



UNIVERSITY OF GOTHENBURG
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Protection of intellectual property Strategies and perception of risk

A case study of Swedish SMEs' expansion to China

Bachelor Thesis

Albin Lingman 871006-3374

Mikael Mörk 860825-2493

Tutor

Professor Inge Ivarsson

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Abstract

Title: Protection of intellectual property: strategies and perception of risk
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Authors: Albin Lingman & Mikael Mörk

Tutor: Inge Ivarsson

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The Chinese market is attracting immense amounts of foreign direct investment (FDI). From only attracting simpler production just ten years ago, it is now attracting technology-intensive industries en masse. However, while the intellectual property is increasing in importance to companies, the Chinese intellectual property rights infrastructure remains perceived as weak by many companies. This thesis therefore aims to create a better understanding of what strategies firms adopt in order to protect its intellectual property when entering the Chinese market, while also providing a better view of how the companies perceive the risks involved. The study approaches the topic through the use of case studies performed on three companies relying on unique technologies. Due to the lack of existing research available on the chosen topic, information has mainly been gathered through extensive interviews with three anonymous companies, and one intellectual property consulting agency.

Our study has resulted in the IP protection barrier model – a model that incorporates the available strategies, methods, and actions for protection. This model has then consequently been applied to the interviewed companies, analyzing their protective actions. Doing this, we have found that although the companies have implemented the available suggested methods and strategies to some extent, the use of the IP protection barrier model identifies a great number of actions available to the companies in order to provide a more comprehensive protection for their intellectual property.

We suggest that further studies look closer at how the personal opinions of the employees and management affect the chosen strategies within the firm, as well as the shared perception of risk. Alternatively performs a quantitative study on the strategies and methods used by foreign firms entering the Chinese market.

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Albin Lingman

Mikael Mörk

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Definitions and acronyms

Definitions

Intellectual property is an intangible asset by nature, and is a collective term for creations of the mind; inventions, artistic works, symbols, and designs used by a company or individual. The term is usually defined by the legal definitions of intellectual property rights. The term also includes assets that can be registered, such as copyrights, trademarks, industrial design, integrated circuits, and patents – even important undisclosed information such as trade secrets that can not be registered is covered by this definition. *(See Appendix 9.1 for further information.)*

Intellectual property strategy is a strategy with the purpose to protect a firm's intellectual property.

Expansion refers to the entrance into the Chinese market, be it for the use of suppliers, contract manufacturers, distributors, or other partners. This refers to an entrance with the intention of using the resources available, as well as to target a potential market. This also includes a situation where the company decides to not target the market (sales/distribution) but only for production.

Acronyms

FDI – Foreign Direct Investment

IP – Intellectual Property

MNC – Multi-National Corporation

NCA – Non-Compete Agreement

NDA – Non-Disclosure Agreement

OEM – Original Equipment Manufacturer

R&D – Research & Development

SME – Small and Medium-sized Enterprise

TRIPS – The Agreement on Trade-Related Aspects of Intellectual Property Rights

WIPO – World Intellectual Property Organization

WFOE – Wholly Foreign-Owned Enterprise

WTO – World Trade Organization

1. Introduction

Intangible assets and intellectual property play an increasingly important role in business – with claims coming from consultant agencies such as PriceWaterhouseCoopers saying that upwards 85 percent of the value of larger multinational corporations consists of intellectual property (PWC, 2005; Smith & Parr, 2000), whether being an exaggeration or not, the fact that intellectual property is becoming increasingly valuable to companies is hard to ignore.

At the same time, China is building and enforcing its position as an economic superpower; with its vast population and rapidly growing economy, while also being able to provide low-cost labor, receives immense interest from foreign enterprises. And with the high rate of technology intensive FDI flowing into the country, the number of intellectual property infringements is bound to increase. In 2010, a study on Swedish firms in China showed that a third of the respondent firms experienced that they were negatively affected by intellectual property infringements in China (Embassy of Sweden, 2011).

Looking through newspapers, it is not uncommon to come across articles regarding intellectual property in China. Searching influential papers such as Financial Times and the New York Times on 'intellectual property' and 'China' results in more than 20 articles from each of them published in the last two months. During the progress of this thesis the Economist also published a thorough article on the subject of China's intellectual property rights system (The Economist, 2012). We find it intriguing to provide a closer look at the combination of perhaps two of the most topical subjects of today; the Chinese market and intellectual property.

As in the case of the articles mentioned earlier by PWC and Smith & Parr, most research and coverage of intellectual property have a primary focus on large MNCs. We would like to instead shed a light on the vast majority of companies; companies of small and medium size. Due to limitations in resources they are less likely to have whole divisions devoted to researching intellectual property rights and related matters, resulting in that the strategies adopted will differ from the strategies of their larger counterparts. We believe that these strategies can be of much interest to delve deeper into, seeing how companies choose to act in an environment with possibly perceived weak intellectual property rights. The involvement of Swedish firms in China increases in order to reduce costs or to reach a large potential market, but could these 'golden' opportunities perhaps be dazzling companies into failing to identify the risks that might be involved with an expansion to the Chinese market?

1.1 Problem background

Literature has a rather unified view that entering the Chinese market carries certain risks related to a firm's intellectual property. This section aims to give the reader a background on why the Chinese

intellectual property protection is limited, the reasons behind the current situation, and a few ways the risks manifest themselves, in order to better understand the topics discussed later in the study.

While China attracts a large amount of foreign direct investments, it is not the strong intellectual property rights that attract foreign investors. In fact, China often serves as an example of how economic development can occur despite flawed intellectual property protection (Yu, 2007). Some researchers believe this to be one of the main underlying reasons as to why the Chinese authorities, despite joining the World Trade Organization (WTO) and accepting the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), and entering many multilateral agreements, have not taken enough action to establish a sound foundation for intellectual property protection. For most countries, and especially developing countries, an intellectual property protection is critical to attract investors, but for China there has simply not been any pressing need forcing it into developing this protection – its immense growth due to other factors is just too great (Chow, 2006).

A pattern seen in countries with rapid economic growth is that it is more common for firms to be short-term driven, seeking quick profitability. This often leads to the firms taking ‘shortcuts’ by adopting another firm’s technology instead of investing in its own research and development (R&D), and in some cases the methods used to acquire the technology is not legal (Moynihan et al., 2004)

Other researchers believe the cause to be deeply rooted in the Chinese culture, and that intellectual property needs to be viewed not only as an economic phenomenon but also as a cultural one (Marron & Steel, 2000). The attitude towards intellectual property can be traced back as far as to the philosopher Confucius, the founder of Confucianism, who allegedly claimed that he had never written anything original, and that people should learn by imitation (Forstner, 1995). This philosophy together with Taoism and Buddhism supports the collectivistic thinking, and it was strengthened further during the Maoist era. The Chinese government during the 1960s reinforced the collectivistic thinking; implementing regulations stating that inventions are national assets, and neither individuals nor organizations may have the exclusive right to them, instead everyone was allowed to use the inventions at their own discretion (Yang, 2003). When Deng Xiaoping later opened China to foreign trade and the country faced the mentality and strategies of foreign companies, the transition into a system of individual ownership of course clashed with the Chinese approach of individual creativity as a collective possession. Although education regarding intellectual property is increasing, as well as the general awareness, attitudes and beliefs take time to change (Yang, 2005).

It is important to note as well, that since most literature written on the subject is a few years old it is not possible to know whether the author’s opinions of the Chinese authorities actions has changed. In 2008 the State Council issued the ‘Outline of The National Intellectual Property Strategy’, a plan aimed at turning China into a country with a higher level of intellectual property rights and protection by 2020. It could be a sign that China tries hard to transform itself into an intellectual property-

friendly nation (Bai & Da, 2011). Regardless of any changes, the idea of economic growth reducing the urge to improve protection, give explanation why it lags behind. Most literature is fairly united in the belief that although China has created an intellectual property rights legal regime, which provides a respectable protection, the country lacks the political will to enforce it, and the laws are constructed in ways that prevent the courts from effectively identifying the responsible parties (McGregor, 2010; Yang, 2005).

In 2005, China recently surpassed the United States as the country where most intellectual property disputes are filed, and the amount of filed cases are rapidly increasing (Bai & Da, 2011). In 2009, over 30 000 civil cases of intellectual property infringement was filed in China, compared to 8 200 cases in the United States, which it surpassed only four years earlier. The amount is an increase of over 25 percent just from 2008. However, foreign parties still only make up a small minority constituting roughly five percent, but are increasing exponentially (Bai & Da, 2011). While the amount of disputes is rapidly growing, disputes concerning trade secrets have been constant over a ten-year period. Bai and Da reflects that this is due to basic difficulties in evidence and legislation, which prevents filing, rather than the fact that trade secret infringements are being stable – which then would be unlike the other types of infringements (2011).

Perhaps less surprising, copyright issues constitute approximately 50 percent of the filed disputes, while patents and trademark related issues together make up a third, and the rest is equally distributed between technology contracts, unfair competition, and other intellectual property cases (Bai & Da, 2011). The survey however, does not try to explain the reasons behind this distribution.

1.1.1 Inherent impediments

James McGregor (Senior Counselor APCO Worldwide) provides a few reasons to why China has an unsatisfactory intellectual property climate (2010). McGregor argues that one of the main reasons to this is the strong political pressure to support local firms and the related 'Indigenous Innovation' initiative. 'Indigenous Innovation' is a campaign by the Chinese government with the aim of turning China into a technology powerhouse, making it independent of foreign technology through the promotion of Chinese domestic innovation. The political pressure is particularly strong when it concerns matters affecting an industry with a technology field targeted by the Chinese government. The Chinese government has earmarked eight main fields of technology in which breakthroughs should be prioritized; bio-technology, information technology, advanced materials, advanced manufacturing, advanced energy technology, marine technology, laser technology, and aerospace technology. This claim, that local protectionism interferes with court decisions, is supported in other research. The Communist Party's officials may give orders to protect intellectual property, providing the local officials with direct power of the local law enforcers. And as some local communities have economical dependence from intellectual property infringement, local officials find the need to put

pressure on the local law enforcers in order to try to stabilize the local economy (Ganea & Pattloch, 2005).

Another problem identified by McGregor is inherent to the patent system itself. According to him it has two weaknesses; i) the relaxed view on definitions and information needed to file for a patent, especially for the 'utility model' patent that requires only basic information of the invention, and ii) the use of a 'first-to-file' approach equivalent of that in Europe, instead of the 'first-to-invent' approach that is practiced in the United States. While the former makes the process of proving who was first easier, it also makes it possible for another party to file an application without being the inventor. (McGregor, 2010). The amount of foreign firms applying for 'utility model' patents are only 0.6 percent (Tillväxtanalys, 2011), which could imply that foreign companies do not have sufficient knowledge regarding this type of patent, or do not consider this type of patent to provide enough protection to be worthwhile applying for.

In 2009, the Swedish Embassy performed a trend analysis regarding the issues perceived among Swedish companies in China. In this analysis it found a less discussed issue faced by some Swedish firms; that the Chinese government demands highly classified information, that later often is found to have been passed down to Chinese competitors. Due to this, the embassy warns Swedish companies to transfer or enter with any core intellectual property, due to the risk of having it transferred unwillingly to the competition. (Embassy of Sweden, 2009).

Another issue is bad faith trademark registrations, an issue raised by The European Union Chamber of Commerce in China (EUCCC). The phenomenon is increasing in China, where Chinese domestic firms register trademarks used by firms abroad. When the foreign firms then later decides to enter the Chinese market, they will become aware that their trademarks have already been registered, leaving them unable to register without filing a dispute, or perhaps even having to take the matter to court. Although no figures are presented, the EUCCC claims that a number of Chinese firms have developed a profitable business on finding international firms without registered trademarks that might enter the Chinese market in the future. The Chinese firms then register the foreign firm's trademarks in China; giving the Chinese firms the opportunity to sell the trademark to the foreign firm upon a future entry. The issues that this phenomenon incurs are not isolated to the firm having to deal with high costs to reclaim its trademarks, but can also provide a persistent problem due to the lengthy legal procedures, taking up to five years, often required in order to reclaim the trademarks if a settlement is not met with the trademark (EUCCC, 2011). The Swedish Embassy also acknowledges this kind of trademark 'poaching' and urges all Swedish firms to register every trademark that they might use in China, in both English and Chinese (Embassy of Sweden, 2011).

1.2 Problem discussion

The situation presented raises the need for proper intellectual property management. However, intellectual property management is a wide subject and involves three tasks (Smith & Hansen, 2002):

- Valuation – Intellectual property is an intangible asset, which needs to be valued along with the firm's other assets. It is seldom recorded properly in the traditional balance sheet, which might cause the firm's stock to be undervalued.
- Generation – How the firm manages innovation in order to generate new intellectual property.
- Protection – Strategies outlined and steps taken by the firm in order to secure the uniqueness of the firm's value.

In order to achieve a more specialized focus of this study, we have decided to only cover the protection aspect of intellectual property management, not delving deeper into the abstract aspect of valuation, or the managing creative processes involved in the generation aspect of the subject.

We believe that protection of intellectual property could be divided into two separate aspects, based on whether the situation depicted is prior to, or after an infringement has been detected. Since the actions taken after an infringement has been detected involve a process in which the proprietor pursues the infringer, our study will focus only on preventive strategies and actions taken prior to the detection of an infringement.

The problem background introduced in the prior section shows issues that combined create a certain level of risk involved that a Swedish firm will perceive as high or low. We therefore find it interesting to research how Swedish firms perceive this risk, and will look closer at the attitudes and feelings regarding the necessity of protecting intellectual property. China provides a suitable region to study, as the market provides extreme conditions – being such a quickly growing, large, and dynamic market – while still being a relevant and real issue as many Swedish firms turn their attention to China. We are also hoping to cover whatever challenges that might be faced by a company relying on technology, methods, or materials that are to be considered the firm's intellectual property, in the Chinese market – a market that could be perceived to have a weaker intellectual property rights infrastructure.

