MASTER

The effects of the unitary patent on innovative small and medium enterprises in the Netherlands

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The effects of the Unitary Patent on innovative Small and Medium Enterprises in the Netherlands

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Summary
The goal of this master thesis was to investigate the effects of the Unitary Patent on innovative Small and Medium Enterprises (SME’s) in the Netherlands. The positive expectations outlined by the European Commission had received some serious critique from academics and practitioners. This thesis has tried to combine figures of patenting behavior by SME’s with the proposals for the Unitary Patent. The results of a literature study were empirically validated with interviews with SME’s and patent experts.

The European Patent system is currently fragmented. After a central application procedure in which a patent can be granted, the patentee has to validate the patent in each separate country. The validation, translation and maintenance costs can be very significant if a patentee validates in various countries. Especially compared to countries as the USA and Japan the European patent system is very expensive. Furthermore if a patentee wants to defend its patent in court he has to do so in every country in which the patent is valid. This increases the costs of litigation and also adds uncertainty as the courts can take different decisions. The Unitary Patent Package provides a patent that is valid in 24 countries of the European Union in one procedure. No validations or translation are necessary for the patent to be valid. The patent can be enforced at one Unified Patent Court (UPC). The decisions of this court are valid across all 24 participating states. According to the European Commission this should be a boost for innovation in Europe, especially for SME’s.

To analyze the costs of patenting by SME’s a broad perspective on costs is taken. For this analysis the transaction cost theory is transformed to be useful for patenting behavior. This theory, normally used to explain make-or-buy decisions, is altered with the use of literature pointing at the costs that a patentee can face. This theory helps to understand the changes that the Unitary Patent brings in the decision to patent for SME’s. Such a broad theory on patent costs was not found in the literature and could add to the understanding of patenting behavior by SME’s but also larger corporations. Important factor here was the split between direct and indirect costs. This division makes clear that patenting behavior is formed not only by monetary costs but that the behavior of other parties also influences this behavior.

A literature study was performed and pointed out that the general expectations about the Unitary Patent were positive. Academics and practitioners feel that a European Unitary Patent is necessary for the patent system to compete for example with the American and Japanese system. The cost of applying for a patent in Europe is too high for the market that the patent represents. Enforcing a patent in Europe in multiple countries is also a costly and complex undertaking as this has to happen at various national courts. This brings additional costs but also uncertainty as the jurisprudence is not uniform. The Unitary Patent could bring relief on these issues as translations costs almost disappear and the renewal fees are limited to the costs of a few countries. Furthermore the UPC creates the option for central and uniform patent litigation. Academics and stakeholders however do not agree on the level of which the Unitary Patent Package could bring relief in these matters. First there are issues with the legal basis for the regulations. The basis of
enhanced cooperation is heavily discussed. A case on this is still pending at the European Court of Justice (ECJ). From the result of a previous case showed that the ECJ is not likely to stop the Unitary Patent. Second, stakeholders mostly show their concerns about the issue of bifurcation and the possible increase in the numbers of Non-Practicing Entities (NPE’s) in Europe. Lastly there was a critique on positive expectations portrayed by the European Commission, which according to some do not display the use of patents in daily practice.

The empirical validation, through a secondary sources review and 20 interviews with SME’s and patent experts, showed that the expected decrease in direct costs only applies to very specific sources and is in general very small. The patenting behavior of SME’s and companies make that the Unitary Patent does not bring a lot of relief in the direct costs of applying for a patent. This is mainly because there are fixed costs, such as application and patent attorney costs, which do not change but also because most companies already use a cost effective way of patenting. The biggest improvement is to be expected in the fees that have to be paid to the patent attorney for paying the renewal fees in several countries. As these renewal fees only have to be paid to the European Patent Office (EPO), a patent attorney can charge less to his clients. Big changes in the indirect costs are also not to be expected. The increased number of validations of European patents in the Netherlands will probably not cause many problems as SME’s think the most valuable patents are already validated. Changes in the litigation system do not affect them very much either. The number of patent cases involving SME’s is low and cases across multiple jurisdictions with SME’s are rare. Patent litigation is experienced by SME’s as very expensive and to be avoided if possible. The UPC is not likely to become much cheaper than the Dutch judiciary system and will not lure SME’s into the system.

The results and analysis show that although that the potential benefits of the Unitary Patent are estimated to be very small, the SME’s indicated that they are likely to choose for the Unitary Patent. The most important improvement is the increased ratio between the investment and geographical and market scope of the patent. In the analysis three types are identified for which each of the potential benefits of the Unitary Patents are discussed. The SME’s in the 3 groups, each for their own reasons, were willing to invest slightly more than their current European patents to gain a much larger area of protection. Indirect costs play a much smaller role in the decision in the choice between a classical European patent and a Unitary Patent.

In conclusion this thesis expects that the Unitary Patent is widely adopted by SME’s. The adoption of the system is crucial for the success of the system. The system will face some problems in the beginning but a wide adaption will make sure that the users can correct the system in the first years. The Unitary Patent is expected to turn out positively but whether it will provide a boost for innovation among SME’s is very doubtful.
Preface

Writing a thesis is not as easy as it seems in advance. Choose a subject, do a literature study, perform some research and write down the results, sounds like an easy job. The master thesis is however far more than that. The master thesis could rather be described as an exploration in doing research and finding your strengths and weaknesses in the process. Although the bachelor and master in innovation sciences prepares you on a lot of aspects of doing research, doing a research on your own for a longer time is a new experience to me. The master thesis holds a lot of aspects of doing research that were unfamiliar. How do I select my cases, what is the best structure for my interviews, how do I retrieve the information I want from the participants etc. These aspects have been discussed in theory but in practice these things do not turn to be as easy as they would seem. Writing a thesis is also taking a course in self-discipline. Sometimes you fail, sometimes you work really hard. You encounter disappointments, but also triumphs. That moment that nobody replies to your requests or asks for impossible favors in return is hard. Compared to that are the moments that your work progresses enormously or you get to meet inspiring people that show real interest in your work. All in all the process of writing a thesis is a process of up-and-downs.

I would very much like to thank the people that made this thesis possible. First of all I would like to thank my supervisors Rudi Bekkers and Isabelle Reymen. They have paved the way for me doing my research and put me back on track when I was lost. Their clear and concise way of giving feedback has helped me going straight towards my goal. Rudi Bekkers has an enormous amount of knowledge on the subject, which has helped me to identify important areas of research. Isabelle Reymen has also helped to keep a structure in my thesis and here straightforward approach has kept me motivated. Next to my supervisors I would like to thank all the persons that have made time for me to do an interview or help me otherwise.

Furthermore I would like to thank my girlfriend Anne Breuer, who has supported me in many ways. Not only did she give feedback on my work as a novice in the field but she has also stood by me for moral support in more difficult times. I would not stand here without her. I also like to thank my family and especially my parents who have stood by me during my entire period at Eindhoven University. They have kept faith and supported me all along. They have always been someone I could fall back on. If it was not for them I would not be the researcher or the person I am right now. Lastly I would like to thank everyone that has made my time here in Eindhoven unforgettable. Ever since the first day I walked in I have felt at home. I have grown as a person during this time because of the amazing people here I met. I would especially like to thank Jim van Heumen, Vincent Joanknecht, Roel van Heck and Tanja Manders for their friendship, without forgetting all other inspiring persons which I have shared my time with.

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June, 2014
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1 Introduction
The world of patents is generally perceived as boring. The layman often has only heard about patents in lawsuits between big tech companies. Yet patents can be an important part of a business and its innovation, especially for smaller companies. Patents are an important way of appropriating the intellectual property of the company. Changes in patent policy can therefore influence the innovative efforts of companies. This thesis discusses one of the most important policy changes in the coming years and its effect on Small and Medium Enterprises (SME’s), the European Unitary Patent.

1.1 The European Unitary Patent and SME’s
Patents are documents describing invention that give the owner the right to exclude others from using or creating the invention described in the document. Such a right is temporary and lasts on average 20 years. Patents create an incentive for companies to innovate as they grant a temporary monopoly in which the business can recoup its investment (Teece, 1986). On the other hand the patentee has to publish the patent. This creates the opportunity for others to learn and improve on the technology. This creates a tool that spurs innovation in two ways. Patents rights are only valid in the country in which the inventor applied for a patent. If patent protection is wanted in several countries, the inventor has to go through the process of applying at several national offices. This can be a lengthy and costly business. In Europe the patentee can request the patent at a central office, the European Patent Office (EPO). The patent can be granted by the EPO but it does not become valid until it is validated at the national patent offices of choice.

The European Commission continuously tries to use its policy instruments to increase innovation in European businesses. One of the important instruments that they can use is patent policy. One of the major issues in patenting in Europe is the cost of patenting and the incongruities in patent litigation (Mejer & Van Pottelsberhe de la Potterie, 2011b). A Unitary Patent with one Unified Patent Court (UPC) could help to overcome these hurdles. Over the last thirty years the creation of unitary patent rights in Europe has been discussed extensively. This discussion seems to have come to an end with the signing of the the agreement on the Unified Patent Court, which along with the regulations on the Unitary Patent (together called the Unitary Patent Package). The European Commission thinks that these plans are “a big leap towards innovation for EU companies.” They stress that these plans are especially beneficiary for Small and Medium Enterprises (SME’s). In the regulations on the Unitary Patent this effect for SME’s is stressed. Also several articles are drawn up especially for SME’s or take into account their interests.  

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3 See for example Article 12.2 in regulation on the Unitary Patent (No. 1257/2012) or Article 4.4 in the regulation on the Translation Agreements (No. 1260/2012).

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SME’s are vulnerable users of the patent system. Patents are costly and for smaller companies this could mean they would refrain from applying for a patent. This could mean that they are missing out on possible revenue and are at a disadvantage compared to larger companies. During the enforcement of a patent, this situation can be even worse. Compared to larger companies, SME’s would have hard time dealing with all the costs and complexity of the patent system and therefore find it difficult to enforce their patent. Changes in the European Patent system that increase the accessibility is something that would be cheered by SME’s.

This thesis aims to map and analyze the expected effects of the Unitary Patent Package for innovative SME’s in the Netherlands. It tries to incorporate all possible effects of the Unitary Patent for SME’s. This study could be useful for SME’s but also larger business. They can use the report to see how they have to adapt to the new situation in a successful manner. It could also be interesting for policy makers who have to see how they optimize the implementation of the new system in the most efficient way. Lastly patent attorneys and lawyers can see how their clients will adapt to the new situation. This thesis could help them to adapt to the new needs of their clients.

1.2 Research questions
Introducing a new patent system brings a lot of complexities with it. To grasp all the implications of such a change requires a broad perspective but also enough detail on the various subjects. To do so, a main research question and various sub-questions are formulated below. The main research question of this thesis is:

What are the expected effects of the introduction of the Unitary Patent on innovative Small and Medium Enterprises in the Netherlands?

The question specifically focuses on innovative SME’s in the Netherlands. The companies have to be innovative in the technological field as this makes them potential patent applicants. The geographical scope is bounded to the Netherlands because of personal and language restrictions of the researcher. To be able to fully answer this question the main research question is divided into four sub questions

SQ1: What are the expected financial effects for Dutch SME’s due to the introduction of the Unitary Patent?

The possible financial benefits of the unitary are important to investigate. For a large part they determine the patent strategy of companies. SME’s might be even more vulnerable for changes in these costs than larger companies. The financial changes are divided among three sub-questions to able to answer SQ1 more precise.

SQ1A: How do the application, validation and renewal fees of the Unitary Patent influence the financial effects for Dutch SME’s?

SQ1B: How do the translation costs in the Unitary Patent influence the financial effects for Dutch SME’s?
SQ1C: How do the litigation costs in the Unified Patent Court influence the financial effects for Dutch SME’s?

The second set of sub-questions focuses on the legislative changes that the Unitary Patent Package brings. The UPC is the center of these changes but other new possibilities such as the license-of-right are also investigated.

SQ2: What are the expected effects for Dutch SME’s due to the changes in the legislative procedures caused by the introduction of the Unitary Patent?

SQ2A: How does the construction of the Unified Patent Court influence the way Dutch SME’s handle litigation?

SQ2B: How does the option of bifurcation influence the way Dutch SME’s handle litigation?

SQ2C: How does the option of license-of-right influence the way Dutch SME’s handle patent applications?

The effects of the Unitary Patent could go further than financial and legislative changes. For example the relationship between large and small companies could be changed but other issues that come up in the research are questioned as well.

SQ3: How do other effects of the Unitary Patent effect the way Dutch SME’s handle their patents?

The last question deals with the end goal of the Unitary Patent, being an incentive for innovation. The question addresses how patents work as an incentive for innovation and how the Unitary Patent can change this.

SQ4: Does the Unitary Patent effect innovation in Dutch SME’s?

1.3 Research methodology

This thesis is comprised of a theoretical and an empirical part. Both are needed to tackle the research questions posed here above. The study aims to fill the gap in the literature on the effects of the Unitary Patent on SME’s.

The theoretical stage is addressed first. This stage is based upon a broad literature review of the literature of the Unitary Patent. First an overview of the current European patent system and the regulations for The Unitary Patent Package are given. This gives the necessary background information about the Unitary Patent Package to help map the expected effects for SME’s. Secondly a theoretical model is presented that is used for analyzing the effects of the Unitary Patent on SME’s. This theoretical model, based upon transaction cost theory, makes a distinction between direct and indirect costs. This distinction is used throughout the thesis and helps to analyze the costs of patenting. The
last part of the theoretical stage is comprised of another literature review but on the responses of academics and stakeholders on the Unitary Patent. Moreover attention is given to literature on how SME’s use patents and how patents can affect their innovative behavior. At the end of the theoretical part statements are formulated which are tested during the empirical stage. Figure 1 gives an overview of the research design that is used in this thesis.

![Research Design Diagram]

In the second stage an empirical validation of the statements takes place. This validation is done in two different ways. First there is an analysis of the cost of patenting combining the existing literature. Secondly the statements are validated by means of interviews with SME’s, patent attorneys and lawyers and other patent experts. The interviews were semi-structured to be able to check the findings of the literature study but also to leave space for the interpretation of SME’s and patent experts.

The second stage is the basis for the third and final stage of the research. In this stage the results are analyzed. This analysis is used to answer the research questions and to check the statements made at the end of the first phase. After this analysis conclusions can be drawn for the final phase. The conclusion contains a summary, the added value of this thesis and advises for SME’s, patent attorneys and lawyers and policy makers.
1.4 Reading guide

This reading guide functions as a guide through the thesis. It briefly explains how this thesis is structured and takes you through the several chapters.

The thesis has started with an introduction into the subject and phrased the research questions this thesis addresses. In Chapter 2 the Unitary Patent is further introduced. The chapter shows the largest changes that the Unitary Patent brings compared to the current European patent system. In Chapter 3 a patent version of transaction cost theory is introduced. This theory functions as the structure to analyze the effects of the Unitary Patent on SME’s. This distinction between direct and indirect costs that this theory makes is maintained throughout the thesis. In Chapter 4 the literature on the debate on the Unitary Patent is explored. It addresses the current opinions on the Unitary Patent from an academic and stakeholder perspective. Secondly it looks at the literature on patenting behavior by SME’s. These two different types of literature combined lead to the formulation of several statements. The structure of the direct and indirect costs is used in the chapter as well. In Chapter 5 the methodology to test these statements is presented. It explains the way the secondary sources review and the interviews were performed and presents and the case statistics. In Chapter 6 the findings of the secondary sources review and the interviews are presented. The findings are presented in line with the theoretical framework. In Chapter 7 these results are analyzed and there is a reflection on the statements made in Chapter 4. The last chapter, Chapter 8, provides a conclusion and a critical reflection on the thesis.
2 Regulations on the Unitary Patent and Unified Patent Court

This chapter explains the current regulations on European Patents and the changes that the Unitary Patent brings. It starts with providing a brief history of the European patent system. Next it explains the most important features of applying for a European patent in the current system. It then discusses the Unitary Patent in three parts, along the lines of the two Regulations on the Unitary Patent and the Agreement on the UPC. The last section looks at regulations especially aimed at SME’s. The goal of this chapter is to provide insight into the European patent system and the challenges that this system has. The regulations for the Unitary Patent Package are discussed in detail to understand which changes these regulations bring compared to the current system.

