.

As shown in figure 3, besides the normal catch up cycle, two other trajectories are possible. The first one is the so called “aborted catch up”, which does not represent an exception. Many challengers fall into this situation when do not succeed in exploiting new market or technology opportunities or in creating higher value products (Lee & Malerba, 2016), so they decline before entering the forging ahead phase. The second case instead refers to those firms which are able to “sustain” their leadership, and so manage to maintain it even after the forging ahead phase. This happens because leaders demonstrate an ability to adapt to changing environments and coexist with new latecomers in the industry. After having understood how the catch up cycle works, it will be analyzed more in details in order to understand what implications of singular stages are.

1.2.2 The entry and gradual catch-up stages

As seen in figure 3, the first two steps for new entrants in the industry are the entry and gradual catch up stages. The reasons why firms decide to enter an industry are various. Firms may want to enter because they want to expand the demand for their products, to scale or scope advantages, to have access to new technologies or capabilities etc. Recent researchers have seen authors more focused on analyzing emerging country decisions to enter. Inequalities in their countries, historical bounds, institutional incentives are just some of the conditions that lead emerging countries to a stage of entry and growth (Deng, 2004, 2012), which, generally mixed with low cost labour and weak value of their currencies (Katz, 1995), represent also a threat to industry leaders for a first catching.

Of course this is not enough. In order to have a chance to compete in the industry and eventually to dethrone the leader, it is necessary to invest in learning and accumulating advanced competencies to be able to compete with them (Fu, Pietrobelli, Soete, 2010): high quality universities, human resources, public regulations, R&D spending are all important steps to go to that direction. As it will be shown in chapter 2, Asian firms have followed this trend in the past decades: knowing that to be the factory of the world cannot last forever, many Asian countries as China, Korea and Taiwan started to couple low cost advantages with strong investments in innovation (Simonetta, 2017); some of them even engaged in alliances with European and American firms to be able to upgrade their position in the value chain.

1.2.3 The forging ahead and falling behind stages

The last two phases consist in the forging ahead and falling behind stages. At this point, industry incumbents are caught and overcome by latecomer firms which are able to exploit the discontinuities and windows of opportunities presented in the industries. The discontinuities represent an obstacle for incumbents because this would mean for them to change their structure in order to adapt to the new context. Few of them succeed in "sustaining their leadership", but the majority will fall into the so called incumbent trap.

In the next paragraphs, the roles that discontinuities, window of opportunity and incumbent trap hold in the catch up cycle will be treated. These concepts are fundamental to explain the past changes in leadership and to understand the future developments. Besides, they will be used in chapter 3 to explain the gradual catch up cycles in the mobile phone industry and to explain why Asian firms represent a threat for the current mobile phone manufacturers.

1.2.3.1 The role of Discontinuity

Van Notten defines discontinuity as “a temporary or permanent, sometimes unexpected, break in a dominant condition in society” (pag.55, Van Notten, 2005). The word “break” used in the definition clearly explains why discontinuity cannot be associated to the simple concept of change: it implies an abrupt and drastic alteration of present equilibria and a clear split with the past; the idea of change at its highest level.

Everything is continuously affected by discontinuities, which may determine victories, failures, progress: we are, as our environment; even firms are not safe, too. Discontinuity has always had an important role in explaining the dynamics of firms’ competitive landscape, so that a great part of the economic literature is dedicated to it. Firms should be able to predict, comprehend and interpret implications that discontinuities may have over their strategies and performance (Hambric & Fredrickson, 2001). Culture, society, politics, institutions, technology are just some of the possible causes of these radical changes in industries.

Among these, I would like to focus my attention on the discontinuities brought about by institutions and technology, since they have had a determinant role in explaining the catch up cycles over the history of the mobile phone industry. In the next paragraphs the concept of technological discontinuities and life cycle will be treated. Institutional discontinuities will be discussed in chapter 2, with a specific reference on the role covered by Asian governments in the past decades.

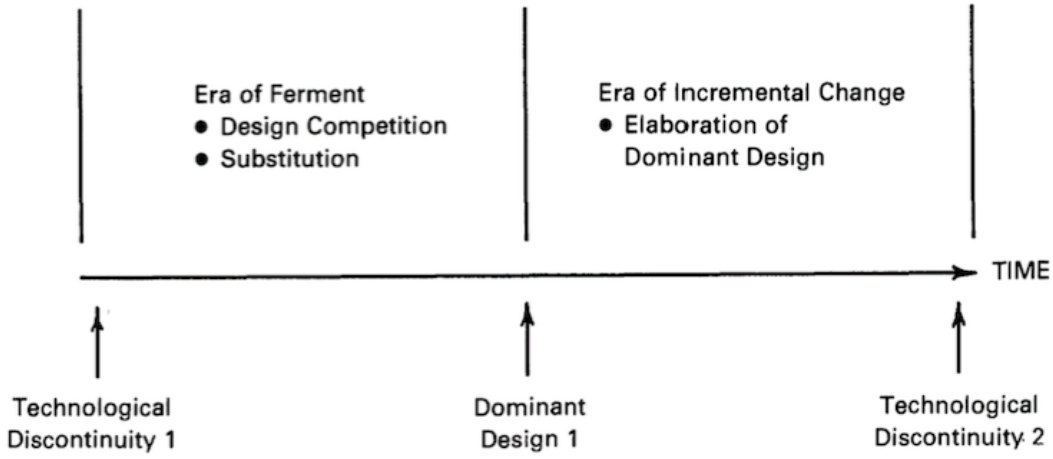
1.2.3.2 Technological discontinuity and life cycle

Technological discontinuity is “an innovation that dramatically advances an industry's price vs. performance frontier” (Anderson & Tushman, 1990). These improvements are generally so high that former technologies could not keep up the same level of technological development and disappear more or less gradually (Anderson & Tushman, 1986; Tushman & Murmann, 1998). Since these innovations “strike not at the margins of the profits and the outputs of the existing firms, but at their foundations and their very lives" (pag. 84, line 33, Schumpeter, 1942), they may bring to conceive existent products in a totally different way, or even in creating new categories. These drastic innovations indeed may be of two kinds: competence destroying or competence enhancing (Anderson & Tushman, 1986), because they either destroy or enhance competences of existing firms in an industry. Competence destroying means developing a new technology that reshapes

core competences completely: competence destroying product discontinuity regards new radical product forms which give performance or quality superiority compared to the previous product class, while competence destroying process discontinuity means being able to make a given product in an entirely different way, which results in considerable improvements in its cost or quality. Instead, competence enhancing discontinuity consists on significant advancements on the existing know-how within a product class. They refer to competence enhancing product or process discontinuities if they better off the present product form or process' efficiency, respectively.

What are the implications for the market when a new technological discontinuity is introduced? Technological discontinuities "come at rare and irregular intervals in every industry" (pag. 4, line 35, Anderson & Tushman, 1990) and when they do, they originate a period of "technological ferment" that will continue until a dominant design is not emerged. After that, incremental changes based on the dominant design follow, which last until stopped by a new technological discontinuity and the process will start again. The general concept of this technological cycle is depicted in figure 4.

Figure 4: A general view of the Technological life cycle



Source: Anderson & Tushman (1990)

The era of ferment generally corresponds to a period of high competition among firms, since they are all trying to impose their products as a dominant design (Giachetti, 2013). Firms invest in product innovation a lot and bring into the market many variations of the new technology, most of them expensive and of mid-low reliability (Anderson & Tushman, 1990). The end of this stage is determined when consumers make their decision about

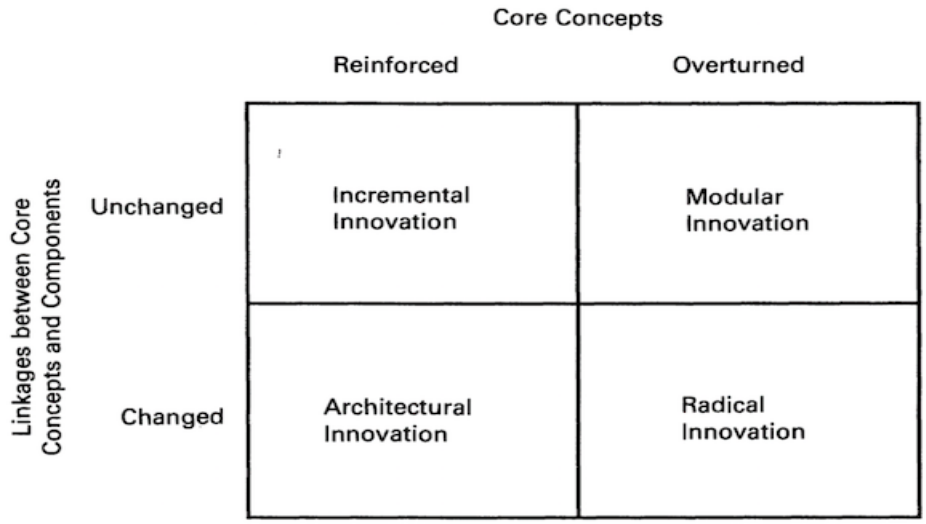
which design is the best: firms that end up having adopted the dominant configuration exploit first mover advantages forcing other participants to incur switching costs (Utterback & Abernathy, 1975). When a dominant design becomes the standard, the incremental era starts. At this point more emphasis is put on the production process, with volumes expanding and prices decreasing (Pyka, 2000). At the same time, consumers demand more sophistication and firms leverage the technology to find as many market applications as they can. The process starts over when a new technological discontinuity comes.

These notions represent a fundamental role because they increase recognition and understanding of the phases that a technology goes through over its life cycle, helping firms to position themselves in the right stage and, as a consequence, to understand the implications for their managerial decisions (Taylor & Taylor, 2012). They also suggest that the competitive landscape changes continuously since its pace of variation and selection originates discontinuities and dominant designs which determine new winners and losers in the process. In light of these considerations it is important that firms develop competences in order to be ready to respond quickly to technological requests that the environment poses to them even if part of them are not easily predictable.

1.2.3.3 The impact of discontinuities on firm structure: the incumbent's competency trap

After having analyzed technological discontinuities, it is important to see what their effects on firm's structure are. As seen in the previous chapter, the greater part of discontinuities that come in the market is the result of the introduction of new innovations. Innovations are not all the same; in terms of effects, origin, development, speed, intensity, we can classify them in different types: in this section we are interested in understanding what innovations bring discontinuities in the market and why established firms show difficulties in responding to them. Regarding the former point, a framework for this analysis has been given by Henderson e Clark (1990) and shown in Figure 5.

Figure 5: Defining innovations



Source: Henderson & Clark (1990)

The table displays different kinds of innovation, focusing on their impact "on the usefulness of the existing architectural and component knowledge of the firm" (Henderson & Clark, 1990). As we can see from the picture, the first two quadrants indicate modular and incremental innovations. The introduction of these innovations does not shape the product architecture in both the cases, since they regard modifications or advancements just on single components, respectively. So, in terms of the Henderson and Clark's frame, these innovations do not involve changes in firm's core competencies and are used to potentially reinforce the firm's competitive position (Abernathy & Clark, 1985). Instead, architectural and radical innovations represent more challenges for established firms. Architectural innovations regard mutations of the organizational architecture but leaving its individual elements almost unchanged. These innovations may originate risky situations since they force the firm to reconfigure its components' interaction in new ways: they are generally translated into changes in the size of some components or other subsidiary parameters in its design which create new linkages with other unchanged elements. Part of what the firm knows will remain useful, but other aspects need to change otherwise the core concept does not. More complicated is the case of radical innovations which require strong modifications in both the product's architecture and components. These innovations are likely to destroy the value of the knowledge and competences accumulated by the firms through the life cycle of the old technology (Cooper & Schendel, 1976; Daft, 1982), often reducing the competitive position of the leader firms that fail or are not willing to shift to the new paradigm (Giachetti & Marchi 2013).

In the catch up cycle, this represents an important issue: if a new radical technology represents a success, incumbents will start as beginners as other latecomers but with the big difference that for the formers this would mean to sacrifice previous investments made to conquer the dominant position. For them, this represents the so called “competency trap” (Nelson & Winter, 1982): firms show difficulties or are reluctant to adopt new disruptive technologies, which would undermine profits from their existing products, and to make changes in their organizational structures and competencies. Their limitations come from previous investment in plants, equipment, and specialized personnel, limited information, routines, relations with suppliers, investors or clients, and established corporate culture, etc. In the face of all these barriers, a true transformation is a difficult and extremely rare event (Daft, 2010).

However, since the general high degree of uncertainty of the new technologies introduced in the market, sometimes incumbents carry on with their old technology, simply because they do not feel the necessity to change and sacrifice previous investments. So that the borderline of the incumbent trap is big enough to comprehend also the ‘innovator’s dilemma’ of whether or not introduce innovations that are harmful to its current business (Christensen, 1997). The case of Motorola being caught up by Nokia because unwilling to switch to digital technology (Giachetti & Marchi 2013) is emblematic of this, and it will be shown in chapter 3.

The aim of this paragraph has been to show what the effects of innovations on established firms in an industry are, in particular how some kinds of innovations are able to “entrap” industry incumbents. But an innovation that is a “trap” for the leaders may represent an opportunity for the latecomers. So, both the categories of firms need to pay attention to the developments of the market and be able to predict and detect the “radicalism” of forthcoming innovations.

1.2.3.4 Windows of opportunity

The concept of windows of opportunity was initially proposed by Perez and Soete (1988) and now it represents a pillar in the theory of the catch up cycle. As we saw in the previous chapter, more or less radical changes occur over the course of the industry evolution. Some of these may even result in shifting basic components of its structure, giving a performance advantage to those firms that adapt earlier so that “disadvantages of being a latecomer would not be large during such moments of time since everybody is a beginner” (pag. 721, Park & Lee, 2006). These mutations in the industry open up the so-

called Windows of opportunity for challenging firms, and create the potential for a catch up in the industry.

Windows of opportunities generally refer to the changes arising in technological patterns, but the notion has been broadened by the literature now encompassing also changes in market demands (Porter, 1990) and institutional and government regulations (Lee & Lim, 2001). Windows of opportunity that come in the industry when a new radical technology arises are called Technological windows. This situation may be fatal for incumbents, in particular if the new technology is competence destroying. Both incumbents and latecomers will start as beginners but for the formers this would mean to sacrifice the previous investments made to conquer the dominant position, as seen in the previous paragraph. A second window opens when a new demand opportunity occurs in the market: this may refer to the appearance of new demands that need to be satisfied, current demands rapidly growing which cannot be fully content by incumbent firms or even strong and unexpected demand changes in the market. A third window of opportunity arises when institutions or governments intervene in the competitive arena (Lee & Malerba, 2014). This is the way of operating in developing countries in particular. In this scenario, the governments tend to subsidize local firms to engage in R&D programs in order to enhance their learning capabilities, for example pushing them to undertake strategic alliances with firms in developed countries. In other situations, the governments may foster the development of new radical technologies by local firms in order to give them first mover advantages or because they want new industry standards in the country to be developed by local firms (Vialle, Song, Zhang, 2012). TD-SCDMA technology, for example, has been promoted by Chinese government with the precise aim of finding technological independency from the foreign companies (Karjaluoto, 2006), helping the rise of firms as Lenovo and Huawei. Still, always in developing countries, authorities sometimes create an asymmetric environment (in terms of taxation, marketing or manufacture restrictions, etc.) putting foreign leader firms in a disadvantageous position in order to strengthen local firms. To address all these purposes, the public regulators put in place a number of incentives, including tax rebates, benefits, low interest loans from state banks, investment insurances (Deng, 2006).

Despite all these considerations, in order to enable the catch up cycle to occur, opportune responses from the challengers need to be combined with these windows. First of all, firms have to be ready to catch and exploit an open window when this appears. Sometimes this is not easy as it seems, since some of them are unexpected and

unpredictable, in particular those following technological discontinuities. It is important that funds are available and prepared to be mobilized in a decisive manner whenever one of the windows of opportunity, as discussed above, occurs. Developing countries in particular in Asia have demonstrated to be prepared to these eventualities, considering the great amount of resources accumulated over the years, thanks to their cost advantages (mostly due to low cost wages in their mainlands and to have adopted the latest technologies) and their propensity to reinvest the retained earnings instead of distributing them to shareholders (Lee & Malerba, 2016).

Cost advantages and accumulated resources represent the first step to exploit the windows of opportunity and narrowing the market share gap with the leader. But it is fundamental that latecomers inves in indigenous R&D a lot (Fu & Gong, 2009) and undertake the right "attack strategies" with an "aggressive" competitive posture to progressively catch up with rivals. The latter topic will be discussed in the next paragraph.

1.2.3.5 Paths to dethrone the leader: attacking strategies and challenger's aggressiveness

The aim of this paragraph is to develop a framework that shows how to attack the leader of the market successfully, focusing on the strategic role covered by aggressiveness in the catch up cycle. A "follower" point of view will be taken since the interest of this thesis is to see the effects of Asian latecomers upgrading their value chain in the mobile phone industry. Stringent conditions will be needed in order to allow these followers to dethrone the leader and specific competitive strategies must be formulated.

A great contribution about these themes comes from the economist Micheal Porter (1985). According to the author, a follower intending to attack the leader has to respect two cardinal rules. Firstly, it is important that the follower does not just implement an imitative strategy because the leader's advantages due to its strong position in the market will overcome such a challenge independently from the challenger resources or power. Secondly, he mentions three conditions that have to be verified to better prepare the challenger in implementing the right attacking strategy:

- A sustainable competitive advantage, that may consist in a cost or differentiation advantage. In the former case, the aim of the challenger would be either to cut prices in order to enhance its position over the one of the leader or to gain higher profits at industry average prices and reinvest in product development or marketing. This option will increase

the challenger's market share. In the latter case, a differentiation advantage would create a product perceived differently from the others with a premium price used to fight against the leader.

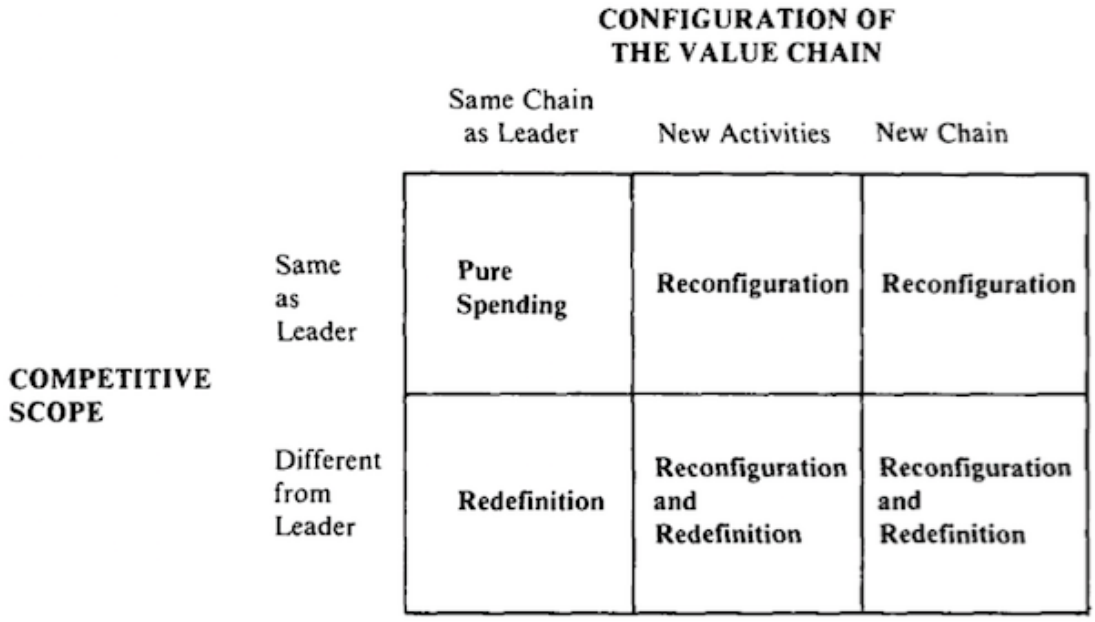
- Proximity in other activities. With this condition, Porter intends the necessity on the part of the challengers to (at least partially) leapfrog also the leader's other inherent advantages. A cost advantage, for example, need to be coupled by a partial differentiation to give an adequate amount of value to the product, otherwise the leader will use a premium strategy as a counterattack. At the same time, a differentiation advantage of the challenger has to be counterbalanced to avoid the leader to use its cost advantage to overcome the challenger's differentiation.

- Some impediments to a leader retaliation. Challengers must be able to resist the leader's responses and put in place several means to protect against an aggressive counterattack. The challengers which succeed in achieving a great success are likely to undergo a fierce reaction from the leader, which still maintains resources and a strong presence in the market.

If the challengers follow these requirements, the leader does not succeed in advancing and attacking them properly and it is forced to consolidate its position conquered during its counterattack. Besides, the challengers' success is also related to the leader's commitment in implementing its responses: a leader that is responding with an aggressive cost or differentiation strategy would call for an adequate response such as a radical innovation or a new redefinition value chain, while a leader with no competitive advantage can be attacked with a simpler strategy that points to the leader's sensitive parts.

Porter (1985) provided also a framework of analysis to better understand what is the right strategy to implement in order to attack the leader. According to him, the attack could be carried out by a challenger either by improving the way it performs its same competitive scope, or reconfiguring its value chain likewise the one of the leader.

Figure 6: Avenues to attack the leader



Source: Porter (1985)

As displayed in figure 6, two dimensions are considered, competitive scope and configuration of the value chain, and three paths avenues are possible:

- Reconfiguration: the challenger improves the way its activities are performed in the value chain or in the configuration of the whole value chain.

- Pure spending: the challenger increases its market shares thanks to its greater resources and the investments made.

- Redefinition: the challenger redefines its competitive scope in comparison with the one of the leader.