1.3 Purpose

The purpose of this study is to provide a deeper understanding of the methods and strategies adopted by a selection of Swedish companies relying extensively on their intellectual property in their business. We aim to contribute to an interesting area of research by studying the methods and strategies that are used by firms in order to protect their intellectual property in the Chinese market. We will also take the attitudes and perception of risk regarding intellectual property rights into

account. This study is intended to provide a foundation on which future studies can build upon, providing sets of generalization points that can be used for finding further research subjects in similar situations, as well as other useful information regarding the protection of intellectual property in China.

1.4 Research questions

Protection of intellectual property: strategies and perception of risk

- A case study of Swedish SMEs' expansion to China

1. How do the examined SMEs perceive the risks surrounding intellectual property in the Chinese market?
2. What strategies have the examined SMEs adopted in order to protect their intellectual property?

1.5 Delimitations

This thesis aims to provide a deeper understanding regarding the strategies used, and actions taken by companies expanding to China in order to protect themselves in an environment with an intellectual property rights infrastructure perceived as weak, as well as how they perceive the risks involved.

In order to study this topic and get viable results, it is important to put restrictions in place in regards of which companies that will be studied. This is mainly due to the fact that larger companies might have enough resources to have other possibilities than to change its strategies in order to adapt to the existing market; such as exposing the local government to political pressure. We have also chosen to only use companies that rely on intellectual property of some kind in their products, materials used, or method of production to be applicable in regards of the research questions.

The situation that we have chosen to study is exclusively within business-to-business, not any kind of retail business aimed at consumers. This is primarily done to avoid the concept of 'piracy' that is a very common problem in the Chinese market today, and therefore also a phenomenon that is widely known and analyzed.

The legal situation will only be covered to an extent that is necessary to understand the reasons behind the actions taken and strategies used by our respondents, and to provide a brief background to the problem. We will not delve deep into the different regulations that surround every kind of intellectual property rights protection in China. Neither will we discuss the moral of the problem, whether it is wrong or right by China to employ the rules creating the current climate, or how it chooses to prevent infringements. In an extension of this, we will not cover the effects that this might have on the economy, especially in terms of FDI loss, slower rate of innovation, etc.

1.6 Outline of the thesis

The introductory chapter provides a background to the problem, a discussion of the purpose of this study and why the subject has been chosen, and also explains the chosen research questions. In the methodology chapter we motivate why certain methods and approaches were chosen, as well as describing the actions taken in order to complete this thesis. The theoretical framework chapter covers the models and theories, as well as the strategies available. This is later used as support in the empirical chapter, and as a foundation for our analysis. The empirical study chapter is divided in primary and secondary data, whereas the primary data gathered through interviews make up the major part of the chapter. In the analysis chapter we compare and analyze the empirical data using the theoretical framework. The findings are then used for the conclusion chapter, where we try to reconnect what we have found to the purpose of the study, and provide answers to the research questions.

2. Methodology

The aim of this section is to provide a better understanding of the way this study was conducted. Focus is going to lie on how the study actually was performed, the steps taken, and not necessarily on methodology theories. It is also going to cover matters such as reliability and validity of the study and its components.

2.1 Research method

There are two main methods available to perform the data collection for a research study; qualitative and quantitative. These decide the approach, interpretation, tools used, and the final presentation. Using the qualitative method provides a more in-depth picture of the situation through, for example, extensive interviews – taking many aspects into account, making it unsuitable for generalizations but gives an overall picture. Using the quantitative method provides more of a description than an explanation to what causes the current situation. It usually involves a large number of respondents and is based on the statistics of their answers, making it suitable for generalizations (Holme & Solvang, 1997).

2.1.1 Method of choice

When looking to our research questions stated in the introductory chapter, it is apparent that we wish to cover both the aspect of how our subjects perceive the risks surrounding intellectual property in the Chinese market, as well as what strategies they have chosen to adopt in this situation. These questions are highly subjective in their nature, and the information gathered by using interviews will most likely be dependent on past experiences, unique attributes or possessions belonging to the subject; such as competencies, materials, or technology - aspects that are considerably harder to cover using standardized interview forms or surveys.

When taking this into consideration, along with the other characteristics of the different methods mentioned above, we found that a qualitative method would suit our study most appropriately; being able to put the gathered data into relevant context.

In line with this decision, we have made a number of longer interviews with a few selected companies in relevant businesses, performing a case study on each of them to provide a deeper understanding of their situation and thoughts on the subject.

2.2 Case study

The thesis aims to cover a contemporary phenomenon in a complex environment and there are many factors influencing this phenomenon. The strategies of companies, and their attitudes are difficult to

compare due to all the influencing factors. As this is in accordance with what Robert K. Yin defines as a case study (2003); this is our method of choice.

The method is highly suitable when the conditions and context surrounding the subject are of a complex nature, and in cases where it is hard to distinguish which aspects and factors that are providing the current conditions. Thus, making it hard to compare the subject to other subjects based on any similarities found, or by utilizing other examination and analyzing methods (Yin, 2008).

While a case study generally covers a single subject; we have chosen to do multiple case studies in order to build a better understanding of the phenomenon.

The case study started off in a preliminary research question but went through a process of gradual change as the study progressed. As this is a usual approach according to literature (Holme & Solvang, 1997), we have felt at ease to let the research question be shaped by the study in order to provide the best results.

A case study can also be of different aims in order to better align with the purpose of the study, these aims include a descriptive aim, an exploratory aim, and an explanatory aim. The descriptive takes the whole context of the situation into account, trying to provide information for further study and perhaps generalization patterns. The exploratory tries to provide hypotheses and premises for future studies, mostly by trying to find patterns by asking questions such as “how much”, “how many”, “where”, or “who” – questions highly compatible with surveys. Finally, the explanatory tries to answer questions such as “how” or “why”, looking more to causality aspects in order to find patterns, thereby making it more compatible with a qualitative data collection method than with a quantitative method (Yin, 2008).

2.2.1 Choice of aim

It is very important to identify the kind of research question that is going to be used in order to know which aim and set of tools that are the most appropriate. We have chosen to use the descriptive aim for our case study since it has the most appropriate approach to answering our research questions; "How do the examined SMEs perceive the risks surrounding intellectual property in the Chinese market?" and "What strategies have the examined SMEs adopted in order to protect their intellectual property?". We aim to provide a deeper understanding of the risks involved, the risks perceived, and the strategies that can be, and are, used to protect intellectual property in the Chinese market.

2.3 Selection of companies

The chosen selection of companies being part of this study is primarily based on their level of dependence on unique technology, materials, or methods to maintain their competitiveness and subsequent profitability. The secondary limitation is based loosely on company size, i.e. limitations in

number of employees and annual turnover. The purpose of the secondary limitation is to focus on small and medium-sized companies, according to the European Commission regulations and definitions of company sizes (*see table 2.1*). We wanted to the greatest extent avoid including large companies due to the fact that they might have a bargaining power great enough to significantly affect the pre-existing conditions and players on the Chinese market – actions that are out of reach for smaller companies. Companies that fall under these specifications are companies such as ABB or Apple, which due to their sheer size can affect regulations and sometimes even legislation (Martina, 2012).

Definition	Employees	Turnover (€)
<i>Small</i>	< 50	≤ € 10 M
<i>Medium</i>	50-250	≤ € 50 M
<i>Large</i>	250 <	€ 50 M <

Table 2.1 SME definition (European Commission, 2003)

2.4 Finding case companies

The search for appropriate companies for the case study began with a list consisting of roughly 900 entries from the Swedish Trade Council regarding Swedish firms with presence in China. The list was then narrowed down, removing firms that did not fit our selection based on size, degree of technology focus, or degree of presence on the Chinese market. Using this method, two out of our three subject firms were identified, while the third was found through other contacts. In addition to this, an intellectual property consulting agency was identified and contacted to provide further empirical data.

2.5 Selected companies

The three firms used in our case studies are three manufacturing companies with advanced technology, diversified in type of industries and market presence, in addition to a consulting agency focusing on issues regarding intellectual property and patents.

- Albihns.Zacco – Intellectual property consulting agency
- Company A – Highly advanced medical equipment, with suppliers in China
- Company B – Ignition systems, with own production units in China
- Company C – Advanced fire suppression systems, with a conscious decision to have no presence in China

These three very different firms together with a consulting agency will provide a fuller image of the phenomenon that we want to investigate; bringing different attitudes and adopting different strategies.

2.6 Validity and reliability

2.6.1 Validity

When we have looked to the validity of our study we have tried to take into account what kind of aim the case study has. If it would have had a causal/explanatory aim we would have had to cover matters such as if all the affecting causes and aspects have been covered, or if the study might have left something out that could change the outcome of the study. In this case however, a descriptive aim has been used, which leads us to focus on an external form of validity; how applicable the results are in other cases - or more specifically, how suitable the results are to base generalization about similar subjects on. The point of a case study is however not to create a universally applicable conclusion, but rather provide information in its results, outcome, or conclusion that might help to find similar subjects - increasing the selection of subjects onto which a wider generalization might later be applicable based on the results (Bryman 2011; Yin, 2003).

2.6.2 Reliability

The concept of reliability heavily relies on the possibility of another investigator to follow the same procedures and use the same methods (in the same case, with the same conditions) and come to the same result and conclusion - essentially repeating the original results. Essentially, in order to increase the reliability of the study, the investigator needs to minimize in the aspects of bias and errors, while keeping organized records (Bryman, 2011; Yin, 2003). To ensure this, we have taken a few decisions. First, all interviews have been recorded with the interviewee's consent to avoid own misinterpretations and bias. Second, to further reduce the risk of misinterpreting the interviewees, the interviewees have themselves been given the opportunity to confirm the empirical data based on their interviews. This also gives them the possibility to comment or clarify anything ambiguous. Finally, we have chosen to keep the all firms and interviewees anonymous in order to avoid the firms to feel less obliged to provide a glorified image of the situation.

2.7 Source criticism

2.7.1 Primary sources

The primary sources used in this study consist of interviews made with a select number of companies applicable in the limitations in regards of company size and technology reliance chosen for this study. The interviewees consist of a Sales manager in Asia (company A), a General Manager (company B), and a Purchasing manager (company C). All of the interviews were performed via telephone or Skype and lasted 30-60 minutes. In order to minimize the time occupied for the interviewee, an outline of the interview questions was sent in advance to give them the opportunity to prepare and research the information they lacked, before the start of the interview. This might give the interviewee the

opportunity to prepare more 'official statements', but we have found that this problem should have very limited negative effect on the study, far outweighed by the well-prepared, researched answers provided for the majority of our questions. All interviews were recorded with the consent of the interviewee, and later transcribed for future reference. We are aware that we as researchers might have introduced a bias to the information gathered, in addition to the bias that might have been provided with the answers made by the interviewees, but we have tried to the greatest extent to stay away from leading questions and involving our own values and context into the study and while interpreting the answers received during the interviews. We believe that the reliability of the statements made by the interviewees should provide a correct understanding of the company at hand by offering the interviewee and company the possibility to remain anonymous and participating under a pseudonym.

2.7.2 Secondary sources

The secondary sources used in this study consist of published dissertations, generally acknowledged models, publications, academic journals, statistical databases, as well as statements made in newspapers. We are aware that the secondary sources selected might be biased, and that the selection of sources may not be complete, but we have tried to counter the bias by using multiple sources on each subject and analyzing each source's reliability.

2.7.3 Observation

To provide the best foundation for an observation it is essential to aim for an as complete coverage of sources as possible, mainly to be able to counteract subjectivity of the source. However, a complete coverage of the available sources is unfeasible for a situation like ours, with limited time and resources available. We have therefore made our best efforts to get an ample amount of varied sources, providing a reliable library of references (Holme & Solvang, 1997).

2.7.4 Origin

In order to qualify the source's origin we have to look to the creator of the source, especially in aspects such as:

- *Is the creator a trusted source?*

He/she could be an acknowledged researcher on the subject or a layman, maybe a journalist writing within the scope of his professional field, a student, etc.

- *What was the purpose of the creation of the source?*

It could be the result of a study made on the subject, a response in a debate, an essay made for a school task, etc.

- *When created, was it a primary or secondary source?*

This is primarily determined by the distance to the source and if the statements made or results presented comes from a first-hand experience or are in turn based on a source used by the source creator. The closer to the original source of the information, the more relevant will the presented information available generally be (Holme & Solvang, 1997).

2.7.5 Usability

The usability of the sources discusses the creator's closeness of the actual information; if the creator experienced something first-hand, or is the information based on something read or heard by the creator? Of course someone directly involved in a matter, especially if affected by the studied phenomenon, will have a more valid perception on the subject. In order to qualify the source, it is possible to take to the following measures to ensure the usability of the source at hand (Holme & Solvang, 1997):

Internal

The internal part of the analysis looks to the source and determines its usability from a number of aspects within the source itself:

- Internal consistency; making sure that the source does not change stance or given information throughout the given statement or publication.
- Reliability of the source's contents; does the information given seem feasible?
- Ease of interpretation; is the information in the source presented in such a way that misinterpretation could easily occur (intentional or unintentional) and can misinterpretation in that case be ruled out? In short, does it make a clear point?
- Subjectivity of the source creator; the presented information should preferably be provided from first-hand experience or research.

External

The external part of the analysis looks primarily to how the source compares to other available sources on the topic, comparing sources in order to counteract subjectivity and rule out unfeasible claims.

3. Theoretical framework

The aim of this section is to present the theories and models on which the foundation for the analysis is built, including the introduction of a new model that summarizes the models in existing literature, focusing on the aspects that are the most relevant to our study.

In this section we will as well present a compilation of the methods and strategies that can be used in order to protect a firm's intellectual property when entering the Chinese market.