To provide a small introduction into the differences between the current patent systems and the Unitary Patent, Table 1 provides the most important changes. When the Unitary Patent is introduced as a new patent system, there are five ways to get a patent in Europe. These are the Unitary Patent, the current European patent system opted-in the UPC, the same system opted-out of the UPC, through applications at national offices or lastly via an international route at the World Intellectual Property Office (WIPO). For each of these routes the protection, at which office the patent has to applied for, which office validates the patent, under which jurisdiction the patent falls and for which countries this jurisdictions holds is displayed in Table 1.

<table>
<thead>
<tr>
<th>Protection</th>
<th>Application Office</th>
<th>Validation Office</th>
<th>Jurisdiction</th>
<th>Revocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unitary Patent</td>
<td>Countries of choice (EPC members)</td>
<td>National patent offices</td>
<td>UPC</td>
<td>All countries</td>
</tr>
<tr>
<td>European Patent opt-out</td>
<td>Countries of choice (EPC members)</td>
<td>National patent offices</td>
<td>National Courts</td>
<td>Per country</td>
</tr>
<tr>
<td>European Patent opt-in</td>
<td>Countries of choice (EPC members)</td>
<td>National patent offices</td>
<td>UPC</td>
<td>All countries in which it is valid</td>
</tr>
<tr>
<td>National</td>
<td>Countries of choice (World)</td>
<td>National patent offices</td>
<td>National Courts</td>
<td>Per county</td>
</tr>
<tr>
<td>International</td>
<td>Countries of choice (World)</td>
<td>National patent office/EPO</td>
<td>Depends on follow-up</td>
<td>Per country/possible unitary protection</td>
</tr>
</tbody>
</table>

Table 5 Different filing options for patents in Europe and their implications
2.1 A brief history

The first systematically granted patents date back to the 15\textsuperscript{th} century and could be found in the city of Venice. Throughout history patent rights were usually confined to national territories and patents are currently still issued on a national basis. Efforts were made to internationalize the patent system in 1883 at the Paris Convention. During the convention it was agreed that a patentee can apply in other countries within a year of the initial filing and still keep the initial filing date (Jaffe & Lerner, 2004). A first attempt to create patent rights crossing borders was the idea of a unitary European patent system in the 1960’s (Bonitatibus, 2001). The negotiation for such a system started in the 70’s, which eventually led to the 1973 European Patent Convention (EPC) in Munich. The convention resulted in a central application procedure in Europe, but not to unitary rights. (Bonitatibus, 2001; Mejer & Van Pottelsberge de la Potterie, 2011b; Rodriguez, 2011). Although the initial idea was to create a Unitary Patent, this idea was soon abandoned as it seemed impossible to reach consensus on uniform legislation. Later efforts were made to create more harmonization in European patent law, such as the Luxembourg convention in 1975 and 1989. These attempts failed due to a disagreement on translation issues and surveillance measures (Bonitatibus, 2001).

In 1997 the European Commission launched a green paper on a Community Patent, similar to a Unitary Patent, which reopened the discussion on European patent rights.\footnote{European Commission, \textit{Green Paper on the Community patent and the patent system in Europe COM(97) 314 final}. Brussels, Belgium, 1997} This led to a proposed regulation for the Community Patent in 2000.\footnote{European Commission, \textit{Proposal for a council regulation on the community patent COM(2000) 412 final}. Brussels, Belgium, 1997} The issues of a single court and translation requirements proved to be a too big obstacle. By 2004 the proposal for unitary patent protection was rejected once again (Schiemann & Lockner, 2005). However the negotiations were not a complete failure as they established the London Agreement. This agreement between 19 different EU member states, which went into effect in 2008, holds that in most cases translation of the patent, except for the patent claims in most countries, is no longer necessary (Van Pottelsberge de La Potterie & Mejer, 2010).

The European Commission gave the idea of a Unitary Patent new life with another proposal in 2007.\footnote{European Commission, \textit{Enhancing the patent system in Europe COM(2007) 165 final}. Brussels, Belgium, 2007} By 2010 it became clear that the translation requirements again were a major obstacle. Spain and Italy did not want English, German and French to become the only languages in which a Unitary Patent could be filed.\footnote{C. Biggi & M. Conti, \textit{The Italian question: Concerns about the unitary patent}, World Intellectual Property review. Last accesses April 29 2014, http://www.worldipreview.com/article/the-italian-question-concerns-about-the-unitary-patent} This made several countries, including Germany, France, the United Kingdom and the Netherlands, to file for a proposal for enhanced cooperation. Enhanced cooperation is the idea that countries in the European Union can work together within European law, without it having to apply to all member states.\footnote{European Commission, \textit{Impact assessment SEC (2011) 482 final}. Brussels, Belgium, 2011.} Spain and Italy refused to cooperate with this idea and they requested the...
European Court of Justice (ECJ) to block the plan. The ECJ decided that the proposal was not in line with Community law and rejected the plan. According to the ECJ the UPC was in need of a structure more like the BENELUX-court (Hilty, Jaeger, Lamping, & Ullrich, 2012).

After this setback the proposal had to be reformulated to fit Community law. These newly formulated proposals were signed on the 11th of December 2012 and the 19th of February 2013. Spain and Italy again tried to block this plan at the ECJ but the judges ruled in favor of the revised proposals put forward by the 25 participating member states (Bodoni, 2013). Spain continues to fight the same case at the ECJ in a second action. The results in this case are expected in 2015 or 2016. Despite the lawsuit of Spain it is expected that the first Unitary Patent is granted in either 2015 or 2016.

2.2 The current European patent system

This section gives a description of the essential parts of the current European patent system. This description helps to understand the changes that the Unitary Patent brings. A description of all the aspects of the European patent system would take up to much space and is not necessary to interpret the differences with the Unitary Patent.

Applying for a patent in Europe can currently be done in four ways. The first method is to file an application at each of the national patent offices of your choice. The applications have to be made within a year of the first filing according to the rules of the Patent Cooperation Treaty (PCT). This could be a good option if protection is only needed in just one or two countries (Stevnsborg & Van Pottelsberghe de la Potterie, 2007). A second option is to first file a national application, either in countries of the EPC or any other, and then within a year turn to the EPO to file a European patent. In which countries the patent is validated can be chosen after the patent is granted as long as the country is marked as designated. A last option which is commonly used is the WIPO route. It is used as intermediate phase before filing at the EPO. This can be done at first instance or within a year of a national filing. The main advantage of a PCT filing at the WIPO is that one has 30 months of time, instead of 12, to decide in which countries it wants the patent to be validated. After these 30 months you can decide to pursue your application at the EPO (Stevnsborg & Van Pottelsberghe de la Potterie, 2007). Figure 2 shows the different options for filing a patent within Europe.

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9 Ropes & Gray, “Unified Patent Court, latest updates”
An application for a European patent at the EPO is a 7-step process. Each of these steps is explained here.

1. **Filing**
   As noted before a patent can be filed directly at the EPO or within a year of a national application or as a PCT-transfer. The filing has to happen in one of the three official languages of the EPO: English, German or French. The application must fulfill the following requirements according to Article 78 of the EPC:
   
   - Enclose an official request for grant
   - Provide a description of the invention
   - Have at least one claim
   - Display any drawings referred to in the description of the claims
   - Provide an abstract

   Filing can be done by the inventor or the company he or she works for, but most commonly the inventor is represented by a European patent attorney. This is someone who has passed the examination at the EPO and is legally qualified to represent their client at the EPO. Hiring a patent attorney is also encouraged as this increases the quality of the patent application and therefore the chances of getting the patent granted (Stevnsborg & Van Pottelsberghe de la Potterie, 2007).
2 Search
The EPO performs a search to identify the relevant prior art for the patent application. The EPO provides a pre-examination with a search report. This report gives advice on whether or not to proceed with the application and provides which prior art might block the grant of the patent (Stevnsborg & Van Pottelsberghe de la Potterie, 2007).

3 Publication of application
A patent is published within 18 months after the initial filing. Before this moment the applicant can still decide to retract the application before it becomes public. This could be the case if one is not certain if the patent is granted. Keeping the invention secret might be a better way of protecting the intellectual property in that case (Visknins & McCrackin, 2007).

4 Examination
The examination determines if the patent is granted. Special attention is awarded to the claims as they define the scope of protection. The examiner checks if the patent application fulfills the patent requirements. The requirements according to the EPC\(^\text{10}\) that the application has to fulfill are (Schotchmer & Green, 1990):

- There must be an invention
- The invention has to be novel
- There has to be an inventive step
- The invention has to be industrially applied
- The claims have to be written in a clear and concise manner such that a person skilled in the art can understand the claims

The definition of an invention is not given but the EPC does provide a list of what cannot be patented. The examiner marks prior art that undermines the requirements in the search report. The two most important reference classes in the examination report are the X and Y. The X indicates prior art because of which the invention cannot be considered novel or to have an inventive step. The Y indicates prior art that together with another document, proofs that the invention cannot be considered to have made an inventive step (Harhoff & Reitzig, 2004).

5 Grant
Once the examiner finds that the patent can be granted he sends an ‘intention to grant’ to the applicant. If the applicant decides that he wants the patent to be granted he has to send a confirmation, pay the granting fees and translate the claims into the two other languages of the EPO. As soon as this has been confirmed by the EPO the patent is published as a granted patent (Stevnsborg & Van Pottelsberghe de la Potterie, 2007).

\(^{10}\) See Articles 52, 54, 56, 57 of the EPC
6 **Opposition**

After the grant there is a 9-month period in which the validity can be challenged by a third party at the EPO. This is currently the only central procedure to get a patent revoked for the whole of Europe. The opponent has to show that the patent should not have been granted. Both the opponent and the patent holder can file an appeal against the outcome of the procedure. Once the 9-month period has ended the opponent has to file for invalidity at the national courts in which the patent is validated. Opposing the grant happens approximately to 8% of the patents (Harhoff & Reitzig, 2004).

7 **Validation**

Once a classical European patent has been granted, it is a bundle of national patents that need to be validated in each of these countries. The applicant now has to decide in which countries he wants the patent to be valid. At each of the patent offices a request has to be filed and validation and renewal fees paid. For countries that are not part of the London agreement (Van Pottelsberghe de La Potterie & Mejer, 2010) and that do not have a language in common with the language in which the patent has been granted, a translation also needs to be filed. Some of the countries also request that a local patent attorney handles the request for the patent to be validated.

Once the patent has been granted at the national level, renewal fees are paid to each of the national patent offices. The patent has the same rights as one that came through national filing only. If there is a case of infringement or a party wants the patent to get revoked this has to be brought for the national court in which the patent is valid. It is possible that different law applies at these courts. This could result in different outcomes of the same lawsuit (Cremers, et al., 2012).

This section has provided the process of applying for a patent. It is only in the last step of this 7-step process that the Unitary Patent brings changes.

2.3 **The Unitary Patent Package**

This section explains the regulations of the Unitary Patent Package (UPP). This package contains regulations on the Unitary Patent and on the Unified Patent Court (UPC). For the Unitary Patent there is Regulation No. 1257/2012 on the Unitary Patent itself and the Regulation No. 1260/2012 on the translation arrangements. The rules for the UPC are recorded in Agreement 2013/C175 on a Unified Patent Court.

The regulations on the Unitary Patent are regulations part of Community law. This means that only members of the European Union can join. The agreement on the UPC is an agreement common to several states of the European Union. This agreement does not fall under the scope of Community law and therefore does not fall under the jurisdiction of the ECJ either.
The regulations are discussed in different sections as all of them influence the patent system. It is important to note that these regulations do not replace the current system. The Unitary Patent and the UPC are a layer on top of the existing European and national systems (Hilty, Jaeger, Lamping, & Ullrich, 2012). How the new system influences the current system is discussed under the heading of the UPC.

The regulations on the Unitary Patent were signed by 25 states. These regulations shall enter into force if 13 countries have ratified the agreement for the UPC, including the three countries with the most patent applications (Germany, France, UK). Poland decided not to sign the agreement for the UPC. This means that the Unitary Patent cannot take effect in Poland. Italy, which did not sign the regulations for the Unitary Patent, has however decided to join the UPC agreement. This means that the UPC will decide on cases on European patents valid in Italy but that Unitary Patents will not have effect in Italy. Spain decided to not sign both agreements. Croatia is a too young member of the European Union to be able to join the Unitary Patent Package.

11 The participating member states are: Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Latvia, Lithuania, Luxembourg, The Netherlands, Portugal, Rumania, Slovenia, Slovakia, Sweden and the United Kingdom.
2.3.1 The Unitary Patent

The most important feature of Regulation No. 1257/2012 is that after the granting procedure the applicant can choose that the patent has unitary effect in all participating states, instead of requesting the patent to be validated in each separate country of choice. The patent gets uniform protection in all the member states. It functions as a ‘tie-wrap’ around a bundle of national patents. The patent functions as the bundle the entire time. The patent “may only be limited, transferred or revoked, or lapsed, in respect of all the participating member states”. An exception to this rule is the granting of licenses. These may be given to parts of the area that it covers.

Compared to the European patent an important change is that the renewal fees only have to be paid to the EPO instead of all member states were the patent is valid. Currently renewal fees vary greatly across the different states. Not only the level of fees but also the fee structure, the progressiveness of the fees varies a lot across countries. The fee structure of the Unitary Patent has not yet been set. Setting this fee structure is a very delicate thing to do; several factors have to be taken into consideration. The regulation mentions aspects as “facilitating innovation and fostering the competitiveness of European business”. It also must reflect the market size covered by the patent, approximately 400 million inhabitants. Next to that it should be similar to an average European patent, currently around 5-6 validations (Van Pottelsberge de la Potterie & Van Zeebroeck, 2008). The EPO has to take into account that it has to distribute 50% of the renewal fees to national offices and that the fees should be enough to cover the expenses of the EPO. The expected level of fees lies between 4 and 7 member states.

A new regulation, at least for the Netherlands, is Article 8 on licenses of right. The regulation states that the patent owner can declare at the EPO that his patent is open for licenses considering an appropriate compensation. The patent owner must do this for everyone; exclusive licenses are not an option. The compensation for this is that the renewal fees of the patent are lowered. Currently the reduction in countries with this system already in place is 50%. The assumption is that this reduction will apply to the Unitary Patent as well. This system already exists in the UK and Germany where about

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12 European Commission, Regulation No. 1257/2012 implementing enhanced cooperation in the area of the creation of unitary patent protection, Article 3.2, Brussels, Belgium, 2013

13 Idem 19, Article 12.2.a

14 Agentschap NL, Het unitair octrooi. Leaflet handed out at meeting on the unitary patent, The Hague, 2013

15 Idem, 19, Article 13.1

16 Idem, 1, Article 10

17 Idem, 21


20 European Commission, Analysis of measures that could lead significant market players in the ICT sector to license interoperability information SWD(2013) 209 final, Brussels, Belgium, 2013
6% of all patents are in the license-of-right system. The use of the system however varies greatly across industries (Rudyk, 2013).

2.3.2 Translation arrangements

Regulation No. 1260/2012 describes the translation arrangements for the Unitary Patent. The regulation states that a patent should be filed in one of the languages of the EPO: English, German or French. The claims of the patent should be translated into the two other languages of the EPO in which the patent has not been filed, just as according to Article 14(6) of the EPC. As an application for a European patent can be filed in any language, the patent has to be translated for it to be granted unitary effect if it is not filed in one of the official languages of the EPO. Compensation for the translation is available for e.g. SME’s.

The goal is to have no translations necessary, but during a transitional period translations have to be filed in order to train the machine translation. During this period the patent needs to be translated into English if it was filed in German of French, or it needs to be translated into any other language of the participating member states if it was filed in English. As an example: A Dutch company could provide an English submission with a Dutch translation. This transitional period ends if machine translations are able to provide sound translations. This is evaluated after six years and thereafter every two years. The maximum is set for 12 years after the date of application of the regulation.

There is an exception to these regulations for example in the case of a dispute. If the court or the alleged infringer wants a translation into a language of where they live or where the patent is infringed, the patent holder has to provide this at his own expense. As well the court has to take into account if the infringer is a SME, a natural person, a university or public research organization that they could have acted in good faith as no translation was yet available.