Sometimes, just one of these avenues may be followed to reach the challenger's purpose; alternatively, the strategy undertaken may involve a blended use of more avenues, as could be seen in the picture with redefinition and reconfiguration, mixed when a new chain or new activities are needed. The general scope of these avenues is to upside-down the competitive landscape in the industry trying to undermine the leader's competitive advantage. This way, the challenger is freer to operate with its own cost or differentiation strategy.

At this point, the three strategic avenues as described in figure 6, will be analyzed more in details. With the reconfiguration strategy, the aim of the challenger is to compete with the same competitive scope of the leader but it does that by reconfiguring its activities in the value chain or its entire value chain in a different way: the more the challenger alters the structure of its activities, the better it succeeds in achieving a long term advantage over the leader. These activities should change in a way that the challenger can enhance its differentiation advantage or lower its cost. Several reconfigurations are possible:

- optimizing value chain activities, trying to renew or make more efficient firm's logistics, bettering off after sale activities, marketing, reconfiguring sales departments, superior personnel, higher product appearance, etc.;

- changing value chain structure and its inter linkages, reconfiguring internal and external processes, such as relations with suppliers, purveyors, customers

- changing in product features, developing a product with higher performances, for example improving software, reducing damages, using higher quality components, or leaving unchanged the quality but reducing its price in comparison with the leader's similar product, finding new raw materials, increasing modularity, etc.;

- employing new and diverse channels from the ones used by the leader firm, being a pioneer in using or discovering a new distribution channel, for example being able to open up to unknown segments or cheaper solutions;

Pure spending strategy, as shown in the first quadrant of figure 6, regards the challenger adopting the same leader's value chain structure and sharing a common competitive scope. As the name implies, this strategy needs a large amount of money to be implemented since the challenger has to invest a lot in order to replicate leader's configuration (and try to conquer its shares), which is of course in a strong position in the market and well equipped to respond with proper means.

Redefinition, instead, involves the challenger attacking the leader by redefining its scope of competition. Widening or narrowing the scope indeed may lead firms to strengthen their competitive advantage, for example finding new undiscovered linkages,

economies of scale or scope, targeting knowledge to a particular product etc. According to Porter, the four types of redefinition strategies are:

- Focus strategy: the firm redefines its activities and focuses just on one or few segments of the industry. This strategy has been long used as a first step in the industry to attack the leader, followed by a broadening of its scope in order to dethrone the leader also in different directions.

- integration or de integration strategy: the firm broadens or narrows activities performed inside its boundaries. A disintegration strategy, for example, may be used to increase its differentiate competitive advantage to contrast an “integrated” leader.

- Geographic (redefinition) strategy: broadening firm presence in other countries or maintaining it just on a country or regional basis. For instance, scale advantages on production could be easier reached if the firm increases its size in other countries or if it has access to cheaper raw materials from elsewhere.

- Horizontal strategy: the firm expands or reduces its activities encompassing also related industries. Porter observed challengers extending their activities to comprehend other business units or industries as a means to increase their competitive advantage against a leader’s which instead based its strategy on a different range of activities.

With the coming of a discontinuity and the subsequent window of opportunity, being able to dethrone the leader depends also on the intensity of strategies that are implemented. In this context, the competitive dynamics literature (Smith, Ferrier, Grimm, 2001; Ferrier, Smith, 1999), suggests that “aggressive” challengers have more chances to succeed in this purpose. Aggressive firms are the ones which show a greater “intensity” and “complexity” in their strategic activities (Ferrier, 2001; Ferrier and Lee, 2002), which means carrying out a high number of diverse competitive actions in rapid succession.

The concept of Aggressiveness originates from Schumpeter’s (1934) theory of creating destruction and has been studied and improved over the years by several authors. Among these, two streams of literature should be mentioned. Firstly, D’Aveni theory of Hypercompetition (1994, 1998) is consistent with and strengthens the notion of aggressiveness, since it suggests that a series of actions (simultaneous and sequential

strategic thrust, position for speed, position for surprise, shifting the rule of the game, position for surprise etc.) gives a strong competitive advantage to firms positioned in industries characterized by rapid evolution. Secondly, the dynamic competitive literature, based on previous studies, developed empirical models which show the right path to follow and its determinants in order to "win the battle for industry leadership". Among these, Smith, Ferrier and Grimm's (2001) studies showed four features the challengers' actions need to have to compete against a leader:

- Attack with a large number of actions. First condition is the amount of new competitive actions undertaken by the challenger. Continuous introduction of new products, for example, is likely to confuse the leader (and as a consequence delays its reaction) and attracts new customers, increasing its market share and reducing its gap with the leader.

- use a complex repertoire of actions. Second condition consists in using a diverse repertoire of actions when attacking. If a challenger hits the leader with marketing, pricing, and product actions together, the leader is likely to experience difficulty and to respond slowly since it has to devise a plan to react to this comprehensive and different set of actions (Giachetti, 2013).

- Be unpredictable. Challengers should make random changes in strategy so future actions cannot be forecasted by competitors.

- Delay the leader's reaction. The more actions the challenger performs, even very diverse among them and unpredictable (as seen in previous points), the more effective its actions are. There is a positive relationship between the delay of the leader's reaction and the performance of the challenger. Firms which succeed in delaying the leader's actions, for example, will enjoy a partial monopoly advantage for some time (before the leader answers back), that will help them to get new customers, more market share and more profit to reinvest.

Moreover, an aggressive behavior can be fostered if the firm adopts particular firm settings or if the firm is located in a particular industry (Ferrier, 2001). An eterogenee top management, for example, is able to build a complex and unpredictable range of diverse strategies, since decision making would involve at the higher degree dialectical debate and discussion (Simons, Pelled and Smith, 2000). At the same time, an industry

characterized by entry barriers, strong concentration or high growth leads firms to behave aggressively (Scherer & Ross, 1990).

Aggressiveness represents a fundamental role in the catch up cycle. As it will be treated in chapter 3, being “aggressive” has been an integral part of the internationalization process by Asian mobile phone firms. Samsung or Lenovo are just few examples that have shown the ability to exploit the windows of opportunity occurred in their countries and coupling it with a large amount of new and diverse product introductions and an intense use of marketing campaign, R&D investments, acquisitions and strategic alliances to win the leadership. In chapter 4, it will be treated the case of Lenovo and TCL, whose aggressiveness has been highlighted by the path of successive acquisitions that they have left behind.

Chapter 2
Understanding the Asian success: patterns of innovation and internationalization of Asian EM MNEs

2.1 Introduction: the new face of Asia

The catch up cycle theories analyzed in the previous chapter have been an important topic of discussion among researches in the past years, in particular in reference with latecomer firms from developing countries. Among these, the ones that have done best are India, China and Brazil which are rapidly catching up with the developed world and changing worldwide economic equilibria. Indeed, these three countries represent 40% of the world population and they have 13% of the total income (World bank, 2007), which is rising at an impressive speed (Fu, Pietrobelli, Soete, 2010).

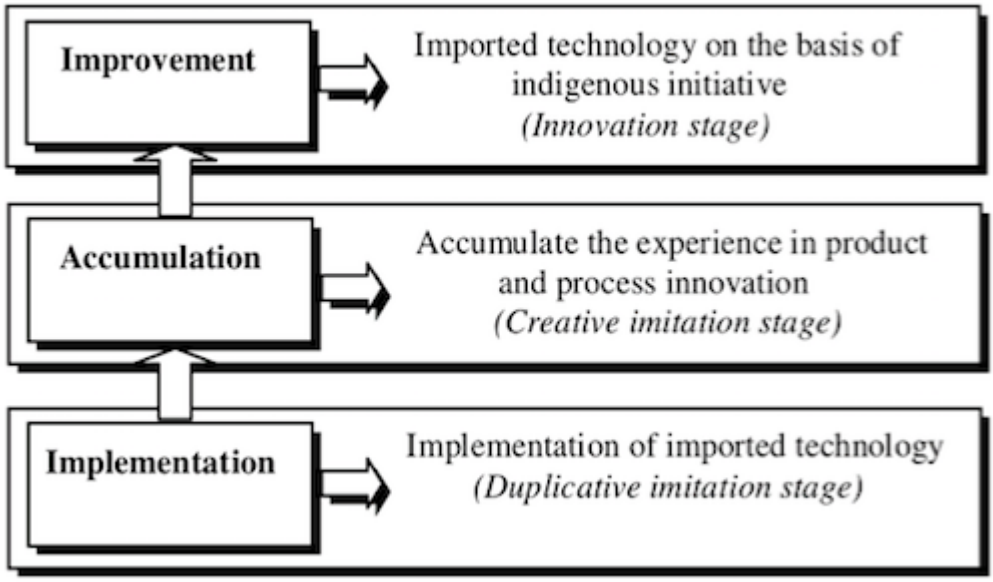
Developing countries hold an immense amount of finances mostly gained thanks to cost advantages, and they are open to international trade and foreign investments. But a big part of their strategies of the past decades have been devoted in investments to promote indigenous innovation. And this trend has been most evident in Asia. Let's take the case of China for example. Recent changes in Chinese strategy have shown that the country has a definite plan, mindful that being the factory of the world won't last forever. The trend of reshoring, the advent of smart manufacturing, rising of local wages could call off advantages due to low cost labour. But the factory of shoddy toys and low end shoes is now becoming the world capital for technology. The new China, is the one which is able to stand its ground to most developed countries in terms of innovation, the one which gave birth to multinational companies as Lenovo, TCL, ZTE etc. How is that possible?

In this chapter the reasons behind the rise of Asia in the economic landscape will be discussed. The first part will be devoted to analyze the innovation process in developing countries, with a focus on Asia, while in the second part the peculiarities of internationalization process by Asian MNCs will be treated, focusing on the main "vehicles" by which knowledge is transferred. It will be shown how the results that Asian firms reached have been possible thanks to their ability of combining foreign technology imported with parallel indigenous R&D, and an institutional presence capable of directing their industrial development.

2.1.1 From imitation to innovation: an overview of the innovation process in developing countries

The innovation process in developed and developing countries differ extremely. In developed countries, technology is generated from private firms, research centers or universities. These countries understand the important role that innovation has for their growth, so that investments in indigenous R&D have always represented a key part of their strategies. But for developing countries, the situation is different. Indeed, these countries prefer to acquire new technologies from the developed world, since indigenous innovation would be extremely risky and costly for them (Fu, Pietrobelli, Soete, 2010). Therefore, foreign technology contributes to a great part of their productivity. Figure 7 shows how the innovation process works in developing countries. The model has been developed in relation to researches (Kim, 1997) made on the Korean pattern of technology imitation and innovation, but could be easily adapted for other Asian countries.

Figure 7: Stages of the technology management



Source: Park, Murad, Chevalier (2011)

The new technology is developed over a three stage process. In the first one, called duplicative imitation, technology is imported from developed countries and it serves as a base of studies to build the knowledge of the product, as the second phase called creative imitation depicts. The more they investigate over the product, the more they get experience, which could be used to enhance indigenous R&D and create innovation

independently (Park, Ali, Chevalier, 2011). This last passage corresponds to the "innovation stage". Moreover, differently from developed countries, the innovation process is more important in the first stages of the process and decreases slowly over the course of the innovation phases, to give space to innovation by product (Kim & Lee, 1987).

Figure 7 describes the process in the simplest way possible, to give a general view. Actually, many things should be considered when analyzing innovation patterns in developing countries, Asia not excluded. The aim of the following two paragraphs is to explain two crucial concepts behind this three stage process: absorptive capacities and at what stage firms from developing countries acquire technology.

2.1.2 The role of absorptive capacity by developing countries' firms

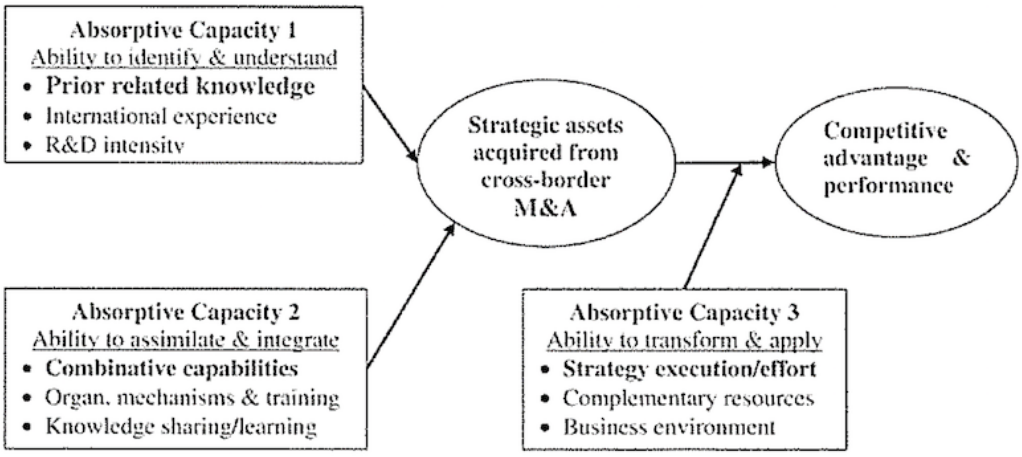
Nowadays technology spreads at an intense pace: moving of goods and capitals thanks to international trade; international research cooperations, alliances, partnerships; foreign direct investments; people moving, travelling; internet, media and news etc. (Pietrobelli, 1996). With all these tools in place, it seems relatively easy for developing countries to acquire and imitate foreign technologies and quickly catch up with developed countries' firms (Soete, 1985).

But is that enough? There are many implications behind this process. First of all, foreign technologies may be unsuitable with the technical situation of the country which imitate them, since they may have been developed to fit the peculiarities of the country where they were created (Acemoglu, 2002). This is highlighted in particular when a technology moves from a developed to a developing country. Technology coming from the formers indeed may be more oriented toward improving high skilled labour, not at all congruent with the capabilities of the latters (which instead would be more focused and capable on unskilled labour). As long as the technical competences of a country does not rise, applicability of foreign (high level) technology does not rise either (Fu & Gong, 2009).

To be able to catch the properties of these technologies, the literature suggests that firms should better off their absorptive capacities. The term refers to the firm's capability of assimilating external information with its own assets and give it a commercial edge (Kogut & Zander, 1992). The concept is extremely useful to understand internationalization patterns by Asian firms. As we will see later on in this chapter, Asian MNCs have been mostly engaged in M&A when entering foreign countries, sometimes counting just on buying physical assets and overlooking the possibility of implementing a better system to

absorb correctly the potentials of (tacit and complex knowledge) that stay behind (Amit & Schoemaker, 1993). Absorptive capacity consists of three stages (Deng, 2010), as shown in figure 8.

Figure 8: The Absorptive capacity model



Source: Deng (2010)

The first phase refers to firms' capabilities to understand the value of external knowledge. This stage is directly related to firms' prior knowledge since is this one which has to be capable of perceiving the features related to the foreign firm's knowledge. As a consequence, firms need to invest in their personal knowledge through indigenous R&D and use it to investigate and to be able to analyze foreign target firms (Kim, 1998). Moreover, if firms do not invest in indigenous R&D, foreign technologies remain static and won't become inward competencies. It's not enough to just acquire technologies, firms need to invest in parallel education, research, incentives to firms to upgrade etc. The second step is represented by firms' ability to combine the new knowledge with existing assets. At this point, coordination and socialization tools are needed. The formers aim at helping the firm to interact with acquired knowledge and promoting exchanges among them: this way, new concepts may be generated (Jansen, 2005). The latters instead serve as an internal governance structure which consists in "tacitly understood" rules that indicate what actions have to be implemented under what circumstances. A system of control is fundamental to allow activities from different sources to be combined, so to build the right strategy. After having diffused foreign knowledge and mixed it within the firm's structure, the third stage involves the generation of new knowledge and implementation of a new strategic action in the market. This is a critical step which is affected (and affects) by

the intensity of absorptive capabilities carried out by the firm (Narasimhan, 2006) and proves if the new knowledge is capable of creating something with a superior commercial application (Hitt, 2001).

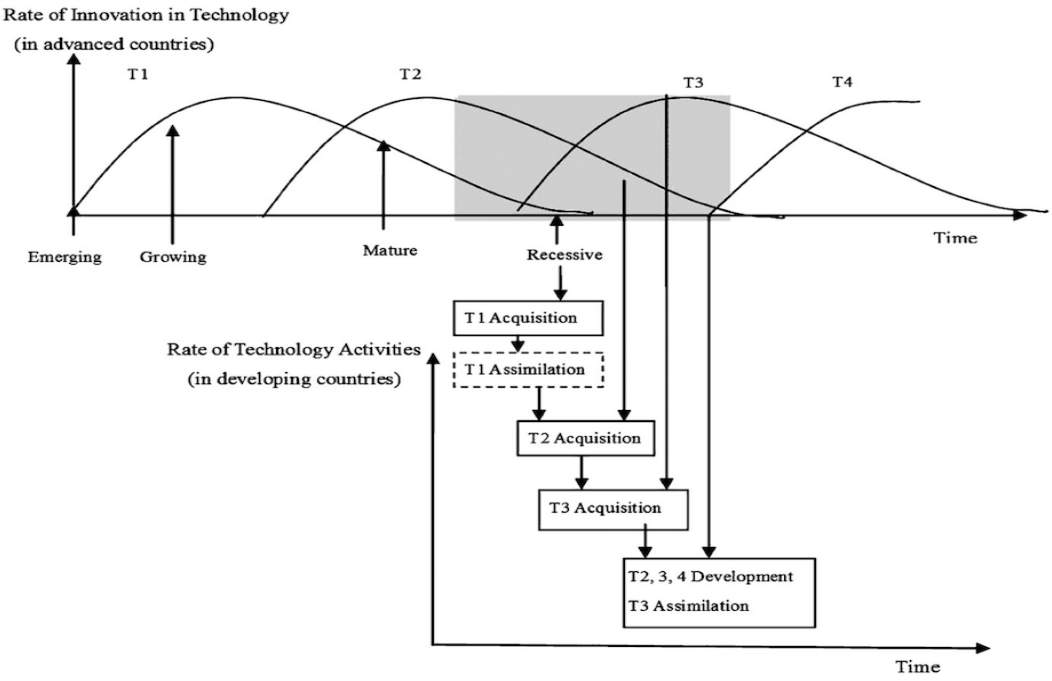
Absorptive capacity has represented the most sensitive part which has determined failures and successes by Asian MNCs engaging in M&A. For example, the famous case of TCL acquiring the French TV producer Thomson: TCL thought that a synergy among the two firms' resources would have been automatically created after the acquisition, without caring to execute a strategy to combine them. The result was a loss of 700 million for TCL, which was later saved by European bankruptcy laws (Deng, 2010).

2.1.3 Patterns of technological acquisition by Asian firms

The industry (product) life cycle follows a four stage process, from the introduction to the decline stage. Since we understood from the previous paragraphs that developing countries strongly rely on the technology brought in from developed ones, part of the literature (Kim & Nelson, 2000; Lall, 1990; Kim, 1980; Kumar, 1999 etc.) has been focused on understanding at what stage of its process, technology is imported.

Among the others, Jin & Zedtwitz (2008) broaden Kim's (1980) model of technological acquisition and development for developing countries, and provided with interesting causes of reflection in particular in relation to Chinese firms, since it has been developed studying evolution of mobile phone technologies in China. Figure 9 gives a synthesis of their model. In the picture, T1, T2, T3 and T4 represent different generations of the same type of technology. The upper part of the figure shows how technological innovations progress along their life cycle in developed countries as seen in chapter 1, while the arrows pointing down represent at what phase of each cycle the technology is acquired by Chinese firms.

Figure 9: Four stages of the technological development



Source: Jin & Zedtwitz (2008)

These firms collect before technological innovations that are in their recessive stage (Jin & Zedtwitz, 2008) in advanced countries; later the ones which are in their mature and growing stages (Kim, 1980). These firms accumulate knowledge of these technologies over different phases of their cycles and generally start their own indigenous R&D after having built sufficient experience, in figure 9 when T4 starts. Technology changes at an high pace and there may be a presence of two different technological generations at some point in time (as shown in the figure where the curves overlap). But it is not just a matter of technology which changes fast and becomes quickly obsolete, Chinese firms acquire technologies at different stages on purpose: as it will be demonstrated in chapter 3, between 1999 and 2004 Chinese firms from the mobile phone industry built many alliances with firms from advanced countries both in 2.5G technology and 3G technology (which was an emerging technology at the time), hopefully to get advantages from the current technology and to be prepared to exploit the next 3G generation at the same time (Jin, Zedtwitz, Chong, 2015). Emerging technologies from developed countries obviously represent an important source of competitive advantage. Instead, assimilating technologies that are obsolete in developed countries, even at the recessive or mature stages, may be useful to increase market shares rapidly and to incubate new industries or technologies in the country. That is what happens in China when the government encourages the introduction of TACS technology. Even if the technology was considered

recessive in the advanced world, the reason was to help the Chinese mobile phone industry to be created and emerge. In this way, local firms built management and market competences in mobile phone industry, which for example accelerate and facilitate the process of assimilation of GSM in 1997, which came later. Even if it refers to Chinese firms, the model could be generalized to other Asian emerging countries (Jin & Zedtwitz, 2008).

2.2 Means of knowledge transfer: strategic alliances and FDIs in Asia

After having analyzed how Asian countries have been able to extract and assimilate technology, now it is appropriate to understand what are the main "vehicles" by which advanced know how flows from the developed world. Most studies about this topic in Asia have been concentrating on the role played by the growth of R&D alliances and related FDIs, which have represented the most important means by which knowledge has been transferred (Fu, Pietrobelli, Soete, 2011; Li & Zhong, 2003).