The aim was also to present previous research covering which strategies are actually used by companies, and not only the options companies have. Unfortunately we have found the existing research to be scarce. Dialogue with expertise within the research field of intellectual property (Petrusson, 2012) confirms that i) firms generally consider information regarding intellectual property strategies as classified information, and ii) the studies performed on the subject at hand is mainly done by researchers that generally lack sufficient knowledge in the research field to approach the subject efficiently.

3.1 Models and theories

3.1.1 The OLI paradigm

The OLI paradigm covers a selection of the different aspects of advantages experienced by a firm and how these can be combined to provide explanations such as to why a company decides to acquire another firm, re-locate to another city/country/region, or choose an export based business model over a domestic one. It is based on a system comparing transactional costs involved with the different available strategic choices, as well as the additional costs incurred due to failures, mistakes, and other impediments. This can then be used in conjunction with an opportunity cost perspective to find the most appropriate strategy to be implemented in the given situation, and also explain the expansion strategies applied by companies expanding abroad, as well as to a certain extent the reasons of their success.

John H. Dunning created the paradigm in 1980, and it has since then been revised to better depict the business climate of today's globalized world. The paradigm is divided into three main areas; in Ownership, Location and Internalization advantages.

Ownership

The ownership aspect of advantages refers to the specific advantages connected to the company itself, or 'firm specific advantages'. These are generally intangible advantages, consisting of 'assets' that easily can be used throughout the whole corporation without incurring any significant costs, including assets such as:

- Production techniques, best practices, and know-how
- Economies of scale
- Research and technology
- Trademarks, brands, and patents

The company's inclination towards performing foreign investments and acquisitions has a strong correlation to the competitiveness of the company's ownership aspect related advantages. This aspect is obviously one of the more important parts of the model seen from the perspective of this thesis, mainly because a theft of knowledge, technology, or brand is a common infringement on intellectual property laws. If the competitive advantage in regards of the ownership aspect is affected negatively, this could have repercussions throughout the company, threatening the profitability of a completed or planned expansion.

Location

The location aspect of advantages refers to the advantages connected to a specific geographical point. This could be due to a number of reasons, but the most common reasons could be assigned to the following categories (not necessarily in order of importance):

- Political – Policies regarding inwards FDI, taxes and tariffs, rules and regulations regarding exports and imports, etc.
- Economical (in the applicable industries) – The availability of raw materials, availability of labor and average wages, market size, infrastructure, etc.
- Social – Attitudes in regards of foreignness and outsidership, psychological distance, cultural impediments, including language, cultural diversities, etc.

It is important to realize that these advantages might change depending on events happening in the local market and political arena; if a change of government takes place, this might set completely new rules for the market, for example taxes might be increased or lowered, regulations can be put in place in regards of imports/exports, certain business might be banned, subsidies can be given to certain actors within specific industries, etc.

Internalization

The internalization aspect of advantages refers to the advantages that are to be gained by owning and controlling the production facilities (such as the ones experienced by having a wholly owned subsidiary), compared to using external suppliers. These advantages become more apparent in a market where the transaction costs are high compared to in-house production, due to inefficiencies related to the production or local infrastructure. Because of this, it is not uncommon that companies

having strong comparative advantages within the ownership aspect find it lucrative to internalize production; improving the efficiency using experientially developed best practices, manufacturing techniques, and technology – thereby addressing poorly functioning companies and/or markets.

Summary of the OLI paradigm

One thing that the paradigm points out is that it is crucial for a company to have a comparative advantage within one or more aspects to such an extent that it makes up for whatever disadvantage any other aspect might entail. Due to the variable nature of these aspects and the many ways in which a comparative advantage could be achieved, it is important to look at the company's advantages as a whole and assess its competitiveness based on that, rather than to compare companies judging by a single aspect.

3.1.2 Barriers to imitation

When developing the resource-based theory, which sees a firm's resources as the competitive advantage of the firm, Jay Barney (1991) defined a sustained competitive advantage to be valuable, rare, imperfectly imitable and non-substitutable. If one of them is compromised, then the firm loses its competitive advantage. Intellectual property in general fulfills these four attributes, and of these four attributes imitation is perhaps the most exposed. Klaus Jennewein (2005) discusses how a firm may create barriers to imitation in order for the firm to secure its sustained competitive advantage.

According to Jennewein a firm can have two different types of imitation barriers, either it is a legal barrier such as patents and trademarks; or it is an imitation barrier resulting from ambiguity. As seen in *figure 3.1* a firm also has to face a trade-off between these barriers. In order to protect a technology through legal barriers, it needs to codify it, which then decreases the ambiguity. For some firms the intellectual property can be tacit knowledge or a trade secret. These are hidden inside the minds of employees, thus making it more difficult for a competitor to imitate.

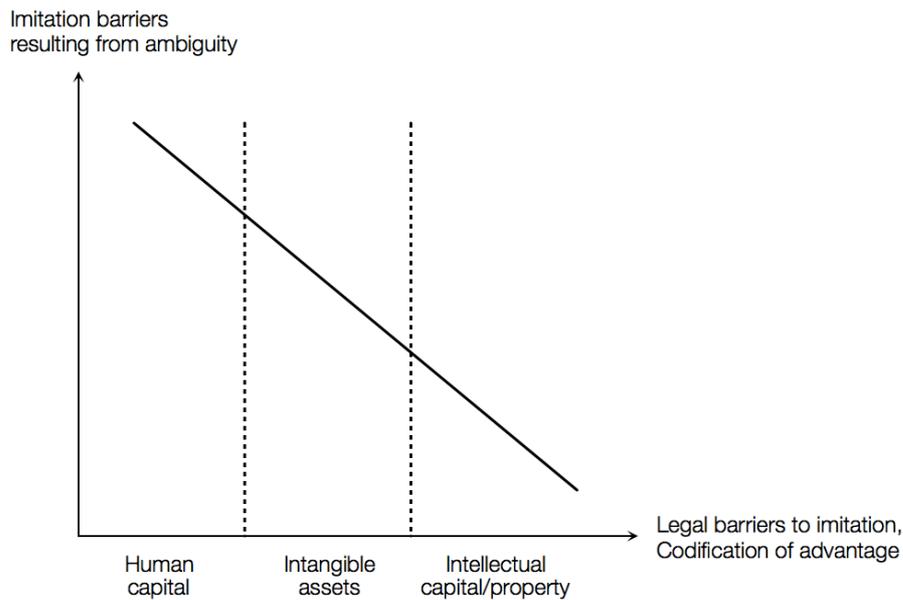


Figure 3.1 The Imitation barrier model (Jennewin, 2005: 207)

He further explains that the firm might enforce the overall imitation barrier by combining legal barriers with ambiguity imitation barriers. The firm might provide a legal protection to the technology, but leave the methods to fully utilize the technology ambiguous in the know-how of the company. Moreover, he emphasizes that to uphold or increase its imitation barriers a company needs to continuously invest in adding supplementary strengths or reinforcing the intellectual property rights.

According to Jennewein many studies show that intellectual property rights are not the preferred mode of protection for the firms intellectual property. Instead of the judicial approach, firms find approaches related to higher ambiguity, such as trade secrets, lead-time advantages, and complexity to be of greater importance.

3.1.3 Transferring technology risk

Transferring technology to a new market infer certain risks of technology loss, the technology being misused, stolen, or imitated. *Figure 3.2* explains how the risk increases through the relationship between core versus peripheral technology, and dependent versus independent technology.

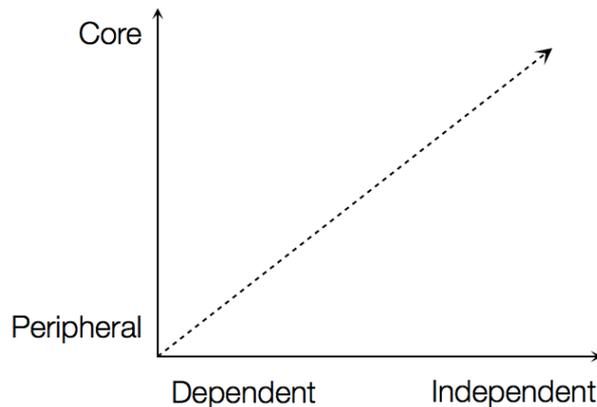


Figure 3.2 The Technology transfer risk model (Cannice, et al., 2003: 183)

The firm is exposed to the most risk when the transferred technology is a core technology, and it is independent of other technologies. The firm can decrease the risk by only transferring a more peripheral technology, a technology that depends on other technologies to be useful, or a technology that fulfills both these criteria. For some reasons however, the firm might not be able to decrease any of these variables; it can be due to an inherent trait of the technology, the attractiveness of the market, or if the host country's regulations might require a certain degree of technology transfer. If that is the situation, then the firm needs to keep operations in-house and can only rely on ownership means to protect its technology (Cannice, Chen, & Daniels, 2003).

3.1.4 Internationalization of R&D

R&D must be considered the most intellectual property-intensive part of a firm's business. As a firm goes through the internationalization process, it can also choose to internationalize a part of, or all of its R&D. A few studies have been made on motivational and discouraging factors to relocating R&D overseas. In a study on Swedish MNCs during 1978 to 1990, Fors and Svensson (1994) found that MNCs choose to locate R&D in countries that have specialized technologically related to their industry to benefit from spillover effects. They also found that firms do it in order to adapt its products and processes to local demand. Another study of Swedish MNCs identified directly related factors like costs and availability of skilled engineers and scientists, but also to keep the R&D close to the production (Håkanson & Nobel, 1993). The influence of intellectual property protection on R&D location decisions has rarely been researched (Prabuddha, 2004). Kumar (1995) did however study the effect, and discovered that for developing countries, the strength of the intellectual property regime has little importance. He argues that it is due to the fact that firms do not at all consider putting vital R&D in a developing country. Instead it is less sensitive R&D, like simpler product-adaptation, that might be located in these countries. This pattern was also found in a newer empirical study on American MNCs, that it is unlikely to use developing countries for global technology development

(Prabuddha, 2004). Prabuddha however also identified adequate intellectual property rights infrastructure as essential to firms' decisions. It was found that stronger intellectual property protection in the host country correlates with greater R&D investments from MNCs.

3.1.5 Shift in intellectual property management integration

Fitzpatrick and DiLullo (2004) have identified a shifting trend in intellectual property management. Intellectual property management was during the 20th century heavily characterized by vertically integrated firms. Most R&D and other activities involving sensitive intellectual property were held in-house. The vertical integration permitted firms to exploit full value chain control and government enforced intellectual property legislation to protect its intellectual property. Since then the economic environment surrounding intellectual property has changed, and according to Fitzpatrick and DiLullo the combination of reverse engineering and a dramatic decrease in the duration time of product and technology life cycles has made intellectual property management more horizontally integrated. Horizontal integration in the form of strategic alliances and partnerships can utilize a more rapid generation of new intellectual property. However, this introduces the companies to control and security issues.

3.1.6 Contract-based model

To counter the issues of horizontal integration Fitzpatrick and DiLullo (2004) introduced a contract-based model, to safeguard the intellectual property through different contractual agreements. The model discusses different steps to take, and can be viewed in *figure 3.3*.

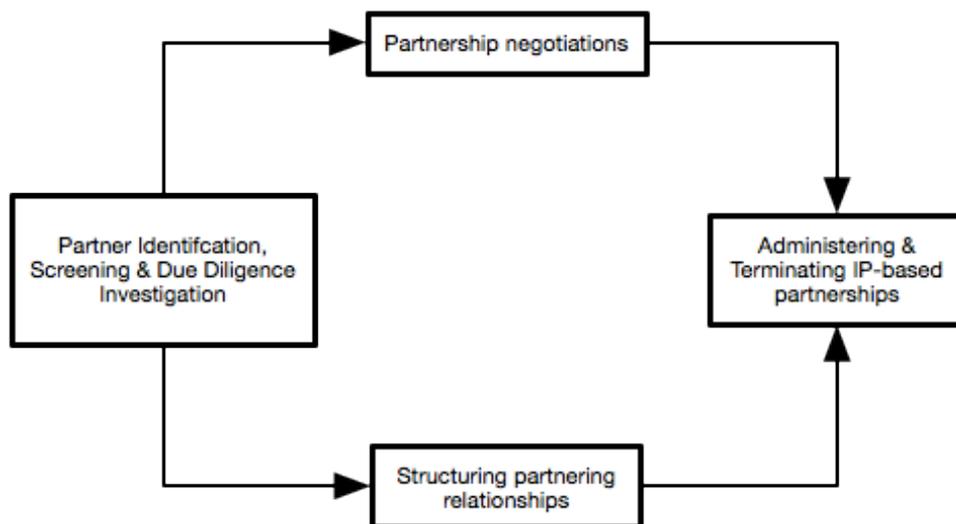


Figure 3.3 The Contract-based model (Fitzpatrick & DiLullo, 2004: 39)

The first step to take is to identify and perform a screening of the potential partner, mainly through a due diligence investigation. This investigation is important to do in order to find that the partnering

firm possesses competencies that provide synergy to the collaboration. The screening also serves to find if the partner has an adequate corporate security infrastructure to protect the intellectual property.

The steps Structuring the partnering relationships, as well as Administrating and Terminating IP-Based partnerships mainly focus on implementing the necessary contracts, which include initial partnering agreements, licensing and royalty agreements, as well as non-disclosure agreements (NDAs) and non-compete agreements (NCAs). Initial partnering agreements are used to define the nature of the partnership, what knowledge that is to be exchanged and the ownership of the intellectual property. Licensing and royalty agreements serve to secure situations when the partnering firm needs to use the firm's intellectual property. NDAs and NCAs are used to regulate the control and dissemination of intellectual property. It is important that the firms and the firms' employees sign both these agreements. Partnering firms often come in contact with the client's competitors, which can lead the competitor to 'rediscover' the trade secret, without necessarily disclosing any information at all. The step of Partnership negotiation emphasizes on the signing of NDAs and NCAs before any further negotiations. This is to fully protect the intellectual property that might be discussed during the negotiations. The screening phase may be the most critical part of the model as it not only evaluates the compatible competencies of the potential partner, but also unveils the partnering firm's history of honoring and respecting intellectual property of others.