2.3.3 The Unified Patent Court (UPC)

The agreement on the UPC contains the regulations a court that decides on the Unitary Patents and European Patents. The decisions by this court apply for all participating member states in the case of the Unitary Patent and for all countries validated in the case of European Patents. For patents with unitary effect this court immediately applies however for European patents a transitional period of 7 years in which patent owners can opt-out of the system is instated. This transitional period is dealt with in more detail later. The UPC exists out of three parts, the Court of First instance, the Court of Appeal and a Registry. Issues concerning the agreement or the regulations itself fall under the jurisdiction of the ECJ.

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21 Council of the European Union, Agreement on the Unified Patent Court, Article 1, Brussels, Belgium, 2013
22 Idem 28, Article 6
The Court of First instance

The Court of First instance exists out of central, regional and local divisions. The Court of First Instance handles cases of patent infringement, counterclaims of patent validity, free-standing validity cases and declarations of non-infringement (DNI). The first two cases are handled by the local or regional division in which the infringement takes place or where the defendant has its principal place of business. In case both parties agree, the case can also take place at the central division. Free-standing validity and DNI’s are to be directed to the central division.

The central division has its seat in Paris, Munich and London. Each of the locations handles different cases identified by the WIPO technology classes. A country may decide to set up a local division and has the possibility to add more local divisions for each one hundred patent cases it handles each year. These numbers are based upon the average of the last three years. Countries can also group together to form a regional division. This is more likely for countries that do not have many patent cases. If a country decides not to host a local or regional division cases are referred to the central division.

Figure 5 Structure of the UPC. Source: (UK IPO, n.d.; Boos, n.d.)

The panel of the Court of First Instance has three legally qualified judges. In case of a local division the panel’s composition depends on the number of cases it handled in the past. If the number of cases on average was below 50 a year, one judge from the member state is joined by two other judges from different member states chosen from a pool of judges. This happens on a case to case basis. If the number is 50 or above two legally qualified judges from the member state are appointed added by one from the pool of
judges. In case of a regional division two judges are chosen from the member states participating in this division added by one from the pool of judges. If the panels of the Court of First Instance in a local or regional division require a technically qualified judge, one is appointed by the Presidency.

At the central division the panel of judges exists out of two legally qualified judges from different nationalities accompanied by a technically qualified judge. The exemption being that is the case is on the administrative tasks with the framework of the EPO three legally qualified judges are appointed.

If the alleged infringer decides to file a counterclaim for revocation at a local or regional division, the court has three options according to Article 33(3). First the court can decide to handle the case itself and request a technically qualified judge. Secondly the case can be transferred as a whole to the central division if both parties agree on this. Thirdly the court can decide to refer the counterclaim for revocation to the central division. The court can either decide to continue with the infringement case or decide to suspend the case until a decision is reached on the validity of the patent. This last option is called bifurcation.

**The Court of Appeal**

The Court of Appeal has its seat in Luxembourg. It handles all the cases of appeal after an initial decision by the Court of First instance. The language of proceedings of the Court of Appeal is that of the proceedings of the first instance, unless all parties agree to use the language of the proceedings during the patent application.

The Court of Appeal exists out of 5 judges of whom three are legally qualified and two are technically qualified. The three legally qualified judges need to have a different nationality. The court can be reduced to three legally qualified judges is the decision is on the administrative tasks within the framework of the EPO.

**Registry**

The public registry administers all the cases that are handled by the UPC. A main registry is set up at the Court of Appeal in Luxembourg but each Court of First instance has its own sub-registry.

**Law and damages**

The decision of the court shall be based upon the following:

- Union Law, including the regulations on the Unitary Patent
- The Agreement on the UPC
- The EPC
- Other international agreements on patents that are binding for all contracting member states
- National law

The use of national law shall be based upon provisions in Union law or international agreements that contain private international law rules.
According to Article 61, if the applicant can show that there is reasonable support that the patent is infringed, the court is allowed to prevent the infringer from moving or dealing the infringing asset, even before the start of the proceedings. This is also called a preliminary injunction. During the procedure the court can take protective measures such as penalties or stopping the delivery of goods. After the decision that a patent has been infringed the court can rule for a permanent injunction. The patent owner is awarded damages, but no punitive damages have to be paid. The damages reflect the costs compared to the situation if the patent was not infringed. The legal costs shall be borne by the unsuccessful party. A ceiling on these costs is set in the Rules of Procedure.

**Transitional regime**

According to Article 83 there is a transitional regime in which European patents can still be brought in front of the national court. The patent owner must therefore report to the Registry that it wishes to opt-out of the UPC. The patent then again falls under the jurisdiction of the national courts. The patent owner can opt-out and opt-in any time he wants unless the patent has been brought before the UPC or a national court. There is a fee for opting-in and out, but this has not yet been set. The transitional regime is evaluated after five years and if necessary can be prolonged with a maximum of another seven years.

**Other issues**

There is a mediation and arbitration center which is seat in Ljubljana and Lisbon, for those that want to settle their case outside court. The results can also be enforced by the member states but a patent cannot be revoked or limited during mediation.

The fees of the court are set so that the court can finance itself but also remains accessible for all parties. During a transitional period the Court receives support from the member states.

The representative at the court is someone that is authorized to practice law in one of the member states. Next to this European patent attorneys with a European Patent Litigation Certificate are allowed to represent someone as well. This certificate can be replaced with other qualifications to be established by the Administrative Committee.

2.3.4 Regulations in the Unitary Patent for SME’s

Although the Unitary Patent as a whole is seen as a positive development for SME’s by the European Commission, the regulations on the Unitary Patent and the agreement on the UPC contain several passages in particular for SME’s. These could be specific for SME’s or take into account the interests of SME’s. The regulations are meant for SME’s, natural persons, non-profit organizations, universities and public research organizations but this report refers, for the sake of keeping focus, only to SME’s.

The regulations often state that the interests of SME’s have to be taken into account, for example in setting the renewal and court fees. A last measure especially for SME’s is found in Article 36 of the agreement on the UPC. It is unclear what this means as other interests have to be taken into account as well. Measures that are directly aimed at SME’s
can be found in the regulation on the translation agreements. As SME’s should be able to file the application easily they can do so in any language of the member states. The translation costs into one of the languages of the EPO are compensated for SME’s. During a dispute the judge has to take into account that SME’s could have acted in good faith as the patent was not translated.

2.4 Conclusion
This chapter has shown the most important differences between the current European patent system and the Unitary Patent Package. By introducing the current European system it became visible that the Unitary Patent Package only brings changes in the validation and enforcement phase. The application procedure remains the same for European and Unitary Patents. A Unitary Patent can be requested after the grant of a patent. It functions as ‘tie-wrap’ around the bundle of national patents of all participating states. This patent functions as this bundle the whole time except in the case of licenses.
3 Theoretical Framework

To answer the research questions posed in the first chapter a theoretical framework is needed. Although the first questions revolve around the costs of patenting, the indirect effects of the Unitary Patent are also an important factor in the analysis. Therefore it is useful to find a theory that incorporates all the costs in patenting. This research uses transaction cost theory to analyse the costs of patenting. Transaction cost theory not only incorporates direct costs but also indirect costs. This chapter first explains the traditional transaction cost theory, involving a ‘make-or-buy decision’ (Williamson, 1981), using the model proposed by Rindfleisch and Heide (1997). Rindfleisch and Heide performed a meta-analysis on applications of the theory and developed an up-to-date model. This model gives a complete impression of transaction cost theory, includes various amendments, often cited in other literature and is therefore used in this chapter. Secondly the chapter looks into which costs are involved into patenting which leads to a proposal for a new transaction cost model based upon the decision to patent.

3.1 Transaction cost theory

Transaction cost theory can best be explained by creating an exemplary Company A. Company A is facing the decision whether it should, for example create an own IT department for an IT system or to look for a service provider to do this for them. We call the service provider, Company B. The decision that Company A faces, is called a make-or-buy decision.

Coase (1937) and Williamson (1975; 1981; 1985) proposed that when evaluating such a make-or-buy decision, the costs of operating in the market, in case of a buy decision, should be taken into account. These costs are called transaction costs. These costs not only involve direct costs but also indirect costs. Rindfleisch & Heide (1997) propose that these two types of costs have three dimensions among which they can be evaluated. Their model works with three dimensions which are explained in Section 3.1.1. Following this section the sources and types of transaction costs are explained.

3.1.1 Dimensions of transaction cost theory

The model of Rindfleisch and Heide (1997) shows that transaction cost theory builds upon three dimensions. These dimensions are asset specificity, environmental and behavioural uncertainty. Each of these three dimensions and their underlying concepts are explained.

The first dimension of the model is asset specificity. Asset specificity refers to how easy it is for an asset to be transferred. The more specific an asset is the more it should be considered as a sunk cost. A common example of this are the costs invested into human assets. One needs to invest into new personnel for them to work effective within the company. The company faces the decision to invest to someone to for example to be able to do sales or it can choose to outsource this. Once invested in human capital, it is necessary to safeguard this investment. An employee who walks away with your knowledge is seen as destroying capital. Next to human assets other types of asset
specificity are site specificity, physical asset specificity, brand name capital, dedicated asset and temporal specificity (Williamson, 1981).

The dimension of behavioural uncertainty is based upon the concept of bounded rationality. This implies that although a company might act rational, they are bounded by their cognitive capabilities and are therefore not able to process all the information that is available. These constraints in the dimension of behavioural uncertainty can be seen if Company A is uncertain about for example the performance of other parties such as Company B, as it cannot be fully aware of all information about this performance. It is difficult to measure the performance of Company B or at least the costs of monitoring you face can be high. These costs differ from case to case and can for example depend on the scale of the transaction.

<table>
<thead>
<tr>
<th>Source of Transaction costs</th>
<th>Asset specificity</th>
<th>Environmental uncertainty</th>
<th>Behavioural uncertainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature of governance problem</td>
<td>Safeguarding</td>
<td>Adaptation</td>
<td>Performance evaluation</td>
</tr>
<tr>
<td>Costs of creating safeguards</td>
<td>Communication, negotiation and coordination costs</td>
<td>Screening and selection costs (Ex-ante)</td>
<td>Measurement costs (ex post)</td>
</tr>
<tr>
<td>Failure to invest in productive assets</td>
<td>Maladaptation; Failure to adapt</td>
<td>Failure to identify appropriate partners (ex-ante)</td>
<td>Productivity losses through effort adjustments (ex post)</td>
</tr>
</tbody>
</table>

Table 6: Transaction cost theory model (Rindfleisch & Heide, 1997)

The concept of environmental uncertainty is also based upon the concept of bounded rationality. In this case Company A relies cannot foresee or anticipate on all changes in the market. This can for example be technological uncertainty in which the requested technology could already be outdated during the transaction. Entrance of competitors into the market could also cause changes that were not foreseen and could require a change in the contract with the service provider.

3.1.2 Sources and types of transaction costs

The model of Rindfleisch & Heide (1997) uses three sources of transaction costs. The first source of transaction costs is the problem of safeguarding that arises from asset specificity. Safeguarding problems can lead to more ‘make’ decisions when the costs are too high. The second source of transaction costs is the adaptation problem. These costs arise because Company A has bounded rationality and therefore cannot foresee all the
changes that a project might need. These changes come from the environment in which Company A operates. The third and last source of transaction costs arise from the performance evaluation problem. These costs arise because the party is bounded by its rationality and cannot predict how the service provider behaves.

Rindfleisch & Heide (1997) also presume two types of transaction costs. These are direct costs and indirect costs. Direct costs, as the name suggests, are faced directly by the company. Indirect costs are costs that originate by the behaviour of others or the environment on which Company has no influence. Each of the three sources of transaction costs has both direct and indirect costs. These costs are explored in more detail in the next two paragraphs.

3.1.3 Direct costs
The direct costs of the safeguarding problem are the costs of creating these safeguards. These safeguards can be lengthy and long-term contract, which are not as profitable as short-term contracts. Company A must agree to such contract because it fears that the service provider takes advantage of its investments or advantage of its dependency on the service providers' expertise.

Communication, negotiation and coordination costs are the direct costs of the adaptation problem. These costs originate because environmental changes could cause the service-seeking company to change the contract and relationship with the provider. Changing the contract costs time and effort and could lead to less profitable clauses.

The direct costs of the performance evaluation problem can be split into two phases, one before (ex-ante) and one after (ex post) the agreement. Ex-ante the agreement the service seeking company has to perform a selection procedure for the service provider. Ex post the agreement, the service provider has to monitor the performance of the service provider. Both can be hard because of an information asymmetry between the two parties. This can therefore lead to significant direct costs.

3.1.4 Indirect costs
In the case of the safeguarding problem, indirect costs can be found in a failure to invest at all or to do the service in-house. This could happen if the asset specificity is high and the trust in the service provider is low. The potential abuse of the service provider could lead to higher costs than the potential benefits, leading to a failure to invest in the project at all.

The indirect costs of the adaptation problem come from a possible stop of the project. If due to environmental changes, the adaptations to the project become too big, the service requesting company could decide to bring a halt to the project. Technological or market changes could stop a project because the service receiving company could not foresee these changes because of its bounded rationality.

The indirect costs of the performance evaluation problem are also divided in ex-ante and ex post costs. Because it is hard to predict the behaviour of the service provider, this
could lead, ex-ante, that no appropriate service provider is found. Opportunistic behaviour by the service providers could lead, ex post, to adaptations in the project.

3.2 A patent version of transaction cost theory

Transaction cost theory cannot be applied directly to patenting. First it is important to identify the decision which is analysed with this theory. In this case the decision to patent or to keep an invention secret replaces the make-or-buy decision of the classical transaction cost theory. Filing for a patent corresponds to looking in the market for a service provider. Keeping an invention secret corresponds to doing the process in-house. Although there are more appropriation strategies (Thomä & Bizer, 2013; Graham & Sichelman, 2008), the model assumes a choice between these two options. These two options are chosen because they represent two rather extreme opposites. Patents are open and formal rights while keeping things secret is not formal and the ideas are not published. Such a division makes the decision to patent easier to compare and highlight the costs of patenting.

The model is further developed in the next sections. First with a look at the literature that is already available on the subject. Secondly the framework of the theory is reviewed to see if any modifications have to be made to fit the decision to file for a patent. Lastly the transaction costs in patenting are discussed in more detail to come up with a complete patent version of transaction cost theory.

3.2.1 Literature on patents and transaction cost theory

The transaction costs of patents have been to some extent discussed in literature. The main topics of discussion are the transaction costs of licensing intellectual property and how patents can reduce these costs (Somaya & Teece, 2001; Arora & Fosfuri, 2003). Another main topic is the validation of the patent system which can also be explained by using transaction cost theory (Heald, 2005; 2007). An analysis of the decision to patent with transaction cost theory seems to be missing. Some do refer to transaction costs in the decision to patent such as Judge Lord Justice Jacob in the case Aerotel Ltd v Telco Holdings Ltd & Ors (2006):

“The patent system is there to provide a research and investment incentive but it has a price. That price (what economists call "transaction costs") is paid in a host of ways: the costs of patenting, the impediment to competition, the compliance cost of ensuring non-infringement, the cost of uncertainty, litigation costs and so on.”

Some patent agencies also refer to other costs such as the costs of inexperienced companies when preparing documents for the patent application, the loss of secrecy and in the case of business-method patents (and perhaps other areas too) a change in public image (Yoches, 2001).

Although the literature gives some direction and examples of in which way transaction costs influence the decision to patent, a full analysis using transaction cost theory seems to be missing. Such an analysis adds to the understanding of the decision to patent. It
provides a new angle at patent costs while it also tries to encompass most theories on patenting behaviour. Having a theory that helps to understand patent costs also helps to compare the European Patent with the Unitary Patent. It shows the improvements and problems of the Unitary Patent Package and makes it therefore easier to compare.

3.2.2 The framework of patent transaction cost theory

To make the transaction cost theory useful for patenting decisions, it is necessary to see if the framework needs to be adapted. First the different dimensions of patenting are discussed and it is concluded that there is no need for adaptations. Secondly the sources of transaction costs all need to be adapted to the new situation. The sources are really specific to the situation in which transaction cost theory is used. Thirdly the two types of transaction costs are not completely compatible with a patent version of transaction costs. Direct costs are also found in patenting, but it is more useful to replace the indirect costs with the indirect costs of patenting. These indirect costs are of more importance than the costs of not patenting. The direct and indirect costs are discussed in more detail in two sub-sections. Table 3 shows the complete patent version of the transaction cost theory.