But, before going on discussing this argument, a few issues need to be mentioned. Asian countries (and their respective MNCs) exhibit many differences among them and obviously they cannot be recognized as a homogeneous group. Even though the previously mentioned patterns of acquisition of foreign technologies and imitation strategies represent more or less common practices already observed in the developing world, generalizations about the characteristics of FDIs and strategic alliances among developing and developed countries should be treated considering peculiarities (motivation, resources requested, previous relations etc.) of individual countries. So, I will proceed giving an overview of the most important issues of FDIs and strategic alliances as technological transfer means focusing on the Asian case, while more specific aspects of the phenomenon will be treated in chapter 3 in relation to mobile phone industry and distinctive characteristics of singular Asian countries.

2.2.1 Asian R&D strategic alliances

In this section, when dealing with strategic alliances, we are referring to those involving R&D activities. In Asia, these kinds of partnerships have been mostly made with advanced countries and have grown exponentially starting from the end of the 1990s, reaching and overcoming in number previous relationships based more on the manufacture area. Among the most successful, we find those ones that started participating as low cost

manufacturers in their global value chain and later on succeed in well integrating into it and in leveraging advanced knowledge from developed countries. This is the case of some Taiwanese and Chinese companies for example which, even in the mobile phone industry, firstly entered as simple components and providers in partnership with foreign OEMs and now have upgraded in the global value chain as brand owners.

Our interest is both in what kind of alliance structure has been preferred among the others and what Asian countries and foreign developed firms look for in an alliance. Internationalization R&D alliances have been facilitated thanks to the new technologies which made setting up the global research activities easier (Li & Zhong, 2003). Most of them are organized in the form of R&D joint ventures or cooperative researches: the formers regard organizing a new legal entity with partners sharing an equity, while the latters regard a more flexible structure participating together in one or more projects and they do not involve the formation of a new independent organization (Stensma & Corley, 2000). Other alliances involve simpler structures as licenses, training contracts, or technological supports, as we will see in chapter 3 with a specific outlook in the mobile phone industry. In this context, foreign MNCs built R&D alliances abroad with the aim at exploiting local inputs, better understanding (or even controlling) local countries demands (Dunnings, 1995), achieving complementary and scale advantages or leaving to host countries uncertain not core activities (Makino & Delois, 1996). Instead, local firms at first have started by searching for alliances capable of providing with basic capabilities in order to understand the intrinsic characteristics of the phenomena (Creamer, 1976) and then have tested what learnt with alliance partners, in order to find commercial applications. The aim of this process is to finally be able to learn and hopefully implement on their own the development of a product. But precisely, what kind of knowledge have Asian firms been looking for in an alliance?

Figure 10: Industry distribution of international R&D Alliances in China

Industry	Cooperative alliances	Joint Ventures	Total
Electronics and computer software	60	53	113
Telecommunication and Internet	57	31	88
Transportation and related equipment	12	10	22
Chemicals and petrochemicals	8	2	10
Power generation equipment	7	2	9
Pharmaceuticals	3	5	8
Agricultural commodities and technology	5	1	6
Consumer goods	2	3	5
Medical equipment and devices	2	3	5
Engineering and construction	0	3	3
Environmental technology and equipment	1	1	2
Miscellaneous	2	0	2
Petroleum, natural gas and related equipment	2	0	2
Food and food processing	1	0	1
Total	162	114	276

Source: Li & Zhong (2003)

Figure 10 (Li & Zhong, 2003) depicts what kind of technologies were acquired by Chinese firms during the last part of the 1990s. Analyzing technology collected during those years by Chinese firms is important in order to understand what kind of technology was needed at the time when very first R&D alliances started to be built. As could be seen from the picture, Chinese firms were for the great part asking for elementary knowledge of electronics, computer software and telecommunications; this probably suggests that Chinese firms were just involved in the manufacturing process and lacked the basic parts of those competences able to allow them to build technologies on their own (indeed, in China as in other Asian countries, governments pushed them in order to start alliances, probably to reach technological independence). After first contacts made with advanced economies in the manufacture area, this represents a fundamental step which gave birth to Asian internationalization process.

Strategic alliances among developed and developing countries, more on the R&D side, have been carrying on increasing over the years. Parallely, FDIs in Asia have increased even more, in particular in the past decades. FDIs is treated in next paragraph, but this decision does not have to be conceived as an intention to split this phenomenon up from

strategic alliances. The reason is more behind the fact that FDI presents some peculiarities, some of which are of great interests among authors in particular in relation to knowledge spillovers.

2.2.2 FDIs and knowledge spillovers

As in strategic alliances, foreign MNCs investing in developing markets, as could be the case of Asia for example, may advantage host countries in many ways, so that local governments undertake favorable campaigns in order to attract them. This refers to Foreign Direct Investments (FDI) by developed countries, which has represented until now the most important vehicle of transfer of advanced competences to developing regions (Dunning, 1994).

FDIs may help host emerging countries in several ways. Foreign MNCs, for example, transfer know how from their headquarters or subsidiaries to other subsidiaries located elsewhere since they are interested in maintaining all of them updated; this is of great interest on the part of developing countries because innovations and other R&D practices, both coming from the subsidiary located there or from other breaches of the entire company, may provide local firms with higher equipment, machines or other managerial and industrial competences (Fu, 2008) or directly improve innovation outputs in the country (Athreye & Cantwell, 2007). Moreover, innovations and competences from foreign firms based in the country may generate knowledge spillovers, positively affecting capabilities of local firms. Presence of foreign competences indeed originates knowledge transfers due to: supply chain relations among foreign MNCs and local firms; trained-skilled workers changing job; competitive pressure by foreign firms, which push local ones to upgrade their technologies and inefficient firms to exit the market, etc. (Fu & Gong, 2009; Fu, Pietrobelli, Soete, 2011). In this sense, in developing countries it is not surprising to see geographic areas characterized by clusters of foreign subsidiaries, which are attracted on purpose by host governments through a system of incentives and tax advantages (Chen, Li, Shapiro, 2008). Around these districts, local firms have been able to exploit knowledge spillovers and introduce new innovations thanks to their connections with a more advanced technology. In Asia the process is well known: in order to push FDIs, Asian countries gave birth to the so called Special Economic Zone (SEZ), which the Chinese city of Shenzen, the fastest-growing city of the world and father of some of the biggest Chinese companies as ZTE, Fei, Huawei, represents the most prominent example.

However, the “knowledge flow” among companies is not easy as it seems: as seen in paragraphs 2.1.1 and 2.1.2, foreign technology cannot better off an innovation process in local firms if not coupled with absorptive capacities and indigenous R&D efforts. Moreover, foreign subsidiaries have not always been available to share their technologies with the locals, also due to the weak regulations of the institutions. Very different results have been shown when considering different countries. India for example has been capable of attracting investments from foreign MNCs and integrate their knowledge with the local one to create superior innovations (Fu, Pietrobelli, Soete, 2011). Instead, both positive and negative results have been achieved by China, according to the region of reference. In some areas of the country, foreign MNCs have mostly exploited unskilled labour (Johansson, 1994) and have not always been willing to share their knowledge, in particular in the high end segment (Zhou, 2006); in addition, parallel indigenous R&D has been promoted just in the past decades. In the end, the China case followed the same pattern of other Asian countries, where the new equipment and machineries imported, have certainly helped the local firms’ technological progress, but indigenous R&D has improved just in those situations where it has been “internally” promoted and foreign knowledge integration encouraged (Fu & Gong, 2009).

2.3 Asia going global: Asian EM MNEs expansion strategies

In the past decades, some Asian MNEs have been able to enter new markets and compete with the most prominent firms. As we saw in the previous paragraphs, most of their successes started thanks to their ability to exploit competences already developed by others, later coupled with a developed indigenous innovation system. These Asian firms have demonstrated how to better leverage globalization, since the great part of these “imitated” competences came from previous international connections with the developed world, which used to outsource to Asia the production part of their processes.

Other authors (Deng, 2006, 2012; Goldstein, Bonaglia, 2006; Mathews, 2006) think that the imitation/indigenous innovation pattern explains just part of the Asian rise, since the same model has been followed also by EM MNCs from other continents. Instead, according to them, the difference stands in particular on other three issues that have been characterizing Asian MNEs in their process of going global. The first regards the Asian firms’ capacity to abruptly switch from domestic to global competitors (Mathews, 2006): Asian firms have demonstrated to be capable of rapidly expanding in foreign markets and to conquer immediately important slices of them. Indeed, thanks to their amount of money

mostly gained due to low cost advantages, Asian emerging firms have been undertaking a path of “accelerated internationalization” consisting on successive (and sometimes risky) mergers and acquisitions which helped to reduce the market shares gap and rapidly catch up with the leaders. These strategies have shown the interest of the literature (Mathews, 2006; Deng, 2006, 2010, 2012) since they differ extremely from conventional theories, which instead see firms internationalizing with slower “step by step” processes, starting from exporting some products, to manufacture them.

Secondly, the “Asian way” consists on a bolder and more decisive strategy, representing the embodiment of the concept of aggressiveness as intended by Ferrier or Smith, in chapter 1. Among the others, the most important trait of this aggressiveness is represented by the fact that Asian EM MNEs mostly used mergers or acquisitions patterns as attacking strategies instead of other simpler modes of entry. Their aggressive strategies have led to important results both due to the complex way and intensity which have been implemented (Ferrier, 2011). One example may refer to specific strategies implemented by Asian firms to internationalize, always involving a complex mix of many diverse activities, from continuous introduction of new products to intense marketing campaigns: their main aim has been the one to confuse competitors, which most of the time have led to delays in their responses or not to implement the right ones (Smith, Ferrier, Grimm, 2001).

A third reason that has been characterizing Asian EM MNEs and has contributed to explain the Asian success is their “dual path strategy”. Actually, this last point should be considered more as a subgroup of “Asian aggressiveness”, treated previously; but, since the importance that this topic will represent in chapter 3, it will be treated separately. Successive acquisitions by Asian firms in emerging countries have been used to enter simultaneously many and even very different target countries, both from the developed and developing world. This decision does not come by accident since it is needed in order to offset the desire of increasing market shares with the necessity of building new competences (Deng, 2012). The former need may be satisfied entering other developing countries, which may be exploited to replicate practices or models already developed for their home markets. In these entry countries the competitive scope of their strategies remains basically the same; what changes is how these are implemented, which may involve small modifications of the value chain or pure spending attacking strategies, as seen in the previous chapter (Porter, 1985). This would lead to rapidly benefit from the same advantages obtained at home and increase financial means, too. Instead, to have access and to build new capabilities, EM MNCs require to enter developed countries. In

this way, they rapidly obtain strategic strategic assets useful to catch up leader firms and overcome their latecomer disadvantage. These of course may regard superior management capacities or sophisticated technologies, as argued in the previous paragraph, but also to obtain distributors and suppliers channels, brand names, etc. to better enter foreign markets (Luo & Tung, 2007; Anderson & Sutherland, 2015). Some of the M&A came from previous relationships, where Asian manufacturers and European-American OEMs relations ended up with the acquisition of the European-American brand by the Asian counterpart. The case BenQ and Fei is emblematic of this and will be discussed in chapter 3.

Accelerated, aggressive and dual expansion path strategies together explain in part the reasons behind the Asian EM MNCs' ability to compete against global rivals. But these patterns represent the most visible aspects of their internationalization process, demonstrating how they have been capable of escalating the global value chain: the recent big acquisitions in the mobile phone industry are proof of that.

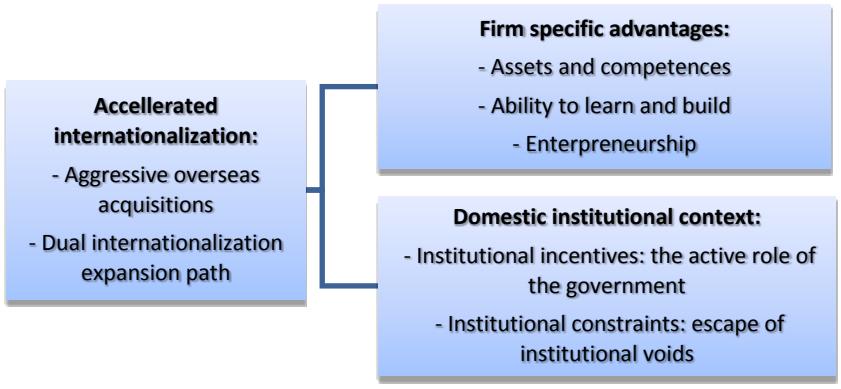
2.4 Asian domestic institutional context: A conflicting scenario

In this section, it will be proposed a brief review of the crucial role played by the domestic institutional context in determining Asian internationalization patterns. The intention here is to explain the active presence represented by the government in Asia in paving the way to the local MNEs, in light of the topics discussed in the previous paragraphs.

As in other emerging countries, many Asian governments have forced the acquisition of particular technologies or have encouraged local firms to undertake strategic alliances with foreign MNCs investing in Asian mainlands; a fast-growing trend has been also the one of pushing local firms to outward investments. About this last point, what seems an apparent contradiction, actually is the result of a design with a precise purpose. Nowadays, the governments in most Asian countries have a strategic role and encourage local firms to overcame their latecomer disadvantages: this involves also to help them leaving the country, if needed. This situation occurs in particular when there are low possibilities of bettering off and improving in the home environment since the presence of institutional voids, mostly caused by macroeconomic and political instability (Deng, 2012). These countries indeed lack of developed job-contract systems, access to talent, specialized intermediaries etc. as we have already said, which cannot give them the same advantages hold by the Western countries (such that sometimes this phenomenon is described more

as an exit strategy instead of an entry one into another country). As a consequence, mostly Chinese, Taiwanese (what before Korea and Japan did) leaders have found that undertaking outward investments represent an essential step in order to be able to compete in global markets, sometimes just in order to reduce uncertainty building a presence in more secure and stable countries.

Figure 11: Determinants of Asian MNEs' internationalization process



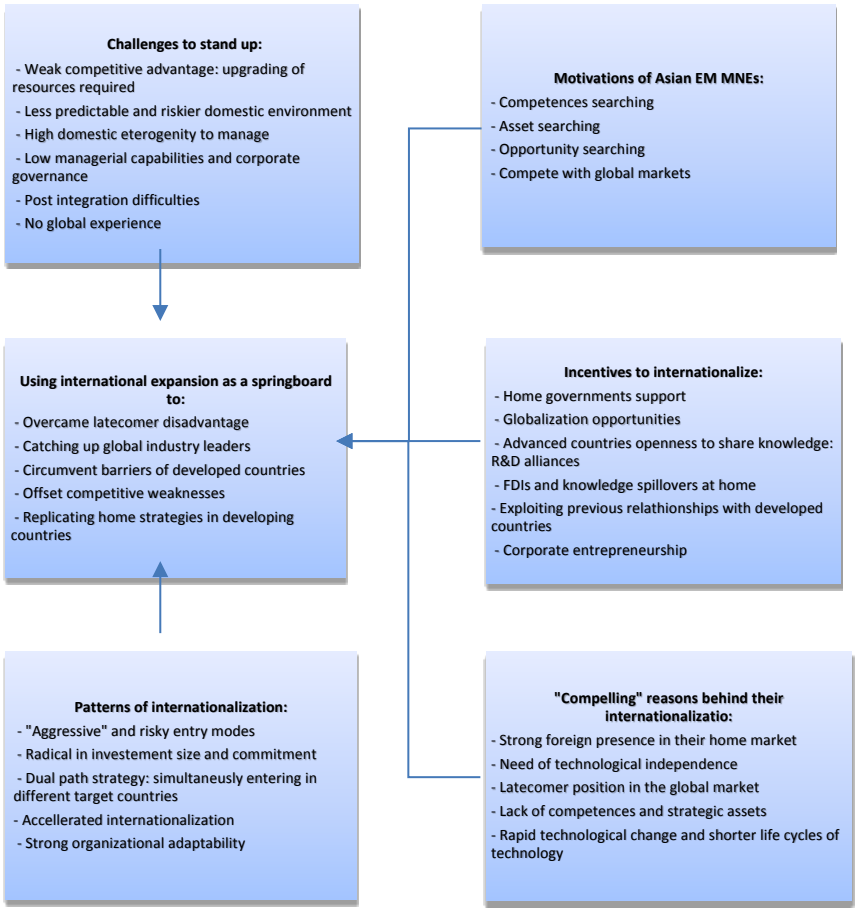
Source: Deng (2012)

Figure 11 above suggests how the recent internationalization process by Asian MNEs has been possible, explained thanks to the interaction among several elements occurred together. The government's interventions could not be understood without an overview of firms specific advantages and strategies; and what seen in the previous paragraphs have shown Asian firms capabilities in implementing their internationalization process thanks to the pushes and incentives by their institutional context. These firms have been able to survive in the difficult environment where they have been set, they have shown strong ability in learning from home country transformation and entrepreneurship in leveraging opportunities that globalization has been offering (Deng, 2012).

2.5 Conclusions

These two chapters had the purpose to introduce the theories behind internationalization of Asian EM MNEs. This introduction stage represents an essential step because the Asian success could only be understood with an overview of the complete picture with all its facets, necessary to be undertaken before starting to analyze the mobile phone industry. Even if Asian EM MNEs in this industry hold their peculiarities, in their process of going global most of their motivations, incentives, challenges and patterns of internationalization are commonly shared by other Asian firms from different industries. Interestingly, what they share in particular are the same “impelling” reasons which force them to go global: need to find technological independence from foreign technologies, lack of strategic competences allowing to develop own technologies, to contrast the foreign firm presence in their country, etc. Moreover, even if a strong effort by Asian firms and home governments have been made, as seen in this chapter, previous connections already present in the home country have facilitated the process of internationalization. Indeed, these have made possible to gain from alliances or FDIs in their mainlands, even upsiding down the trend, since now Asian EM MNEs are the ones searching for investments abroad.

Figure 12: An overview of Asian EM MNEs' internationalization process



Source: My elaboration

Figure 12 resumes what seen in chapters 1 and 2, and what briefly discussed above. These considerations are extremely useful because all together "point" to explain how international expansion abroad by Asian EM MNEs has served as a "springboard" to catch up with industry leaders. The "leap", in this springboard perspective, has been made by institutional or external sources and, last but not least, by the entrepreneurship of corporate Asia, which mixed together have shown the tremendous potential this continent has.

Chapter 3
An analysis over the mobile phone industry's evolution and the gradual catch up of Asian handset companies

3.1 Introduction

In my opinion, the mobile phone industry represents an interesting sector: highly competitive, very dynamic, always changing. Innovation in this industry has never stopped, and what we see in the ads on the television or in the shelves of shops is proof of that: every year new models are brought into the market, new technologies are available, new designs are invented, giving us new features and emotions, from which we have never been bored.

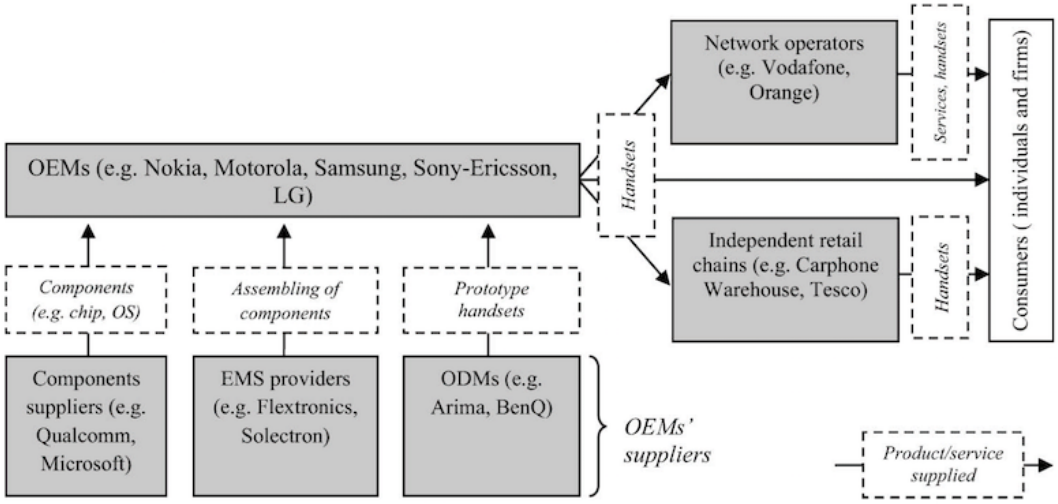
New introductions in the mobile phone industry have not stopped since the very first mobile phone was invented. But behind every new phone camera or application there is always a much less visible process, which had its origin decades ago and of which we are starting to be conscious only lately with the recent mergers and acquisitions that have been affecting the industry. Western leadership in this sector has started to lose and cease its power to Asia. Indeed, "Asian success" discussed in the previous chapter has involved many industries, the mobile phone one not excluded. Asian EM MNEs of this industry have started a long process from being simple components and EMS providers and they have now upgraded and hold their own brands.

In this chapter, I will start with an overview over the global mobile phone industry evolution, from its birth until today. In this way it will be possible to recognize the determinants of its development, identify the actors that have had an active part in the process and explain why the mobile phone industry has become the one that is today. All of this will be used to understand how Asian EM NMEs have been capable of progressively entering a scenario mostly dominated by Western firms.

3.2 The mobile phone industry

The mobile phone industry consists of a complex interweaved system, in which each part has its role and is dependent on the others. Figure 13 gives an idea on how this interconnected structure works.

Figure 13: The mobile phone industry



Source: Giachetti & Marchi (2010)

In the upper-left side of the figure, OEMs (original equipment manufacturer) represent those firms that mark under their own brand mobile phone handsets they produce (Giachetti & Marchi, 2010). As it can be easily understood from the arrows pointing to OEMs' quadrant, OEMs strongly rely on other providers for the manufacture part of their products. These partnerships have changed continuously over the course of the mobile phone industry evolution and are mostly of three kinds: EMSs (electronic manufacturing service) which assemble electronic components for OEMs; components suppliers, which provide OEMs with software, hardware, microchips, etc.; and ODMs (original design manufacturers), which design and prototype handset models for OEMs (on their specifications) which on the other hand sell them under their own brand. Other actors in this ecosystem are network operators and independent retailers, which together sell the majority of handsets to the final customer. The formers provide customers with mobile phone services based on coverage (calls and messages) and web functionalities and generally buy stocks of handsets from different brands which are later re-sold to customers together with network subscriptions; the latters instead market and sell handset models generally as part of a wider range of other (electronic) products (Giachetti & Marchi, 2010).