3.2 Intellectual property strategies

The available research covering the topic intellectual property management is rarely based on proper investigations. The majority part of the publications available on the topic is based on advice from consultants and/or attorneys working with intellectual property publicizing their opinions on different business forums, not necessarily referring their advice and conclusions to any academic research or objective studies. In addition to this, the presented methods and strategies have not been presented in conjunction with any kind of measurement of effectiveness, or any kind of study regarding to what extent the suggested strategies and methods are being used by companies today. In this section we make an attempt to summarize the methods and strategies proposed by available business publications in order to provide a compilation of strategies that can be used to protect intellectual property when entering the Chinese market.

3.2.1 Rules and regulations

Understanding the rules and regulations by which the market works is key in order to learn its strengths and weaknesses. When competing in the Chinese market and working proactively to prevent any infringements from occurring, an educated understanding of Chinese law is important. This can be achieved either by hiring an in-house lawyer with experience of Chinese laws, rules, and regulations, or by hiring consulting agencies specializing in this kind of consultation (Stephen, 2008).

3.2.2 Registration

A rule of thumb when acting in the Chinese intellectual property environment is that no protection is provided or recognized until an application has been filed and approved by the appropriate Chinese agency (Greguras, 2007). No foreign patents, trademarks, or copyright are to any extent recognized in China, and do therefore not provide any protection at all in the case of an infringement dispute (Firth, 2006). Keeping this in mind, there are multiple aspects that needs to be considered in regards of:

Patents

Applications should be filed for both the **core and peripheral technologies** of any enterprise, especially in cases where one type of technology is needed for the other (Firth, 2006; Stephen, 2008). This is mainly to avoid the precarious situation that could arise given that either of the technologies ends up in a dispute, making the other one useless. China uses the approach '**first-to-file**', which essentially means that the applicant that first filed his/her application for a patent has the right to the patent, given that the invention is patentable. This approach is identical to the one used in Europe in determining who was 'first' (EPO, 2000; Firth, 2006). However, companies are repeatedly encouraged to file all their patent applications as soon as possible, since the protection does not exist until approved, and due to the fact that China does not recognize international patents (Firth, 2006).

Albeit the topic in general is rarely elaborated on, the importance of proper **translation to Chinese** in all applications is of utmost importance (Firth, 2006; Stephen, 2008) – the main reason being that without proper translation the legal protection provided by the application is greatly reduced, with the risk of giving little or no protection for the intended innovation. The Chinese intellectual property rights infrastructure provides three **different kinds of patents**; design, utility model, and invention patents. The design patent primarily exists in order to provide a protection for shapes or patterns of a product, the utility model patent is a version of the invention patent with a less thorough review and is thereby easier to obtain than its invention counterpart. Therefore, companies are recommended to apply for both the utility model and invention patents, since the former will provide some protection while awaiting the approval of the latter (Firth, 2006). Before filing an application it is, not unlike in other countries, recommended to **research prior art** to make sure that there are no previous applications with similar innovations. In China however, these searches also need to be performed in Chinese (Stephen, 2008).

Trademarks and brands

It is vital to register any trademarks in **both English and Chinese** (Firth, 2006; Stephen, 2008), this is mainly due to the fact that a registered trademark in English does not provide any protection against infringements of trademarks in Chinese, even if the pronunciation is the same. Before applying, it is

also important to check the registered trademarks for infringers (Firth, 2006), in order to avoid future headaches with disputes coming from the party holding the registered trademark in Chinese.

Copyright

No intellectual property is protected unless an approved application of protection has been received, software is no exception of this (Lu, 2007)

3.2.3 Employee policies

Companies need to introduce policies that help building a safe environment for handling intellectual property. A good way to start is to run background checks while hiring new people (Firth, 2006), focusing on making sure that the new employees have a sound financial status (Greguras, 2007), being less prone to be tempted to sell intellectual property to competing firms. At the time of hire, it is also recommended to include NDAs and NCAs in the job contract, since most unauthorized transfers of intellectual property occur at the end of an employment (Firth, 2006; Greguras, 2007; Gzybowski, 2004; Lu, 2007). To follow up on this initial agreement, it is also often suggested that the employees receive education including a clearly communicated policy on protecting intellectual property (Firth, 2006; Greguras, 2007), and work toward integrating intellectual property as a core responsibility of the whole team, not just the legal counsel (Firth, 2006). It is also equally important to enforce these policies, guidelines, and rules in a way that deters any further violations; e.g. firing the violators (Firth, 2006).

An often overlooked variable is the interaction between engineers and the sales force, since they together combine the technology and know-how with capitalization and marketing, often resulting in the emergence of new competitors (Firth, 2006). Therefore it is recommended that these workgroups are kept separate if possible.

3.2.4 Partners and suppliers

The following points-of-interest, methods, and strategies are of a variety that are mostly relevant in situations where the company deals with an external party, generally a supplier, distributor, or partner of any kind.

Background and contracts

When initiating a new partnership it is important to always research the background of the partner-to-be (Gzybowski, 2004; Stephen, 2008), it is recommended trying to, if the choice is available, pick a partner with an interest in protecting an asset of its own, such as a trademark, technology (Stephen, 2008), or brand reputation (Firth, 2006) to decrease the risk of your own intellectual property assets. If possible, a due diligence investigation of the partner-to-be should be performed, researching its networks for weak points that can affect its possibility to keep the distribution chain clear from

unauthorized selling, or the introduction of counterfeit products. Including intellectual property agreements in all contracts with the partner is also highly recommended in order to reduce the risk involved (Firth, 2006).

Information policies

Partnerships with an external party rarely benefits from full disclosure of information, this will more likely hurt the partner providing the information; creating competition by disclosing too much.

It is therefore considered key to provide only essential information to the supplier end of the partnership (Greguras, 2007; Stephen, 2008), principally providing information on a need-to-know basis (Firth, 2006; Greguras, 2007). One way of doing this is to make sure to distribute the information in pieces, not giving any single partner, engineer, or production facility the information needed to receive the insight to the complete product or process (Firth, 2006; Greguras, 2007; Lu, 2007; Stephen, 2008). To facilitate the incorporation of these guidelines the firm can adopt a system in which it classifies information based on sensitivity (Firth, 2006; Greguras, 2007; Stephen, 2008), in which it is also possible to identify certain vital, often latest, designs, technologies, and procedures that can be kept in the home country (Firth, 2006; Stephen, 2008), not distributing them abroad in an environment with less control, where the risks might be higher. Other ways to prevent knowledge from being transferred involuntarily is to i) keep process innovation knowledge tacit (Lu, 2007), being passed on from employee to employee on a need-to-know basis, and ii) keeping some know-how separate from the product itself (Lu, 2007), the main purpose of this is to prevent a competitor from gaining full insight from reverse-engineering by requiring one or multiple steps in the production process that is performed by, for example, special equipment only available in the production plant.

Wholly owned manufacturing

An alternative is to acquire a manufacturing company; this firm can then in turn manage its partnerships with suppliers, but keep the manufacturing in-house. This kind of setup provides a somewhat better protection with the increased possibility of management control. It is however important to realize that although this kind of setup minimizes the risks of intellectual property theft, it does not eliminate the risks completely (Stephen, 2008).

Having a wholly owned manufacturing facility does provide the company to introduce security measures that would otherwise be hard to enforce; both physical and electronic (Greguras, 2007), such as regular check-ups, as well as monitoring the use of flash disks and file transfers (Firth, 2006).

3.3 Conclusion

The theoretical framework has served to provide a foundation onto which we have decided to build our own model, taking into account all the relevant aspects of previously covered models and theories, as well as the compilation of methods and strategies.

3.3.1 The IP protection barrier model

By thoroughly analyzing the models and theories presented in our theoretical framework, we have tried to isolate the essence of each separate model and theory that are of importance to the topic of our study. This has then been used to create the IP protection barrier model, a model that primarily focuses on the aspects that are relevant for an intellectual property-relying company that enters a new market. Please note however, that while this model tries to incorporate many of the different factors that matter to a firm entering a new market, along with many of the choices that a firm faces in that situation, it does not provide the complete picture; it just covers the aspects that are related to the protection of intellectual property based on the provided theoretical framework.

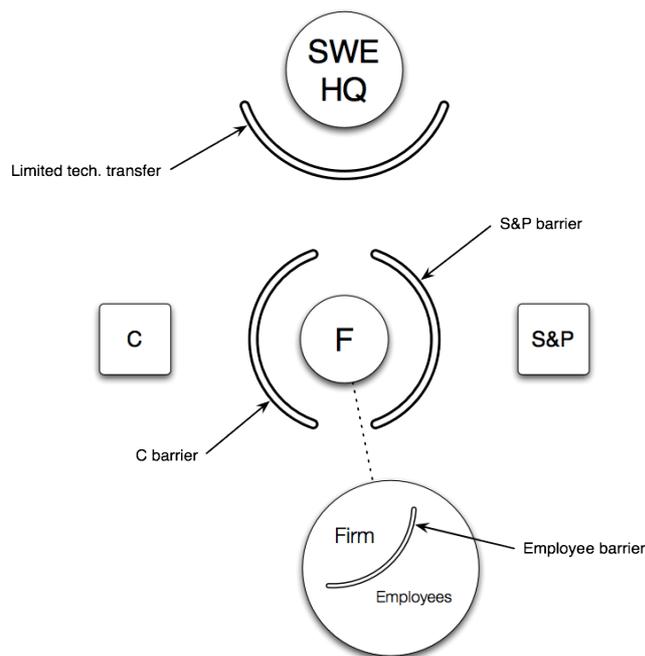


Figure 3.4 The IP protection barrier model, elaborated by the authors

3.3.2 Explanation of the IP protection barrier model's components

Legend

- **SWE HQ** (*Swedish headquarters*) – The company's operations in its home country
- **C** (*competitors*) – The competitors existing on the local market
- **F** (*firm*) – The legal entity representing the company's presence on the local market
- **S&P** (*suppliers and partners*) – The suppliers and partners of the company's local legal entity, on the local market

Intra-firm limitations

When deciding on the relationship between the company's headquarters in the home market and the local firm, it is important to consider the involvement in the local market – we have chosen to focus on the technology transferred and the level of internalization. The **level of technology transfer**, or the actual amount of technology transferred to the firm operating in the local market is essentially the stake invested in that market. Looking to the technology transfer risk model by Cannice, et al. (2003), which explains that the amount of risk involved in the transfer depends on the type of technology being transferred; a peripheral technology entails a lower risk than a core technology, and a technology dependent on other technology entails less risk than a independent one. When these characteristics are combined, the amount of risk involved in a transfer can be compared between different technologies. When considering technology transfer to a market with an intellectual property rights infrastructure perceived as unsatisfactory, the firm might limit its transfer of technology to a basic peripheral level, or to technologies being highly dependent on other technologies to be useful.

Protection against competitors

The competition of the local market generally consists of actors with the advantage of having a better knowledge of the local market and its business, giving them a head start in regards of production facilities and contact cultivating. Because of this, the company is well suited in making sure to protect its methods and technology to stay competitive – one aspect of this is the imitation barrier model, in regards of knowledge and technology transfer. The **imitation barrier** model discusses the internal actions available to a firm in regards of protecting itself against the competition imitating its intellectual property. There are two main paths to go, either keeping the intellectual property ambiguous as a form of tacit knowledge among its employees, or to legally protect it with the use of patents or other judicial registration. The compilation of methods and strategies (*see section 3.2*) provides a wider illustration of available types of imitation barriers.

One of the risks involved in legally protecting the firm's intellectual property is that to protect it, it has to be codified, making it more easily transferrable. In a situation of entering a market where the legal protection is perceived as uncertain there are ways in which the firm can increase the protection. One way to accomplish this is by **adding complexity** through the combined use of ambiguity and legal protection, filing applications for legal protection, while keeping certain details tacit; thus protected in the know-how of the employees. This provides the firm with protection even in the case of a patent infringement, since not all information has been disclosed.

Safety measures regarding suppliers and partners

When entering a new market, the involvement with local suppliers and partners can benefit all parties involved, and some kind of involvement is nigh unavoidable – making it important to decide on the

level and type of integration, as well as making sure to protect the firm from exploitation. Adopting a **vertical integration** scheme provides more protection of intellectual property due to the inherently larger amount of control that this form of integration brings. While **horizontal integration** provides increased efficiency in technology-intense processes, at the cost of having less control over the access to the firm's intellectual property. With the horizontal integration growing increasingly popular recently, it is important that the firm evaluates the situation closely, especially in order to be able to provide additional safety measures, if necessary.

Whereas the main reason for having a vertically integrated organization is to provide the company with control over the involved parties, **internalization** is often performed with the intent of lowering costs or improving production levels. However, not using external parties for the internalized processes also provides a high level of protection for the intellectual property used in these processes, since it is kept in-house with the company. Thus, vertical integration and internalization goes hand-in-hand, with internalization often accomplished through the acquisition of the supplier or partner in question, making it a WFOE. While this does not ensure full protection of the intellectual property, it does minimize the risks since the firm is able to exercise full control, implementing any security measures it finds appropriate.

If the firm decides on a situation where it does not fully internalize external operations, the contract-based model points to the importance of performing a thorough **screening** of any potential partner or supplier. The recommended course of action is to perform a **due diligence** investigation on any considered partner or supplier before deciding, in order to ensure that the right partner or supplier is chosen and minimizing the risks involved. The contract-based model further states how firms should manage the relations held with external suppliers and/or partners through the use of regulations agreed upon in signed **contracts and agreements** – two kinds of agreements being particularly important when dealing with intellectual property; NDAs and NCAs.