<table>
<thead>
<tr>
<th>Source of Transaction costs</th>
<th>Asset specificity</th>
<th>Environmental uncertainty</th>
<th>Behavioural uncertainty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature of governance problem</td>
<td>Application</td>
<td>Validity</td>
<td>Infringement</td>
</tr>
<tr>
<td>Type of Transaction costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct costs</td>
<td>Cost of applying</td>
<td>Certainty about patent validity</td>
<td>Monitoring costs of competitors (ex-ante)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Litigation costs (ex post)</td>
</tr>
<tr>
<td>Indirect costs</td>
<td>Embedded patents</td>
<td>Inability to commercialise patent</td>
<td>Disclosing information (ex-ante)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inventing around by others (ex post)</td>
</tr>
</tbody>
</table>

Table 3 Patent transaction cost theory model

*Dimensions and sources*

Transaction costs can originate from the asset specificity of the patent and from the asset specificity of the invention. The specificity of the patent and the invention are both resembled in the patent application. It is this application that is the source of the transaction costs. The first type of asset specificity deals with the patent application. The application can be specific in several ways such as the length and the geographical scope of the application. The length can be a source of costs because this leads to higher application and patent attorney costs (Roland Berger Institute, 2004). The geographical scope leads to higher costs in the validation phase of applying for a patent (Harhoff, Hoisl, & Van Pottelsbergh de la Potterie, 2009; Van Pottelsbergh de La Potterie & Mejer, 2010) Secondly, there is the specificity of the invention. The specificity depends
on how embedded the invention is. To make a distinction between different technologies Cohen, Nelson & Walsh (2000) created the idea of discrete and complex technologies. Zaby (2010) makes a same distinction but calls these respectively, horizontally and vertically differentiated inventions. Complex technologies are seen as cumulative, adding on to other inventions. Patenting in this field is often difficult or requires a lot of effort. It is hard for a company owning just a few patents to be able to make a product without infringing another. Examples of this can be found in the field of electronics (Hall & Ziedonis, 2001). Discrete or horizontally differentiated technologies are stand-alone inventions. The technology does not or hardly relies upon other technologies. A company can therefore manage with a few patents to create good safeguards around a single product.

The second source of transaction costs originates form the dimension of environmental uncertainty. The patent environment holds institutions such as patent offices and patent courts. A big uncertainty is whether not the patent is granted at all. The patent can get rejected by the examiners at the EPO or if has been granted it can face opposition at the EPO. Even if the patent has been granted one is not certain about its validity until it is enforced in court. A company applying for a patent has to be aware of the chances its patent might not be valid. The environment of a patent also consists of the market of the technology which it protects. Patent validity in a competitive market can be a very important to be able to commercialise the technology.

The behaviour of other parties is of importance in the patent environment. They create a great amount of uncertainty for the patent owner. A patent is the right to exclude others from using the technology, the behaviour of others is therefore of great importance. Other parties can infringe the patent, the costs of tracking these infringers and perhaps taking them to the court, can be very high (Intellectual Property Institute, 2010).

3.2.3 Direct costs
To see what the transaction costs entail the costs are discussed in more detail in this section and the following section. This section starts with the direct costs which are discussed along the lines of the three sources of transaction costs.

**Application**
A direct transaction cost that originates from asset specificity is the costs of the patent application. The specificity lies within the complexity, the size and the geographical scope of the application. A direct cost when dealing with the patent application is the fees that the applicant has to pay. These direct costs are not only the fees that have to be paid to the patent office but also originate from various sources. The costs of applying for a patent can be divided among several categories. A detailed analysis of the costs can be found in Chapter 6.

First of all there are the official fees one has to pay to the patent office. At the EPO these include filing, search, examination, granting and renewal fees. After the patent has been granted by the EPO, the patent needs to be validated in the countries of choice. Some countries again ask for a validation fee. Then each year the patent holder has to pay
renewal fees to all of the offices in which it wants its patent to be valid (Harhoff, Hoisl, & Van Pottelsberghe de la Potterie, 2009).

Secondly there are the costs of translation. Many of the patent offices around the world require that the patent to be translated into an official language of the country. Currently in Europe several countries have agreed in the London Agreement that translation is no longer needed. This sometimes involves the entire patent but other countries have agreed that only the claims have to be translated (Van Pottelsberghe de La Potterie & Mejer, 2010).

Lastly there are the costs of the patent attorney. Patent attorneys are able to write and apply for a patent on behalf of the inventor. The costs of attorney depend on the length and complexity of the patent and to what extend the inventor is able to write down the requirements themselves.

Validity
Applying for a patent is not a guarantee for success. One is not certain if the patent will turn into a successful innovation. Companies have to face the costs of uncertainty about the patent validity and the uncertainty of success of the invention. Five sources of uncertainty for companies when facing patents are identified by Gans, Hsu and Stern (2008). The first three sources they identified are direct costs. The first uncertainty is whether or not the patent will be granted at all. Granting rates varies around 70% for the U.S. (Frakes & Wasserman, 2012) and just around 50% for Europe (European Patent Office, 2012). Some doubt these rates as they do not take into account patent applications that are revised at a later stage in the process. Patent grant rates in the US might therefore be as high as 90% (Quillen Jr. & Webster, 2006).

Quillen Jr. and Webster show that a lot of patents go through amendments before they will be granted. Usually the patent examiner will come up with prior art and the applicant then has to show this is either not relevant or it will have to amend the claims to narrow down the scope of the patent. This second kind of uncertainty creates costs for the applicant as he is not sure beforehand what the scope of protection is.

The third source of direct costs arises from uncertainty in patent enforcement. First of all there is the chance that the patent gets revoked at the opposition procedure during the first year after the patent has been granted at the EPO. Other patent offices do not have such a procedure. Although only a small number of patents are opposed, roughly 7% (Harhoff & Reitzig, 2004), the chances of getting your patent revoked (+/-38%) or amended (25%) are relatively large (DG Internal Market and Services, 2011). Secondly there is the chance the validity is tried in court. Even though only a small number of patents are litigated there is a reasonable chance that the patent will get invalidated. Cremers et al. (2013) show that the outcome of patent litigation in Europe varies between the different courts. The chances of a patent getting revoked during an infringement case are quite low, a maximum of 25% in the UK, but during a revocation case these percentages can go up to 70% in the Netherlands. So once a patent is granted a company still faces the uncertainty whether the patent is valid or not.
Infringement

The last direct transaction costs originate from the behavioral uncertainty about other parties. The most vital of these issues is if the others’ products infringe your patent. The direct costs of infringement can be split into two cases, the time before (ex-ante) detecting the infringement and the time after (ex post). Ex-ante the costs are mainly in detecting who is infringing your patent. Whether these costs are high will depend on the patent strategy the applicant is using. Those who use patents mere for blocking will not be on the lookout for infringers, but those who are actively willing to license their patents take a more assertive approach (Arundel, 2000).

The ex post costs are seen as an obstacle to patenting (Arundel, Demandt, & Steinmueller, 1997; Intellectual Property Institute, 2010). These reports also show that the probability that a patent case ends up in court is small. Most cases are settled between the parties themselves. If the case does end up in court, in many cases the parties reach a settlement before the judge comes to a decision (Cremers et al. 2013). But those cases that end up before court can be very costly. A more detailed analysis of litigation costs follows in Chapter 6.

3.2.4 Indirect costs

When deciding to file for a patent, not only direct costs have to be taken into account. There are indirect costs, originating from the behavior of others that play a role in this decision. These costs are discussed below again along the lines of the three sources of transaction costs.

Application

Indirect costs in the patent application also come from the asset specificity of the patent. As explained in section 3.2.2 an important distinction in specificity is between discrete and complex innovations. Companies operating in industries with complex innovations, such as the semi-conductors industry, have a larger probability of facing a thicket of other patents (Hall & Ziedonis, 2001). Having a single patent in this case will not provide sufficient protection for the invention. If one is likely to infringe other patents, agreeing on cross-licenses or dealing with patent pools is necessary for a company to get the freedom to operate (Giuri & Torrisi, 2010). The costs of operating in such a thicket range from doing a thorough patent search beforehand to see which patents it might face, to negotiating deals with other companies or patent pools. In the case of cross-licensing a company has to share the market with a competitor, which leads to reduced profitability (Shapiro, 2001). Those companies that work in a market with discrete innovations have less of these costs. Often an invention is only supported by one or a few patents which are not as closely related to each other as in the case of cumulative innovations.

Validity

Out of the five sources of uncertainty identified by Gans, Hsu and Stern (2008) three dealt with direct costs. The fourth and fifth kind of uncertainty relate to the indirect costs of the validity of the patent.
The fourth kind of uncertainty deals with the situation in which the patent is pending. A lot of patent offices around the world have backlogs because of the enormous amount of patent applications. This prolongs the time until the patent is granted. This could increase the indirect costs of the applicant as he is not sure if it can commercialize its invention. How big these costs are, is however uncertain. The uncertainty of pending patents can also be interpreted in a positive manner. Mejer and Van Pottelsbergh de la Potterie (2011a) show the pendency time at the EPO is not created by backlogs, such as at the US Patent and Trademark Office (USPTO), but by the strategic behavior of the applicant. Companies like to postpone the decision on where to get their patent validated, as this could unnecessarily increase costs, because they are not such sure which inventions could be commercialized.

The last source of indirect costs related to validity is the uncertainty of the value of the patent. This largely depends on if the technology can be commercialized. Identifying beforehand technologies that become a success is a very difficult task. The decision to patent could be a costly business if the technology does not result into a successful product. As is seen in Europe, many companies therefore apply delaying tactics in order to see if they can postpone the costs of patenting to have a clearer view of the chances that the product will become a success (Mejer & Van Pottelsbergh de la Potterie, 2011a).

**Infringement**

The last costs belonging to this framework originate from indirect costs from the behavioral uncertainty of others. This involves others using the patented idea to their benefits. Arundel (2000) showed that for a lot of companies the disclosure of the patented idea is for many an obstacle in patenting. Disclosing the information in a patent leads to opportunity for others to come up with a solution that will achieve the same result without infringing the patent. Secrecy is often more valued than patenting, especially if the scope of protection is unclear (Arundel, 2001). The ex-ante costs of disclosing your invention are generally perceived as small but the ex-post costs of inventing around the patent by others can be larger (Cohen, Nelson, & Walsh, 2000). The doctrine of equivalence might provide some support for patent holders. This doctrine holds that the patents scope extents to inventions that are not do not fall under the patent claims but are nevertheless the same as the invention. (Petherbridge, 2010) When writing the patent, applicants therefore try to remain as vague as possible, without narrowing down the scope of the claims. ‘Inventing around’ leads to higher indirect costs because competitors enter the same market, without having the costs of Research and Development (R&D).

3.3 Conclusion

This chapter has developed a patent version of the transaction costs theory. First the model proposed by Rindfleisch and Heide (1997) on the classical transaction cost theory was explained. It clarified the concepts used in the theory. Secondly it has looked at the literature already existing on patents and transaction costs. Patents and transaction costs are often mentioned, especially in the case of licensing, but a transaction cost model on the decision to patent was missing.
Taking into account the literature on the costs of patenting the model was transformed to be useful for patent applications. The biggest change is that types of transaction costs are different to the original model. Not the opportunity costs but the indirect costs are more important to patentees. Another change is more obvious, the sources of transaction costs are different in the case of patents than in traditional ‘make-or-buy’ decisions. For patents these lie during the application phase, uncertainties about the validity and in the case of infringements by others.

This chapter has made clear that the costs of patenting not only lie in direct, monetary costs. Companies deal with uncertainties from the environment and the behavior of others. This means that when evaluating the effects of the Unitary Patent such costs also have to be taken into account. The changes in the regulations could mean that the environment and behavior of others could change as well. The transaction cost theory helps to analyze such costs. The distinction between direct and indirect costs will be used throughout this thesis to be able to present the changes in a clear and concise way.
4 Literature study on the effects of the Unitary Patent and SME’s

Analyzing the effects of the Unitary Patent for SME’s requires a deeper understanding of two subjects. First there is the need to understand the current European patent system and the regulations on the Unitary Patent as is done in Chapter 2. To interpret these changes responses by academics and stakeholders are analyzed. These stakeholders include businesses, policy makers, patent attorneys, patent lawyers and national patent offices. This analysis helps to see where the most important improvements and pitfalls lie. Secondly to see whether the Unitary Patent provides improvements for SME’s a thorough understanding of the way SME’s protect their intellectual property, be it by patents or other appropriation techniques, is required.

These two subjects are analyzed using the theoretical framework proposed in Chapter 3. In Section 4.1 the literature on the direct costs is analyzed. This involves the responses by academics and stakeholders on the changes in regulations but also the way SME’s face direct costs in patenting. In Section 4.2 the literature on the indirect costs is discussed. This section also starts with responses on the effects of the Unitary Patent on indirect costs and the way SME’s face these costs. The section finishes with a section on the effect of patents on innovation. An analysis of the literature on this subject is added, because this indirect effect is seen as the goal of the Unitary Patent. Using the literature review and the theoretical part of this thesis, conclusions are drawn and statement are formulated.

The literature study was performed with a broad search on the Unitary Patent and its synonyms in several databases for academic articles. To find responses of academics the performed search seemed to be sufficient as the papers often cited each other. The responses of stakeholders required a broader approach, which involved looking at some of the popular blogs (such as IPkitten). From these blogs references to other reliable sources, such as reports from (non-) governmental agencies or journal articles, were sought. For the stakeholders such sources were often hard to find, therefore press releases, letters and presentations were used as well. For literature on the behavior of SME’s the same databases with scientific literature were used. After some initial findings other articles were mainly found by references in the articles.

4.1 Direct Costs

4.1.1 Responses on the effects on direct costs by the Unitary Patent Package

A lot of different stakeholders have responded to the propositions for the Unitary Patent Package during the entire process. The responses by the stakeholders differ greatly. Generally the idea of the Unitary Patent is received in a positive manner. Business (Gutierrez, 2013; Pentland & Mukherjee, 2012) as well as patent attorneys (Jorritsma &

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23 On the following synonyms for the Unitary Patent a search was performed: EU Patent, Community Patent and COMPAT.
24 Databases that were used include: Google Scholar, Focus and Sciencedirect
25 IPkitten is found to be one of the most influential and most read blogs on IP matter. The blog can be accessed at http://ipkitten.blogspot.nl/. Other blogs that were used included ipwatchdog.com, ipcopy.com and patentlyo.com.
Clarkson, 2011) do see the advantages of the Unitary Patent. There are a lot of reservations about the Unitary Patent as some details are unknown and plan has to prove itself into practice. There are others that critique the Unitary Patent on its flaws.

Several academics have questioned the legal basis for the Unitary Patent Package (Lamping, 2011; Ullrich, 2012). Uncertainties about the legal basis and therefore patent validity would increase costs and potentially scare away applicants. The regulations that are part of the discussion are built upon Article 118 of the Treaty on the Functioning of the European Union (TFEU). Article 118 states that European Parliament and the Council can set up intellectual property rights with uniform protection and it provides for regulations to establish language arrangements. It also states that a decision to create such rights has to be taken unanimously. This can be overruled as the TFEU also leaves space for cooperation between countries within the EU, also called enhanced cooperation. The topic of enhanced cooperation is debated a lot in the literature (Hilty, Jaeger, Lamping, & Ullrich, 2012; Lamping, 2011; Ullrich, 2012a; Ullrich, 2012b; Ullrich, 2013). The common finding in these studies is that the legal basis for enhanced cooperation is rather weak. The point of argument is whether or not the enhanced cooperation would lead to negative effects for those countries that do not participate, which is not allowed according to the TFEU. The problem with enhanced cooperation is that there is little jurisprudence in this field (Lamping, 2011). It is therefore unclear on how to interpret the option of enhanced cooperation. What follows is a rather strict interpretation of the rules.

A rather controversial issue, not just among academics but also practitioners, is the issue of the Articles 6-8 in the regulations for the Unitary Patent (Wadlow, 2013). These articles, currently moved to the agreement on the UPC as Articles 25-27, are at first sight uncontroversial. They determine the rights of the patent holder and limitations of these rights. However these articles were issue of debate and eventually placed in the agreement on the UPC. Especially the UK government opposed the idea of placing these in the regulations on the Unitary Patent as they would then be subject to possible rulings of the ECJ (House of Commons European Scrutiny commission, 2010). This could lead to lengthy cases at the ECJ which would generate uncertainty for patent holders and therefore increase their direct costs. Placing the articles in the agreement on the UPC makes them subject to the UPC as this is an agreement outside the scope of the ECJ. Wadlow (2013) argues that moving Articles 6-8 would leave the regulations on the Unitary Patent without any communitarian character. This would endanger the foundation of the regulation as this unitary character is needed according to Article 118 of the TFEU. This problem has not been recognized by the ECJ.