3.3 Evolution of the mobile phone industry: a focus on the progressive entrance of Asian handset challengers into the global scenario

In this section I will present how the global mobile phone industry has evolved over the years. An industry life cycle perspective will be used, to better understand the reasons behind strategies played by OEMs over the past decades, as discussed in paragraph 1.1. The aim, in particular, is to show when and how Asian firms were able to enter the global mobile phone industry and successfully integrate, nowadays representing a relevant part of it.

3.3.1 From the 1980s to the first half of the 1990s: Introduction stage and first growth

Introduction and first growth stages in the mobile phone industry follow the traditional ILC cycle. The former phase started in the 1980s in the US, which can be considered the years when the mobile phone industry was born. At the time, most countries developed their own standards: among these, the UK, the US, North European countries together adopted their own TACS, AMPS and NMT technology, respectively. They made use of the analogue system (1G) and were considered the most advanced ones. For this reason they also widespread in other countries mostly from the developed world, which, alternatively, developed their own technologies, too (Blackman, Cave, David, 1996). The world soon understood that common standards were needed. Indeed, these would help decrease prices and would give birth to a mass market, since the only customers at the time were businesses. Moreover, competition among OEMs was minimal: at the time, the market was highly concentrated since manufacturers such as Motorola, Ericsson and Nokia were exploiting first mover advantages, getting the biggest portions of a market still insecure about the new technology, with low volumes of products sold at high prices. Remarkable results were also reached by the European Alcatel and Siemens, and the Asian Sony and Samsung.

In 1991, the GSM technology (2G) was introduced in Europe (in 1995, in the US). This represented the first attempt to create a common standard, which, using a digital technology, allowed prices to drop, sizes to be reduced, better data and voice services and supplementary capacity to be included (Giachetti & Marchi, 2010). This is of great interest since it determined the first discontinuity in the mobile phone industry and the consequent rise of those firms such as Nokia, which understood the potentials of the new

technology, at the expenses of the leader Motorola, which, instead, did not consider upgrading, certain that customers would accept the technology enforced by its leadership in the market (Giachetti, 2017). In addition, many network operators entered the industry and, as said before, started to buy OEMs' handsets and re-sell them coupled with network subscriptions, thus incrementing numbers of retail channels and stores. Many and different technologies were introduced which involved all the spheres of the products, since a dominant design was not introduced yet. All these elements coming together gave rise to a mass market for the mobile phone industry and, consequently, created opportunities for new firms to enter.

3.3.2 Second half of the 1990s: the second growth

Starting from the mid 1990s, the industry went through its growth stage. As it can be seen from figure 14, the world market was still dominated by those firms that had conquered the previous decade, but with a Nokia rapidly growing at the expenses of a Motorola losing ground, and a Panasonic and an Ericsson maintaining their shares.

Figure 14: Unit sales and relative market share (%) per firm in the global mobile phone industry

	1997		1998		
Company	Unit sales	Market share	Unit sales	Market share	Growth
Nokia	20,593	19.1	37,374	22.9	81.5
Motorola	25.328	23.5	32,319	19.8	27.6
Ericsson	15,914	14.8	23,827	14.6	49.7
Panasonic	8,627	8.0	13,397	8.2	55.3
Alcatel	2,631	2.4	6,967	4.3	64.8
Others	34,725	32.2	48,972	30.0	41.0
Total	107,818	100.0	162,856	100.0	51.0

Source: Gartner (1999)

However, over the second half of the 1990s profit opportunities and high growth of the market pushed new competitors to enter, as shown in figure 15 below, which represents new entrants in the industry. Both figure 14 and 15 show a scenario of firms, which, added to already existing Siemens, Samsung and Sony, was still dominated by brands from developed countries, mostly Westerns. We have to wait until the first five years of the new millennium to see entrances of Asian firms from the developing world in the mobile phone

industry.

Figure 15: New competitors entering the mobile phone industry in the second half of the 1990s

Company	Country	Date of entry
Benefon	Finland	1999
Bosch	Germany	1997
Maxon	Germany	1999
Mitsubishi	Japan	1999
Nec	Japan	1996
Philips	Netherlands	1996
Sagem	France	1997
Telit	Italy	1999

Source: my elaboration from Giachetti & Marchi (2010)

Following the traditional ILC model, during its growing stage the mobile phone industry experienced strong innovations by product. This led mobile phones to be reduced in size, equipped with brighter screen and better keyboards, which were also used to reflect individual personality: more space to mass consumers was given and focus mainly on businesses decreased. All this was coupled with new radical features such as SMS, podcasts, games and WAP services (which allowed to browser internet pages and pave the way to further application inventions) mostly developed by Nokia, sometimes in partnership with Ericsson and Motorola. Moreover, a more differentiated market called for more segmentation on the OEMs' part. In order to respond to different customers' preferences, they were required to get involved in several product categories so as to satisfy different age ranges, lifestyles, customs, and others. Evidence of this is the number of new mobile phone models brought into the market, which increased rapidly in the last part of the 1990s.

New innovations required strong R&D expenditures which pushed OEMs to concentrate on those higher value activities and to start outsourcing the low value ones, such as manufacturing of components and applications, to EMSs, also with the purpose of downsizing fixed costs from manufacturing activities and shortening time to market. Besides, following the ILC framework, the fact that process innovation had become more important, led OEMs to invest on it in order to exploit scale advantages (Utterback & Suarez, 1993), but not at the expenses of product development, which unexpectedly

continued to grow (Giachetti & Marchi, 2010), as shown in next paragraph.

3.3.3 First half of the 2000s

As mentioned before, the first part of the 2000s represents the most important phase in the mobile phone industry evolution. These years indeed witnessed first entries of Asian companies from the developing countries into the global scene, which firstly appeared as low cost manufacturers.

The previous annual growth rate that was experienced by OEMs ended in 2001, when sales abruptly fell and originated a phase of shake out (Gartner, 2001). In these years, the world capacity caught up with demand (Gartner, 2000). Moreover, since the US economic recession decreased users' purchased power, many OEMs reacted introducing low price handsets into the market, causing the exit (and entrance) from the market in particular of those firms which did not take into consideration an aggressive price strategy (Giachetti & Marchi, 2010).

Figure 16 shows annual shipments and relative market shares of major OEMs in the mobile phone industry, between 1999 and 2001. The table depicts total shipments' decreases during the shake out and consequent changes in the market share. Among these, Siemens and Nokia reached strong results in terms of shipments since they were able to respond by cutting prices of their products, while Motorola overall kept a strong position in the industry just due to its performances in the US and China (Gartner, 2001).

Figure 16: Shipments (in million) and relative market share (%) per firm in the global mobile phone industry

	1999		2000		2001	
	Shipments in million	Market share %	Shipments in million	Market share %	Shipments in million	Market share %
Nokia	76.3	26.9	126.4	30.6	139.6	35.0
Motorola	47.8	16.9	60	14.6	59.1	14.8
Ericsson	29.8	10.5	41.5	10.0	26.9	6.7
Siemens	13	4.6	27	6.5	29.7	7.4
Panasonic	15.6	5.5	21.5	5.2	15	2.7
Samsung	17.7	6.2	20.6	5.0	28.2	7.1
Others	83.4	29.4	115.7	28.0	100.8	26.3
TOTAL	283.6	100.0	412.7	100.0	399.6	100.0

Source: my elaboration from Gartner (2000, 2001)

At the same time, the high level of penetration in the developed world of these years drove OEMs to concentrate on consumers' demand for replacement (Giachetti, 2013). New features were brought into the market such as MMS, cameras for mobile phones,

coloured display, UMTS/3G technology, etc. which more than ever before, made mobile phones to be conceived as a multitask gadget, instead of simple “phone for calls”. Price still represented an important part of OEMs strategies, but the continuous introductions of new features did not suggest either an OEMs’ core focus on innovation by process or even a convergence of a clear dominant design (which still was not definitive), as was predicted from the ILC model (Giachetti & Marchi, 2010). As a consequence, even if some firms such as Siemens and Alcatel focused on low end products, as evidenced in figure 16 in first part of the 2000s greater results were reached by those firms such as Samsung (but also LG and still Nokia) which were capable of widening their portfolio (Gartner, 2003), giving both higher end phones with such new features, and lower end products, as well. Moreover, to make things more complicated, a shorter product life cycle needed a lower time to market for the new models (Umashnker, 2004).

3.3.4 Turnover of the first 2000s: Asian firms venturing into the global handset industry

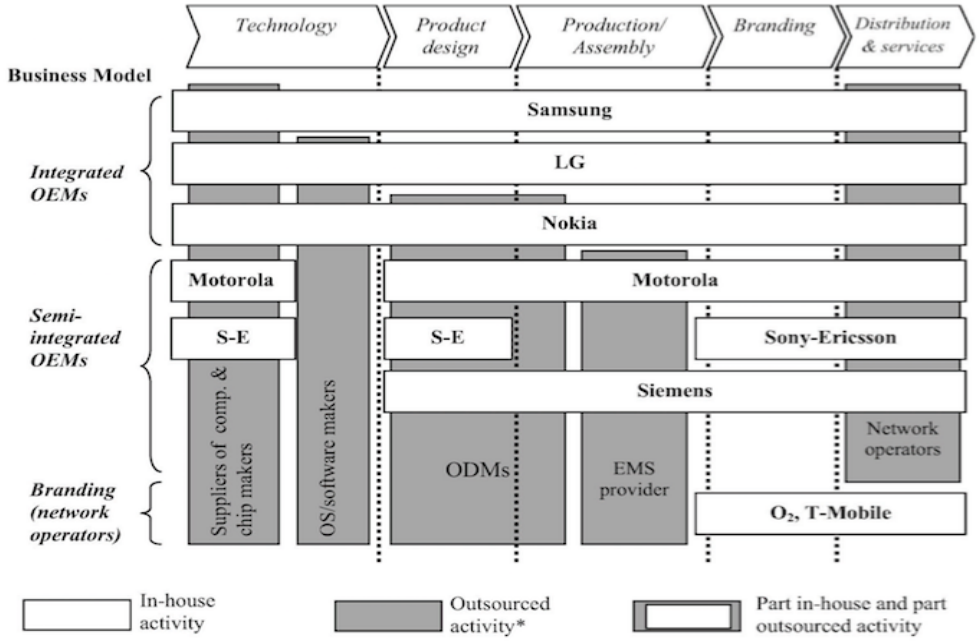
The inability of same firms to both keep up product innovations and enlarge product portfolio, in addition to previous discussed decreases in terms of demands, caused a new turnover in the industry (Giachetti & Marchi, 2010). What is more, another trend observed was the downsizing of selling prices of end products due to the entrance of many Asian manufacturers into the field (Umashnker, 2004). This last event particularly affected market concentration and the rules that used to drive competitive intensity in the industry. In fact, since more than ever before established OEMs required both a major focus on core businesses (such as sales, marketing and product R&D) to face the higher level of competition (Giachetti & Marchi, 2010) and to cut prices in order to bear new price variations (Umashnker, 2004), many established OEMs started decomposing their vertical structures, firstly by outsourcing a large part of their manufacturing and assembling activities, and by ending up later to give away the entire (or mostly) design part of their products (Giachetti & Marchi, 2010). As a consequence, a great part of these activities were outsourced to EMSs and ODMs, most of which were Taiwanese, South Korean and Chinese manufacturers.

Nevertheless, addressing to ODMs from Asia held some advantages. Firstly, they were able to provide products in a faster and more flexible way. These helped reducing time to market while decreasing costs at the same time, since engineers and designers were much less expensive. Moreover, this became more than ever a necessity, since the need

for introducing newer and newer models and consequent increases in R&D expenses were pushing down profits (Giachetti & Marchi, 2010). Secondly, Asian ODMs simplified product management of their clients, providing them with several services. For example, ODMs developed a range of different products that needed to be ready and from which OEMs could chose, whatever there was a need to fill a gap in the market or in the product line. In other cases, ODMs provided particular specificities for those firms which may hold particular resource constraints.

Figure 17 shows how some of the major OEMs' structure of the first 2000s looked like.

Figure 17: OEMs' business model of the 2000s: the deverticalization strategy



Source: Giachetti & Marchi (2010)

Strong brands such as Motorola, Ericsson and Siemens had semi integrated structures, while LG, Samsung and Nokia still maintained their vertical integrated configuration. In the former case, we can see how the value chain is disintegrated and what strategies are preferred by individual vendors: branding activities remain still under OEMs control, the production and assembly part is completely outsourced or shared with EMSs and ODMs, while technology and design, that in the past were always kept inside, now is split with ODMs.

For European and American OEMs, outsourcing part of the production represented a must at the time, considered what discussed above. But the growing number of Asian ODMs apart from changing the rules in the value chain, created also new powerful actors,

because collaboration with technological advanced clients gave them new competences. Moreover, OEMs power started to be in serious danger in particular when ODMs made alliances both with mobile operators (as it can be seen in the lowest part of figure 17), which had the intention to bypass established brands, and with software provider companies such as Microsoft, which were pushing to make their big break into the industry (Umashnker, 2004; Schwartz, K., 2003).

All of this coming together strongly benefited Asian ODMs (but also in EMSs) which, learning from advanced countries rapidly upgraded their capabilities, some of them even entering as OEMs in the industry and becoming competitors. This very last trend was well documented and proved by Alcacer & Oxley (2014), who showed that those firms which had longer supplying relationships with their clients, involving both manufacturing and design activities, were accumulating experience, since the number of patents introduced was increasing. Figure 18 shows some of the relations that Motorola, Siemens, Panasonic and Ericsson undertook with Asian ODMs between 2001 and 2003 and the technologies Asian ODMs went in contact with in the same years, most of which pave the way to for their future growth. Most of the skills collected during those years regarded design or manufacture technologies, both 2G and 2.5G, in other cases also smaller software capabilities.

Figure 18: OEMs/ODMs relationships and expertise matured in the first 2000s

OEM client	ODM	Year of the deal	Technological expertise matured by ODMs
Motorola	Eastcom (China)	December, 2001	- Motorola's Digital DNA license (design technology), chips, and displays technologies - Motorola's expertise in integrated circuit design (training in Beijing) - expertise in producing GSM (2G) handsets
	BenQ (Taiwan)	January, 2002	- Chips, software and certification of Motorola's 2.5G i.250 platform - expertise in producing GSM/GPRS (2G and 2.5G) handsets, WAP - Products produced (in partnership): T190, T191, C300
	Compal (Taiwan)	September, 2002	- Motorola's expertise in producing GSM (2G) and 2.5G i.250 platform, GPRS, WAP expertise, camera technology - Products produced (in partnership): E360, E365, G60
	Giga Telecom (South Korea)	September, 2002	- Motorola's general expertise in producing 2.5G i.250 platform - several other smaller technologies
	TCL (China)	November, 2002	- Motorola's expertise in voice, high speed data (also for businesses), camera-phone building from i.200 and i.250 platforms (2G and 2.5G) - WAP, EMS and MMS technologies
Ericsson	GVC (Taiwan)	March, 2002	- Ericsson's expertise in design, developing and producing GPRS (2G) handsets, several other smaller features - Possibility to use Ericsson platforms to test products - Products (in partnership): R600, T200
	HTC (Taiwan)	June, 2003	- Ericsson's expertise in designing and manufacturing handsets from the production of EDGE and W-CDMA (3G standard used by GSM phones) devices
Siemens	HTC (Taiwan)	March, 2003	- Siemens' expertise GSM (2G), GPRS, other features as radio, games, MP3 player - Products (in partnership): SX56
	Quanta (Taiwan)	June, 2002	- Siemens' expertise in producing and developing GSM (2G), WAP technology, smaller features - Products (in partnership): CL50
Panasonic	Compal (Taiwan)	June, 2003	- expertise in producing and developing GSM (2G) and GPRS (2.5G), WAP technology, several other smaller technologies - Products (in partnership): G60
	Quanta (Taiwan)	September, 2002	- Expertise in developing GSM (2G), WAP technologies, smaller features in the organizer - Products (in partnership): GD55, G50

Sources: my elaboration from Umashnker, (2004), Imei.info, gsmarena.com and other sources

Among ODMs we recognize some of the successful brands of today. For instance, emblematic is the case of HTC and BenQ, which in the first 2000s started by being ODMs for Nokia, Motorola and Siemens, later entering with their own brands in 2003 and 2006 respectively, to compete against their clients. In particular, BenQ started its relation with Motorola in January 2002, producing Motorola's models T190, T191, C300 as an ODM. In 2003, it entered with its own brand and in the first months of 2004 it had already overcome

Nokia in Taiwan, becoming the second biggest handset vendor in the country (Umashnker, 2004).

In the meantime, similar relationships were also occurring among Asian partners, involving analogous knowledge transfer patterns and learning trends, and helping those countries which were left behind in catching up. These kinds of alliances have received a great interest from part of the literature (Cooke, O'Connor, Searle, 2013; Larcon, 2009; Lee & Kim, 2004), particularly concerning Chinese and Korean firms, and have in part explained the rapid rise of the formers in the handset industry. Between the last part of the 1990s and the mid 2000s, many Chinese handset firms such as Konka, TCL, Eastcom, Datang, CEC, ZTE, Haier, Bird, and others, have rapidly grown also thanks to their alliances with Korean companies (Shenjum, 2007). In fact, Korean firms were expanding in China, furnishing local firms with finished products, while Chinese partners where marketing them under their brand names. These relations gave Chinese firms strong expertise in design and manufacturing mobile phones with GSM and CDMA technologies especially when the Koreans started to behave as ODM and relocated part of the manufacturing side to China. At the time, these represented a necessity in order to penetrate the market, due to the high level of competition and the restriction of the government (Lee & Kim, 2001). Moreover, outsourcing the marketing and branding side, strongly increased Chinese firms' bargaining power, which forced some Koreans to set up joint ventures instead of considering just OEMs-ODMs relations (Lee & Kim, 2004). Many of these alliances (such as Daxian T.-Pantech or Sewon- Haier) involved R&D activities and have decisively benefited the Chinese counterpart.

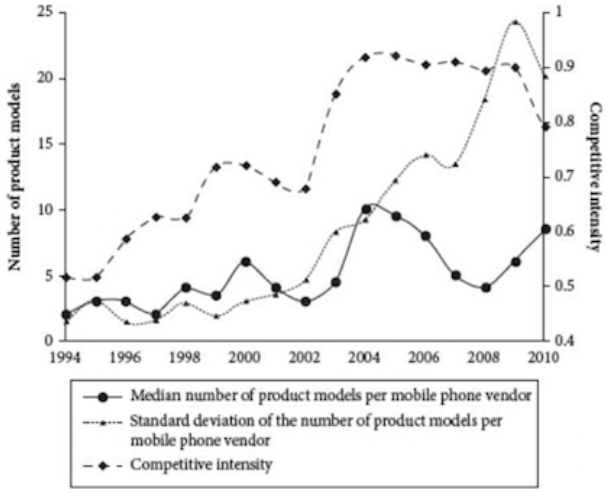
Considerations previously made, justify the entrance of Asian firms into the global scene, which affected the industry's concentration level. Figure 19 shows some of the biggest Asian firms that entered the world handset industry as OEMs between 2002 and 2005, while figure 20 pictures competitive intensity between 1994 and 2010.

Figure 19: Asian OEMs entering handset industry

Firm name	country	Year of entry	Firm name	country	Year of entry
Amoi	China	2003	LG	South Korea	2002
Asus	Taiwan	2005	Mitac	Taiwan	2003
BenQ	Taiwan	2003	Pantech	South Korea	2003
Bird	China	2003	VK Mobile	South Korea	2004
Gygabyte	Taiwan	2005	Qtek	Taiwan	2004
Haier	China	2003	Innostream	South Korea	2003

Source: Giachetti & Marchi (2010)

Figure 20: Competitive intensity in the handset industry



Source: Giachetti (2013)

The two figures are linked, since figure 20 shows the effects on competition in the mobile phone industry caused by the entrance of firms from developing countries, mostly Asians. As a matter of fact, after the growth of the 1990s and the recession of 2001, between 2002 and 2004 Asian manufacturers entered the industry with competitive prices and competition exploded. Not surprisingly, as shown in figure 20, reaction of incumbent firms was an aggressive introduction of new devices, extending product portfolio also to low end phones (Giachetti, 2013).

3.3.5 Asian handset firms upgrading in the global value chain: the role played by strategic alliances

Many Asian firms entering the global handset industry for the first time lacked most of the resources that other companies had in the sector. Being component suppliers and ODMs for important European and American brands certainly helped Asian low cost manufacturers to improve their capabilities, especially on the manufacturing and designing side. However, a technological leap still was needed in order to fill the gap and be able to compete with Western brand's advanced technology.

According to some authors (Chen, 2003; Li & Zhong, 2003; Zedtwitz & Jin, 2015) a technological transition for Asian mobile phone manufacturers happened thanks to the innumerable international alliances between the last part of the 1990s and the first part of the 2000s, which encompass also those same years when Western brands started to decompose their vertical structures in favor of Asian ODMs and EMSs. As a matter of fact, these kinds of international alliances in the handset industry as well as in others, had

already started in the first 1990s, but in the mobile phone sector its pace largely increased between 1999 and 2004, a period consistent with the rise and internationalization of many Asian local brands. Moreover, 1999 was an important year in particular for Chinese handset manufacturers, which started establishing themselves in the mobile phone market. Among these, we remember today's well known brands such as SED, Lenovo, Bird, ZTE, Haier, Konka, TCL, etc. (Chen & Wen, 2014; Giachetti, 2013).