Internal protection

While focusing all the firm's resources at keeping unauthorized parties out, increasing the protection and secrecy, it is easy to forget about what happens inside the company walls. It is important that the firm considers having policies regarding the internal protection, as well as external. The thought of selling intellectual property to a competing firm could be very tempting to an employee, especially if that employee has a less than sound financial status. One way to address this is by performing **screenings and background checks** when hiring new people, and while this does not ensure a completely honest workforce, it lowers the risks involved. In addition to performing thorough screening at the beginning of employment, the firm could further deter intellectual property leaks by having **contracts and agreements** in place, e.g. NDAs and NCAs incorporated as a part of any job contract signed with employees.

4. Empirical study

In the following empirical study we are performing case studies on one consulting agency in the field of intellectual property and patents, and three manufacturing companies within different fields of business – including medical equipment, ignition systems and engine optimization, and advanced fire suppression systems. The aim is to provide a deeper understanding of the companies' perception of risk in the Chinese market and what actions that have been taken in order to protect their intellectual property. We have tried to structure this study based on the aspects that we have identified as important to the models in our theoretical framework. These consist primarily of the internalization of processes from the OLI paradigm, technology transfer risks, structuring of partnerships, the contract-based model, and the protection barriers. The study is also linked to the IP protection barrier model, which we have developed from the theoretical framework (*figure 3.4*). It is worth mentioning that none of the companies have discovered any intellectual property infringements in China, nor have they experienced that any government official has tried to make them reveal more information than what is considered standard procedure in most countries.

4.1 Primary empirical data

4.1.1 Consultancy firm - Albihns.Zacco

The interviewee and his background

Henrik Aurell is the region manager at Albihns.Zacco's office in Malmö, and is also a European patent attorney. He has been working with intellectual property for 12 years. He has personally not worked in China, but in his work as consultant he needs to be well informed on the subject in order to advice his clients.

Company background

Albihns.Zacco AB is a large European full-service consultancy firm within intellectual property, with operations in the Scandinavian countries, the Benelux, and Germany. The company employs approximately 500, where almost 200 work in the Swedish unit. It is known under multiple names; while in Sweden its name is 'Albihns.Zacco,' the business name in the rest of the countries is 'Zacco'.

Albihns.Zacco assists clients in handling patents, trademarks, design protection, copyright registration – and also offers intellectual property portfolio management and intellectual property consulting.

The company is on a daily basis dealing with consultation to all kinds of clients; how they should protect their assets, and act in different conflicts of interest. With the exception of very small enterprises, Albihns.Zacco will work continuously with the client firm over longer periods of time,

especially when it comes to patents, since patent filing procedures normally take four to five years. During this time it will provide the client with consultation.

While Albihns.Zacco has no operations of its own in China, it instead has collaborations with its counterparts abroad, such as Chinese intellectual property consultancies, which are used when applying for and managing patents and trademarks, and keeping infringements at bay, among other activities in China.

Clients

The client base of Albihns.Zacco is composed of a full spectrum of firms, from MNCs to one-person innovation enterprises. The clients that expand to China do not differ from the rest of its clients.

The consultancy firm acquires clients both actively, by finding potential clients and selling in the firm's services, and passively by having clients themselves contact the firm for consultation.

The interviewee's perception of intellectual property risks in China

Mr. Aurell acknowledges that there are risks involved with dealing with intellectual property on the Chinese market, as China is a very large and relatively young country when it comes to dealing with intellectual property. There has been a great transformation of the Chinese business environment, and there is still a lot to adjust and improve in order to prevent infringements. He does however not agree with people saying that the intellectual property system does not work. He instead believes that the system does not work the same way people are used to in Europe, and that the firms may need to adopt another approach. Neither does he reckon that managing intellectual property in China requires a lot more effort, it only requires a different course of management.

Clients' attitudes to their intellectual property

Most Swedish firms today consider their intellectual property to be an important asset of their business; protection is a substantial part of the business strategy. However, it is not general practice for firms to do a complete valuation of their intellectual property, although it is becoming more frequent. Albihns.Zacco notices this as it itself provides this kind of valuation services, and also assists in selling intellectual property, if desired. This is a very complicated matter as firms themselves value their intellectual property based on how much time spent researching and developing, as well as protecting it – which often differs greatly from the actual market price of a patent.

Firms mostly seek consultation and other services from Albihns.Zacco with a preventive intention, rather than as a reaction to an already occurred infringement. When infringements and damages occur, the firm is generally already a client of the consultancy firm.

Clients' perception of risks in China

Mr. Aurell sees that the involvement of China in Swedish firms' business models has gradually been gaining in importance, as a result of the increasing maturity of Chinese market. For many years, China has mostly been used as a production site; used for assembly and processing, exporting the finished goods back to Europe or to the United States. Now the Chinese market itself has become interesting, which leads to deeper involvement and thereby increased risk involving intellectual property. Most Swedish firms with manufacturing presence in China are quite aware of what the market demands in regards of protection and risks are, Mr. Aurell says. It is an inherent trait of the Chinese market; high level of involvement in the market forces the firms to learn how the Chinese business environment is composed. He is also convinced that these firms share his attitude, which is that the business environment works differently, but in the end it works.

There are clients that have a strong concern that there is no functioning intellectual property rights system, and that they therefore might lose everything. In those cases Mr. Aurell advises his clients that there is a fully working legal system, although it does not work the same way as in Europe.

Mr. Aurell believes that it is common in all industries, whether it being business-to-consumer or business-to-business, to observe a slightly increased risk related to intellectual property upon entering the Chinese market, although he has no experience of any client choosing not to enter the Chinese market due to fear. There are multiple reasons for this; first, firms seeking consultation with AlbiHns.Zacco have generally already decided on making an entry prior to seeking consultation. Secondly, Mr. Aurell has never himself advised against entering China and the clients follow the advice given by the firm. Finally, if a firm decides to not enter the Chinese market, it is Mr. Aurell's belief that there are many other motives that are of higher priority, and that safety of intellectual property is not likely the determinant cause.

Strategies used by clients

According to Mr. Aurell, all clients of AlbiHns.Zacco do have some kind of intellectual property strategy. However, it differs to what extent the strategy is developed and put in print. For most of the companies this business strategy is official but for some, especially the smaller firms, the strategy may only exist in the head of the CEO.

Mr. Aurell explains that filing for patents goes hand-in-hand with the firm's business strategy. If a firm's strategy involves exporting to, importing from, or producing in China – protection will naturally also be included in the strategy, thus patenting as well.

On the topic of legal actions versus practical business methods Mr. Aurell makes clear that one does not exclude the other. A firm should, and most often do, start by filing for intellectual property rights, be it patents, trademarks or design patents, and when the legal actions have been taken, the firm can

concentrate on exercise more practical protection. Mr. Aurell names two business methods that are especially common:

- The first method is to produce only parts of the product in China, or to distribute the manufacturing to several different manufacturing plants in order to prevent one single plant to attain knowledge to assemble a complete product.
- The second method is to collaborate closely with the customs – the Chinese, the European, and Swedish customs. In Europe it is possible to establish advanced monitoring systems connected to the customs, while the firm performs surveillance of the Chinese customs. This is more common in business-to-consumer industries, when fighting piracy goods and counterfeits.

Mr. Aurell further explains that patents as protection are less discouraging in China compared to Europe, which is demonstrated by the considerably larger amount of deliberate intellectual property infringements observed in China. Firms using patents as a protection strategy in China seldom do it with the intention of receiving enormous compensations for damages, but instead to prevent piracy and illegal distribution. Another reason to use patents is to create obstacles for competitors. Mr. Aurell means that it is not always apparent how patents are stopping the competitors, but it is important to keep them occupied to some extent.

If an infringement has been discovered there are of course legal channels in which the firm can take actions. However, many firms have been unfortunate to experience that when one infringing factory is shut down, a new will appear shortly after on a new location. Therefore, Mr. Aurell explains that there are civil means available that often can be more effective. One option is to focus on the landlords in the troubled area to prevent new factories to establish themselves.

The foreign firm generally discovers infringements itself, often by finding copies of the product. The discoveries are often made in the customs, due to the earlier mentioned collaborations.

4.1.2 Case study – Company A

The interviewee and his background

The interviewee has worked for Company A since 2010 and has previously worked both as a manager within the Swedish banking industry, as well as a trade commissioner. He currently holds the title as Director of Marketing and Sales for the Asia region, which constitutes most Asian countries situated east of India.

Company background

The company in itself is based upon the capitalization of a technology that was invented in the 1970's in Sweden. It got new owners in 2005 and changed the name in the process. It has around 35

employees, of which most are hired for R&D purposes, and had a turnover in excess of 100 million SEK during 2010. It is based in the central parts of Sweden, where it has its production facilities. It also has outsourced production in China, in the Shanghai region, since 2007. The company has a partner who is a major player on the American and Japanese market; a larger American corporation making urinal catheters, using the coating solution provided by the company on its own products. Currently, the company is in the process of gaining product approval in China, in order to initiate sales towards Chinese hospitals in the near future.

The interviewee considers the company's competence in infection prevention, along with the coating know-how, to be the main **core competencies** providing competitiveness. The **technology** consists of a special type of coating that prevents the growth of bacteria or other microbes on the coated surface. Its primary intended use is for coating medical equipment, in order to dramatically reduce the risk of infection. This is made possible through the use of precious metal and thorough research in order to make the coating applicable to different kinds of surfaces.

The company possesses no outspoken additional products or technology, apart from that of which is needed in terms of application and the production of the actual solution containing the coating.

Worth mentioning is that the interviewee also claimed that the product is unique in the way that no reports have ever been made regarding side effects or complications from contact with the coating.

Intellectual property strategies

The company currently holds **globally valid patents** covering the coating process in which the coating is applied to a large number of different materials. This also includes a great number of patents filed in China. However, the **coating solution remains unpatented**; no patent has yet been filed in regards of the formula used to produce the coating solution. The protection that the company has chosen for this formula is to simply shroud it in great secrecy – much like the Coca-Cola recipe – according to the interviewee. He explains this choice is primarily based upon the fact that to be able to patent a formula like this, the company needs to thoroughly describe the recipe for creating the coating solution. By doing this, the formula and associated process become openly available to anyone. And although the patent provides a form of protection, the disclosure of the formula and process opens up the possibility that a competitor can copy the process down to the smallest detail – and then change its own formula and/or process just enough to not be considered as an infringement.

The company has chosen to let all of its **R&D operations remain on Swedish soil**. This is, according to the interviewee, due to the fact that the original inventor of the coating and associated technology is based in Sweden, and is still working for the company. In addition to this, the company has not found any good enough reason to move or expand its R&D operations to another country that trumps the dynamic that has developed between the hired scientists and engineers, and advantages that comes with the vicinity to competence that a tightly knit group provides. Albeit the coating process is taking

place at multiple locations worldwide, currently in Sweden, the United States, and in China, the preparation of the coating solution is **exclusively made in Sweden**. This is of course a part of the secrecy-strategy adopted regarding the contexture of the non-patented formula.

The company has an outspoken strategy to always use **multiple sources of expertise** in regarding any matter when dealing with new partners, clients, or any other actor on a new or existing market. It has in-house lawyers and experts working exclusively with the company and exclusively regarding these matters, performing check-ups on the protection in place and the situation regarding its intellectual property; trademarks, processes, technology, etc. The main reason to this strategy is due to the fact that such a major part of the company's value lies in intellectual property; with a large number of patents in the company portfolio, the reasons to increase protection and play it more safe becomes clear. Especially since these provide protection for a large part of the operations that give the company its competitiveness.

Attitude towards risks in China

The interviewee confirms that the company perceives the risks surrounding operations on the Chinese market to be great and refers to the partnership with a Chinese company, working by contract to apply the special coating to medical equipment, as “**a little scary sometimes**”. This opinion is shared within the company and, although the partner company in question here is the result of a joint venture between a Chinese and an American company, are considering if it is going to change the way it does business with the partner company in order to reduce the risks involved. Further it has not considered acquiring this manufacturer, or any other manufacturer, mostly due to the fact that it wishes to keep the flexibility of a contract manufacturer in terms of output, as well as being able to have multiple production sites.

According to the interviewee, the Chinese market is to be considered “...**one of the riskiest markets in the world** to work and cooperate with partners on...” given the current situation, but that it is also a market with one of the biggest potentials for the future. In general, it is trying to utilize the potential available and reap the benefits of its access to the market, while trying to minimize the risks taken. The interviewee also points out that all the foreign companies currently active in China have experienced some kind of ‘copying’ and have some trouble due to this, but that in nine out of ten cases the revenue generated and the potential of the market offset this. He does however also point out that it is not unlikely that it will reduce its presence in China, shutting down the production in the country completely, when it has a stable, working manufacturing network in other locations. This is mainly in order to decrease the liability in its ‘system’.

Having faced strong competition in terms of funding and research assets for several years on major markets (upwards 15 years on the American and Japanese markets), the company believes that its product and technology will remain **inimitable** by normal competitive means. Looking past that risk,

and focusing on the risk of a situation arising where a competitor or black market/counterfeiting agent acquires the coating solution and uses it without authorization – either on its own or with counseling from a partner company – that risk is considered very small.

This is mainly due to the fact that i) the application process is extremely complicated, to perform it correctly it is necessary to have complete knowledge of how it is done, which makes it hard to transfer the know-how. In addition to this, the company has introduced **contracts and regular check-ups** in order to ensure that no unauthorized use of the coating solution is performed, and that no part of the application process technology or know-how regarding the method is being transferred to third parties. And ii) the coated **medical products are used and purchased by hospitals**, not by the consumers themselves. This means that there is a much higher demand on providing a stable production and delivery; hospitals need to refill their stocks regularly, which means that this unauthorized manufacturer needs to have a regular supply of the coating fluid, only being sold by the company in Sweden (or stolen from a partner company in China). In addition to this, hospitals only buy products from manufacturers that can provide approved products and have a permit to sell this kind of products. All the products needs appropriate approval stamps. Since the hospitals will bear the responsibility of complications that arise from using faulty products, it's in their own interest to buy the real products.