The direct costs of certainty about patent validity should be reduced if there would be a uniform jurisdiction in Europe. Whether the UPC can operate properly is however heavily doubted. Smits & Bull (2012) doubt whether the court is able to create more uniformity among the local divisions as there currently is between the national courts. Not only the decisions could differ, but also the speed and the way the courts would work are likely to vary among the different divisions. Courts could handle the issue of splitting cases into an infringement and a validity case, bifurcation, differently. Bifurcation is a common practice in Germany, but not elsewhere in Europe. Some local divisions might
use these methods, while other divisions might opt not to do this. This would increase the chances of forum shopping among the patentees. Smits & Bull (2012) and Brinkhof (2012) also indicate the number of qualified judges is inadequate. This could reduce the speed and quality of the courts. The proposal for the UPC states that the idea is to rotate experienced judges among the other local divisions, but the number of experienced judges is probably too low to handle the workload.

4.1.2 Direct costs and the reasons to use the patent system for SME’s

This section discusses how SME’s use the patent system and which direct costs they face. First the literature on the reasons to patent is analyzed. Not only the costs of patenting but also the potential benefits of patenting are important when deciding to file for a patent. Secondly the direct costs of patenting are discussed and analyzed to see which costs apply specifically for SME’s.

Protection from imitation is the most important reason for patenting among SME’s and large companies (Graham et al., 2010; Rassenfosse, 2012). As this is the basic idea of the patent system, such results do not come as a surprise. Preventing imitation is however not the only reason to patent. Patents can also be used for reasons such as (cross-) licensing, having the freedom to operate, avoiding litigation, attracting investor capital, enhancing the firms’ reputation, being a substitute for non-disclosure agreements and motivating and monitoring R&D personnel (Graham & Sichelman, 2008; Holgersson, 2013; Motohashi, 2008, Rassenfosse, 2012).

Although all of these could be incentives for a company to patent not all companies have the same reasons to patent. There are differences in the reasons to patent between SME’s and large companies. SME’s might not have the capacity to exploit their patents in the way large companies do (Hall, Oppenheim, & Sheen, 2000; Lanjouw & Schankerman, 2004). A reason to patent that is more important to small firms compared to large companies is to look for investors or adding to the company’s value when trying to get sold. Other important reasons for companies are keeping the freedom to operate by preventing others from suing them. This freedom to operate is more important for large companies than small though. According to Graham et al. (2010) licensing is rather low on the list and is only considered important by a few companies. Gambardella et al. (2005) however find that licensing is more important to small firms than larger ones. Enhancing the patents firm reputation is only considered more important by small firms. Large companies have other channels of improving their reputation which are too costly for SME’s (Graham et al., 2010). The reasons and level of patenting among SME’s also differs across industries (Graham et al., 2010). Especially start-ups in the biomedical and medical devices industries make great use of patents compared to other industries.

One of the major issues among policy makers is that SME’s are at a disadvantage compared to larger businesses when it comes to the direct costs of patenting (Thomä & Bizer, 2013). Thomä & Bizer however indicate that starting from a point of formal intellectual property rights is not always the best solution to address this problem. They indicate that appropriation strategies in general as a starting point might be a better option. There are other options than patenting which could include different formal
intellectual property rights such as trademarks, designs and copyright but also informal methods such as secrecy and speed to the market (Leiponen & Byma, 2009). The most important informal methods used to protect to their intellectual property by SME’s are secrecy and speed to the market (Graham et al., 2010 Kitching and Blackburn, 1998; Leiponen & Byma, 2009). A secret can be kept in a company by spreading it across only a few researches in the company. This reduces the chances of the secret leaking out. Spreading the secret across the entire staff is an option to make sure nobody runs with the technology. This method makes sure that the company does not rely one just a few key persons. Secrecy is often effective until the product reaches the market, only a few products are hard to copy once being on the market. Companies hope to have established a market name before someone is able to copy them, which is described as constantly innovating and speed to the market. These informal methods are often rated much higher in value and effectiveness than formal Intellectual property rights (IPR) (Kitching & Blackburn, 1998).

When it comes to patenting SME’s indicate a variety of reasons why they do not use the system. For some inventions a patent cannot be granted and companies (not only SME’s) therefore do not apply. Direct costs are the most voiced reason not to patent. These costs can be split into the costs of obtaining a patent and the costs of enforcing a patent. (Burrone, 2005; Graham et al., 2010; Holgersson 2013; Roland Berger Institute, 1995). An interesting remark by one of the SME’s in the research of Holgersson (2013), was that the cost of patenting was too high because of the lack of an EU-wide patent. Other reasons not to patent are mostly due to indirect costs. Companies have to disclose their information, which could lead to other companies inventing around the patent. Others believed that a trade secret was adequate protection or that there was no need for legal protection (Graham et al., 2010).

4.2 Indirect costs

4.2.1 Responses on the effects on indirect costs by the Unitary Patent

The responses on the effects on the indirect costs are aligned according to the three sources of transaction costs. First the application costs are discussed, followed by costs on the validity and lastly the costs on infringement are being reviewed.

An often heard critique on the Unitary Patent Package is that the Unitary Patent adds another layer on top of the current system, which does not reduce the complexity of the system. As well the geographical scope of the patent, which does not include all EU countries, adds to the complexity of the system. In a transitional period, in which the Unitary Patent is only valid in the countries which validated the UPC agreement, the complexity grows even further. (Hilty, Jaeger, Lamping, & Ullrich, 2012). Such complexity would raise the indirect costs in the case of uncertainty about the validity of the patent. The Unitary Patent could decrease costs if all patents would be valid in the same countries, but the complexity of the layers could make it harder to commercialize the patent. The surroundings the patent holder has to deal with, would become more complex. Keeping the current national and European system is however a request made by industry, as sometimes national protection serves companies better (Pagenburg, 2012).
This could increase indirect costs as the field in which a company has to operate becomes more complex. An increase in the inability to commercialize the patent could be expected due to this.

Critique on the indirect costs in infringement has received a lot of attention in the news. The critique comes from an alliance, who calls themselves a Group of Global Innovators\textsuperscript{26}. The group includes companies such as Apple, Google and Samsung. These innovators showed two reasons of concern for the UPC. First of all they fear a use of the litigation system called bifurcation, which is described in section 2.3.3. They fear that bifurcation might be abused by some as there are no clear rules on how to bifurcate. Bifurcation could lead to a quick injunction without the patents’ validity being tested. The Group of global innovators ask for the Rules of Procedure to be adjusted, so that they do not have to fear the injunction and might settle while the patent might actually be invalid. Secondly they mark upon the lack of rules on preliminary injunctions. They fear that non-practicing entities abuse these vague rules and hinder innovation (Gutierrez, 2013).

Nokia, Ericsson and BAE systems also pointed at the risks of forum shopping among the local divisions.\textsuperscript{27} Nokia also pointed out that a bifurcated system on its own might be bad for European business (Vary, 2012). They point at the large number of invalid patents that are around but still can cause damage because of a bifurcated system. This can lead to injunctions for invalid patents and something described as the ‘Angora Cat’ problem. This problem occurs in infringement cases in which the claims are presented with a broad scope, like a fluffy cat. But during validity the cat is wet and small and able to ‘sleek through’ prior art. This could lead to injunctions that are perceived as unfair. Nokia points out that big business already moved their factories and distribution out of Germany where the bifurcated system is already in practice. Vary fears that entire factories might be moved outside Europe.

These effects are also felt by SME’s. In a hearing on the UPC by the UK European Scrutiny Commission (2012) the SME Innovation Alliance voiced the same concerns about bifurcation and injunctions. Especially for a SME an injunction could be devastating. Next to these arguments they voiced concerns about the costs of the UPC. They mentioned that not only the court and attorney fees are important. Expenses for management, such as travel and hotel costs, are also likely to rise. Lastly the SME Innovation Alliance indicate, like Smits & Bull (2012) and Brinkhof (2012), the lack of experienced judges. They already signal that those who judge on patents are not what they would name a person skilled in the art. They fear a worsening of the system.

\textsuperscript{26} Group of global Innovators. Open letter to EU members states, MEPs, the Commission and the preparatory committee of the Unified Patent Court. Last modified September 26, 2013, http://www.iam-magazine.com/blog/Detail.aspx?g=11fd5a2a-11f3-46cd-8cf9-1e67f649f298

An unexpected critique on a rise in indirect costs came from the Polish government. The Polish government, under which presidency the agreement for the Unitary Patent was signed, decided to not participate in the Unitary Patent and the UPC. Based upon a report of Deloitte Polska (2012), which estimated negative effects for especially Polish SME’s, the Polish government decided not to participate. The main reason for a negative effect was that a lot of patents would also become valid in Poland. Currently only a small percentage of European patents are validated in Poland. An increase in validations would mean a decrease in the value of the current patents as they are more embedded. As well litigation against Polish companies would rise. Only a small increase in enforced new European patents would lead to negative economic effects (Xenos, 2013).

An issue that adds to the complexity of the system, and possibly to indirect costs, is that of the missing articles on compulsory licenses. This would leave these issues to national courts which creates 25 different regulations on these issues. Patent holders would therefore need to check these regulations in 25 different countries and adapt their practiced to them (Ullrich, 2012a). However what the impact of this is, and to what extent these regulations have been harmonized is unclear.

The last two critiques do not address the indirect costs of a patentee directly, but can cause problems with the Unitary Patent. Xenos (2013) looked at policy setting issues that arise after the implementation of the UPC agreement. Xenos argues that the UPC is unable to set policies on the patentability of subjects. According to Xenos, the participating member states do not have a common policy on patentability standards and it is difficult to reach such common policy, as all member states have their national interests. As well a forum is lacking to establish such a common policy. A federal system such as in the USA is therefore impossible. The last critique on the Unitary Patent Package concerns the opaqueness and the quickness of the process. Xenos (2013) mentions the limited amount and sloppiness of research on the effects of the Unitary Patent that has been done. According to Xenos the impact assessment of the European Commission and the report of Harhoff (2009) are lacking certain elements and are full of data which could be incorrect. Also Lawyer Ingve Björn Stjerna revealed several pieces which showed that the legal staff of the European Commission had some serious doubts about whether or not the regulations provided enough certainty. Sterjna shows that the solutions that were chosen are “sub-sub-suboptimal” and therefore some of the negotiations were held behind closed doors.

4.2.2 Indirect costs in the use of the patent system by SME’s

In Section 4.1.2 differences in the reasons to patent between SME’s and larger companies were signaled. This section looks at the patenting behavior of SME’s compared to larger companies. Such behavior could influence the position of SME’s and potentially the indirect costs they face. Secondly such a difference could not only exist in applying for patents but also in enforcing them. A review of the literature on patent litigation by SME’s is therefore performed.

SME’s might be more sensitive to IPRs as they don’t have access to channels such as marketing and distribution. Especially start-ups would therefore have to rely on intellectual property rights as something to fall back on (Brouwer & Kleinknecht, 1999; Graham, Merges, Samuelson & Sichelman, 2010). Jensen & Webster (2006) find that given the innovation potential of small firms they are more likely to patent. Brouwer & Kleinknecht also find that those SME’s that do patent have a relatively higher number of patents. Bound, Cummins, Griliches, Hall and Jaffe (1984) find that SME’s with R&D have more patents per dollar spend on R&D than large companies. These patents are filed more at national offices than via an international route (Friesike, et al., 2009; Van der Poel, Seip, & Snoei, 2010a). However there are others that do find that small firms experience thresholds when it comes to patenting (Arundel & Kabla 1998; Brouwer & Kleinknecht, 1999; Mansfield, 1986). When it comes to patenting an often heard argument is that it is too expensive for SME’s and therefore they are less likely to patent than larger companies (European Patent Office, 1995; Jensen & Webster, 2006). Patent propensity is found to decrease with firm size (Arundel, 2000). Arundel, Demandt, & Steinmueller (1997), in a survey among Dutch SME’s, find that SME’s more carefully look at each innovation and whether or not they should patent it. Large companies with in-house patent offices have fewer costs in patenting and therefore patent routinely. This might lead to unnecessary patents and Arundel et al. feel that SME’s should not patent more than they do right now. The finding that SME’s are selective when patenting is confirmed by Rassenfosse (2012).

In the literature absolute numbers can be found in a report by Rogers, Helmers & Greenhalgh (2007a). Figure 6 displays the number of patents in the UK arranged according to the size of the company. SME’s and micro enterprises together file about the same amount of patents as large companies.

![Figure 6 Number of patents arranged by company size. Source: Rogers, Helmers & Greenhalgh (2007a)](image-url)
To put these numbers into perspective Rogers, Helmers & Greenhalgh looked at the patent propensity of companies. The results in Table 4 show that patent propensity is high for Micro companies. SME’s also have a higher propensity than larger firms. These figures are highly skewed towards companies with only one or a few patents. There are only a few firms that have a lot of patents, this holds for both large and small firms. It is hard to compare the precise patent propensity because information about whether or not these companies have inventions that could be patented is not available.

<table>
<thead>
<tr>
<th>Sample size</th>
<th>Micro</th>
<th>SME</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patent Propensity (Patent/£1 Million of assets)</td>
<td>7.576</td>
<td>0.366</td>
<td>0.029</td>
</tr>
<tr>
<td>Patent/Firm</td>
<td>1.5</td>
<td>1.5</td>
<td>2.9</td>
</tr>
</tbody>
</table>

Table 8 Patent propensity according to company size. Source: Rogers, Helmers & Greenhalgh (2007a)

Van der Poel, Seip & Snoei (2010b) reported figures for Dutch companies between 2003 and 2007. The numbers in Table 5 show that the majority of patenting in the Netherlands is done by large companies. The majority of patent applications are filed by a few large companies. Philips stands out in this case applying for over 30% of all Dutch patents. The largest SME filed for 40 patents in 5 years.

<table>
<thead>
<tr>
<th>% SME</th>
<th>% Large companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of applicants</td>
<td>94%</td>
</tr>
<tr>
<td>Patent applications</td>
<td>30%</td>
</tr>
</tbody>
</table>

Table 9 Number of patent applications and applications classified according to size. Source: Van der Poel, Siep & Snoei (2010b)

When it comes to performance of companies that patent Andries & Faems (2013) find that patenting increases the financial performance of SME’s. Although SME’s profit less from licensing activities than large firms, both SME’s and large firms profit from patenting. Motohashi (2008) found that for very small and new firms patent licensing could be an important source of income. This is as well valid for very large firms, but medium sized companies do not profit from licensing that much. Rogers, Helmers & Greenhalgh (2007b) looked at survival rates, growth and profit margins but did not find any positive effect of patenting for SME’s. Important to mention is that they looked at all SME’s not just those active in technological field and undertaking any R&D activities.

Not only in applying for a patent SME’s experience barriers. Also in patent litigation there are costs that could put SME’s at a disadvantage compared to larger companies. Kitching & Blackburn (1998; 2003) suggest that high monetary costs can be a barrier to the use of patents. The threat of litigation by large firms and preliminary injunctions could even scare away SME’s from certain areas of R&D (Lanjouw & Lerner, 2001; Lerner, 1995). Such monetary costs can lead to indirect costs, as SME’s are afraid to litigate. The costs of litigation can lead to settling cases earlier, which could mean that
SME’s are more vulnerable to patent trolls. Lanjouw & Schankerman (2004) show that companies with a small patent portfolio have a higher risk of being litigated. Their explanation is that companies with a large portfolio have the chance to engage into cross-licensing or other types of negotiation and therefore do not have to settle in an early phase. These results would support the findings that some companies patent to decrease the chance of litigation (Graham & Sichelman, 2008; Hall & Ziedonis, 2001).