Asian firms adopted both equity and non equity alliances, as discussed in chapter 2. Asian handset companies generally preferred the former type when relating with "culturally" similar firms: for instance, most of these types of alliances organized by China had as partner other Chinese or Korean firms, but also from Taiwan or Hong Kong (Zedtwitz & Jin, 2015). The latters, instead, were set mostly with Northern American and European countries. However, as we see below, many "remarkable" joint ventures were also set with Western brands, in particular when there was a need to complement the acquisition of advanced foreign technologies with an "access" to the network and distributions of their countries.

In their research, Zedtwitz and Jin (2015) studied international R&D alliances implemented by Chinese firms between 1999 and 2004. In this period, they observed 15 local handset makers' alliances with more than 30 foreign firms coming from several countries. Figure 21 shows the results of their research.

Figure 21: International R&D alliances with Chinese partners in the handset industry (1999-2004)

Foreign partner	% of total	Country
Texas Instrument	14.5	USA
Siemens AG	6.5	Germany
Motorola	6.5	USA
Lucent technol.	4.8	USA
Qualcomm Inc.	4.8	USA
Ericsson	3.2	Sweden
Philips	3.2	Netherlands
Samsung	3.2	Korea
Intel	3.2	USA
Microsoft	3.2	USA
TOTAL	53.1	

Source: Zedtwitz & Jin (2015)

The table gives an idea of which partners were preferred in the alliance and what country partners they were from. As shown in the figure, almost all alliances were set with the USA and Europe, with brands that we have already seen before. But, why were so many alliances made with Western brands? What were most important factors behind this decision?

To answer this questions, figure 22 summarized some of the strategic alliances I found, which were set up from the last part of the 1990s and until the mid 2000s among Western brands and Asian handset manufacturers, mostly Chinese. Most of the alliances represented are organized in the form of joint venture, others were acquisitions; some of the joint ventures even ended up with an acquisition by the Asian counterpart. The use of Chinese joint ventures with foreign firms for this analysis has not been made accidentaly. Even if, in number, these types of equity based agreements were generally set more by Asian firms among them, equity investments with Western counterparts have represented the most effective means by which knowledge was transferred (Mowery, 1996), also in light of considerations by Alcacer & Oxley (2014), which have demonstrated suppliers' incapacity of accumulating capabilities (and clients' unwillingness to share) with simpler methods. This analysis has been helpful to understand what motivations led Asian firms to undertake strategic alliances and corroborate investigations made from previous researches (Li & Zhong, 2003; Zedtwitz & Jin, 2008).

Figure 22: Resources acquired by Asian handset firms in strategic alliances with Western companies

Companies involved	Type of deal	Technologies acquired from the partnership	Distribution, network and management competences acquired	Sources
TCL - Alcatel	- Joint Venture and License agreements - August, 2004	TCL: - Collaborates with Alcatel in the next generation technologies (3G) - strengthens its R&D, gaining access to Alcatel's R&D site in Paris	TCL: - expands its coverage into the European market as well as in North America (they have complementary markets in terms of distribution and sales) - with the partnership, becomes a mobile handset leader, able to compete with global competitors - gets the exclusive license to use Alcatel brands, exploiting its brand name - with Alcatel wants to strengthen its position attacking the medium low cost range - puts the basis for its differentiation strategies (uses different brands to cover different niches)	- Alcatel's reports, 2004, TCL-Alcatel joint venture officially started operations - Goldstein, P., 2015, TCL buys Palm brand from HP, FierceWireless, January 06 - Auchard, E., 2017, How Chinese handset makers are resurrecting vintage Western phone brands, Reuters, March 02 - Yuxin, H., 2005, The disillusion of TCL and Alcatel, Caijing, March 28 - Shengjun, L., 2007, Chinese enterprinses: Journey to the west, Ceibs, pag. 2-3 (Case study) - Rusconi, G., 2016, Da Lenovo a Wiko, ecco gli smartphone alternativi e low cost, Il sole 24 ore, February 23 - Deng, P., 2006, Investing for strategic resources and its rationale: The case of outward FDI from Chinese companies, Business Horizon, Vol.50:71-81, Issue No.1, Elsevier Pub., pag. 6-7
Benq – Siemens Mobile	- Acquisition - October, 2005	BenQ: - Has immediately access to Siemens' IPs on GSM (2G) and GPRS (2.5G), staff and manufacturing facilities - has access and collaborates in R&D on 3G with Siemens - it gets immediately Siemens Mobile's R&D facilities and more that its IPs - reduces its expenses on materials up to 10% with the consolidation of the two manufacturing platforms	BenQ: - With the acquisition, becomes the fourth largest supplier company - it obtains immediately customers from Vodafone, Orange, Telefonica and T Mobile operators - Exploits Siemens's brand to increase recognition of its products (exploiting the Siemens Brand in Europe and Latin America) - Obtains the right to use Siemens' brand name up to 5 years - hires thousands of Siemens Mobile's formers employees	- Datamonitor, 2005, Industry comment: BenQ/Siemens:cash in hand, July 02 - Lai, R., 2013, BenQ rejoins the smartphone market, Engadget, December 02 - gsmarena.com - Torchiani, G., 2006, Inattesa e un po' prematura la decisione di BenQ, Il sole 24 Ore
Bird - Sagem Wireless	- Joint Venture - March, 2005	Bird: - gets competences in GSM (2G) and CDMA (2.5) technologies from Sagem - obtains expertise in Sagem's design and manufacturing capabilities - makes more efficient its product development costs creating a common range of products for both of the brands - has access to Sagem's R&D facilities	Bird: - acquires management techniques - uses Sagem's channels to enter in the European market (in particular, in Italy and Russia) - increases its knowledge of sale channels in Europe - combine their capabilities to coordinate worldwide strategy (they have complementary markets)	- Shensen, Z., 2010, Handset firm set for profit, Shanghai Daily, January 12 - MacDonald, M.,2008, Siemens sales slump in China, TelecomWorldWide - Mobiware and Ningbo Bird – GlobalSource - Ningbo Bird Co/Bloomberg - Deng, P., 2006, Investing for strategic resources and its rationale: The case of outward FDI from Chinese companies, Business Horizon, Vol.50:71-81, Issue. No.1, Elsevier Pub.,pag. 6-7 - Larcon, 2009, Chinese Multinationals, World scientific Publishing, Singapore, posizione 44% - Cooke. P., O'Connor. K., 2013, The economic geography of the IT industry in the Asia Pacific Region, Routledge, London & New York, pag. 158-183
Bird - Siemens	- Joint Venture - March, 2004	Bird: - gets access to 2G and 2.5G technology platform - expertise in designs, manufacturing and software development of Siemens - cooperates to develop 3G technology (Siemens detains many patents in 3G TD-SCDMA technology)	Bird: - enlarge knowledge on the network and distribution of the European market (acquires also marketing competences) - points to bring Siemens expertise of design and software development in the Chinese market	- MacDonald, M.,2008, Siemens sales slump in China, TelecomWorldWide - Chang, C. Wang, F., 2008, Analysis of strategies for the mainland China mobile phone industry, International journal of electronic Business Mnanagement, Volume 6: 93-98, Issue 2, pag. 2-3 - Larcon, 2009, Chinese Multinationals, World scientific Publishing, Singapore, posizione 83%, 88% - Cooke. P., O'Connor. K., 2013, The economic geography of

				the IT industry in the Asia Pacific Region, Routledge, London & New York, pag. 158-183
Shenzen SED El. - Philips	- Joint Venture - 1996	SED Electronics: - obtains expertise to GSM technology (sold also under its brand) - develops handsets with CDMA technology in collaboration with Philips (2004) - gets expertise from the JV's R&D for 3G technology (3G phones lunched in 2005)	SED Electronics: - leverage Philips' brand knowledge for mobile brands in fast emerging domestic market, also in China and India (at the time, the brand had been present for 71 years) - strengthens its coverage in the Chinese market and abroad	- Bennett, A., 2001, Philips calls on Chinese for cell phones, Itworld, June 26 - Global sources, 2004, Market intelligence report, mobile phone and accessories, ASM Business service ltd, pag.114-115 - Praveena, B., 2012, Philips re entry into Indian mobile market, Amity research centers, pag. 2, 9-12 (Case study)
TCL - Sagem Mobile	- Acquisition	TCL: - acquires Sagem's R&D center (design, manufacturing, product development, etc.) in Ningbo - obtains expertise in 3G technology (and previous ones) and patents related - consolidates its manufacturing platforms with Sagem's one	TCL: - rapidly broadens its presence in China and abroad with 3G competences - leverages Sagem's brand knowledge - obtains immediately Sagem's channels and distribution to strengthen its position in the European market - acquires immediate competences from Sagem's employees	- Ko, Cheung, 2011, TCL communication, KGI report, pag 3-5
CEC – Philips mobile	- Joint Venture - November, 2001	CEC: - has access to R&D platform and competences in manufacturing from Philips - acquires GSM (2G) and CDMA (2.5G) technologies	CEC: - obtains knowledge of the European market - associates its name to the Philips brand in Asia (where Philips is well known) - hires hundreds of human resources from Philips	- Global sources, 2004, Market intelligence report, mobile phone and accessories, ASM Business service ltd, pag 48 - Lee, K. Kim,M., 2004, The rise of China and the Korean firms: looking for new divisions of labor, pag. 16 - Cooke. P., O'Connor. K., 2013, The economic geography of the IT industry in the Asia Pacific Region, Routledge, London & New York, pag. 158-183
TCL - Philips	- Joint Venture - February, 2004	TCL: - gets expertise on GSM (2G) and CDMA (2.5G) - upgrade its capabilities in product design and manufacturing technology having access to Philips' Research and product development	TCL: - increases its exports, broadening its manufacturing scale and reducing costs - improve its knowledge of the European market - invest with Philips in improving sales channels in China - emends its management competences - diversifies its product range activities	- Larcon, 2009, Chinese Multinationals, World scientific Publishing, Singapore, posizione 43% - Cooke. P., O'Connor. K., 2013, The economic geography of the IT industry in the Asia Pacific Region, Routledge, London & New York, pag. 158-183

Sources: my elaboration

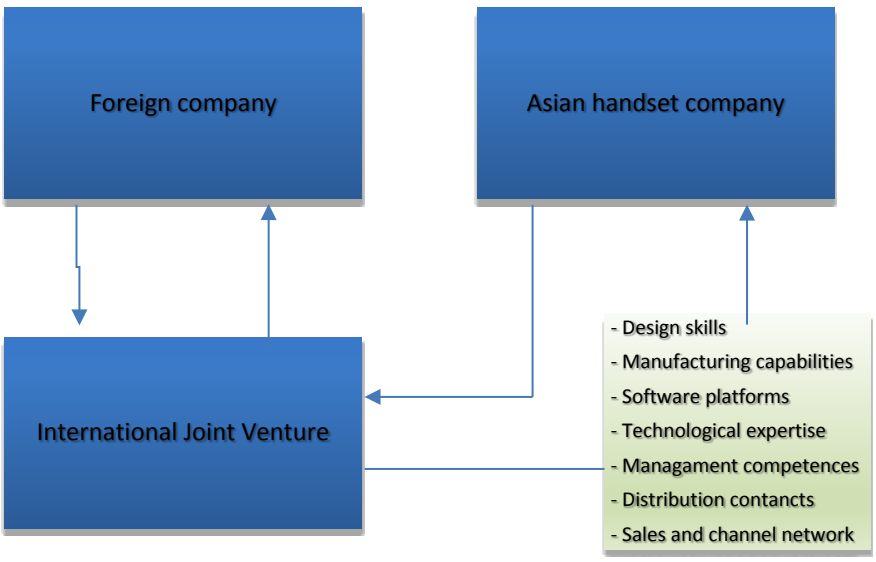
From the table, technology seems to be the first reason that may have led Asian firms to engage in an alliance in those years. In fact, in chapter 2 we saw that Asian firms mostly made alliances to be able to access advanced foreign technology and upgrade their capabilities; our focus is addressed especially on what technologies were acquired. Evidences from the figure 22 suggest that Chinese firms were looking for research and development platforms, design or manufacturing technology, regarding 2G, 2.5G and 3G technologies. This is a topic of interest, since it reflects what showed in chapter 2, which explains the rapid rise of Chinese (as other Asian) firms. Between the last part of the 1990s and the first 2000s, Asian handset firms engaged in these alliances with the aim of importing and assimilating mature (2G), growing (2.5G) and emerging (3G) technology, in this order but with the boundaries of the different technologies acquired co existing (different generation of technologies often acquired by different partners). The exposure and assimilation of 2G technology (even if considered mature in advanced countries) served as way to cultivate a still emerging mobile phone industry and gave Chinese mobile manufacturers those competences able to accelerate their development and catch up with competitors, making future acquisition of next generation technologies easier. Instead, 2.5G and 3G were looked for to be able to compete with global firms in the growing and emerging standards, respectively. As a consequence, we can say that the type of technology Asian handset firms needed and the partners which could provide with it, were the most important factors behind the decision of what kind of alliance to make.

A second reason were the resources that the western counterpart detained in the industry. Firms with a stronger position in terms of R&D facilities, brand knowledge and distribution networks were preferred. For Asian mobile handset firms, the searching for strategic alliances in order to have access to R&D was the priority, as could be demonstrated in the transfer and acquisition of 2G, 2.5G and 3G common to all firms in figure 22. From each joint venture, the Asian counterpart was able to extract several other competences, ranging from design to manufacturing capabilities, which helped them develop current and future handset product technologies. But observations from our sample show that Chinese firms were using alliances also to have access to foreign firms' distribution and networks that established firms had in their market. Even if this last trend will be more evident in future developments (in particular with the pattern of acquisitions used as internationalization strategy), this means that, already in the first years of the 2000s, most prominent Asian firms, when making alliances, were choosing foreign partners considering further expansion strategies. Many Chinese firms, for example, in the

second part of the 2000s entered other Asian emerging markets leveraging Western firms' brand knowledge of their partners. The case of Philips Mobile used by Sang Fei (and its partners) to enter in the Indian market is emblematic of this (the joint venture was set up during these years but the Indian entry will occur in the second part of the 2000s) (Praveena, 2012). The brand in India was well known among users and has always reached a great consensus. The advantage of having a brand such as Philips, as could be the cases of Siemens, Motorola and Alcatel, is that it is known both in the developing and developed world, and could be used to play dual path strategies, as discussed in chapter 2, or even for dual brand strategies (in the same country) or to target particular segments, as followed explained.

Figure 23 resumes in a simple way how the joint venture's relationship has worked among the two companies. The arrows entering the international joint venture's box suggest both Asian and foreign firms' intention of exploiting the relation positively, in order to share and acquire knowledge from the alliance. In this case, the green box resumes those competences I observed been acquired in figure 22 by the Asian handset companies in their joint ventures with foreign partners.

Figure 23: International joint ventures and capabilities acquired by Asian handset companies



Source: adapted from Larcon (2009)

A third reason that is likely to push an alliance with that particular firm was the previous relationship that Asian handset manufacturers had with the chosen partners. For example,

many strategic alliances of these years evolved from antecedent OEMs-ODMs (or OEMs-EMSs) relationships had in the past. Firms' relationships considered in the table are proof of that, since in many of them, the Asian counterpart was furnishing manufacturing services to the other or had other types of relations (such as Bird-Sagem, SED El.-Philips, TCL-Philips, etc.). Carrying on and even evolving a relationship helped fostering trust and accelerating decision making (Deng, 2012).

Besides, the technological background of local firms affects foreign MNCs decision whether or not creating an alliance (Zedtwitz & Jin, 2015). I observed for example that, in most of the strategic alliances (both joint ventures or much simpler agreements) set among Asian and developed country firms from the last part of the 1990s until mid 2000s, Asian partners were the most prominent firms in the handset market of Asia, at least at that time. In the course of my research I have come across many TCL and Bird's joint ventures with some of the "biggest names" of the time (as represented in figure 22), even if the mobile division of few of them was struggling (as the case of Siemens, "acquired for nothing"). Still, with no surprise, I have found other Asian leading manufacturers in the same situation; an example is Huawei, one of the leader firms in the handset Chinese market, which used to cooperate in R&D with IBM, Motorola, Intel, Microsoft, Nec, Infineon, AGERE, 3COM, Texas Instruments, etc. Even Zedwitz & Jin (2015), analyzing a bigger sample of strategic alliances among Asian and Western countries in the mobile phone industry, evidenced (and corroborated) this trend. Their findings show that most of the alliances among Chinese and foreign brands were made with "the biggest TCL, Bird, ZTE, Huawei and Eastcom". Moreover, they said that two Asian firms within their poll (they do not reveal the names) tried to set a joint venture with Motorola multiple times, but they were refused repeatedly by the American counterpart, and accepted only after the Chinese firms upgraded their capabilities. After all, as shown in chapter 2, successful Asian handset firms are only the ones which were able to couple assimilation of foreign technologies with indigenous R&D efforts, bettering off absorptive capacities (Deng, 2010). This of course was necessary to help their own development, but it is likely that this was also used to show to foreign firms that an alliance with them could be a win-win relationship.

3.3.6 Second half of the 2000s and afterwards: the advent of the smartphone and Asian emerging markets' opportunities

During the second part of the 2000s, a great portion of the market was in the hands of Samsung, Motorola, Nokia, LG and Sony Ericsson, while historical brands such as Alcatel, Nec, Philips, Siemens and Panasonic, were losing ground mostly because of their inability of widening their product range, as followed explained (Giachetti, 2010). At the same time, previously mentioned Asian handset makers, such as ZTE, Huawei, Eastcom, TCL, were achieving remarkable results in the low end market (Giachetti, 2013). But new entrances during the second half of the 2000s caused a new turnover in the industry.

First of all, it is important to remember that, after the mid 2000s, the global handset industry was undoubtedly divided into two markets: developed countries of Northern America and Western Europe versus the emerging ones of Asia, Africa, East Europe and Middle East (Giachetti, 2013). The developed world was clearly in its maturity stage. Saturation so far was reached, with demand mostly trained by replacement and, with a much lower degree, by first time buyers (Gartner, 2007). In order to push users to substitute old phones, OEMs concentrated their efforts on increasing their portfolio of products, introducing a large variety of mobile phones. Most of the new models were both from the low and high end side of the market, advanced with new innovative features even belonging to other sectors, as new phone cameras, music players, web connections, etc. (Giachetti, 2010), leading handset producers to become competitors in different industries. This "technological convergence" experienced in those years forced firms from other industries to react in the same way; for example, many PC and software maker firms started expanding their product range also to mobile phones. Among these, HP, Microsoft, Acer, Dell and Apple entered the handset industry with the hope of exploiting the knowledge and the trust customers had for their brands. Moreover, another trend observed was the numerous partnerships of OEMs with fashion houses, as Roberto Cavalli-LG, Armani-Samsung, D&G-Motorola, Escada-Siemens, etc. (Giachetti, 2010). These agreements used to compete just on the aesthetic side, differently from other brands or mobile networks, which on the other hand were stressing both design innovations and product functionality (Giachetti, 2010).

This trend of introducing always new features, even in the maturity stage, corroborates what seen in relation to the ILC in chapter 1, proving the role that product innovation still has as an element of differentiation in the mobile phone industry (Giachetti, 2010). Maybe, these new products incorporating many features and functionalities in one phone, not by

accident known as Smart-phones, need to be conceived as a totally new category of device, and as a consequence constitute a new curve with its own life cycle. In this case, probably we would be in the first part of the growth stage. Whether or not this is the hypothesis, we are sure that at the end of the 2000s, these multitasking devices represented the new dominant design. The coming of the smartphone strengthens the position of the new entries Research in Motion and Apple, and the Taiwanese HTC, which were basing their competitive advantage on these expensive devices, while the "big five" controlling the market were also starting to encompass smartphones as part of their product range (Giachetti, 2013). The smartphone started to show great results in particular in the third and fourth quarters of 2007, with the introduction of the new iPhone in North America and the new Sony Ericsson and Nokia's models Western Europe (Gartner, 2008), even if the global recession pushed smartphones' sales (and generally the global mobile phone industry) to experience a period of deadlock between 2008 and 2010.

However, a much more evident process from the mid 2000s was fueling handset sales: emerging markets' mobile phone demand. What was happening in developing countries? Figure 24 shows global handset sales from 2005 to 2008, just before world recessions.

Figure 24: Global mobile phone sales divided per region from 2005 to 2008

	2005	2006		2007		2008	
	Sales (in million)	Sales (in million)	Growth (%)	Sales (in million)	Growth (%)	Sales (in million)	Growth (%)
Asia/Pacific	204	301	48	394	31	434.4	10
North America	148.4	164.2	11	176.4	7	180	2
Western Europe	164	175	7	189.4	8	173.4	- 8
Latin America	102	118	16	124.8	6	142	13
East Europe, Middle East, Africa	153.5	185	21	199.2	8	229.5	15

Source: my elaboration from Gartner (2006, 2007, 2008)

Towing the mobile phone demand in number was in particular the increasing request from developing countries, with Asia taking the lead, considering that the number of mobile phone sales more than doubled in 4 years, and Africa, Middle East and Latin America with their 120 millions of extra units sold together in the same period. Good results were

reached also by the “mature” North America and Western Europe, where handset firms brought into their markets many new models, challenging the traditional ILC framework.

While demand for replacement was feeding Western regions, in the meantime emerging countries’ demand was boosted by sales of low cost handsets, allowing hundreds of millions of new potential users to buy mobile phones, most of which were first time buyers. Firms investing in these countries were able to catch opportunities not available in Western Europe and Northern America, in some cases helping their future expansions, in others to gain enormous amount of cash by exploiting scale advantages.