Reasons for an expansion to China

The initial main reason of the company's expansion to China was because of the production aspect; its aim was to find a contract manufacturer that was highly flexible in regards of output capacity, while still providing high quality goods at low prices – one which was found in China. The company later also started moving towards initiating sales and local distribution in China, which has provided yet a reason for its presence in the country.

Strategies used when entering China

Among the strategies that were used when entering China, according the interviewee we can find that the company used the following main modes of action in order to reduce the risks faced when entering a new, in this case risky, market:

- All the contracts written with its distributor, as well as with its manufacturers, have **extensive NDAs and NCAs**. These are all signed before any partnerships are initiated, in conjunction with the evaluation phase of the potential partner.
- The partners used in China was selected based on **recommendations** coming from other, existing, partners in other countries. The location of the partner was of no importance.
- As mentioned in an earlier passage, the company has an outspoken strategy to employ **multiple sources of expertise** in any legal or representative matter. In the case of China it

used, among other external lawyers and specialists, the Swedish Trade council. The company never signs a deal without having second opinions from a multitude of sources within matter expertise and counseling. This approach is used with little care to what the other party represents; distributor and manufacturer alike.

4.1.3 Case study – Company B

The interviewee and his background

The interviewee started working for Company B in 2005, close after the official opening of the company group's first production unit in China. Prior to this, the interviewee had been living in China since 2000. Most of his career has been in the telecommunications industry, with a large Swedish MNC. Besides his work related presence in Sweden and China he is a permanent resident of Australia. He currently holds the title as General Manager of the local company.

Company background

The company is a medium-sized firm with 150 employees, manufacturing ignition systems with focus on engine efficiency. It has been most successful in the supply of electromechanical solutions for the automotive, professional outdoors and forestry machinery industries, and several Swedish MNCs can be found within its customer base. The annual turnover of 2011 for the business area of engine efficiency, the business area to which the company belongs, was in excess of 230 million SEK. The company, which is located in the Jiangsu Province, is a wholly owned subsidiary. The group was founded in 1986, and attained presence on Chinese market in 2005 as a result of the establishment of the company.

The company group has its headquarters in the central parts of Sweden, it employs just over 400 people and had an annual turnover in excess of 600 million SEK in 2011. The group has two main business areas, engine efficiency and renewable energy. While both business areas do have sales activities in China, only the engine efficiency business has any local manufacturing activity there through the company.

The interviewee identifies the company's **core competency** to mainly consist of the know-how possessed by the employees in regards of small and large engine solutions; more specifically the ability to design solutions that makes engines able to meet the different performance and environmental demands set on different markets. He also considers the way in which it is able to use a combination of software and hardware to provide optimal results in that specific situation as one of the primary core competencies. The company is highly reliant on its very skilled engineering department involved in R&D, located in Sweden, in order to do this. The business area of engine efficiency mainly **manufactures optimized ignition systems**; a vital part of the engine that initiates the whole reaction in a combustion engine that makes it run. The fundamental technology behind

ignition systems in general is not a new invention; in fact, it has existed since the year 1780. However, the ignition systems needed today are of a much more advanced construction, and requires plenty of optimization to get the most out of a combustion engine. The strategic focus of the company is to supply systems for more efficient energy usage and eco-friendly technology. It has mostly been focused on traditional fuels, but is currently developing ignition systems to be used with alternative fuels such as ethanol and methane gas. In addition to ignition systems, it also manufactures solenoids for the vehicle and engineering industries.

The company is working with engine optimization, and all projects are developed with the specifications from the customer in mind, for the specific engine that needs to be optimized; thus all manufactured ignition systems are unique. However, as the interviewee puts it: “We do not reinvent the wheel every time...”, instead it has platforms on which it builds customized solutions. As more and more of the employees' line of work becomes digital, the use of platforms are more frequently used, and the major differences are found in the software, and how this is configured.

The goal is to match the product with the expectations of the customers, and that can be a whole new product or enhancements on an existing one.

Intellectual property strategies

The interviewee considers the **intellectual property of the company** to be the technology itself, as well as the knowledge possessed by the employees in terms of engine optimization; and how the company is structured to fully function in different conditions. He also identifies certain in-house developed hardware and software used in manufacturing as an important asset. The local company does not own the products it manufactures; the customer owns the created solution and product. The manufactured product is a made-to-order product where the client holds all rights – including the design concept. Because of this, **the company does not hold any patents**; the company group instead holds these in its patent portfolio. The interviewee does not have any information on what patents the group holds, or if these are used by the local company. The **trademarks** of the company are all completely registered at Chinese authorities; ensuring no one else may use them.

The company group has made a strategic choice to keep all the **R&D in Sweden**. Of course many reasons contribute to this strategy, one being that the strong competence within the company can be found in Sweden, and the company cannot find any benefits associated to relocation to China, or anywhere else at the current stage. It tries to create a value chain in China, and is currently in the industrialization phase, working to secure the inbound local supply chain. The group has had no discussion to relocate or in any way expand R&D activities to the Chinese market. A second reason for keeping its operations in Sweden is that the group has a better overview of, as well as an improved possibility to protect its intellectual property in Sweden. Because of this, the company can focus on manufacturing. Thus, the company **does not work extensively with legal protection**, and if any such

action is undertaken the group controls the activities. Instead it is mainly focused on establishing a strong consciousness within the company to not share information outside the company.

While the company introduces the processes and parts to the customers, it does not share the details with anyone else. The same applies to all testing of customer modifications; all results are kept within the company, not allowing competitors to attain valuable knowledge and know-how of the process. One alternative could be to internalize some of its manufacturers and suppliers; however, the company does not consider this necessary at the moment – current agreements and provided protection are sufficient in its point of view. All Software and other digital assets that the company utilizes include encryption to protect the information.

Attitude towards risks in China

The interviewee acknowledges the risks of infringements threatening the company's intellectual property. Due to this the company is very conscious of which suppliers that are used, how it interacts with suppliers, and what information is being shared. According to the interviewee, **always being conscious** regarding taking necessary steps to protect the company's goods, comes natural when having worked in China for some time, especially with a few years worth of experience from the Chinese market. There are many businesses and individuals in China that are doing really well, a consequence of this is that less genuine operators will try to make a profit out of them, often using less accepted ways. A competitor would be able to produce a copy that will look the same, but the interviewee points out that it will be **hard to make a copy without compromising on quality**. The core competency of the company is essential to produce a copy similar to the original. He does not see this being a great risk, as the company has taken the necessary steps, and kept the core competence in Sweden; thus making it hard to copy anywhere else. Further, the company works closely together with its customers during the development stages. It is however not worried of customers learning too much about the valuable processes, which could then be used by them or be shared with competitors. The interviewee explains that its local customers, although in the local market, consists of global enterprises sharing the same interest; that the information is kept confidential.

The interviewee says that all markets, in Asia and the rest of the world, all have some kind of issues, although perhaps not related to intellectual property. These issues might even be worse than the problems companies have with intellectual property in China. The issues regarding intellectual property rights are of course a bigger problem in China than in Sweden or Australia, the interviewee states. In its totality however, he believes that **China offers more opportunities than risks**; and that is why the company has chosen to expand there. "One simply cannot afford to not operate here."

Reasons for an expansion to China

The company was through decisions assigned by the company group to set up operations in China. The current line of products was at the time produced in Sweden, but when the company had set up in China, those activities were transferred. Today most of these products are produced in China. The aim was also to establish a local supply chain, in order to utilize the cost situation in China, since ignition systems are labor-intensive products. Not only the company's own manufacturing processes are labor-intensive, but the suppliers and their suppliers have labor-intensive production, the interviewee explains.

The good access to lower-cost labor as well as access to a high number of well-educated people is according to the interviewee some of the driving forces to localize the company's needs to the Chinese market. The interviewee points out that it is important for any company operating in China to realize the importance of not being import dependent; that it is not beneficial to import parts, assemble them and export them; "You need to work through each tier".

The dominant part of the company's activities is export-based. However, the company's customers are also to a large extent involved in labor-intensive businesses, and have therefore also moved some of their manufacturing operations to the Chinese market. The expansion was a necessary step in order to stay close to the company's customers, and to be able to serve them in the best possible way. The customer base in China does therefore not consist of domestic companies, but rather foreign suppliers that themselves export most of their products.

Strategies used when entering China

From the interview a few strategic actions taken by the company in order to reduce risks on the Chinese market can be identified:

- All employees sign NDAs, and the introductory phase for any hired employee includes **training and education** in company procedures and what is not to be shared with outside parties. The suppliers also all have to sign **NDAs**, as well as **NCA**s. The interviewee sees it as prerequisite to at all do business, and they are all signed at the start of discussions.
- The company has distributed its external production to **several different contract manufacturers** in order to make sure that no supplier receives enough information to get insight in the production of a finished system. The interviewee does not know if this is a strategy adopted by the whole group, but he considers it being a common practice in the industry.
- The company is quite **closely involved with its suppliers and contract manufacturers** in China. It provides the processes, and allows its contract manufacturers to produce the tools later used in order to produce parts. This is mostly due to the company's experience that

letting them become experts in producing the components leads them to be able to give useful input, feedback and critic which later can be applied in the design phase of new solutions. The interviewee explains that the company does not try to find the perfect supplier; it rather finds one with potential and develops that one to meet the expectations. To ensure that the partners do not abuse this, the company tries to work closely with them; therefore all partners are either in the Jiangsu Province, the province in which the company is located, or in the neighbor province Zhejiang, south of Jiangsu. The company considers having a close dialog important, and to be able to visit them in person on a regular basis. The location was chosen due to its good access to a strong potential supplier base, as well as good access to ports and existing contacts.

- The company tries to keep all **monitoring and selection of suppliers** internally, and it has a structured process on handling these matters. However, in the end the interviewee as General manager makes a decision based the financial- and performance records, but also based on what he feels is the best for the company. External consultants have been used in some occasions, but then merely to point the company in a direction, leaving the company to explore the opportunity based on the decision it takes.

4.1.4 Case study – Company C

The interviewee and his background

The interviewee has worked for Company C since January 2012 and has previously worked as Supplier quality assurance engineer, and as Quality manager – both positions in internationally active companies – and is currently holding the position of Purchasing manager. He works with partners and suppliers in multiple countries all over the world, with a main focus on European partners and suppliers.

Company background

The company was established in 1995 with the main purpose of performing the capitalization of a number of unique technologies comprised into a single product. The company has around 30 employees that generated a turnover in excess of 75 million SEK during 2010. It is based in the southern parts of Sweden, with fully localized production and R&D being performed in-house. In terms of sales organization it has a regional retail division, and retail agents and fitters all over the world.

The interviewee considers the company's competence in regards of fire suppression using a unique method involving a specially designed fog, and its related technologies, being the **core competencies** of the company. The **product line** is based on a range of configurations of a single main idea; fire suppression/extinguishing systems for closed compartments, such as engine compartments on buses,

construction equipment, boats, as well as for industrial motorized equipment, and any other situation where a rapid suppression of fire is needed in a confined space. The product is in turn based on a number of technologies, such as the special composition of the extinguishing liquid, the triggering system that is based on a physical burst release instead of using sensors, the pressurized cylinders containing the liquid, and the spray nozzles that creates the fog that attacks the three pillars of a fire; oxygen, heat, and oxidizing material, thereby putting the fire out quickly.

Intellectual property strategies

The company currently holds **globally valid patents**, with a focus on the markets where the company has sales and operations, as well as in several pre-emptive cases. In China however, it does not hold any patents. Every part made by the company that is unique, and not readily available as an off-the-shelf product, has been **patented and is produced locally in Sweden**. The rest of the needed parts are OEM products purchased from all over Europe, as well as from China. As a part of the company guidelines, all contracts signed with suppliers, agents, and other partners always include **NDA**s and **NCA**s. This procedure has not yet been implemented with the employee contracts, but is scheduled to be introduced in those as well in the near future.

All of the company's **production is done in Sweden**, with a small exception in a local production on the North American market. This is solely due to the legal situation in the United States regarding equipment that is intended to be fitted inside public vehicles. The regulations state that this kind of equipment demands a local content requirement of 65 percent, which is circumvented by shipping the parts at a discounted rate from the Swedish company to the North American affiliate, where it is then assembled and sold. One and a half full-time positions, focusing exclusively on improving the technology used and its application, perform all the **R&D performed in the company in-house in Sweden**.

Attitude towards risks in China

Since the product in itself, and its technologies, are not very complicated, a competitor could copy the essential parts and use it to his own gain. The company has already experienced patent infringements and disputes in regards of the technology used, in some occurrences with the infringing party even trying to acquire a patent themselves for the imitated technology. However, it has great confidence in winning in the countries where this has occurred, but is unsure if the situation would be the same in China – or if the system in regards of rights would provide any protection at all.

Reasons for avoiding an expansion to China

According to the interviewee, the main reason for not entering the Chinese market is because of the risk of competitors copying the product and technologies being all too high. He adds that it would be reasonable for the company to have some of the production relocated to China, and this might be a

move that is decided on in the future, but at this time the management says no. No part of the production is currently being considered to be transferred to China, not even simpler stages and components of the production. OEM products are currently being purchased from China, but an acquisition of these companies has never been considered, partly because the company's suppliers are generally world leading in their field and perhaps somewhat out of reach.