There are however findings that suggest that there are no differences between small and large companies. In a study on UK SMEs, Greenhalgh et al. (2010) found that about 25% of the companies had been in an IP dispute. This involved patents, trademarks and creative industries. Those that possessed a patent had a 39.5% chance of being in a dispute compared to 7.4% of non-patentees. Most of these disputes however ended with an exchange of letters or negotiations. Even if the case went to court, 40% of the cases were settled before a decision was made. Although Lanjouw & Schankerman suggest that SME’s are at more risk because of the size of their patent portfolios, Greenhalgh et al. do not find evidence that SME’s more often face larger companies. SME’s are also just as likely to win cases as large companies, only micro enterprises have a smaller chance of winning. The idea that they cannot face larger companies because of budgetary reasons is shared. As well Greenhalgh et al. do find that companies recognize the importance of a strong patent portfolio to negotiate and not end up at court.

Greenhalgh et al. also look at the costs of patent litigation for SME’s. Opposite to what the numbers suggest many SME’s note that the costs are prohibitive and if one ends up in court it could mean bankruptcy. Next to the monetary costs they identify three others costs: Commercial costs, PR damage and internal resource costs. Commercial costs deal with not being able to exploit you product or not fully getting refunded what damages the other party has brought to you. When being in a trial PR damages can be substantial as there is a great amount of uncertainty. These effects can last longer than the trial. Lastly patent disputes can be very time consuming and could require attention of a large piece of the staff especially in SME’s.

As shown above the evidence around the risks of SME’s in patent litigation is mixed. This could be due to the countries in which the investigations took place. The UK system is very expensive and knows only a few cases each year (Helmers & McDonagh, 2013). Patent litigation in the USA is more common (Lanjouw & Schankerman, 2004). Results for these countries could be very different because of these institutional differences. Conclusions for Dutch SME’s are therefore hard to draw, because these findings are hard to compare. Both studies do find that SME’s are at a disadvantage when it comes to portfolio size and capital. They are therefore more likely to settle.

If parties would want to go to court a solution for these high costs could be to take out litigation insurance. These insurances are relatively unknown among SME’s. If they are known many perceive the costs as very high for the protection that the insurance provides (Greenhalgh et al., 2010; Kukrus & Kartus, 2011; Kumar, 2008). Therefore only a small amount of SME’s (25%) takes such insurances.
Thambisetty (2010) comments on the small amount of evidence that policy-makers base their decisions on in this field. She notes that it is not clear that SME’s are in need of more patent litigation. A low amount of litigation might actually be beneficial for society. High costs could be an incentive for all parties to seek solutions outside the court.

Literature on patent litigation and SME’s is scarce. The evidence provided is also mixed. It is unsure whether SME’s have a higher risk of being involved in patent litigation. Those companies having a dispute like to settle this outside the court as the costs are seen as a major obstacle. These enforcement costs could also lead to SME’s not taking out patents. Others argue that these high costs could lead to more negotiations which are more beneficial for society than a lot of court cases. Patent litigation insurance as a remedy for these costs is unknown among SME’s or perceived as too costly.

4.2.3 Patents as an incentive to innovate

The European Commission 30,31 assumes that the indirect effect of patents can be used as an instrument in innovation policy to increase innovation. They recognize that the link between patents and economic growth has not been researched extensively, however do assume that the Unitary Patent will spur innovation. This section looks into this link and tries to draw conclusions on the existing literature.

Much of the literature on innovation and patents can be referred to Arrow (1962). The ideas of Arrow can best be illustrated by using an example of a drug company; such an example is commonly used as it is clearly illustrates how the patent system works (Lerner, 2009). The example starts with company A investing money into R&D trying to develop a new drug. Several millions are needed to develop this drug. Many hundred millions more are needed to go through several stages of approval. Company A pursues several different drugs at the same time knowing that only one or a few drugs come to the market. In a patent free world, once the product is brought on the market, it would be easy for others to copy the drug. This would create a competitive market with low prices for the drugs. Company A that made the investment would however not be able to recoup their investments. So imagine the manager deciding whether or not to invest into a drug. He is sure that certain projects never reach the market and those that do, do not provide enough profits to recoup the investments. In a patent free world, such a company would not start new R&D projects. Patents grant a monopoly for 20 years (in most cases) which gives the company time to make a profit. This monopoly gives the company the power to charge more than is beneficial for society. However would such a monopoly the drug would not have been there in the first place. The patent system is therefore a necessity to innovate.

This case is too simplistic, although the relation between patents and R&D investments in drug companies is often as such. Many other industries do not work like this. Three

issues are left out in this simple case. First companies have other ways of protecting their innovations. Other ways of protecting your intellectual property such as secrecy and lead time advantage are already discussed in Section 3.4.3. Secondly, many inventions do not occur in isolation but built upon existing knowledge. As already discussed in the theory section, this cumulative innovation means that a single patent does not always grant the freedom to operate. Often a company cannot bring a product to the market with just a single patent but it has to navigate through a patent thicket. This could involve negotiating deals and (cross-) licensing with others (Somaya & Teece, 2001). The last issue is the abuse of the patent system. Patents are not only used for protection of others but can be used offensively (Lerner, 2009). With the rise in the number of patents granted in the 1980’s, especially in the USA, more and more lawsuits were filed. Patents in these cases can often be of dubious quality. The outcome of these lawsuits also depended a lot on in which jurisdiction the case was handled. These lawsuits create great uncertainty among innovators (Jaffe & Lerner, 2004).

These three issues show that patents, although intended as an incentive to innovate, could have the opposite effect. The usefulness of the system depends on how the users handle it. Abusing the system creates uncertainty among innovators which could lead to less innovation. The next section discusses a number of papers which provide empirical evidence around the link between patents and innovation.

Patents are also often used as a measure for innovation. Patents represent inventions which could turn into innovations. They have at least passed a test of novelty and are likely to represent more value than the cost of patenting. Moreover, patent data is easy to use as it is classified and available for a long period (Greenhalgh & Rogers, 2010). The other way around, Bound et al. (1984) find that R&D is a good indicator for patenting. However they do note that not all companies that do R&D, patent. This is one of the difficulties of patents as indicator of R&D and innovation. A second problem is indicated by Griliches (1998) who notes that the value differs from patent to patent. Some patents only indicate a small improvement, while others might cover an entire new field. Simply counting patents therefore does not indicate the level of novelty. Other problems are the varying rates in patent propensity across industries, that some inventions cannot be patented, the strategic use of patents and the standards that vary across countries (Greenhalgh & Rogers, 2010).

Patent policy also has an influence on the number of applications, while this might not mean that innovation has risen drastically (Jaffe & Lerner, 2004; Lerner, 2009). Jaffe & Lerner show that the surge in patent applications in the US since the patent reform in the 1980’s is not due to an increase in innovation. Reduced standards and incentives for universities to patent have led to a huge increase in the number of applications. This has also led to an increase in the amount of litigation which has increased uncertainty among businesses and could even hinder innovation.

In the literature a division between those which base their research on data before the 80’s and those after can be found. Griliches (1998), Bound et al. (1984) and Hall, Griliches & Hausman (1986) do find or assume a relationship between patents and R&D.
An exception to this is Mansfield (1986) who only finds a weak relationship. The group dealing with data from after the 80’s finds different results. Arundel (2000) recognizes that from the 80’s the world has become more pro-patent. This is because decreased standards at the patent office and changes in legislation. But other factors such as an increase in applied research and a shift to a knowledge economy also played important roles in the increase in the number of patents (Arundel, 2000; Kortum & Lerner, 1997).

Patents seem to be a good indicator for innovation as they represent an invention. This section has shown that there are some difficulties in using patents as an indicator for innovation. Next to this a surge in patent applications since the 80’s has shown that policy can increase the number of applications but that does not necessarily mean an increase in innovation. An increase in the number of applications, as is expected after the introduction of the Unitary Patent\textsuperscript{32,33}, does not necessarily mean an increase in innovation.

4.3 Conclusion and statements

This chapter is a literature review on the effects of the Unitary Patent on the transaction costs. The analysis performed was split into two parts, one for the direct costs and effects and a second part on the indirect costs and indirect effects. For both parts it has looked at the responses by academics and stakeholders on the effects of the Unitary Patent. A general positive response could be found on the direct costs, however there are uncertainties about the validity of regulations and agreement. This could increase uncertainties among patent holders which could increase direct costs. The operating of the UPC also raised some concerns as the wished for uniformity in litigation might not be reached. Concerning the indirect costs we saw some more troublesome predictions. Especially members of industry expressed their concerns about the issue of bifurcation and patent trolls.

Secondly this chapter took a look at the literature on patenting behavior by SME’s. For the direct costs it looked at the incentives for SME’s to patent and if they did not patent which other appropriation strategies they used. The literature provided evidence that SME’s patent for different reasons than larger companies. As well they were more likely to use other appropriation strategies. For indirect costs we saw that SME’s could be at a disadvantage compared to larger firms because of a lower patent propensity. A small patent portfolio could mean a weaker negotiation position during a conflict. This disadvantage could also be seen in patent litigation, although the evidence was not conclusive.

The last section dealt with the question whether or not the expected increase in patenting also leads to an increase in innovation. The section showed that for some industries innovation would not happen without the patent system but that for others it is not that important. More over the increase in patent application in the 1980’s cannot be entirely explained by more innovative behavior. This means although patents and innovation are

linked an increase does not necessarily mean increase in innovation, but could also be an increase in patent propensity.

Together with the theoretical framework of chapter two several hypothesis are formulated. These hypotheses take into account how the new regulations affect the costs of patenting in the broadest sense as is defined in Chapter 2. The hypotheses incorporate the way SME’s use patents or use other ways to appropriate their intellectual property. They follow according to the research questions in Chapter 1.

S1: In some specific cases SME’s the Unitary Patent cut costs. Those that profit are a minority.

When looking at all the costs of the Unitary Patent the costs reductions for most SME’s are minimal or non-existing. Most of the patenting is currently only done in a few countries so the Unitary Patent does not provide much relief. Other major costs such as patent attorneys are not changed.

S1A: The renewal fees of the Unitary Patent bring some relief but are dependent on the level set by the EPO.

The renewal fees level is set to be expected just around the average number of countries that is patented. A large number of patents however uses less than the expected level of renewal fees. Setting the level of fees for the Unitary Patent just a bit higher might already mean that a larger number of SME’s does not profit is this respect.

S1B: Translation costs after the transitional period is likely to go down, but this is only minimal.

Due to the London agreement many of the popular countries among applications already require no translation or just a translation of the claims. Only those that patent in countries outside the London agreement can profit from this extensively. A problem here is that some popular countries such as Spain and Italy are not taking part in the Unitary Patent.

S1C: Litigation costs are not likely to change a lot for Dutch SME’s.

The number of Dutch SME’s that litigate is small. Those that do this multiple jurisdictions are almost non-existing. Cost reductions are therefore only for the happy few. The Netherlands is expected to have its own local division and therefore not a lot is likely to change. The number of cases abroad is hard to predict but is likely very low.

S2: Dutch SME’s are not likely to be affected by changes in legislative procedures

Dutch SME’s are hardly involved in litigation. There are some changes from which they could profit and some pitfalls. But chances are small that these effects influence patenting behavior by SME’s in a major way.
S2A: The construction of the UPC mainly creates more threats than opportunities for SME’s.

The number of cases litigated by SME’s in multiple jurisdictions is very low. Potential suits in other countries for which the SME has to adapt could be a threat. With an increase in scope for a lot of patent holders in other countries Dutch SME’s are at a higher risk of being litigated. The intensity of this happening is hard to predict but the current construction does provide this opportunity. This could also mean an increase in ‘patent-trolls’ which can deliberately choose to prosecute as far away from the SME’s home country. This increases the costs for litigation and means that SME’s are more at risk.

S2B: The license-of-right option provides opportunities for SME’s but these are not likely to be seized.

Licensing is not often mentioned as a reason to patent among SME’s. This option is therefore not likely to be attractive for many. The license-of-right option is not very well known and has the problem that exclusive licenses are not allowed. In Germany the system only receives little attention. Only for those patents that are already licensed in for example a standard or at the end of their lifetime, this could provide some costs reductions.

S2C: Bifurcation could have a small negative effect on SME’s

The bifurcation system could cause some uncertainty and situations in which SME’s are faced with injunctions while they are not justified. The system however functions in Germany without any problems. Whether the system is widely spread across all divisions is hard to predict. The system could be open to abuse but the rules of procedure of the UPC could provide strict guidelines to prevent this.

S3: A larger number of validated patents does not affect Dutch SME’s as much as other European SME’s.

The Polish government decided to opt-out of the Unitary Patent because a larger number of validated patents would mean problems for Polish companies. The Dutch situation can however not be compared to the Polish. A larger percentage of patents are already validated in the Netherlands. More over the Dutch economy is much more innovative than the Polish.34

S4: The Unitary Patent has a slightly positive effect on innovation among Dutch SME’s

Although the literature does not point to large costs savings or a surge in patenting among SME’s, the Unitary Patent can have small positive on innovation. The link between patenting and the performance of SME’s is not clear, but the literature tilts towards a

small positive effect. The connection between an increase in patenting and innovation is also heavily discussed. This does not take away that small costs savings and a small increase in the number of patents can be expected. Money that is not spend on translation costs and fees and protection that can be sought in cheaper ways is likely to have a small positive effect on innovation.
5 Methodology for empirical testing

This chapter provides the research methodology to test the statements formulated in the previous chapter. The first section describes the selection of secondary sources which are used to evaluate the direct costs of applying for a patent. It also explains the selection of cases and experts to empirically test the statements. The cases are various SME’s which were interviewed. The second section explains the methodology used for the interviews. In the third second some of the characteristics of the SME’s are displayed.

5.1 Secondary sources selection

Secondary sources are used to be able to compare the current monetary costs of the European Patent with the Unitary Patent. These sources were mainly retrieved from the search already performed for the literature review in Chapter 4. This literature review pointed to many useful sources or referred to other sources. To update specific information to the current situation several online sources were used. The findings were cross-referenced as much as possible, for example with data from patent offices, to make sure that these data were correct. For information on the costs of patent litigation sources found in the literature review of Chapter 4 were also used. An additional search on patent litigation costs was also performed. In total 17 journal articles and reports and 12 internet sources were used to come to the results.

5.2 Sample Selection

To be able to check the data from the secondary sources with the practice of Dutch SME’s, a sample of Dutch SME’s is interviewed. Because the focus is not just on the costs of patenting but also the interpretations of these costs and capturing the experiences of SME’s in the patent system, interviews are chosen as the method to capture data. This provides the opportunity to ask what SME’s think about the Unitary Patent and what they think potential advantages and pitfalls are. Not only SME’s are interviewed but also patent attorneys and lawyers and a group of patent experts. There is a variety of groups because they all can provide different insights into the patent behavior of SME’s. First of all SME’s, because they can react form their own experiences. The reviewed literature in Chapter 4 however suggested that SME’s might not always be aware of changes in the patent environment and leave the patent strategy up to their patent attorney. Therefore several patent attorneys and patent lawyers are interviewed as well. It is expected that they are well aware of the Unitary Patent and could have a better understanding what the consequences for their clients could be. Lastly a group of experts is added because they could provide a neutral or different point of view on the matter and could have a possible oversight on the situation.

The goal of the empirical validation is to get a broad and in-depth view of the effects of the Unitary Patent on SME’s. It was estimated that around 15 to 20 SME’s needed to be interviewed. In practice it showed that after 13 SME’s saturation was reached. This

35 These sources were found by searching for keywords such as patent costs, renewal fees, patent attorney costs and validation fees.
36 Key words for this search were: Patent litigation, Patent litigation costs and patent lawyer costs.
ensured a broad selection of different types of companies. All the interviewed SME’s are active in the technological field and have some R&D activity which could possibly lead to a patent application. For SME’s the definition of the European Commission\textsuperscript{37} is taken as they also refer to this definition in their policy documents. This definition is displayed in Table 6. Micro entities are in the sample group, but freelancers are not taken into account.

<table>
<thead>
<tr>
<th>Company category</th>
<th>Employees</th>
<th>Turnover</th>
<th>or</th>
<th>Balance sheet total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium-sized</td>
<td>&lt; 250</td>
<td>≤ € 50 m</td>
<td>≤ € 43 m</td>
<td></td>
</tr>
<tr>
<td>Small</td>
<td>&lt; 50</td>
<td>≤ € 10 m</td>
<td>≤ € 10 m</td>
<td></td>
</tr>
<tr>
<td>Micro</td>
<td>&lt; 10</td>
<td>≤ € 2 m</td>
<td>≤ € 2 m</td>
<td></td>
</tr>
</tbody>
</table>

Table 10 Definition of a SME. Source European Commission (2003)

Among SME’s three different groups were made, those with no patents, those with a few patent (applications) and a last group with several (>10) patent (applications). This is done to have a broad spectrum of possible different patent strategies. The number of patent applications was based upon numbers found in the Espacenet database. As patent strategies also vary across industries the aim has also been to select SME’s in several industries.