Figure 25 depicts changes in leadership occurring in the mobile phone industry, most of which as a consequence of all considerations made above.

Figure 25: Units sold and market share per vendor in the global mobile phone industry from 2009 to 2014

	2009		2010		2011		2012		2013		2014	
	Units sold	Market share	Units sold	Market share	Units sold	Market share	Units sold	Market share	Units sold	Market share	Units sold	Market share
Nokia	440,881	36.4	461,318	28.9	422,478	23.8	333.938	19.1				
Samsung	235,772	19.5	281,065	17.6	315,052	17.7	384,631	22.0	444,472	24.6	392,546	20.9
LG	121,972	10.1	114,154	7.1	86,370	4.9	58,015	3.3	69,094	3.8	76,096	4.0
RIM	34,346	2.8	47,151	3.0	51,541	2.9	34,210	2.0				
Apple	24,889	2.1	46,598	2.9	89,263	5.0	130,133	7.5	150,786	8.3	191,426	10.2
Sony Ericsson	54,956	4.5	41,819	2.6					37,596	2.1	37,791	2.0
Motorola	58,475	4.8	38,553	2.4	40,269	2.3	33,916	1.9	17.997	1.0		
ZTE	16,026	1.3	28,768	1.8	56,881	3.2	67,344	3.9	59,903	3.3	53,910	2.9
HTC	10,811	0.9	24,688	1.5	43,266	2.4	32,121	1.8				
Huawei	13,490	1.1	23,814	1.5	40,663	2.3	47,288	2.7	53,296	2.9	70,499	3.8
TCL					34,037	1.9	37,176	2.1	49,538	2.7	64,026	3.4
Microsoft									250,835	13.9	185,660	9.9
Lenovo									66,463	3.7	84,029	4.5
Micromax									25,431	1.4	37,094	2.0
Xiaomi									13,423	0.7	56,529	3.0
Others	199,617	16.5	488,569	30.6	595886	33.6	587399	33.6	570,764	31.5	629,360	33.5
Total	1,211,239	100	1,596,802	100	1,775,712	100	1,746,175	100	1,808,600	100	1,878,968	100

Sources: my elaboration from Gartner (2011, 2013, 2015)

Firms with empty cells are the ones which at the time had not entered the industry yet or detained a market share not high enough to be considered. Having a brief look, we can see most relevant new entries into the global handset industry, some of which are firms from Asia, others from North America. ZTE, Huawei, TCL, Xiaomi, Lenovo represent some of the names we have already seen. Indigenous technological investments, interventions from home country governments, alliances with more advanced firms: all of this coming

together helped these firms building and strengthening their shares in the world handset industry. These firms in particular have sold millions of low cost mobile phones in their home market and have replicated this strategy in similar countries, in this way catching new opportunities by covering a demand never been satisfied and gaining enormous amount of resources by exploiting scale advantages. The knowledge they had on their own (and similar) markets, coupled with their aggressive price strategy (as we will see in the next paragraphs), represented key tools behind their first successes achieved, used to build up their power and to dethrone foreign presence in particular in Asia, Nokia's one before the others.

The case of Nokia is emblematic considering that it was the one which had lost the most those years, as shown in figure 25. The reason was mostly related to its inability to compete neither in the high end smartphone market nor in the low cost segment (in particular in the one in developing countries), a must for those handset firms which wanted to succeed in that period of time. The company was able to maintain a slice of its old market share, focusing on the medium end side of the market and introducing new devices as Nokia Asha and the latest Lumia models, until it lost 18% of it, in 2013 (Gartner, 2013).

On the opposite side, Samsung was always in the podium, since it understood the importance of competing on both sides of the market, with total sales reaching a 41 per cent growth just from 2011 to 2013. These were towed in particular by the sales of its smartphone segment: in 2011 it constituted 53 per cent of its vending, pushed by Samsung Galaxy which already was at the time synonymous for Android (Gartner, 2015). Moreover, Samsung was attacking by introducing a large amount of new models, even with different operating systems and spreading its image with aggressive marketing campaign. Part of its success was due to the first mover advantage got from adopting the CDMA technology in its country in time, thanks to the pushes made by the Korean government (Lee & Lim, 2001): the institutional active presence, in addition to Samsung's aggressive strategies, determined the second technological discontinuity and consequent catch up of Samsung over Nokia, which felt in the competency trap not investing on Android OS (Giachetti & Marchi, 2017).

Moreover, it is important to note the role played by the previously mentioned HTC and RIM, and IT firms Apple and Microsoft, entering the industry in these years. These companies have constituted a threat since the beginning in particular because some of them were playing in the field with their own innovative operating system. In 2012, IOS, RIM and Microsoft's operating system constituted 20, 3.5 and 3 percent, respectively

(Gartner, 2013), while Android controlled more than 69 per cent of the entire industry. Handset firms executing their strategies may affect the rise of a particular operating platforms (Suarez, 2005). Indeed, Samsung's choices of these years gradually fostered Android platform (Cecere & Corrocher, 2014) and are still affecting nowadays mobile phone industry as predicted by IDC (2012).

3.4 The mobile phone industry in Asian emerging countries: the cases of India and China

As we saw in figure 24, the Asian continent has shown extraordinary results in terms of mobile phone sales and growth. In the past decade, for the entire handset industry, this has represented the most active area of the world: wars among established Western brands have never stopped; in addition, newcomers born and rapidly grown in this market, have made things even more complicated, wiping away every idea we had about European and American leadership over the industry. The starting point of their success has been here in their home, Asia. However, as always, due to time constraints and since Asia is a big continent (too many events have affected the mobile phone industry we are seeing today), I decided to focus just on the most important markets of this vast area and to discuss some issues consistent with the theory analyzed in chapter one.

Figure 26 depicts the mobile phone market geography segmentation in Asia, in 2011 and 2015.

Figure 26: The mobile phone market geography segmentation in Asia in 2011 and 2015

Area	2011		2015		
	Market Value ($ bil.)	Market Share (%)	Market value ($ bil.)	Market share (%)	Growth (%)
China	44.8	49.1	59.5	44.9	33
Japan	18.1	19.9	16.9	12.8	- 7
India	7.4	8.1	16	11.8	60
South Korea	5.8	6.3	10.6	8	83
Rest of Asia Pacific	15.1	16.6	29.8	22.5	97
Total	91.2	100	132.5	100	45

Source: Marketline (2012)

The greatest results are reached in particular by South Korea, India and China. In terms of units sold, there is no doubt that China is the leading country. However, South Korea and India clearly show higher growth rates, which are likely to upside down future trends. I will start treating the Indian market and the great possibilities that this country offers; coherently with Smith & Ferrier's theories, I will then prove aggressive attacking strategies carried out by home and foreign Asian handset companies. Finally, I will briefly discuss the Chinese case, focusing on the role played by the government in promoting TD-SCDMA technology.

3.4.1 Growth opportunities in India: foreign Asian firms entering the Indian handset market

In chapter 2 we have seen how Asian firms' aggressive internationalization strategy has involved entering simultaneously many and even very different target countries, both from the developed and developing world. This decision does not come by accident since it is needed in order to offset the desire of increasing market shares with the necessity of building new competences: in this sense, the Indian market helped Asian handset companies dealing with the former situation. India represents a great opportunity on the part of other Asian mobile phone firms from other developing countries which want to replicate practices and models already developed for their home markets. This is evident in particular considering Chinese firms entering this market which, after having crowded China with their products, have exploited the similarities owned and replicated their fierce in India. Moreover, the Indian handset market is one of the fastest of the world considering

the rapid economic growth that the country is witnessing and that a great part of the mobile phone demand still has to be satisfied in terms of first buyers (Gartner, 2017).

Those years from the mid 2000s on represented a critical period for the Indian market. Nokia's supremacy at the time (64% of market shares in 2008-2009) (Telecomtiger, 2010) was starting to die away: its low end segment was attacked by home handset firms such as Karboonn, Spice, Micromax, while its high end shares were coping with the increasing competition exerted by Blackberry and Samsung which together detained 24% of the entire market in 2010 (Bindal, 2010; Deccan Herald, 2011). Apart from established vendors, the number of new handset firms entering the market was increasing abruptly, representing in 2010 more than 41 per cent of the entire sales (IDC, 2010). These firms were rapidly expanding and crowding India with their brands, hoping to catch the highest share of an inexperienced market with an opportunity of 652 million user base (Financial Times, 2010; Thomas, 2013), attacking at first mostly the low-mid end segments with feature phones. The new entrances originated an intense competition landscape for all players, forcing them to engage in a fierce price war as well as to introduce a vast range of new models; same of them accepted the consequent drop in terms of profit margins (Voicendata, 2011), others left the market. Still responsible for the new challenges requested was mostly the entrance of Chinese and other Asian mobile phone firms, joining the industry for the reasons discussed in the first part of the paragraph; and aggressiveness still represented the key word.

In 2010, low cost phone sales constituted 80% of the entire Indian handset market (Gartner, 2010). In terms of numbers, feature phones still were the rule, but smartphones' introductions were starting to drive the new growth in the market. Two trends explain this change in paradigm experienced in the first 2010s. At first, smartphones' increasing popularity among business users and part of the younger generation (IDC, 2010), considering those new features that these devices could offer compared to basic phones. Secondly, the price gap between feature and smartphones was rapidly decreasing, due to the intense competition among firms always trying to exploit new opportunities to conquer the Indian market. All of this caused a booming in smartphone sales, whose shares compared to the ones of feature phones, rose from 7% to 19% between 2012 and 2013 (IDC, 2013).

These years, 60% of the rising Indian smartphone market was controlled by Samsung and two established home handset makers, Micromax and Karbonn; the remaining share was incredibly fragmented. But with a new shift in paradigm, Asian firm's aggressive

attitude may only come after. Indeed, few domestic handset makers plus many old (and new) Asian firms responded with a new wave of introductions, this time oriented mostly to the smartphone business, even if feature phones were not completely abandoned. Figure 27 shows handset introductions by some of the most popular foreign firms in the Indian market.

Figure 27: Number of handsets introductions divided per year and relative price range by vendors in India

	Number of introductions per year						Price range (%)**				
	2014	**2015**	**2016**	**2017**	**2018*** **	**Total**	**Low**	**Mid-Low**	**Mid**	**High**	**Premium**
Asus	8	19	17	14	12	70	6	8	69	9	8
Celkon	15	12	13	15	N/A	55	71	16	13	0	0
Gioinee	10	9	17	19	11	66	4	12	59	13	12
HTC	16	19	18	20	8	81	2	4	60	16	18
Huawei*	7	4	26	50	34	121	2	7	57	19	15
Lava	19	33	58	35	N/A	145	68	14	18	0	0
Oppo	5	5	12	20	13	55	0	6	44	31	19
Xiaomi	5	8	20	52	36	121	1	13	52	26	8
Vivo	5	12	18	27	15	77	2	7	57	27	7
ZTE	4	0	18	28	16	66	2	13	65	13	7
Intex T.	48	67	73	84	N/A	272	66	23	11	0	0
Micromax	50	46	45	76	N/A	217	53	25	21	1	0
Samsung	27	21	38	58	19	163	5	9	49	17	20
Market average	17	20	29	38	18	122					

*Huawei with Honor
** when price was available
***Planned (if disclosed)

Sources: my elaboration from online distributors: Killerfeatures.com, Digit.in and others

Data were extracted by a sample of 100 Asian foreign and local handset brands I observed entering India. The picture corroborates considerations made before about aggressiveness played by Asian handset firms entering, considering the high number of models introduced in the market. Moreover, the table provides us also with price ranges of the products introduced. Some firms have concentrated their activities on a particular segment of the Indian market, as seem to do Oppo, HTC and Huawei focusing on the mid high end side; others as Asus or ZTE instead have tried to cover different price ranges, probably hoping to catch as many shares as they could or as a form of experimentation. In every case, the general trend of Chinese and Taiwanese mobile phone companies in this market seem to be the one of having abandoned the lowest segment, in particular in the last couple of years, concentrating their products on the mid and high sides. Interestingly, all local handset companies have addressed a similar path: their strategies have consisted

on a huge number of introductions of both low cost smartphones and inexpensive feature phones, even in the last couple of years (introductions of basic phones continued over 2017).

An interesting trend which strongly affected also the Indian handset market too has been recent acquisitions of Western mobile phone brands. Figure 30 shows some Asian handset firms entering Indian market in partnership with Western brands previously acquired (or got in license).

Figure 28: Asian handset companies entering the Indian market with acquired or licensed Western brands

	Brand	Type of deal	Year of acquisition	Number of devices introduced	Price range					Target/Scope	Sources
					Low	Mid-Low	Mid	High	Premium		
Lenovo	Lenovo	/	/	83 (2014-2018)	5	13	58	6	1	- Lenovo intends to test Indian market by exploiting a dual brand strategy and covering different segments	- Online distributors: Digit.in, Killerfeature.com - Sharma, N., 2017, Lenovo's India's Dual brand strategy: will it pay off?, Amity Research centers HQ (case study), Bangalore, pag. 5-9 - D'ascenzo. M., 2016, Lenovo manda in pensione Motorola, Il sole 24 ore, January 09 - Salvioli. L., 2014, Lenovo compra Motorola da Google per 2,9 miliardi: ecco chi ci guadagna e perché, Il sole 24 ore, January 30
	Motorola Mobiles**	Acquisition	October, 2014	45 (2014-2018)	2	1	25	9	8		
Foxconn	Sharp	Acquisition	April, 2016	12 (2016-2018)	0	0	6	4	2	- Foxconn uses different brands, introducing both feature and smartphones, from low to premium segment, to enhance its penetration into the market	- Online distributors: Digit.in, Killerfeature.com - Purcher, J., 2017, Why is Foxconn pushing Sharp back into the smartphone market so aggressevely, Patently Apple, April 21 - Mochizuki, T., Dou, E., Ma, W, 2016, Foxconn and Sharp approve $3.5 billion takeover deal, The Wall Street Journal, March 30
	InFocus	License	June, 2017	32 (2015-2018)	13	7	12	0	0		- Online distributors: Digit.in, Killerfeature.com - Aulakh, G., 2017, Foxconn to bring Sharp phones to India by year end, relaunches InFocus with $10 million marketing investment, Telecom News, The economic Times, June 29
	Nokia*	Acquisition	May, 2016	10 (2015-2018)	7	3	0	0	0		- Online distributors: Digit.in, Killerfeature.com - Vendrame, F., 2016, Microsoft vende i feature phone a Foxconn, WebNews, May 18
Fei	Philips	JV and acquisition	April, 2007	25 (2011-2017)	7	5	12	0	1	- Fei leverages Philips well known brand to enter Indian market and uses Xenium technology to target business users	- Online distributors: Digit.in, Killerfeature.com - Praveena, B., 2012, Philips re entry into Indian mobile market, Amity research centers, pag. 9-12
TCL	TCL	/	/	7 (2015-2018)	0	0	6	0	1	- TCL lunches first devices in India with its own label by exploiting Alcatel's superior competences and brand knowledge	- Online distributors: Digit.in, Killerfeature.com - Alcatel's reports, 2004, TCL-Alcatel joint venture officially started operations
	Alcatel	JV and acquisition	August, 2004	43 (2014-2018)	8	4	24	2	5		

* feature phone branch, ** with Moto Mobiles

Source: my elaboration

Among these, Philips and Motorola for example, have represented important labels in the history of the mobile phone industry. However, as we will see analyzing singular cases and in the following paragraphs, these brands have lost ground and could be considered so far as defunct, at least in the developed countries.

Acquiring these labels from the Asian counterparts has meant having instantly access to competences capable of improving firms' knowledge. On the other hand, the devices' introductions (and their respective price ranges) shown in the table demonstrate Asian handset firms' intentions to use Western brands also to expand and exploit opportunities present in the Indian market. Indeed, some of these acquisitions have been used to simply enter the country; in other cases, more aggressive strategies have been implemented using Western brands to diversify Asian firm strategies and cover different niches. The Indian market represents a fast growing and partially still new market, so experimenting different segments may be fundamental in order to put a foot into the country or to enhance penetration into it.

Let's take the case of Lenovo and Motorola for example. Before Motorola's buyout in 2014, Lenovo had already entered the Indian mobile market (Beryl, 2012; Rai, 2006), intending to replicate the successful strategy performed in China. Moreover, the firm had a solid presence in the Indian PC industry were it detained the position number 1 (Lenovo P. Releases, 2012). Between 2012 and 2013, Lenovo brand already encompassed several smartphone lines in its portfolio as A, K, P, S and Vibe series, which ranged between 6,000 and 28,000 rs (Preethi, 2012). When Motorola was acquired in October 2014, Lenovo was not hiding its intentions to use the American brand's network to enter Western developed countries. In addition, the brand would serve other developing countries such as India, where a dual brand strategy had been adopted. According to IDC India, Lenovo kept both its brands' images separated on purpose, to be able to reach different segments under a common label, and experiment a strategy to cope with its several lines of product (Misra, 2014). The chief himself of Lenovo India branch's sales confirmed that a dual brand strategy represents the best option in order to test and understand the users' preferences in the market (Lenovo News, 2014). Motorola's smartphones at the time were priced between 5,000 – 15,000 rs, except Nexus 6 and Moto X Force models, which were sold above 35,000; Lenovo's portfolio, instead, consisted of handsets ranging between 20,000 – 35,000, in addition to some cheaper models, precisely Moto G range, A6000 Plus and K3 note. These last two models were Lenovo's best selling phones in India in 2015 (Digit.in, 2016), helping the company to get a 260 million annual profit (in contrast to

the loss experienced in 2014) (Abhik, 2015). Moreover, Lenovo got a market share growth of 3% in period April-September 2015, mostly at the expenses of Lava's competitive smartphone (Sharma, 2017). Its products introduced with two different brands (and price ranges) represented a test strategy: the success gained by Lenovo's 2015 affordable models has pushed the firm to increase introductions of new Lenovo devices targeting the mid low range segment, while Motorola (and Moto) series have instead started to be focused more on the mid high side of the Indian market. This will represent also future trends for the Lenovo Group in India, as predicted by analysts from Counterpoint (Bhushal, 2017). In addition, The Economic Times reported that Lenovo's sales boom observed on the low cost and offline market, pressed the company to switch most of its PC stores into smartphones' ones and to open other 100 centers (summed to the 52 already present in more than 40 towns) (Louis, 2015), while Moto devices remained exclusively sold online. The only exception for Lenovo was ZUK Mobile, an independent brand lunched by the Chinese company, which experimented its 8 mid-high end models only on the online market, but ceased operations in 2017. IDC says that Motorola's acquisition and Lenovo's dual strategy played in India helped the firm to become the no.3 smartphone seller in the market, reaching 7% market share in 2016 (Aveek, 2016). In figure 28, I reported Lenovo and Motorola's models brought into the Indian market between 2014 and 2018. The strategy, also considering 2018 plans, seems to leave to Lenovo more space for medium affordable smartphones; opposite trend instead for Motorola.

A similar situation seems to be followed by the Taiwanese Foxconn, one of the biggest contract manufacturer of the world, working also in the mobile phone industry for famous brands such as Nokia, Apple, Xiaomi, Oppo and Blackberry (George, 2012). Recent acquisitions that the colossus has been undertaking are likely to be used to climb technological value chain and upgrade its low margin manufacturer position (Aggarwal, 2017), corroborating previously mentioned patterns of aggressive internationalization strategy even more. The starting point of its strategy seems to be India. Figure 28 shows those brands used by the company to enter the Indian market. The strategy is very recent, but as we can see from price ranges of the models introduced, Foxconn, through its associated brands, is attacking different segments in order to enhance its penetration into the market.

Sharp which was acquired in April 2016. After the acquisition, Sharp, under Foxconn's directives, carried on the previous trend of introducing mobile devices covering the mid premium side of the Indian handset market, as shown in figure 28: its high end Aquos

series is likely to be used to help Foxconn‘s overall aggressive strategy, even if in terms of numbers, there are not as many mobile phones introductions as to corroborate Ferrier and Smith theory (I counted less than a dozen models). But exploiting the Japanese brand to attack the high end side of market seems to have sense: Sharp detains superior OLED screen technologies which allow to make high quality devices and compete with the best display technologies available in the industry (Purcher, 2017). Moreover, according to Foxconn (Mochizuki, Dou, Ma, 2016), it is possible that the brand will drive the next generation of premium handsets. Upgrading to high component producers, coupled with Sharp’s label association, certainty has allowed Foxconn to boost its brand; a great start for a company which is considering a forthcoming entrance into the mobile phone industry with its own brand devices.

Foxconn was also able to rapidly cover the mid low end side of the market acquiring Nokia’s feature phone branch from Microsoft in May 2016 (with HDM global) (Thomas, 2016) and getting in license InFocus brand in June 2017 (Aggarwal, 2017). Both the brands were well known among Indian users; InFocus in particular had already been present into the Indian market since 2015 and was also rapidly expanding in Northern African countries, Middle East and other Asian developing countries. (Chopra, 2015; Singh, 2015). This brand was perfect for Foxconn aggressive push into the country: the Taiwanese company could couple Sharp’s high end smartphones with InFocus’s affordable ones, so to offer a complete range of smartphones. InFocus smartphones’ prices (from August 2017 only produced by Foxconn facilities) range from 3000 to 15000 rs, capable of offering good smartphones at an ultra competitive price (InFocus M260 and popular A1 smartphones are sold at 3,875 and 4,399, respectively). Moreover, among 32 models that I counted being sold in India between 2015 and 2018 (planned), 11 were feature phones, some of these introduced very recently (from July 2017 four models) and one of this experimenting a 4G Volte technology for basic phones (Aulakh, 2017). The feature phone’s market in India was clearly not showing any growth; after all, Microsoft itself, which sold Nokia’s feature phone segment Foxconn (and HDM), declared in a public statement (Microsoft Newsroom, 2016) that it intends to concentrate its activities just on smartphones. However, it is likely that Foxconn with this strategy aims to follow all possible paths to conquer market shares of low segment, even those ones of basic phones, which do not show particular growth but still represent part of the Indian sales. To better penetrate into the market, Foxconn has also established deals with important Indian distributors (Snapdeal and Amazon for Turbo 5 model) and has planned to open more

than 500 service centers across India (Aulakh, 2017); in this way, it hopes to strengthen its sales both on the online and offline segments.