Strategies used for international expansion

In terms of strategies and tools used on the Chinese market, the interviewee adds that no benchmarking or investigation has been made on the market and the business climate of China. No risk analysis has been performed, and no expertise has been brought in on the subject. It seems as if the 'gut-feeling' of the company's management is one of the primary reasons why China has been avoided.

The company has expanded its reach to selling its equipment through a retail division aimed at southern Sweden in conjunction with a large number of agents selling and installing the equipment worldwide. The company is present in most countries, and on all continents; all of Europe, including the Eastern European countries, as well as India, all of Southeast Asia, Japan (albeit somewhat limited since the earthquake and the following tsunami that occurred on 3/11 2011), Australia, New Zealand, South Africa, Northern Africa, South America, and North America. The only countries the company has decided on not entering are the countries of former Soviet Russia and China; former Soviet Russia because of the notoriously slow payments, as experienced by employees in earlier employments, and China because of its insecurities in the intellectual property department, says the interviewee.

4.2 Secondary empirical data

This section will present results from a few surveys found regarding firms' attitudes and the perceived risks involving intellectual property in China. As mentioned more thoroughly in the introduction of the theoretical framework, little research has been done regarding what strategies that are used by companies in order to protect intellectual property.

4.2.1 Geographical differences within China

As China is a very large country, regions differ from one another in regards of the risk of intellectual property theft. Studies performed by the United States International Trade Commission made on how American businesses rank different geographical locations in China shows a very diverse image of the situation (USITC, 2011). Different regions are ranked differently depending on the surveyed industry. The Shanghai region was rated among the best in the information services, other services, and transportation manufacturing sectors, but was rated the worst in high technology and heavy manufacturing sectors. Beijing was rated the opposite; being rated the best in high technology and heavy manufacturing sectors. Guangdong, the third big region for FDI, was generally ranked low, except in the consumer goods manufacturing sector. The survey however mentions that the results may have been affected by that few firms have experience from other regions (USITC, 2011). Depending on which industry the firm is in, and where it chooses to locate its business, the risk of intellectual property infringement will likely vary.

4.2.2 Attitude survey on Swedish firms in China

In 2010, the Swedish embassy in Beijing made a survey with Swedish firms in China, regarding the perceived situation regarding intellectual property rights in China. A third of the respondents experienced that "...their business was negatively affected by intellectual property rights infringement..." (Embassy of Sweden, 2012, p.13). The two biggest problems experienced in China by Swedish firms were copyright and trademark infringements (Embassy of Sweden, 2011).

5. Analysis

This analysis will cover the firms' attitudes towards the Chinese market, and the risk that they perceive. It will also compare the information from the empirical study with the theoretical framework, from the perspective of the IP protection barrier model presented in *section 3.3*.

One aspect to bear in mind, as pointed out by Mr. Henrik Aurell of Albihns.Zacco, is that the intellectual property strategies of a firm is generally developed to different degrees, depending on its reliance on intellectual property for the firm's operations, as well as on its experience on foreign markets.

5.1 Attitudes and perceived risk

Company A identifies partners and suppliers as the component that provides the largest risk to its intellectual property, expressing the collaboration as "...a little scary sometimes.". The company considers changing the way it does business with the partner company, and may reduce its presence in China in order to decrease liability as it establishes production elsewhere. According to Mr. Aurell some of his clients perceive the risk as devastating; a fear based on the belief that a functioning intellectual property rights infrastructure is non-existing on the Chinese market. It is difficult to interpret a common view of Mr. Aurell's clients. However, the fact that the interviewee states that he needs to inform clients that China has a working intellectual property system might signal that there is an existing worry among the clients, but to a for him unknown extent. Another notable mention might be that the clients do not file for patents in order to have a full legal protection, but rather to provide some kind of barrier, which might imply that there is no full trust in the Chinese intellectual property rights infrastructure.

Company B considers the issues regarding intellectual property rights to be more prominent in China than in Sweden and Australia, but perceives the risks directly faced by the company as low. This is primarily due to the fact that core competencies of the company are kept in Sweden.

A survey performed by the Swedish Embassy in Beijing showed that firms find the Chinese market to pose a threat to their intellectual property. The information given is not sufficient to draw any other conclusions, as no further explanation to the expression "...their business was negatively affected..."(Embassy of Sweden, 2012, p.13), is provided.

5.1.1 Nature of the industry

In the case of Company A it becomes apparent that the nature of the industry, which a firm operates in will affect the risk it perceives. The consumers of the medical equipment are hospitals, and hospitals are heavily regulated to only buy approved products from authorized manufacturers. Therefore, risk associated with issues such as trademark infringement is offset; plain copies of the product will not

find a buyer. If the nature of the industry would had been different the same issue would have another risk associated with it. As one of the strengths of the technology of Company A is that it is unique in the way that no report of any side effects or complications. A competitor selling bad quality copies using Company A's trademark could create severe damage to the firm.

5.1.2 The unique case of Company C

Mr. Aurell recalls to never having experienced any client making the decision to not enter the Chinese market due to risks involving intellectual property. He provides the possible explanation that firms do not approach his company for consultation unless they have already decided to enter the market. He continues to explain that he does not believe risks involving intellectual property to be the determining factor if a firm decides to not proceed with an expansion. The case of Company C however, shows that intellectual property risks can be a directly determining factor to refrain from entering the Chinese market. The risk perceived by the company does not originate from any investigation or evaluation of the situation; instead it is based on the intuition of the management. Company C relies on its unique technologies and applications to remain competitive. The same technology that the company is dependent of is considered relatively easily copied and imitated, which it has previously experienced in terms of patent infringements. Infringements that are being contested and, according to the company, will be won. The company also finds the Chinese intellectual property rights system unreliable, and would not trust it to properly deal with the problem if an infringement would occur. This is undoubtedly a determining factor when choosing countries to expand to. A notable aspect however, is that this perceived risk in the case of the Chinese market is not based on any thorough screening or evaluation, but on the intuition of the management.

5.1.3 Benefits and risks

Company A is outspoken in regards of the risks perceived, but the company is also clear on the point that it currently considers the benefits outweighing the risks in regards of operating on the Chinese market. According to the interviewee of Company A, nine out of ten companies share this opinion. The interviewee of Company B shares this view as well, stating: "One simply cannot afford to not operate here". However, in some cases the risks are outweighing the benefits. While Company C acknowledges that it would benefit from expanding to the Chinese market in terms of production costs and capacity, it has also found great risks, which currently are too great to bear.

5.1.4 Time of expansion

The two companies that have entered the Chinese market entered around the same period of time; Company A in 2007, and Company B in 2005. Although the Chinese market is developing rapidly, it is not unlikely that the Chinese market provided similar conditions at the time of their entrance.

Company C has decided to remain operating outside the Chinese market, and does not currently discuss the matter of an expansion to the market.

5.1.5 The geographical aspect

Neither Company A, nor Company B chose to locate their operations in China in the Shanghai and Jiangsu provinces due to considerations regarding the available intellectual property rights infrastructure. According to the survey performed by the United States International Trade Commission with businesses from the United States, the Shanghai region was rated worst by high technology and heavy manufacturing industries.

While it is impossible to draw any conclusions regarding Company A and B from this, it should be noted that the intellectual property rights infrastructure in this region, which by some are regarded as providing unsatisfactory protection, might affect how these companies perceive the risk.

5.2 Implementing the IP protection barrier model

5.2.1 Intra-firm

Level of technology transfer

None of the respondents state that they have any form of R&D being performed outside of their home country, Sweden. The reasons given for this decision differ between the companies, but there is a clear consensus of 'keeping the competence at home'. Company A states that the main reason remaining in Sweden is because of the already assembled close-knit group of researchers working for the company. The main focus of Company B is to capitalize on the R&D performed by its company group on the Chinese market, as it was the purpose of the expansion from the start. Company C has chosen to keep the R&D in Sweden mostly due to the fact that it is also where its production resides, making the process of trying new discoveries more streamlined.

In regards of actual technology transfer, Companies A and C have clearly taken a stance of keeping their core technologies in their home market. Company A produces all the coating solution used for coating products in facilities on foreign markets in Sweden, while transferring the very dependent coating process technology and knowledge. Company C manufactures all its products in Sweden, while letting agents manage sales and peripheral technology in the fitting of products in the appropriate application based on the client's demands.

5.2.2 Competitors

Imitation barriers with occasional added complexity

In regards of imitation barriers we can see that Company A has chosen to provide a great deal of legal barriers, codifying the application process of the coating and filing patents to protect it in markets all over the world, while also adding a large amount of complexity by keeping the formula for the coating solution completely ambiguous – even keeping it secret. The two technologies are obviously completely dependent on each other, making it hard for any (potential) competitor to copy the final product. Company B has chosen to keep the main part of its intellectual property ambiguous, within the know-how of the employees. This is partly due to the kind of business in which it operates, having unique projects with every assignment received from a customer, but also because this kind of know-how is relatively hard to codify and protect legally. Company B supplements this barrier with an amount of its base knowledge continuously being codified as the employees' line of work becomes increasingly digitalized, thereby making it possible to protect legally. Company C has chosen a fully codified, legally protected approach; patenting every part of the unique technology created and its application, in every market in which the company's products are present, including prospective markets.

Albihns.Zacco states that the patenting of technology and knowledge is a natural part of the intellectual property strategy of most companies, seeing as the legal protection usually comes first, before other practical strategies. Mr. Aurell also states that patents are not always filed in order to provide a complete legal protection of an invention, but rather to provide some kind of barrier to keep the competition occupied. In markets like the Chinese, where firms perceive a patent to have a less deterring effect, the patent is utilized more as a strategic competition tool.

5.2.3 Suppliers & partners

Vertical or horizontal integration

Mr. Aurell states that distributing the production processes among multiple partners and suppliers is very common among firms on the Chinese market, and dramatically reduces the risk involved with dealing with external parties, since it significantly increases the difficulty to gain insight in the complete production process for any one supplier or partner. This advice has essentially only been implemented at Company B, using multiple suppliers for the components that are not produced in-house. It also strives to create close relationships to all its suppliers and partners, making it possible to educate them, shape them, so that they later on can provide valuable input back to the company. This approach connects closely to horizontal integration, where it is believed that the company will benefit from increased efficiency with its partners. It is however important to keep in mind that there are risks involved with educating partners or suppliers, especially if they gain too much insight in the

company's processes. A partner or supplier can always become a competitor – a risk that needs to be evaluated in situations where close relationships are cultivated.

The advice regarding distributed production processes is less applicable to the two other companies, mostly due to their production arrangements. Company A only has in-house production at its location in Sweden, this is of course related to the fact that the production process of its coating formula is shrouded in secrecy, and therefore ill-fitted to be performed by any external partner or supplier. In order to provide a more flexible production capacity it has decided to utilize an external partner to assist in some parts of the production process that does not involve the preparation of coating solution. The production process consists of relatively few steps, leaving the distribution of said process on different suppliers unnecessary. As any use of the coating solution is regulated through the supply from Sweden, unauthorized use is unlikely. Company C has, with one exception, located all its production to Sweden. The exception is an associate company in the United States, this is however only due to the local component requirements put in place by the United States government in regards of public transportation vehicles – it is not in any way related to distribution or other aspects. Companies A and C could be considered having mostly vertically integrated organizations.

Internalization

None of the companies are considering an acquisition of any partner or supplier, internalizing its processes. The main reason for Company A's expansion to China was the flexibility offered in regards of production by its supplier/partner, a quality that likely would be lost in conjunction with an internalization. Company C has to a great extent already internalized most of its processes, with the exception of production of off-the-shelf components – which it has no intention of internalizing.

Screening and due diligence

All of the companies perform thorough screenings, using due diligence investigations, before entering any kind of arrangement with a potential partner or supplier. This is an important aspect of the contract-based barrier (S&P barrier) of the IP protection barrier model, used in order to lay the foundation for future contracts and agreements.

Contracts and agreements

The use of contracts and agreements plays a big role in all of the interviewed companies, with NDAs and NCAs being the ones specifically mentioned by the interviewees. Other types do exist, but was not mentioned during the interviews. Company A states that due to the importance of its intellectual property, and the vital part of its business that it constitutes, all agreements are thoroughly reviewed by multiple consultants from different agencies. This is a way to safeguard against irregularities and making sure that all contracts and agreements are legally binding in the way intended.

5.2.4 Internal

Screening

None of the interviewed companies perform background checks when hiring new people, exposing them to a potential risk of having less faithful employees in the terms of keeping intellectual property away from the hands of competitors.

Contracts and agreements

Companies A and B have NDAs and NCAs in place with all of its employees, signed at the time of hiring. In addition to this, Company B educates its employees regarding company guidelines for intellectual property handling as a part of its employee introduction phase. Company C states that due to the fact that the company is a relatively young organization, which has recently grown rapidly, it lags behind in terms of organizational rules, regulations, and guidelines. As a result of this, no NDAs or NCAs have been signed with the employees, but that this is due for implementation in the near future.

5.2.5 Comparison with suggested intellectual property strategies

In *section 3.2*, a compilation was created from what existing publications by consultants and attorneys suggest firms should do in order to protect its intellectual property. The strategies of Companies A, B, and C are to a large extent corresponding with what is suggested in this compilation. There are however a few strategies that some of the companies have not yet adopted, which are suggested in the gathered publications. A firm should always file for protection for all technologies; not only core technologies, but peripheral technologies as well. Company B does not hold any patents; based on the perception that it does not have any technologies or processes worth legal protection. However, based on the suggestions stated in the compilation, it should seriously reconsider this perception. Company C has not filed for any patents in China, due to its lack of presence in the local market. It could be argued that it has possibly neglected the risks of bad faith filing, the first-to-file approach practiced in China, as well as the fact that no foreign patents provide any protection in China. A Chinese firm might file an application for patenting the technology of Company C, in order to use it to its own gain, or to receive a hefty settlement at the time of Company C's entry to the local market. As mentioned earlier however, on a whole the strategies correspond well to the ones suggested. Company A has chosen to keep some of the know-how separate from the final product, which is also in line with the imitation barriers taken into account in the IP protection barrier model. Company B has adopted the strategy to distribute its production processes and technology information with multiple partners and suppliers. Company C has, with the exception of China, adopted a full patent protection worldwide. All three companies also utilize information policies, mainly present in the form of NDAs and NCAs, and provide its suppliers with information on a need-to-know basis.