The SME’s were selected from several databases. The SME’s both have to active in the technological field and perform R&D that could possibly lead to a patent application. The following databases were used to search for possible interviewees.

- Dutch ‘SME innovation Top 100’ (2011-2013)
- Techno Stars Platform
- Biotech Systems Platform
- High Tech NL group
- Mikrocentrum High Tech Platform

All the databases contained only SME’s, or the list could be sorted according to company size. The databases all contained innovative SME’s in the technological field except for ‘SME innovation top 100’. From this list the companies active in the technological field were handpicked. A focus was on companies within the Eindhoven region but companies outside this region were addressed as well. This had two reasons, first of due to the ease of travelling to these companies and secondly because of the high patent propensity in the Eindhoven region (Van der Poel, Seip, & Snoei, 2010a). The companies were also selected based upon the products shown on their website and the number of patents found in the Espacenet database.\textsuperscript{38} Companies were addressed via an email and were send a reminder after two weeks if they did not respond. If the company replied in a positive


\textsuperscript{38} The Espacenet database is a public patent database provided by the EPO. It can be accessed at http://www.espacenet.com
manner, they were sent an information sheet with more detailed information on the research and on the Unitary Patent. In addition to this sample two cases were specifically selected because they were involved in patent litigation. During the research it became clear that most SME’s were not involved in patent litigation. In order to have some in-depth data on patent litigation these cases were selected.

Patent attorneys and lawyers were found online or through contacts that were mentioned during interviews with SME’s. There was a focus on larger patent attorney bureaus because they were more likely to have had the option to look into detail into what the Unitary Patent could mean for them. Patent lawyers were contacted based upon advice during interviews with patent attorneys. They were contacted through email and were send a reminder if they did not respond. The goal was to speak to around five patent attorneys and lawyers of which at least one was a patent lawyer. This number of interviews provides some different insights across different patent attorneys but the number was thought to be enough to get a conclusive idea of the opinion of patent attorneys and lawyers.

Experts were sought in (non-) governmental institutions involved in patents and involved with (innovative) SME’s. These experts added a perspective not provided by the SME’s or patent attorneys. Next to expert interviews two conferences on the Unitary Patent were visited in order to gain insights from experts and to hear the latest developments which could be relevant. Around three experts from different fields were sought to speak to. Three different perspectives should add enough depth to the report to get a full view on all the aspects on the consequences of the Unitary Patent for SME’s.

5.3 Interview methodology

A semi-structured approach was used for the interviews. This approach was used to leave enough room for the participants to express what the most important issues for them are or to add any additional information (van Aken, van der Bij, & Berends, 2012). The issues addressed during the interview were general questions about the company’s characteristics, their current patent strategy and their expectations for the Unitary Patent. A general layout of an interview can be found in Appendix B.

To analyze the results of the interviews with the SME’s a template approach was used (van Aken, van der Bij, & Berends, 2012). This approach was chosen because it made it easy to compare the different SME’s and draw conclusions about specific topics. From the theoretical background and the literature study many of the important topics are already known and can be addressed easier in this way without losing the depth of the information that the interviews provided.

For patent attorneys and experts a semi-structured approach was used as well. A slightly stricter approach was used here as they were expected to have more knowledge on all the aspects of the Unitary Patent. Especially on the issue of the UPC they often provided more information. A general layout for the interviews with the experts can be found in

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39 This information sheet contained the leaflet by Agentschap NL. Agentschap NL, Het unitair octrooi. Leaflet handed out at meeting on the unitary patent, The Hague, 2013
Appendix G. It must however be noticed that for each of the experts a different focus was applied.

5.4 Sample characteristics

In the selection phase 60 SME’s were addressed. Three SME’s responded that they had nothing to do with patents. Another three SME’s responded that they did not have any patents because they believed the system did not work. After asking them if they were willing to perform an interview, even though they did not use the patent system, they rejected. In total 13 SME’s agreed to do an interview, after which saturation was reached. The last interviews did not add any new perspectives from those already gained in the previous interviews. All other SME’s either replied negatively or did not respond at all.

The patent experts mainly replied in a positive manner, only one patent attorney did not respond and a patent lawyer referred to a patent attorney that was already interviewed.

In total 20 interviews were performed en two conferences were visited. Below there is an overview of the industries of the interviewed companies and experts. Detailed information on each case can be found in Appendix C.

<table>
<thead>
<tr>
<th>Type</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>SME’s as user</td>
<td>1 Embedded Systems 2 Medical Systems</td>
</tr>
<tr>
<td></td>
<td>1 Heating Systems 1 Automobile</td>
</tr>
<tr>
<td></td>
<td>1 Semiconductor 1 Mechatronics</td>
</tr>
<tr>
<td></td>
<td>1 High Tech 1 Components Industry</td>
</tr>
<tr>
<td></td>
<td>1 Optics 1 Security Systems</td>
</tr>
<tr>
<td></td>
<td>1 Video Systems 1 Power Conversion</td>
</tr>
<tr>
<td></td>
<td>1 SME Alliance</td>
</tr>
<tr>
<td></td>
<td>1 Patent Lawyer</td>
</tr>
<tr>
<td></td>
<td>1 Dutch Patent Office</td>
</tr>
<tr>
<td>Total</td>
<td>20 Interviews 2 Conferences</td>
</tr>
</tbody>
</table>

Table 11 Overview of industry type of interviewed SME’s

The SME’s varied in their size from micro businesses to medium sized companies. The distribution was rather normal, although there were no companies above 120 employees. The number of patents that the companies had applied for varied from 0 to over 40. This is the numbers that the companies provided during the interview. The data found in the Espacenet database was not always confirmed by the companies itself. Especially if the number of patents was higher there was some discrepancy between the figures. As well some applications were still pending and not published and could therefore not be found in the Espacenet database. The numbers of this research are not likely to representative for innovative SME’s because there was a bias towards companies already using the patent system.

<table>
<thead>
<tr>
<th></th>
<th>Smallest</th>
<th>Largest</th>
<th>Average</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nr of employees</td>
<td>5</td>
<td>120</td>
<td>51</td>
<td>30</td>
</tr>
<tr>
<td>Patents</td>
<td>0</td>
<td>40+</td>
<td>6.8</td>
<td>2</td>
</tr>
<tr>
<td>Age</td>
<td>4 years</td>
<td>38 years</td>
<td>13.9</td>
<td>8 years</td>
</tr>
</tbody>
</table>

Table 12 Case Statistics of interviewed SME’s
The age of companies provided some interesting results. The companies are divided into two groups, young companies from 4 to 8 years old and companies older than 20 years. Although a statistical analysis is not possible because the sample size is too small, it should be noted that the companies in the middle of the spectrum own the most patents. For younger companies such a result could be explained, as they are still in the start-up phase of their company. Why the older companies did not apply for patents is unknown, this could be a coincidence.
6 Empirical results

This chapter displays the results of the secondary sources review and the interviews. The results are divided into two sections according to the theoretical model, direct costs and indirect costs. The results of the secondary sources review and the interviews are presented separate for each of these costs. Although during the interviews the companies were asked to give an estimate of their costs, a lot of companies did not have any exact figures on this or could not even say what services were delivered for these costs. A comparison on the basis of these data was therefore difficult. Companies were rather asked what sort of influence these costs had on their patenting behavior. The first section compares the findings represented by the European Commission and those found in other secondary sources. In the second section the results mainly depend on the interviews. These results reflect the expectations about what the Unitary Patent will bring.

6.1 Direct Costs

This section starts with the view of the European Commission on the direct costs of patenting. The results presented by the Commission have been heavily criticized. Yet a thorough analysis of what the costs actually are seems to be missing. The secondary sources review presented in this section is an all-encompassing view on the direct costs of patenting. In order to give such an all-encompassing view on the costs, the costs are split into various categories. The categories are the application, validation & maintenance costs, patent attorney, translation and litigation costs. The results of this review are compared with the findings of the European Commission. This gives the opportunity to critically assess the statements made by the Commission. Furthermore the section provides a view on the direct costs about uncertainties about patent validity. The section ends with a conclusion about the direct costs of patenting and an assessment on the claims of the European Commission.

6.1.1 The European Commission calculations

The European Commission was glad to announce that an agreement on the Unitary Patent was reached. The Unitary Patent could possibly reduce the costs of applying for a patent from €36,000 to €4725.40 It would provide possible cost reductions up to 80%. The UK intellectual property office comes to a reduction of €20,000.41 These figures have received some heavy critique. According to the writers at IPcopy showcasing such a reduction in costs is therefore very misleading and gives a wrong image about the costs of applying for a European patent on the moment. 42 The statement on these costs by the European Commission is also remarkable as the renewal fees are not yet known. The

level of these fees could be a determining factor in the decision whether to choose for the Unitary Patent or for the current European patent (Edmonson, 2013). This affects the evaluation of the Unitary Patent.

These claims are based upon the impact assessment that the European Commission has made. The European Commission has launched another report called ‘enhancing the patent system’ in which it makes another assessment about the costs of patenting.\textsuperscript{43} Both reports are discussed in this section.

The impact assessment of the European Commission focusses on the validation costs of a patent in Europe. In the assessment it has created various scenarios of which one most closely corresponds with the current proposal for the Unitary Patent. This model displayed in Table 9 shows various options within the scenario. It takes into account the translation costs, fees that have to be paid to the national patent offices for publication and the costs of patent attorneys for assisting in this progress. This model comes to a total cost of above €32000 for validating in all member states.

\begin{table}[h]
\centering
\begin{tabular}{|l|c|c|c|c|}
\hline
 & European Patent 27 MS & European Patent 5 MS (DE, FR, UK, IT, ES) & Enhanced cooperation 16 MS + 11 other MS & Enhanced Cooperation 22 MS + 5 other MS & Enhanced cooperation 25 MS + 2 other MS \\
\hline
Translation & € 23375 & € 3910 & € 14365 & € 10455 & € 5610 \\
Publication & € 2987 & € 308 & € 1485 & € 588 & € 308 \\
Representation & € 5750 & € 500 & € 2750 & € 1250 & € 500 \\
Total & € 32112 & € 4718 & € 18600 & € 12293 & € 6418 \\
\hline
\end{tabular}
\caption{Comparison of patent costs. Source: European Commission (2011)}
\end{table}

The report ‘Enhancing the patent system in Europe’ takes a broader approach to patent costs. In this report the European Commission takes into account the application, validation, translation and external services costs.

Table 10 shows a shortened version of the costs of patenting as presented in the report. The Commission makes a distinction between EPO-3 (UK, DE, FR), the EPO-13 group (EPO-3 and AT, BE, DK, ES, IE, IT, LU, NL, SK, SE), and the US and Japanese patent costs. These results show that the cost patenting is clearly higher when taking into account more than just the validation costs as in the impact assessment. It also shows that patenting in Europe is costly compared to the American and Japanese system (even when taking into account the cost per capita). Moreover the reports note that a lot of costs are in the maintenance of the patent, the renewal fees.


The European Commission has chosen several groups to be able to compare the costs of patenting in both reports. In the conclusions of the reports they refer to the EPO-13 category as an average European patent. The secondary sources review presented below also looks if the groups chosen do indeed represent an average European Patent.

6.1.2 Application, validation & maintenance fees

The analysis in this thesis starts at the beginning of a patent life cycle, the application. During the application a patentee has to pay several fees to the EPO. The pre-grant fees, in case of an application directly at the EPO, are shown in Table 11.

Table 15 EPO fees. The total is based upon a patent containing 15 pages, 4 pages of claims (less than 15 claims) and 1 page of drawings. Source EPO

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The total fees at the EPO are based upon a patent containing 15 pages of text, 4 pages of claims (with no more than 15 claims) and 1 page with drawings. The choice for these numbers is made because these were also used in the reports by the European Commission.\footnote{European Commission, \textit{Enhancing the patent system in Europe COM(2007) 165 final}. Brussels, Belgium, 2007} However the average patent length at the EPO between 1998 and 2002 is different. The average was close to 30 pages and 18 claims per application, the medians are 7 pages and 10 claims. They might not reflect the median length because the averages are inflated by some applications with enormous numbers of pages and claims \citep{VanZeebroeck2009}. As well the numbers have been increasing throughout the years. Especially the number of applications with a large number of pages and claims has been on the rise. The suggested ‘average’ patent used here, reflects a rise in the number of pages and claims but for conveniences does exceed the limit in which applicant has to pay additional fees. Using such an average patent is not without any controversy. A large number of patent attorneys would not agree with creating an ‘average’ patent as this would not exist \citep{RolandBergerInstitute2004}. To be able to analyze the differences, such an exemplary patent is necessary.

In order assess the post-grant fees it is necessary to know in how many countries a current European patent is validated. The European commission uses and average of 13 countries but also used scenarios with 3, 5 and all 27 member states. On average a patent is only validated in 5-6 countries \citep{VanPottelsberge2008}. The distribution of the number of validations is shown in figure 7. The median number of validations lies at three countries.

![Figure 7 Relative frequency of the number of EPC countries that a patent is validated. Source Straathof, Van Veldhuizen, Van der Wiel (2012)](image)

Figure 8 shows the patent validation rates in the countries with the most validations. Germany has most validations with over 90\% of all European patents. Close are France and Great Brittan around 80\%. They are followed by Italy which has a validation rate of
over 50%. Next are Spain, the Netherlands and Switzerland with rates between 25% and 35%. Validation rates for other countries are just above or even below 20%.

Because of the differences in validation rates across countries, costs comparisons are often made for groups of countries. These are the EPO-3 and a new category the EPO-6 (EPO-3 + IT, ES, NL). This category is created because it reflects the EPO-5 often used but also includes the Dutch system, which is more typical for Dutch SME’s. Other groups of countries that are often used are the EPO-13 (European Commission, 2007; Van Pottelsberghe de La Poterie & Mejer, 2010) and the EU-24 countries participating in the Unitary Patent. In this case the EU-24 group is used as only 24 countries participate in the Unitary Patent; this thus excludes Spain, Italy and Poland. Figure 9 displays the costs of patenting for all of these different options. The maximum age of the patent is also varied. A large part of the patents never reaches the maximum age, which leads to differences in the cost of patenting. (Danguy & Van Pottelsberghe de la Poterie, 2009).

The fees for a patent application at the EPO are the same for the Unitary Patent as the pre-grant procedure remains the same. The differences lie within the costs after the grant, in the validation phase. A large part of the validation costs could be in translating the patent. Translation costs are discussed in more detail in Section 6.1.4. The most significant post-grant costs are the renewal fees. After the initial validation each year renewal fees have to be paid to each of the national offices to keep the patent valid. Other post-grant costs are validation fees at the national patent offices if the patent is first handled by the EPO. Not all patent offices charge these fees (Harhoff, Hoisl, Reichl, & Van Pottelsberghe de la Poterie, 2009).

The fee levels for the Unitary Patent are based upon an average of five countries. The exact costs are not yet known but are said to reflect an average European patent.46 Five

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46 European Commission, Regulation (EU) (1257/2012) of the European parliament and of the council implementing enhanced cooperation in the area of the creation of unitary patent protection. Brussels, Belgium: December 17, 2012
countries is an average estimate of what the renewal fees might be. Because the fee levels and structure differ greatly across the countries are the fees based upon the average level of the EPO-6.

Figure 9 shows that patent protection is expensive especially in the last five years of the protection. The total cost of the fees nearly doubles in the last five years. The renewal fees also become the largest part of the costs as the age of the patent progresses. The level and structure of the renewal fees of the Unitary Patent therefore become more important for those that wish for long term protection. Filing only at the EPO-3 is cheaper than the unitary considering only the fees. We see that the Unitary Patent is slightly cheaper than the EPO-6. If Spain and Italy are included, as in the EPO-6, using the current European system is less costly. The costs of the Unitary Patent are much lower compared to the EPO-13 and EPO-24.

![Figure 9 Patent fees for several options. Source: Own calculations based upon EPO(2012), Innovaccess (n.d.) and Europat (n.d.). Figures from Innovaccess and Europat were cross-referenced with some information of National Patent Offices.](image)

Although the Unitary Patent is cheaper in cases when a lot of countries are validated it lacks flexibility. Companies might choose to drop patents in some countries and keep them in others in the later stage when the renewal fees become expensive. The Unitary Patent can only be dropped in its entirety, lacking the flexibility that European patents have.