A similar case has involved TCL, which in 2015 has introduced its first smartphones in the Indian market, exploiting Alcatel joint ventures and license agreement. TAMP joint venture (ended up in being acquired by the Chinese counterpart) served to TCL to acquire necessary competences in order to produce products with its own brand, as said in previous paragraphs (Zhiming, 2005); moreover, through Alcatel brand's associations the Chinese company is likely to increase its sales in the Indian (and not only) market, where the French company has lunched more than 40 models between 2014 and 2018.

Sang Fei joint venture has exploited the Philips' brand to enter the Indian market. Total shares of the Dutch brand were acquired in 2007 and used to increase Fei's market share in the Chinese handset market. By entering into India with Philips in 2011, Fei intended to replicate this strategy. As said before, at the time almost all the models introduced in India were basic phones and competition was really high. The market was still "experimental"; as a consequence, most of the brands entering were trying to introduce feature phones with different and innovative characteristics, hoping to get first mover advantages. In this sense, the acquisition and successive cooperation between the two brands represented the perfect fit: Philips owned intensive R&D and was "re-entering" (it has been present in the country for 81 years) with a partner with a strong logistic system, distribution network and manufacturing facilities. The dual partnership pointed to a strategy to penetrate with mobile phones for business professionals (Ronendra, 2011), as a way to distinguish their products from other brands present in the country (Epsonpower, 2011): Philips' Xenium technology (which allowed both fast internet connection and devices' batteries to last weeks without recharging them) and innovative design, coupled with Fei's dual sim system (Ronendra, 2011), brought into the Indian market X513, X116, X121, X806, X523 and X518, in 2011. The strategy played by Fei targeting the business segment ended up being a success. We don't know if CEC, current parent company of Sang Fei, will use Philips' brand to promote a new arrays of handsets, yet, even if the paths followed might suggest so. What we know is that Sang Fei has used the Western brand to enter India and is carrying on bringing into the market new Philips' models.

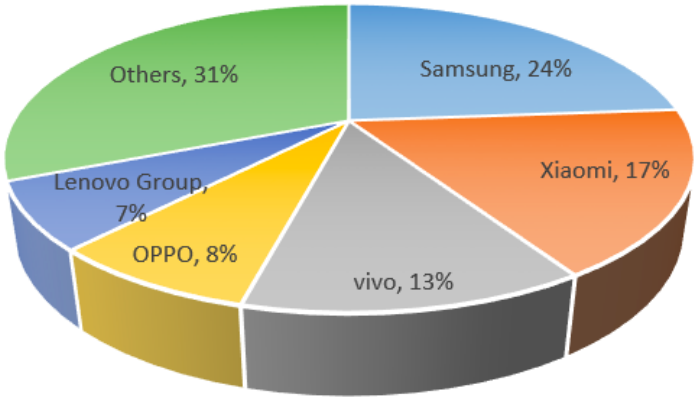
These four cases used as an example have served to show the role covered by old Western handset brands in helping Asian handset companies to rise in India. In the first two cases the European and American brands have clearly served as an experimenting strategy in order to test preferences of Indian users and better penetrating the market. In

the last two cases instead, the strategy seemed to be focused more on facilitating the entrance in the fast growing Indian market.

In every case, it is still too soon to figure out altogether strategies played by contendents in the market: future development will clear every doubt. Lenovo, Foxconn, TCL and Sang Fei's cases previously mentioned have represented the most evident examples, but not isolated ones: Optiemus Infracom used BlackBerry's brand in license in India (with BlackBerry Key one) to attack country's higher segments (BusinessLine, 2017; Times of India, 2017); Micromax Infirmatics co-branded some of its product with Modu in order to exploit Israeli's superior product development facilities which produced stylish modular and customizable devices, so to enhance even more its penetration into the market (Micromax annual report, 2010); Intex Technologies, having in license Jolla's Sailfish OS, expands even more its vast portfolio (with Intex Aqua fish line), attracting that "young tech savvy" segment that was not covering by offering a totally new platform which may in the future compete with Android and Apple' iOS (Jolla press releases, 2015; Rusconi, 2015). This way of entering foreign markets (or increasing possibilities of success), using Western old brands, clearly does not concern just India. Other countries are involved, both from the developing and developed world, as it will be clear out in next paragraphs. Moreover, dual brand strategies have not been adopted just using Western foreign brands. Many firms lunched or acquired other brands from their home country to augment their penetration in India (and not only): ZTE - Noida, Micromax - Yu Mobiles, Lava - Xolo, etc. are emblematic of this.

In figure 29, it is shown how the Indian smartphone looked like in the second quarter of 2017. There has been a clear change in leadership considering that in 2010 more than half of the entire handset market was controlled by Nokia.

Figure 29: Best vendors in the Indian smartphone market, second quarter of 2017



Source: IDC (2017)

The picture corroborates successfulness of Chinese aggressive strategies: Lenovo, Oppo, Xiaomi and Vivo have passed from representing a mediocre share of the Indian market to constitute 45% of it. The Chinese grip of the market is starting to hinder Samsung's supremacy, which shows a 4% down from the second quarter of 2016, in particular both due to the experience cumulated in the offline market and the strong competition on the mid side exerted by other brands (IDC, 2017). The highest results seem to have been reached by Lenovo and Xiaomi, which are doubling their shipments year after year (Pratap, 2017), and increasing their presence offline. In the picture, a "foreign Chinese perspective" has been taken, as a demonstration of strategies mentioned before. Actually, also established Indian handset companies such as Micromax and Intex, which have adopted similar aggressive strategies, represent a relevant slice of the market, too (about 12% and 7%, respectively).

Figure 29 pictured smartphone's market share per vendor, since these devices are representing recent growth trends: according to Gartner (2017), while in countries as China and Brazil the smartphone penetration compared to all handset sales has overtaken 90% in the fourth quarter of 2016, in India it has reached barely 50% in the same period; in 2018 smartphone's sales are calculated instead to represent 62%. However, interestingly the feature phone's shrinking market is expected to stabilize already from the third and fourth quarters of 2017, thanks to new advanced 4G feature phones (IDC, 2017).

3.4.2 Government interventions in the competitive arena: the case of China

Analyzing in details the Chinese mobile phone's evolution over the decades would be extremely expensive in terms of time. As a consequence, in this site I decided to give an overview of most important issues regarding the Chinese handset market. In particular, I will briefly discuss the most important events which have affected the mobile phone industry in China, focusing on the role played by the Chinese government in fostering TD-SCDMA standard technology. This last event is of great interest for the purpose of my thesis, since it has been responsible for the rising of some Chinese colossuses such as Lenovo, Huawei and ZTE, now among the biggest handset companies in the world and probably future rulers of the industry.

In the past decade, China has represented a critical market in the mobile phone industry, since it has been the starting point of some of the today's biggest handset firms, to initially catch up with foreign established brands. The Chinese market has been a fundamental resource which has enriched home makers thanks to scale advantages got from low cost smartphones' sales and have paved the way to that internationalization process we are still experiencing today. As we previously mentioned, the government played a critical role pushing local companies to undertake a series of steps in order to wipe away dependence from foreign firms; the advent of the smartphone, the rising of the middle class and a billion user base opportunity made the rest.

Figure 30 recalls some of the most important events in the Chinese mobile phone market, which contributed to raise abnormally the number of subscribers. As we can see from column number 4, dependence from foreign technology has been slowly replaced by indigenous resources.

Figure 30: Most important events in the Chinese mobile phone market and degree of dependence from foreign technology

Year	Chinese handset market	Local subscribers (million)	Dependence on abroad (equipment, software technology, R&D, etc.)	Standards and technology adopted	Sources
Before 1995	China adopts foreign technology; no domestic mobile phone makers	3.6	Foreign dependence	- 1G (TACS) - Feature phones	- Jun, J. Zedtwitz, M., 2008, Technological capability development in China's mobile phone industry, Technovation, Vol.28: 327-334, Issue No.6, pag.8
1997	TACS systems closes; GSM devices are provided by foreign companies and lunched by China Telecom; five local firms involved in manufacturing	13.2	Foreign dependence	- 2G (GSM) - Feature phones	- Pecht. M., Lee. C., Fu. Z., Lu. J., Wen. W., 1999, The Chinese Electronics Industry, CRC Press LLC pag. 153-155 - Jun, J. Zedtwitz, M., 2008, Technological capability development in China's mobile phone industry, Technovation, Vol.28: 327-334, Issue No.6, pag.8
1999	Chinese handset firms start investing in R&D (mostly chip technology) and bring into the market very first models with local labels; many local firms enter the industry	43.3	Foreign dependence/parallel Indigenous technology		- Jun, J. Zedtwitz, M., 2008, Technological capability development in China's mobile phone industry, Technovation, Vol.28: 327-334, Issue No.6, pag.9 - Giachetti C., 2013, Competitive dynamics in the mobile phone industry, Palgrave Macmillan, pag. 71
2001	CDMA technology and patents are provided by Qualcomm and lunched by China Unicom, pushed by Government	144.8	Foreign dependence/parallel Indigenous technology	- 2G (GSM) - 2.5G (GPRS, CDMA) - Feature phones	- Qualcomm Press Release, 2000, Qulcomm signs CDMA intellectual Property agreement with China Unicom, February 01 - Qualcomm Press Release, 2000, Qualcomm notes positive impact of PNTR vote on CDMA development and adoption, May 26
2002	Chinese firms invest and produce devices with 2G and 2.5G technologies; Government pushes handset firms to start investing in 3G emerging technology and to establish R&D alliances with developed foreign brands	206.6			- Table 22 - Fu. H. Chang. C. Wang. F., 2009, A strategic analysis of the mobile telephone industry in Mainland China, Journal of Manufacturing Technology Management, Vol.20: 489-499, Issue No.4, May 16, pag. 7-9
2007	Government liberalizes Shanzai makers and financially supports local champions	530.2			Chen, S. Wen, P., 2013, The evolution of China's mobile phone industry and good enough innovation, Oxford University Press, pag 2-4
2009	China allows 3G and lunches indigenous TD-SCDMA technology	726.4	Indigenous technology	- 2.5G (GPRS, CDMA) - 3G (TD-SCDMA, local) - 3G (W-CDMA & CDMA2000, foreign) - Feature phones - Migration to smartphones	- Lin. R., Zhang. H., Fan. J., Hou. R., 2008, Alliance network and innovation. China third generation mobile communication industry, Journal of Business Asia, Vol. 6, Issue No.2, pag.2-4, 6 - Chen, S. Wen, P., 2013, The evolution of China's mobile phone industry and good enough innovation, Oxford University Press, pag 10 - Gao. X., Liu. J., 2012, Catching-up through the development of technology standard: the case of TD-SCDMA in China, Telecommunication Policy, Vol. 36:531-544, Issue No.7,0
2010	China Mobile, Datang, Lenovo, Huawei, CEC, ZTE, etc. create an alliance to develop and commercialize TD-SCDMA; government pushes R&D investments in 4G technology	842.6			- Chen, S. Wen, P., 2013, The evolution of China's mobile phone industry and good enough innovation, Chung Hua economic research, pag 2-19 - Lin. R., Zhang. H., Fan. J., Hou. R., 2008, Alliance network and innovation. China third generation mobile communication industry, Journal of b. Asia, pag. 9-12 - Gao. X., Liu. J., 2012, Catching-up through the development of technology standard: the case of TD-SCDMA in China, Telecommunication Policy, Vol.36, Issue No.7,0
2012	Local brands are leader in China, and have a strong foreign presence; government lunches its TD-LTE indigenous technology and pushes handset firms to start investing in 5G emerging technology (tested in 2017 and it will be lunched in 2019)	880.4	Indigenous technology	- 3G (TD-SCDMA, local) - 3G (W-CDMA & CDMA2000, foreign) - 4G (TD-LTE, local) - 4G (FT-LTE, foreign) - Smartphones	- Perez. B., 2017, China's chance to lead global innovation may lie with 5G mobile technology development, South China Morning Post, October 01 - Kwak. J., Lee. H., Chung. B., 2012, The evolution of alliance structure in China's mobile telecommunication industry and implications international standard, Telecommunication Policy, Vol.36:966-976, Issue No.10,11, November 17, pag. 1-3 - Marwan. S., 2014, FDD LTE 4G licenses could get China Telecom back in the race, Forbes, June 25

Source: my elaboration

How did Chinese handset makers arrive here? Before 1999, in China mobile phones were only sold under foreign brands, and very few domestic mobile phone manufacturers were present (Zedtwitz & Jin, 2008). Some Chinese firms were able to evolve in component providers and ODMs for Western brands, as well as to start making first R&D investments. However, since GSM at the time was a mature technology for China, most of the innovations were already patented (and very expensive); in addition, advanced established firms' monopoly in the industry would not allow new entrants to enter the competitive landscape (Zedtwitz & Jin, 2008). This is likely to explain why in 2002 the Chinese government was making such an effort to encourage Chinese firms both to adopt 2.5G growing technology and to invest in 3G emerging standard; when the Chinese TD-SCDMA technology (3G) was brought into the market, later in 2009, it happened to be in time with the generation of the new devices introduced. The Chinese government has always had a crucial role in helping to upgrade its firms, as could be seen from figure 30. For instance, it incentivized Chinese handset firms to engage in strategic alliances with Western brands, with the aim of improving indigenous capabilities; still, the government allowed local brands to test the new generation's technologies in several cities before lunching them; it was always the government which promoted and advantaged indigenous standards before the foreign ones, allocating them higher frequencies (Beebe, Hew, Yueqi, 2006). But the introduction of TD-SCDMA in 2009 clearly represented the most important event in China's mobile phone history: for the first time the country was able to provide for its own technology (Gao & Liu, 2012). Moreover, in order to allow 3G technology to dot China, Chinese government advantaged some national champions: a window of opportunity was opened for China Mobile, Lenovo, CEC, ZTE and Huawei, which formed together an alliance to bring TD-SCDMA into the market (Chen & Wen, 2013; Gao & Liu, 2012). These firms were also capable of bringing into the market models with features and characteristics very similar to the ones of more established brands, but sold at lower prices, trying to cover both the cities and more rural areas (Giachetti, 2013). Between 2009 and 2010, sales saw an explosive growth of 57% (Marketline, 2012, 2016); the result is even more terrifying if analyzed in terms of number of units sold (from 196 to 307 million units, compared to 2008), which suggests the unique opportunity offered by this country. However, in the past few years, mobile phone sales in China experienced a drop in terms of units sold and a parallel increase in South Korean and Indian markets (Marketline, 2016).

The trend of having an institutional context covering a role of protagonist did not stop with the 3G technology. Between 2010 and 2014, Pechino had already pushed local firms to invest in 4G and even to put the basis for 5G (Perez, 2017): the new China so far was completely independent from foreign technologies and able to develop and invest in new standards on its own. But the Chinese success of course was not only due to its institutional context. Local firms have always shown their ability of coupling product innovation with aggressive pricing strategies (Giachetti, 2013; Hamm & Roberts, 2006), as shown with the Indian market case.

The case of the Chinese government's intervention in the mobile phone industry has been used as a case example, but it has not been an isolated one. As previously mentioned, the raise of Samsung in South Korea has followed a similar trend (Giachetti, 2017; Lee & Lim, 2001). This suggests how, in particular in the second part of the mobile phone industry, it is fundamental to consider different aspects from just strategies by product. The case of the mobile phone industry has clearly showed that the Asian success has been the result of a mixture of well played government's interventions and aggressiveness.

Chapter 4
Acquisitions of Western brands over the 2010s: an analysis through the TCL and Lenovo cases

4.1 Introduction

The last step of my project has been devoted to give an analysis over the pattern of acquisitions of Western brands carried out by some Asian handset firms over the 2010s. In fact, in line with the historical excursus previously followed, acquisitions of some of the most notorious American handset brands by Asian companies occurred in the past few years. This for many firms has seemed to be the last step of their expansion strategies; for others, as TCL and Lenovo, it may be the start of their rise. In order to present the topic, I will describe the role that acquisitions of foreign Western brands have represented for these two companies and why the future may reserve them a role of protagonist in the mobile phone industry. The series of buyouts undertaken by the two Chinese firms have enhanced even more that concept of aggressiveness as previously discussed, considering that this pattern of sequential acquisitions has been coupled by aggressive attacking strategies, as intended by Smith and Ferrier (1999).

Figure 31 shows the internationalization expansion strategies played by TCL and Lenovo, from their first growth to recent acquisitions.

Figure 31: Internationalization expansion strategies by TCL and Lenovo

Phases	Countries attacked	Purpose	Strategy	Mode of entrance	Entered Countries		Year		Brands used	
					TCL	Lenovo	TCL	Lenovo	TCL	Lenovo
1	Home country	Scale advantages	- Low cost production - Manufacturing for foreign firms	/	China	China	From 1981	From 1984	TCL, Schneider (from 2002)	Legend Group
2	Developing countries	Scale advantages	- Aggressive push - Replicating strategies	Exports, FDI	India, Asia Pacific, Russia, South Africa, South America	India, and Asia Pacific, South America	From 1998	From 1994	TCL, Alcatel (from 2004) Schneider (from 2002)	Lenovo, Motorola (from 2014), CCE (from 2007)
3	Developed countries	- Bypass barriers - Market access - Technologies - Co-branding - Customer bases	Acquiring Western companies	Acquisition, Join Venture, License	USA, Europe	USA, Europe, Japan	From 2002	From 2003	TCL, Schneider, Govideo, Alcatel (JV, license), Siemens (JV), RCA, InFocus (JV), Thomson (JV), Sagem, Palm, BlackBerry (license)	Lenovo, Motorola, IBM, Medion, NEC (JV), Stoneware, CCE

Source: my elaboration from: Ahrens, N. & Zhou, Y. (2013); Lahiri (2015); Sharma (2017); and others

As it can be seen from the firms acquired in the last column of the table, I have considered the entire portfolio of the two companies; as we will see, brands from other sectors have

had a crucial role for their mobile phone divisions, too. Their internationalization strategies have undertaken the traditional pattern also followed by other companies from Asian emerging markets: they started by building their presence in their home countries thanks to their manufacturing capacity and low cost products; they replicated their aggressive strategies in developing countries, getting enormous scale advantages; they built their competences and presence by establishing relationships with more advanced foreign firms.

However, TCL and Lenovo's strategies have followed a bolder approach, considering that in the last step of their process both companies have undertaken mostly the "acquisition path", instead of simpler alliances' forms. This has been a countertrend, since, as we have seen in chapter 2.3.2, Asian firms' tendency, when undertaking relations with "culturally non similar" countries, was the non equity form (even if we saw that some very effective joint ventures were undertaken with Western companies).

So, what is the reason behind their decisions to engage in risky and expensive acquisitions (or joint ventures)? Firstly, this pattern may be preferred over simpler alliances, as evidenced by Pack and Saggi (2001) and Oxley and Sampson (2004). Their researches showed how firms' willingness to share knowledge with direct suppliers or to augment the scope in their alliances were sometimes sacrificed, since firms felt threatened by a possible entrance into the market on the part of the suppliers or alliance partners acting as competitors. Secondly, as we have previously pointed out, acquiring foreign brands allows buying firms to have immediately access to both foreign market and distribution's networks (and their advanced technologies). This represents an important point for our firms, Lenovo and TCL, considering that owning foreign brands may allow them to bypass foreign entry barriers and rapidly having access to foreign channels. Moreover, many alliances were also made with handset operators, which have represented a critical marketing tool that should not be neglected; after all, how to better speed up penetration into the market, if not by exploiting direct contacts mobile operators have with their customers' base? The issue was posited by Alcacer and Oxley (2014), who discussed and proved the importance of establishing alliances with handset operators for those firms which intend to enter with their own brands. A problem well known by Huawei, one of the biggest investors in new 5G standard technology and in the podium as third worldwide smartphone best sellers (Gartner, 2017); despite this, as evidenced by Canalys (2017) the company won't maintain its worldwide third position any longer if does not make any relations with US operators, from which has been excluded for political reasons

(Forbes, 2017). But observations from acquisitions of Western handset companies in the last years have shown the buyers' intention to circumvent another time foreign barriers, leveraging strong relations that acquired Western brands have with their mobile operators' partners.

In the next two paragraphs, I will use two case examples to show what observed in this section.

4.2 Acquiring Western brands for bypassing foreign barriers and upgrading market position: an analysis through TCL case

Let's have a look at TCL's internationalization expansion strategy. It is likely that, behind acquisitions of Govideo, RCA, Schneider and the joint venture with Thomson, between 2002 and 2004 (as observed in figure 31), TCL aimed to circumvent American and European barriers, understanding that entering developed world just as an exporter would not give strong results. These firms manufactured and sold TVs, radios, audio visual products, DVDs and other components for consumer electronics, which have nonetheless positively affected TCL's mobile division, allowing to get knowledge and access to foreign distribution channels or at least to help TCL giving awareness of its brand; proof of that is the Schneider group which, despite being a television manufacturer, when it bankrupted (in 2002) it was acquired by the Chinese company and co-branded with TCL's phone label (Deng, 2006), to facilitate its visibility.