5.3 Further model modification

On the whole, the model has covered the majority of the aspects that concern the companies' strategies. We have however identified two additional aspects that might need to be taken into consideration. See *figure 5.1* for the graphical representation of the changes incorporated into the model; mode of entry and local governments.

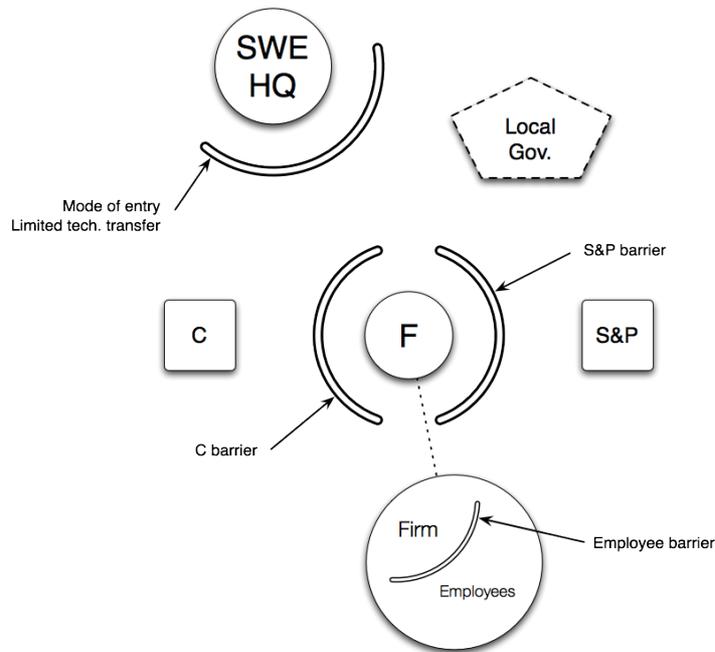


Figure 5.1 The Modified IP protection barrier model, elaborated by the authors

5.3.1 Mode of entry

The chosen mode of entry is often overlooked in the aspect of intellectual property protection, leaving the choice of mode to be decided by other strategic factors, and is to some extent covered by other aspects of the model. However, the decision behind the mode of entry essentially lays the foundation for all further actions a firm will take in order to protect its intellectual property on the new market. In the case of Company C, the chosen mode of entry was to refrain from entering the Chinese market at all. Companies A and B have chosen different modes of entry; forcing them to act against different threats and adopt different strategies. Mode of entry is to be considered as a part of the protection for the firm's headquarters in the home market.

5.3.2 Local governments

In the introduction of this study we refer to situations where the local and national protectionism of Chinese provinces might affect local governments and officials; making them exercise their power to force foreign firms to reveal classified information in order to favor the local competition. Although this might not affect all foreign entrants on the local market, and has not been experienced by any of

the interviewed companies, it causes a great threat to any firm encountering the phenomenon. A firm therefore needs take this possibility into account in any situation involving local officials or local government, and proceed with caution when dealing with sensitive information in official matters. As a firm cannot simply ignore demands of governments, the only strategy to protect itself from this, in our opinion, is to limit the level of technology transfer to the new market. Our intention is not to label the government as an entity that is either hostile or friendly, but rather as a force that can significantly affect the situation for the firm. We have therefore found it natural to assign the local government component a different representation than that of suppliers and partners, and competitors – while also not having any separate barrier for protection.

5.4 Compare results to existing research

In order to provide further insight into the subject at hand, and to indicate the field and scope of our study, it is desirable to compare the results presented from this study with the relevant existing research available. However, the situation presented to us is one where available existing research on the subject is extremely limited. This has been further confirmed through a dialogue with expertise on the subject (Petrusson, 2012), which has previously been covered in *chapter 3*.

The limited research available on the subject consists of studies with significantly different aims; studies on international (non-Swedish) MNCs in the multi-billion dollar turnover segment operating in the retail sector, studies providing descriptions of the actions available to protect intellectual property, and how to pursue infringements in a foreign market, to name a few.

None of the existing research available on the subject has been found similar enough to be applicable to our field of study; Swedish technology-reliant business-to-business manufacturing SMEs, not operating in the retail sector.

An evaluation of the strategies and methods chosen by the interviewed companies have been performed using a compilation of the available publications on the topic of existing strategies and methods for a company to protect intellectual property. This evaluation can be found in *section 5.2*.

A relevant comparison to existing research regarding the strategies adopted by companies, as well as the perceived risk within companies, in regards of intellectual property protection can however unfortunately not be performed.

6. Conclusion

The purpose of this study was to gain a better understanding of the strategies used by the selected companies, as well as their attitudes towards the Chinese market and the risks associated with a presence on the local market in regards of intellectual property. This has been done with two main research questions in mind: i) “How do the examined SMEs perceive the risks surrounding intellectual property in the Chinese market?”, and ii) “What strategies have the examined SMEs adopted in order to protect their intellectual property?”.

6.1 How do the examined SMEs perceive the risks surrounding intellectual property in the Chinese market?

Drawing any simplified conclusions on the perceived risk poses major challenge, as all companies are in different situations given the stage of their integration with the market, and are affected by their management's own personal experiences and opinions. In order to get a clearer understanding of a company's shared perceived risk it is necessary to perform extensive interviews with a large number of the firm's employees.

In spite of this problem, we did however manage to find some interesting results. All of the interviewed companies acknowledge that the Chinese market provides an increased risk to their intellectual property; although it is somewhat hard to concretize it in order to estimate its impact. The companies that are more technology-reliant, and use patents as protection, perceive the risks to be greater. This leads us to believe that the Chinese intellectual property rights infrastructure is a strongly contributing factor to the perceived risk. Another contributing variable seems to be how content a firm is with the protective measures taken and the strategies adopted. A third possible contributing factor to the perceived risk is the nature of the industry; some industries have natural barriers protecting it, making it less exposed to risk. A shared view in all the interviewed companies is that they consider themselves weighing the benefits associated to the Chinese market against the risks involved. One company is of the opinion that the benefits clearly outweighs the risks, one is more moderate in its statements but still considers the benefits to be far too great to not tap into the market, while one identifies the risks to simply be of such magnitude that any involvement is unthinkable.

6.2 What strategies have the examined SMEs adopted in order to protect their intellectual property?

In our study we used the relevant aspects found on the subject of strategies for protecting intellectual property and created the IP protection barrier model (*see figure 5.1*), which summarizes the relevant operators on market; making it possible to summarize the different defensive actions taken, strategies adopted, and methods used for protection in a fashion that is easy to grasp, in the form of protective barriers. Using this while studying the companies we identified several actions and decisions taken.

The first decision the companies have been needed to make is which mode of entry to choose. One of the interviewed companies chose to refrain from entering the Chinese market at all, while the ones that did enter it either principally used it for externalized production with a future intent of sales operations on the local market, or made green field investments with in-house production for locally available customers. These two companies have chosen to protect themselves by regulating the level of technology transferred to market, transferring only peripheral technology dependent on other technologies of the firm - keeping core technology in the home country.

Following the choice regarding mode of entry, we have found that the two companies entering the Chinese market chose to outsource less advanced parts of the production process to external suppliers and partners in order to achieve a greater flexibility in their production. However, any intellectual property-intensive parts of the production process are generally kept in a vertically integrated organization structure, with this kind of production held in-house. None of the interviewed companies have chosen to internalize any processes provided by external firms in order to decrease risk, as suggested in publications.

After this, firms take further strategic defensive action; screening and due diligence investigations are among the most common, being performed by all of the interviewed companies prior to initiating any form of partnership with an external operator. This is considered an important part of the process, as it lays the foundation for any future contracts and agreements - which are a necessity for doing business, according to the interviewed companies. The most commonly mentioned agreements being NDAs and NCAs, which are considered an essential part of any signed contract.

Further, the companies have implemented legal barriers through the use of patents, or barriers coming from ambiguity regarding some of the involved technology and processes. Two of the companies have implemented both types of barriers. This increases the total level of protection since a potential competitor must commit an infringement while also manage to misappropriate the non-codified information from its target in order to gain full insight. One of these companies also has the possibility to patent some of its processes and products, but have chosen not to. This is more common in a situation where the invention either is relatively hard to codify, or when the filing of an application would mean that the invention is exposed to more risk than if it were to remain a secret.

To conclude, all of the interviewed companies have implemented the suggested methods and strategies recommended in available publications to some extent. However, using the IP protection barrier model it is possible to identify a great number of actions available to the companies in order to further improve their protection, this applies both to the companies already present in the Chinese market, but also for the company that has chosen to not enter the market at this time.

7. Suggestions for further research

While performing this study, we have found a great number of topics for further research, some of which we would like to include as suggestions in this section.

There are two main, quite different, approaches that we find especially interesting;

- A quantitative study on the strategies and methods employed by foreign, technology-intensive companies entering the Chinese market. This could utilize and build upon the IP protection barrier model of this study, and be aimed at finding similarities and patterns regarding what actions are being taken.
- An extensive qualitative study of the perception in regards of intellectual property among the individuals of a single firm. The reason for this is mainly due to the possible bias when basing the shared view on the matter within the firm on a single representative. Looking closer at how the personal opinions of the employees and management affect the chosen strategies within the firm, as well as the shared perception of risk

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9. Appendix

9.1 Intellectual property concepts

Intellectual property is an intangible asset by nature, and is in itself a very broad concept, thus it also has numerous definitions. We have chosen to foremost use the two largest international organizations that deal with intellectual property, WTO, and the United Nation's agency World Intellectual Property Organization (WIPO). The traditional definition includes three areas under its name; patents, copyright and trademarks (Mertha, 2005). However, today it is not uncommon to rather divide it into two main segments; copyright and industrial property.

9.1.1 Copyright

Copyright is perhaps the kind of intellectual property best known to the general public. In many languages is known as an "author's rights" (WIPO, 2005, a), hinting at how it protects a literary or artistic work from unauthorized duplications, adaptations, and modifications. Originally copyright only protected traditional literary and artistic works, which rarely are relevant to industrial companies. But along with the emergence of computers, software, and code now also falls under the protection of copyright, and thus became applicable for companies in the software producing business (Mertha, 2005).

9.1.2 Industrial property

Industrial property is the collective term for all intellectual property other than copyright. The term includes patents and trademarks but is much broader; covering any intellectual property possessed by firms (WIPO, 2005, a). The TRIPS, established by the WTO, includes a list of what constitutes intellectual property. While this list also covers matters that are related to copyright, the rest of the points would fall under industrial property. The list states the types of intellectual property as follows (WTO, 1994):

- Copyright and Related rights
- Trademarks
- Geographical indications
- Industrial designs
- Patents
- Layout-designs ('Topographies') of integrated circuits
- Undisclosed information

9.1.3 Trademarks

Trademarks are signs or characteristic marks that are used to identify a company's product or service from another product or service. This includes names, logos, pictures, letters, colors, or a combination of these. Trademarks provide differentiation from other firms and hold a lot of the firm's public identity (Maskus, 2000). Geographical indications are of a related kind, where the origin of a product could be used as a trademark and should therefore not be used falsely. This is especially common in sparkling wines; where for example the name 'Champagne' can only be used on the label when the origin of the sparkling wine actually is the region of Champagne.

9.1.4 Industrial design

Industrial design has a lot in common with trademarks. Not unlike a trademark it is used to differentiate a company's product from that of other companies, but it needs to be produced by industrial means, thus called 'industrial'. Aesthetics are not the only condition needed to be met in order to be classified as industrial design; it also needs to have utility, making it different from copyright (WIPO, 2005, b).

9.1.5 Patents

Patents are protection for inventors, individuals as well as enterprises, giving them exclusivity rights for a limited amount of time for a newly invented product, technology, or process. For companies where R&D is a substantial part of the budget the need to file patents for their inventions is of great importance. Patents can be used in any industry or business, although some industries use them in a much larger extent than others, as pointed out by Maskus (2000). Enterprises within industries in areas such as pharmaceuticals, agricultural and industrial chemicals, and biotechnology perceive patents as more important, stating that they are critical to capture the returns created by all inventions, no matter how simple or basic it might be.

9.1.6 Integrated circuits

Integrated circuits and semiconductors are essential parts to most electronic products, the application of which are anything ranging from watches to cars, and the development of new and better integrated circuits is in high demand as smaller and smarter circuits mean less material used and less space needed; giving consumers smarter, faster, lighter, and smaller devices. A competitor only needs to gain access to photographs of the layers to be able to copy the circuit boards, making the companies in these industries highly exposed to copying. This combined with high development costs leave the firms vulnerable. The protection situation regarding this kind of products are complicated, mainly because the needed protection differs from what is offered through patents as it is often not new inventions, it does not count as industrial design as it has no aesthetic function, and therefore cannot

be protected by these means; hence the layout design or topographies of circuit boards has gained their own regulations. (WIPO, 2005, a)

9.1.7 Undisclosed information

Under the definition of intellectual property, the TRIPS also count undisclosed information, which is essentially trade secrets that has commercial value for the firm and information that the firm has tried to keep secret (WTO, 1994). This is a step taken to prevent unfair business.

9.1.8 Further definition

The United Nations' agency WIPO goes further to include "...all other rights resulting from intellectual activity in the industrial, scientific, literary or artistic fields." (WIPO, 2005, b) under the definition of intellectual property rights. The definitions in place from the TRIPS, along with the additional from WIPO, do not make a very narrow definition. However, this appendix should provide more clarity to the wide concept of intellectual property