After having built its brand awareness, recent acquisitions of Palm in 2014 (Cheng, 2015) and the licensing of BlackBerry brand (Baruah, 2017) may suggest TCL's intention to better off its positions in Western handset markets. Furthermore, considering that:

1. using different brands to enhance penetration into foreign markets (to simply enter, to cover different segments or to foster aggressiveness, etc.) seems a pattern already observed by some Chinese handset companies, which, as pointed out in chapter 3, have aggressively entered India acquiring (or licensing) other Western labels, TCL not excluded;

2. the most recent report by Gartner (2017) showed a moderate increase in smartphones' sales increase from 2016 to the third quarter of 2017, almost all concentrated in the APAC region (15% increase) and in Europe and the USA (about 11% increase, each), with the smartphone high end market towing sales in the last two (Gartner, 2017; Forbes, 2017);

TCL may be trying not only to improve its brand awareness in Western regions, but also to progressively move toward higher segments, using Western defunct but "evocative" brands' labels for the purpose. Considering recent acquisitions, the country which TCL seems intended to target the most is the USA. Indeed, differently from Europe and Asian countries, in North America, TCL markets few models with its brand, but has a history with Alcatel low mid range phones (Dunn, 2017). Sequential steps TCL has been undertaking over the years seem to prove this trend.

By surfing online mobile phone databases and distributors (Imei.info, Gsmarena, Kimovil.com and others)[i], I noticed that TCL (with Alcatel brand), starting from the early 2010s, decreased new feature phones' introductions abruptly and broadened and diversified at the same time its product portfolio, which suggests its intention to extend its competitiveness toward higher segments. In September 2010, the company introduced its first smartphone, Alcatel OT-980; after just one year, I counted TCL having already brought in its markets 17 new smartphones (7 of which were TCL branded), 35% of the total of new models. In 2012, the company introduced almost 50 models in total, more than doubling the number of TCL branded smartphones, compared to the previous year. From the following years on, the number of feature phones has gradually decreased. The aggressive push by TCL was advantaged by the Alcatel label, which has increased its coverage (exploiting its distribution network) (Alcatel's report, 2004) as well as promoted its own brand, both in developing and in developed world. Some models were even co-branded, such as TCL S820 and the several TCL Idol models; others were re branded copies of Alcatel devices. Focusing on Western countries, TCL, in terms of number of introductions, has introduced just a dozen models with its own brand (LX1, LX2, 750, Flash, Idol 3, P561U, Hero N3, Idol X+, etc.), priced around 100$ and 300$ (nowadays prices)[ii], but it has not been less beneficial. Since 2004, when the license agreement with Alcatel was established (Alcatel's Report, 2004), TCL has had enough time to successfully enter Western markets (as well as in other Asian countries) and increasing its brand knowledge exploiting the French label; the license agreement will expire in 2024 (Cosmin, 2017), but TCL has already succeeded in upgrading its phones toward the mid segment, considering features and prices of its models.

However, the Chinese company seems not to have stopped this trend. After BlackBerry's takeover, in 2016, TCL has manufactured and introduced BB DTEK50, BB DTEK60, BB Key One (just in the US) and BB Motion, whose prices are about 250$, 480$, $600 and 500$, respectively (Amazon.us). BlackBerry represents the best option for TCL

in order to make the next step in its climb toward the high end side of Western countries, in particular the US market: the BlackBerry label still evokes the premium segment once the firm used to control; besides, its software (which is licensed to TCL) is synonymous of privacy and security (Baruah, 2017), and still maintains its important role in the business sector (Ruffilli, 2017).

What about Palm? The brand was acquired in 2014, but no strategy has been disclosed, yet (Friedman, 2017). TCL has only revealed that new Palm devices will be brought into the market in 2018 (Robecchi, 2017) and, since its webOS software is licensed to LG (Friedman, 2017), there is no doubt that the strategy points to recall the nostalgic Palm brand. Palm devices had a different price range. A great part of them (such as the Pilot Professional of 1997 and Palm Treos until 2008) used to target higher segments, with prices between 300$ to 650$ (according to CNET reviews from 2003 until 2008), and among the first being cataloged as Pocket PC phones (able to send mails, editing documents, location and navigation capabilities, personal organizer functions, etc.), as a consequence very popular among business users (Cha, 2006).

It is possible that TCL is intending to win back old Blackberry and Palm fans, maybe in a near future even co-branding their labels with its own brand (as it did in the past with Schneider and Alcatel): an interesting strategy to slowly increasing its position toward higher end side of the handset market. In this case, a window of opportunity may be offered by a business segment which currently, in my opinion, does not seem to be "labeled" by any brand specifically (differently from the past), since business or professional customers are buying traditional high end smartphones (as could be the case of Apple and Samsung): the two American brands could be used to push this category of users switching from current leaders, in particular in the US market. 2018 for now seems to corroborate this trend: the new BlackBerry Mercury, for example, will be released with the QWERTY keyboard (Price, 2017), probably a nostalgic strategy to remind the role BlackBerry's phones had in the pre smartphone era.

Moreover, as said before, TCL' acquisitions have also served as a strong marketing tool to promote its own brand, leveraging Alcatel and BlackBerry's stable relationships with local mobile operators: Alcatel has always had a solid past with Orange, Telefonica, Wind and Vodafone; BlackBerry with T Mobile and AT&T, instead. Not surprisingly, several TCL models were introduced in partnership with mobile operators such as Orange and Vodafone. These last considerations can be confirmed checking their respective online sites where several models are introduced in comparison with mobile operators.

Still it is too soon to confirm that this is the strategy TCL will undertake and, if so, what results it might bring: it is likely that 2018's introductions will give more insights to help this analysis. But the most interesting finding is that, even if with a lower intensity (in particular in terms of numbers of introductions) and clearly for different purposes, in order to penetrate developed countries TCL has not played a different strategy from the one undertaken to enter the developing world.

4.3 Successful integration pattern of acquired brands: an analysis through the Lenovo case

As previously analyzed, among other things, acquisition of Western brands has been clearly used in order to have rapid access to more advanced technologies. This pattern is not new and has been observed also in other industries. In relation to this, as pointed out in chapter 2, acquiring companies and their respective patents may result successful only if coupled with investments in indigenous absorptive capacities.

A perfect example of Western brands' acquisitions and successful implementation of absorptive capacities is Lenovo, a Chinese company involved in several sectors covering the electronic field. As TCL and many others, over the years the company has been undertaking aggressive marketing strategies, such as being NBA official partner in 2004 and in the Olympic games of 2005, etc. (Clifford, 2008; Lenovo Newsroom, 2006), as well as a series of acquisitions and JVs, as shown in figure 31. Figure 32 shows Lenovo Group's introduced patents and R&D spending from 2007 to 2017.

Figure 32: Lenovo Group's introduced patents and R&D expenditure from 2007 to 2017

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
R&D spending (millions of $)	196.23	229.76	220.01	214.33	303.41	453.33	623.98	732.45	1220.92	1491.37	1361.69
Patents introduced	466	597	709	565	588	852	1669	3746	4439	3858	2003

Sources: My elaboration from European Patent Office; Statista (2018)

Expenses in R&D were supplied by Statista, Inc., while the introduced patents were extracted querying the European Patent Office, excluding on purpose those ones from brands incorporated in the portfolio of the Group. These data may be a good way to quest Lenovo's capacity to grow in terms of innovations, which represents the most important

aspect considering the highly competitive industries in which the company is involved. In the figure, the introduced patents show a rising trend; besides, the increasing R&D spending over the years clearly depicts the firm's efforts to make indigenous investments to be able to improve its absorptive capacities (and assimilate knowledge coming from acquisitions). Lenovo's impressive increasing in R&D spending in particular in the interval 2014/2015, years of Motorola acquisition, may prove even more this trend. The company carried out also several mechanisms of integration that involved also changing its internal structure; the process was not easy as it seems in particular in the first stages, considering the low experience that Lenovo, as other Asian firms internationalizing, had (Ahrens & Zhou, 2013). In this site, I am not interested in giving an overview of what tools have been used to successfully integrate Lenovo's buyouts: my interest is to show why Lenovo, with the series of acquisitions of Western brands (in different industries) it has been undertaking, may represent a true threat in the mobile phone industry.

Looking back into acquisitions and JVs Lenovo has being engaged with, we can observe the richness of competences the firm has come across: PC and software industries, such as IBM and Medion (acquired in 2005 and 2011, respectively), which were among the most notorious manufacturers and developers; the new frontier of cloud computing and software for managerial solutions, of which Stoneware (acquired in 2011) is one of the leaders of the sector; the server and internet service industries, where NEC (joint venture in 2011) had a long experience; Motorola (acquired in 2014), present in the handset industry from its first moments, etc. These activities together give extraordinary opportunities to create superior products. After all, we are at the beginning of the so called PC plus era, which of course does not mean a post PC world (Jonathans, 2013), but a world where "the mobile device is becoming far more important than notebooks and tablets. The last thing people use a phone for now seems to be to make phone calls. It is all about the apps and user experience" (line 118, Caruana & Spring, 2014). As understandable from the quote, nowadays mobile phones represent tools used to improve or make the life of users easier. Applications for smartphones for example are part of a new frontier, since inventors are incorporating what we used to do before with computers and several other instruments. What is changing is the new technology to incorporate or the new way of using of handsets, but not the pattern, since adding new features belonging to other sectors (as putting a camera in a phone) has been already observed many times over the industry of mobile phone (chapter 3). Lenovo with its complete portfolio has all elements it needs to succeed toward the new direction the mobile phone

industry is undertaking, whether applications or something else. It will be easier for it to catch future trends and as a consequence to create unique products; moreover, its increasing R&D spending seems to confirm its efforts to combine these activities. After all, how to better tackle the industry leaders, Apple and Samsung, which are involved in several segments, if not investing in different competences?

This chapter has highlighted what Western acquisitions have meant for Asian handset firms: in the first part, the case of TCL shows how these takeovers helped expansion strategies played by the Chinese colossus and what we may expect from the future considering the TCL's portfolio and observations made previously in relations to Asian expansion strategies; in the second part, instead, Lenovo's example has been used to suggest how the mobile phone industry "has crowded" other sectors so far, and why, with this pattern of acquisitions, Lenovo seems to have understood it before many others. The cases of these two firms pointed out important issues in relation to the mobile phone industry in general; this does not mean that other firms could have been used as a case example. Moreover, it is important to remember that TCL has acquired brands even belonging to other electronic industries and Lenovo has clearly used Medion, IBM and CCE to expand its position toward other countries as well as Lenovo-Moto co-branded devices to upgrade the image of its handset models: even if with a lower degree, both of the cases could have been switched.

Final discussion

This section gives a brief review of the crucial points examined in the thesis, which have corroborated previous researches and have also provided new insights for the future development of the mobile phone industry. In particular, this work hopes to furnish new findings able to explain the reason behind the "caught" and successive dethronement of Western handset companies by Asian challengers based on developing countries. In addition, its considerations want to be a contribution to the current literature of the competitive dynamics (Ferrier & Smith, 1999; Smith, Ferrier, Grimm, 2001) and catching up process (Malerba & Nelson, 2012).

Chapter 1 served as an introduction to the most important theories behind the catch up phenomenon. The concepts of the window of opportunity (Lee & Lim, 2001; Perez & Soete, 1988) and challengers' aggressiveness (Ferrier & Smith, 1999; Smith, Ferrier, Grimm, 2001) have represented crucial topics which have been treated over the entire course of the project; in addition, the model of the industry life cycle has been examined in consideration to the fact that, in order to introduce the rise of Asian firms in the handset industry, a sectorial point of view has been used.

Chapter 2 wanted to highlight the steps undertaken by Asian firms' innovation process and most important vehicles by which knowledge has been transferred.

Drawing on the theories from the first two chapters, findings from chapter 3 provided several information, giving confirmations and even new directions to explain the internationalization process undertaken by Asian handset companies. First of all, observations from the development of the industry have suggested that two different types of strategies have been played by Western and Asian handset firms over the entire course of the mobile phone industry evolution. Following Giachetti & Marchi (2010), it is clear that, starting from the 1990s, the handset war carried out in the sector has been based on innovations by product or bettering off the technological process. Moreover, until the first 2000s, players in the industry came (almost) only from the developed world. During the second part of the mobile phone industry evolution instead we witnessed several companies from Asian developing countries coming into the scene. Unlike the strategies implemented by Western players, the reasons behind the rise of this category of challengers were a mixture of opportunities well caught and aggressiveness well played. The first window of opportunity opened thanks to the changing pattern occurred in the industry itself over the first 2000s, when Western companies deverticalized their structures to Asian ODMs; the prolonged alliance in the ODM business allowed Asian handset

companies to be in contact with technologies and to make their first step into the industry. The second window of opportunity was offered by home countries' institutions. The examined case of the Chinese government has shown how its pushes toward engaging on R&D in the TD-SCDMA technology has made the difference in advantaging several local firms, which, consequently, have been able to provide for their technology on their own. A possible explanation for the different strategies played by these two categories of firms is that they have been carried out in two different stages of the industry catch up cycle. However, the venture of the smartphone might be intended as a totally new industry; if that was the case, a strategy such the "aggressive" one played by Asian handset firms from developing countries may have been even more effective because it started right in time since the first stages of the smartphone life cycle (as opposite to GSM technology), where everyone is a beginner and no barrier is present. This would suggest considering the smartphone as a sort of discontinuity which gave birth to a new industry and opened a third window of opportunities responsible for part of the Asian success.

Governments' encouragements toward establishing alliances with Western brands and the consequences this has brought, have represented a crucial point of the project. Among the several alliances founded using Lexis Nexis and Business Source Complete's databases and in line with observations made by Alcacer & Oxley (2013), equity based alliances were chosen, and the focus was directed toward what these relationships have meant from a technological and distribution/network point of view. At first, findings from the selected firms confirmed Asian handset firms' intentions to exploit partners in order to acquire foreign technologies even belonging to different stages of maturity, as evidenced by Zedwitz & Jin (2008). Besides, parallel observations from international strategies played by these firms clearly depicted an expansion path which has implied entrance both in developed and developing similar countries; this strategy in some cases was observed been coupled with defunct Western brands, acquired or got in license. Findings from this last trend have suggested to abandon the "general view" and start looking into singular expansion paths. Over the course of the thesis, it has emerged that Asian mobile phone companies have undertaken two paths. The majority of them has followed the "traditional" sequential expansion route, starting building their strength in their home country, then moving on a sequential basis to developing and developed ones. Some of them, in order to follow a similar path and enhance their aggressiveness in these expansion strategies (as it will be subsequently explained), have been engaged in a series of acquisitions (or licensing) of Western brands which have been coupled with their own labels when

invading foreign countries; in relation to the region attacked (developed or developing world), acquired Western brands have been useful in different ways.

After a deepened research and in consideration of the opportunities for the handset market as evidenced by Marketline (2016), the Indian market was chosen as a first case example to test strategies played by Asian challengers; in this analysis the concept of aggressiveness, as mentioned in chapter 1, found its applicability. The data constructed using online Indian distributors evidenced that, after the mid 2010s, the general trend toward the Indian market on the part of Asian handset firms has been the one of aggressively attacking with an impressive number of introductions, which in several cases undertook the even 50 introductions per year. The fierceness by which handset companies have been observed attacking the market proved, with concrete data, both the aggressiveness on which Asian handset companies based their strategies and the possibilities that India seems to offer to the industry, as forecasted by Gartner (2017). Observations from the collected price range and features of the models, have allowed to make further suggestions. At first, the general trend of Indian handset companies has been the one of introducing an enormous quantity of models focusing on the lower side of it, while the devices introduced by Chinese and Taiwanese handset companies interestingly seem to be more oriented toward the mid higher segments. Secondly, and more importantly, those mobile phone companies which have exploited and coupled Western handset brands as part of their assortment, as previously mentioned, have used their larger portfolio either as a strategy to attack specific niches otherwise not able to cover with their own labels or as a way to enhance their penetration into the market covering complementary categories of users.

Chapter 4 proved that the pattern of acquisitions did not stop with the Indian handset market. TCL and Lenovo have been the absolute protagonists of this trend, and their cases were used as an example to show what acquired brands have meant to them and what we may expect from the future strategies of other firms. Findings from chapter 4 show that TCL and Lenovo, even if in a different way, carried on exploiting the Western brands previously acquired. In these case examples, the two companies have followed a different strategy based on associating Western labels to their brands, as a way to gradually move toward higher segments in developed countries. In light of the similarities previously observed regarding the expansion paths in other markets, and considering what evidenced by Gartner (2017) in relation to sales' increases toward the higher segments (in

particular in developed countries), it is possible that other firms will follow TCL and Lenovo cases.

To conclude, the strategies played by Asian handset firms seem to be successful. The fact that a catch up in the mobile phone industry has occurred is a matter of fact as can be evidenced comparing data from Gartner in 1997 and 2017: having a look at firms in the first six positions, it is clear that something has changed; and it is not a matter of which firm is first, but rather, the provenance of them. Apart from their ability to catch opportunities, as suggested in the first part of this section, it is clear that their success was possible also thanks to two other aspects:

1) their ability of carrying out effective attacking strategies;
2) their strong ability in changing their internal structure and activities.

Regarding the first point, the concept of aggressiveness has come up several times. Their strategies have been based on: attacking with many and diverse introductions; they have used a repertoire of different actions together, from aggressive marketing to pricing strategies; they have been unpredictable, confounding leaders entering several and even very different countries and playing different strategies. Asian handset firms have respected in all its facets the definition of aggressiveness as intended by Smith, Ferrier, Grimm (2001). Actually, they have even adjourned it, or better, broadened its bounds. As evidenced over the entire course of the paper, through the brands acquired or got in license, some firms have been able to foster, variegate and accelerate even more the effectiveness of their strategies and of all the points mentioned as part of the definition.

Regarding the second point, the general trend of Chinese and Taiwanese handset companies has been the one of moving up toward higher segments: after gaining enormous scale advantages due to low cost smartphone sales, the prices collected from the past years' models in the Indian market, in addition to the 2017 models sold in developed countries[iii], have shown that these firms have upgraded to the mid and mid/high segment, so far. This has proved their ability to understand that being engaged in imitative strategies or focused just on low cost sales won't have lasted long: building a true sustainable competitive advantage was crucial. Not by accident, they have reinvested the high profits gained in their home and similar countries in research and product development or marketing and other activities. Following Porter (1985), as treated in chapter 1, we can say that these firms have been involved in a sort of reconfiguration

strategy of their chains and activities. They have been able to optimize their logistics, marketing, distribution and network channels, extend to other industries, etc.; all of this has allowed them to create higher quality products. Once more, the success of many Asian handset firms from this point of view has been reached leveraging relations with other firms.

Further researches should investigate if similar patterns, as observed in the case of the mobile phone industry, have been followed in other sectors, too. If that was the case, both Ferrier & Smith's definition of aggressiveness and Porter's attacking strategies theories should be definitively broadened and encompass in their definitions the considerations made in this project about the role played by acquired foreign brands. Moreover, other researches should explore what is the proper response that Western competitors in the industry should implement as a counterattack strategy to the aggressiveness played by Asian handset firms. More precisely, in my opinion further investigations should be oriented to understand if the case of Blackberry, which has outsourced all its hardware and operating costs to focus its entire R&D on the software business for smartphones, should be a right response strategy to be followed by other Western firms, or a new entry opportunity for firms belonging to other industries.

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[i] TCL and Alcatel phones introduced worldwide, 2010-2012

	2010		2011		2012		Source
	Feature	smartphone	Feature	smartphone	Feature	smartphone	
TCL	4	**0**	6	**7**		**17**	Imei.info/tcl
Alcatel	24	1	26	10	13	18	Gsmarena.com/alcatel
Tot	28	1	32	17		35	

[ii] TCL phones sold in Western Countries (Today's prices)

Year	TCL	Price ($-Euro)	Source
	TCL LX1	About 200	Amazon.us
	TCL LX2	About 150	Amazon.us
2016	TCL 750	About 300	Pdevice.com
May 2016	TCL Flash Plus	About 200	Igogo.com
Gen 2016	TCL Idol 3	About 300	Igogo.com
May 2016	TCL P561U	About 111	Banggood.com
Sept 2015	TCL 3N M2U	About 130	Gearbest.com
Feb 2015	TCL M2U	About 130	Dealsmachine.com
Jun 2014	TCL Hero N3	About 270	Kimovil.com
Jun 2014	TCL S720	About 110	Banggood.com
2014	TCL 3S M3G	About 140	Gearbest.com

[iii] Prices of the last models in the US and Italy

	USA ($)	Avarage ($)	ITALY (Euro)	Avarage (Euro)
HUAWEI	240, 800, 150, 320, 570, 300,570, 264, 320, 380, 880	426	340, 114, 240, 250, 270, 910, 300, 620, 250, 280, 990, 360	410
LG	900, 140, 900, 406, 150, 150,	441	370, 320, 470, 160	330
ASUS	230, 140, 302, 380, 702, 322, 200, 140, 150, 400, 740	337	440, 180, 150 , 160,200,180, 500, 270, 270, 290	264
ZTE	600, 150, 250, 170, 275, 275, 350, 120, 460, 100, 290, 230, 570	296	270, 280, 190, 100	210
VIVO	435, 375, 450, 300, 560, 375, 440, 470, 155, 215, 440, 110, 260, 470, 440	366		
OPPO	180, 1100, 250, 440, 190, 310, 330, 125, 420, 190, 170, 600, 470, 380	369		
XIAOMI	700, 240, 250, 140, 600, 188	353	230, 485, 180, 178, 370, 220, 280, 280	277
HTC	170, 350, 415, 310, 155, 320, 295, 155, 285, 500, 170, 520, 750, 185	326	740, 390, 532, 227, 123, 890, 140, 330, 160	393
ACER	250, 260, 70, 380, 400, 450, 520, 170, 260, 310	307	65, 160, 760, 240, 100, 131, 623, 396	310
LENOVO	450, 399, 479, 400, 363, 98, 273, 500, 171, 250, 414	345	480, 600, 330, 130, 207, 320, 262, 480, 500	368
Total		360		320

Sources: Amazon.us, Amazon.it, mobilewithprices.com