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47 Agentschap NL, Het unitair octrooi. Leaflet handed out at meeting on the unitary patent, The Hague, 2013
49 “How much Unitary Patent Cost?”

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Interview results

One of the results of the secondary sources review that was confirmed in the interviews is that there is no such thing as an average patent. SME’s select the countries in which they need patent protection. SME’s are not busy with defining the European market in contrast to larger companies. Larger companies can often choose to just select the EPO-3 countries. If a patent is valid in these countries, the market is no longer interesting for their competitors. For SME’s this does not hold, they compete on more regional markets. This does not mean that SME’s patent in a lot more countries than on average. The maximum number of countries found among the SME’s was six. Noteworthy was that several SME’s were not aware in which countries there patents were valid. The quote indicates that the knowledge about patents among SME’s is sometimes very limited.

SME’s generally had little idea on the exact costs of patenting. Some managed to produce an estimate of the costs, but they could not indicate how to split these costs. Most of them indicated that they thought patenting was expensive, though the investment generally was seen as worth it. The companies had thought about this carefully as it was a large investment for them. All of the companies welcomed the Unitary Patent if this meant that there would be a cost reduction. Whether this would apply for their situation was not clear. All companies however indicated that if the costs were equal to, or only slightly more than their current situation, they would choose the Unitary Patent. More patent rights at no expense sounded attractive to them.

Companies not only invested money but also time into patenting. Some of the larger SME’s had someone in the company which handled this, but mostly this was done by management. Most time was however spent by R&D personnel that wrote down the invention in an orderly manner, which made it easy for the patent attorney to use. Companies having more patents already implemented procedures in their R&D process, making it less time consuming.

According to the expert at the Dutch Patent Office most SME’s first use a Dutch application to see the potential of their patent. Only larger medium sized companies with experience in patenting directly apply at the EPO. 80% of all applications at the Dutch Patent Office come from SME’s. The Dutch patent office provides a search report at a rather low price. The patent always is granted in the Netherlands as the Dutch Patent Office uses a register system. The search report provides a good and cheap indication if the patent has a chance of being granted at the EPO. At the EPO 80% of the Dutch application is done by larger companies. Only between 10%-30% of the applications of Dutch SME’s at the Dutch Patent Office is continued at the EPO. If the patent gets granted at the EPO an SME picks on average 4-5 countries. The expert of the Dutch

“I thought our patent was valid across the whole of Europe”

R&D manager, In the field of Mechatronics, 40 employees

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Patent Office provided data on the costs of patenting. The example provided was based upon a Dutch application first followed by a European application which is validated in 6 Countries. The six countries corresponded with the EPO-6 used in the secondary sources analysis. The costs indicated by the Dutch Patent Office matched the data found in the secondary sources review.

The patent attorneys and experts gave a clearer image of the number of countries that SME’s patent in, but it was hard to give any specific numbers. They also agreed that SME’s are more specific when choosing in which countries they want their patent to be valid. Costs considerations are important when choosing. The patent attorneys and experts expected that SME’s would choose for the Unitary Patent if they patented in Europe. A cost reduction would however not be likely for SME’s. Only in a rare case the Unitary Patent could provide some cost reduction. They estimated that the costs would be the same for an average application compared to the Unitary Patent. Choosing for the Unitary Patent and therefore more protection, would then be a sensible option. Companies could use such a patent to ‘show off’. One of the patent attorneys even suggested that patent attorneys themselves could use the Unitary Patent as advertisement.

6.1.3 Patent attorney costs
A lot of companies make use of a patent attorney to file for a patent at the EPO (Hall, Oppenheim, & Sheen, 2000; Holgersson, 2013). In the Netherlands 98% of the applications was done by a patent attorney (Baarsma, Berndsen, Bottelberghs, De Nooij, & Van der Rijken, 2006). Baarsma et al. looked into the costs of patent attorney across Europe. Table 12 displays the results of their survey. These costs are however costs that patent attorney charges which can include fees and costs for drawings etc. They estimated that 68% of the costs of patenting could be attributed to patent attorney fees.

<table>
<thead>
<tr>
<th>Country</th>
<th>Average</th>
<th>Standard deviation</th>
<th>Lower bound confidence interval</th>
<th>Upper bound confidence interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Netherlands</td>
<td>€9.678</td>
<td>€6.121</td>
<td>€7.757</td>
<td>€11.599</td>
</tr>
<tr>
<td>Germany</td>
<td>€7.379</td>
<td>€8.626</td>
<td>€3.853</td>
<td>€10.904</td>
</tr>
<tr>
<td>France</td>
<td>€6.688</td>
<td>€3.407</td>
<td>€5.068</td>
<td>€8.307</td>
</tr>
<tr>
<td>Denmark</td>
<td>€9.789</td>
<td>€4.813</td>
<td>€7.625</td>
<td>€11.953</td>
</tr>
<tr>
<td>Belgium</td>
<td>€10.241</td>
<td>€7.478</td>
<td>€6.786</td>
<td>€13.696</td>
</tr>
<tr>
<td>UK</td>
<td>€5.985</td>
<td>€3.258</td>
<td>€4.059</td>
<td>€7.910</td>
</tr>
<tr>
<td>Average</td>
<td>€8.638</td>
<td>€6.308</td>
<td>€7.541</td>
<td>€9.735</td>
</tr>
</tbody>
</table>

Table 16 Costs of a patent attorney in six different countries. Source: Baarsma et al. (2006)

Baarsma et al. also show that the costs of an attorney in case of national, European and international (PCT-route) application routes vary a lot. The type of industry influences the costs of the application as well, probably due to the complexity of the patent. Table 12 shows the differences in application types.
### Table 17 Costs of a patent attorney for different applications in the Netherlands. Source: Baarsma et al. (2006)

<table>
<thead>
<tr>
<th>Category</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>National</td>
<td>€7.741</td>
</tr>
<tr>
<td>European</td>
<td>€11.943</td>
</tr>
<tr>
<td>International (PCT)</td>
<td>€8.946</td>
</tr>
<tr>
<td>Other</td>
<td>€5.950</td>
</tr>
<tr>
<td>Chemistry or biotech</td>
<td>€8.882</td>
</tr>
<tr>
<td>Other industries</td>
<td>€10.076</td>
</tr>
</tbody>
</table>

The Roland Berger institute (2004) provides more detailed information on what a patent attorney charges. The report shows that patent attorneys charge for pre-filing activities such as writing the patent, processing the application and translation of the claims into the three official languages of the EPO. The numbers do not completely match with the results of Baarsma et al. as only 68% of the costs their results are accounted to the patent attorney.

### Table 18 The cost of a patent attorney specified. Source: Roland Berger Institute (2004)

<table>
<thead>
<tr>
<th>Category</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>€9.630</td>
</tr>
<tr>
<td>Pre-filing</td>
<td>€3.900</td>
</tr>
<tr>
<td>Processing</td>
<td>€5.200</td>
</tr>
<tr>
<td>Translation of claims</td>
<td>€530</td>
</tr>
</tbody>
</table>

Some online US sources indicate the costs of a patent attorney vary between $5000-$10000. US patent attorney Quinn presents figures that differ from $5000-$15000. He makes distinctions between the complexities of the patent application. Simple inventions such as a paper clip or an electric switch only costs around $5000-$7000 in attorney’s fees. Complex applications in which specific knowledge of the subject is required might cost more than $15000.

The costs of a patent attorney might not stop after the patent has been granted. Some companies leave the patent strategy, where the patent should be validated and for how long, to the attorney. But even if a company decides to pay the fees themselves they face costs as it is obligatory in some countries for a patent attorney to pay the renewal fees. The Roland Berger institute (2004) calculated that for the validation phase in 4 countries an attorney on average costs €2850 and for paying the renewal fees during years 5-10 costs an additional €5300. According to their research for a patent that is validated in 4 countries for 10 years the patent, the patent attorney contributes for 55% of the total costs.

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50 “How much does it cost to patent an idea?” Last modified September 2013, http://patentfile.org/howmuchdoesitcosttopatentanidea/


52 “The Cost of Obtaining a Patent”
Interview results

The use of a patent attorney was very common among the SME’s, all of them made use of it. The indicated patent attorney costs varied from €5000 to about €10,000. One of the companies specified that the cost of the national filing was about €3000 and for the European filing €5000-€6000. These costs can be compared to the findings of the secondary sources review. All of the SME’s indicated that they thought this was expensive. According to one SME, patent attorney costs were the main costs in patenting. Most agreed that it was better to invest some money into a good patent attorney because otherwise the patent would not be worth that much. Some of the SME’s had experience with writing patents because they worked with larger firms with a substantial patent portfolio. They therefore prepared the documents for the patent attorney in such a way, that the attorney had to do less to understand the invention. This reduced the costs of the patent attorney for the company.

Patent attorneys themselves indicated no exact numbers for their services. They however said that their costs differed on a case to case basis. The complexity and the length of the patent played a large role in this. The patent attorneys indicated that Unitary Patent changed their income in a substantial manner. The fees that the patent attorney asks for paying the validation and renewal fees to the national patent offices will diminish. The renewal fees are often paid through the patent attorney because companies might not be aware of different regulations. As well they often outsource this to make it easy for themselves. In the Unitary Patent system the renewal fees only have to be paid to the EPO. This means that fees are reduced quite substantially. One of the patent attorneys said that they calculated a percentage of the renewal fees as fee and would therefore not be affected so much by it. He however knew of companies asking a fixed fee for the service. The patent attorney expected that they could compensate any losses in this field by an increase of patent application for Asian businesses.

The expert of the Dutch Patent Office also gave an indication of patent attorney fees. The estimation was that for a Dutch application the costs would be about €5000. Continuing into the European phase would cost another €6000. These estimates are also in the range of the secondary sources review. They are however higher than indicated by the SME’s.

6.1.4 Translation costs

Translation costs are often a barrier for applying for a patent or validating a patent in more countries (Roland Berger Institute, 1995). Due to the London agreement not all patents have to be translated. This can already reduce the costs significantly (Van Pottelsbergh de La Poterie & Mejer, 2010). The Unitary Patent should reduce these costs even further. Translations are no longer required after a transitional period in which
one translation is needed. Only the claims have to be translated into English, German and French.53

The costs of translation are estimated by European Commission54 on €85 per page. Straathof et al. (2012) also take €85 per page but just for the claims. For the descriptive text they assume €76. These numbers are also used by the Roland Berger Institute (2004). The figures from Straathof et al. and the Roland Berger Institute are used for the calculations because these figures are more detailed; they make a distinction between the claims and the descriptive text. Figure 10 shows the estimations for the translations again based upon the ‘average’ patent. The London agreement has been taken into account for these calculations. It is assumed that the patent is filed in English.

The Unitary Patent provides a substantive saving compared to the EPO-24 patent. Compared to the EPO-3 and EPO-6, especially when Spain and Italy are included, the savings are only small. For the EPO-13 category the rate with which the costs increase is less than for the EPO-3 and EPO-6 group. This slower increase is due to the London agreement. The Unitary Patent does provide savings for the EPO-13 patent but not as big as compared to the EPO-24.

Taking the results from Section 6.1.2, on the number of countries in which SME’s validate, it is not likely that there will be significant cost reductions. The countries most validated are already part of the London Agreement or do not participate in the Unitary

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53 European Commission. Regulation (EU) No.1260/2012 implementing enhanced cooperation in the area of the creation of the unitary patent protection with regard to the applicable translation arrangements. Brussels, Belgium: December 17, 2012

Patent. Those SME’s that ignore certain countries, because of the translation costs, could have easier access to these countries because of the Unitary Patent.

Interview results

For some of the SME’s translation costs are the largest part of their expenses in patenting. They indicated that these costs ran over €30,000. In these particular cases protection was also sought in several Asian countries contributing to a large part of the costs. Others also indicated that these costs are a severe problem. One of the companies therefore only filed in countries which accepted English as the patent language. Other companies also tried to avoid translations because of the large costs. The London Agreement therefore provided quite some relief for the SME’s. What relief the Unitary Patent could provide remains unclear because most SME’s did not indicate in which countries they validated their patents.

The patent attorneys and experts also did not indicate to expect major changes in translation costs. The claims of a patent still have to be translated into English, German and French. These translations account for most of the translation costs. In certain cases this could provide some relief, but most SME’s already patent in countries falling under the London agreement. Those SME’s that want their patent validated in Spain or Italy, face the same costs as they did before.

6.1.5 Litigation costs

In order to give a good overview of litigation it is necessary to see the frequency and the costs of patent litigation. First an overview of the frequency of litigation and duplication is given, followed by a comparison of the costs of litigation in various countries.

Most disputes are settled outside court, but when parties do not come to an agreement a judge has to decide. Going to court is often expensive. (Kitching & Blackburn, 2003; Greenhalgh, Phillips, Pithkethly, Rogers & Tomalin, 2010). The chances of getting to court are however small. Harhoff (2009) and Mejer & Van Pottelsberge de la Potterie (2011) estimated that only 0.125% of patents still valid get prosecuted each year. This number does not match earlier results found on IP disputes among SME’s. Greenhalgh et al. (2010) found that patent owners had a 39.5% chance of being in a dispute. A dispute does however not mean that the patent gets prosecuted. The number can be further brought down because companies often multiple patents. The difference between the numbers however remains remarkable. Germany has the largest number with around 500-700 cases each year. Other large countries in patent prosecution are France (100-500 cases), the UK (30-150 cases) and the Netherlands (40-70 cases) (Cremers et al., 2013; Harhoff, 2009; Mejer & Van Pottelsberge de la Potterie, 2011; Van Zeebroeck & Graham, 2011;). These figures are estimates as no data is available. Only Van Zeebroeck & Graham use a database but they indicate that the database is not complete.

A problem the UPC tackles is that of double prosecution. As currently patent rights are nationally bound, a patent also needs to be prosecuted in national courts. The same case could be fought over in a different court (Harhoff, 2009). Harhoff estimated that in 2013 between 200 and 430 cases were duplicated. The UPC would then lead to savings
between 120 and 260 million euros. Graham & Marco (2011) had a look at cases from the 7 countries in Europe with the most patent litigation. They find that less than 5% of all cases are duplicated. The duplication rate varies across industries and countries. The pharmacy (19%) and chemicals (13%) industries have much higher rates as the patents in these industries often have much more value. In machinery industry the rate is as low as 2%. Some countries such as the Netherlands show more duplicated cases. Cremer et al. (2013) also looked into case data and found that in the Netherlands (15%) and the UK (26%) more cases are duplicated. The large share of duplicate cases can partly be explained by the high percentage of European patents in these countries. The duplicated cases are mostly between large multinationals. In Germany the number is low with only 2% of duplicates. Most cases that are duplicated are only prosecuted in 2 countries, only in pharmacy and chemicals litigation in more countries is seen more often. Cremer et al. find that between 2000 and 2008 only 265 cases were duplicated. These numbers and those of Graham and Marco are significantly lower than the estimates of Harhoff.

The cost of litigation varies across different jurisdictions. Table 15 shows the estimated costs of patent litigation in the 4 countries. The cost of litigation at the UPC is unknown at the moment. The proposal for the UPC aims for the costs to be the same as low-level countries such as Germany, France and the Netherlands.

<table>
<thead>
<tr>
<th>Country</th>
<th>First instance proceedings</th>
<th>Second instance proceedings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Small-medium</td>
<td>Large</td>
</tr>
<tr>
<td>DE</td>
<td>€50.000</td>
<td>€250.000</td>
</tr>
<tr>
<td>FR</td>
<td>€50.000</td>
<td>€200.000</td>
</tr>
<tr>
<td>UK</td>
<td>€150.000</td>
<td>€1.500.000</td>
</tr>
<tr>
<td>NL</td>
<td>€60.000</td>
<td>€200.000</td>
</tr>
</tbody>
</table>

Table 19 Costs of patent litigation in Europe. Source: Harhoff (2009)

The levels in Germany, France and the Netherlands are rather equal. Only in the case of large second instance proceedings, the Netherlands seems to have lower costs. UK levels are much higher compared to the other three countries. This is one of the reasons why the UK has less patent cases relatively to its economy’s size (Mejer & Van Pottelsberghe de la Potterie, 2011).

Interview results
Looking for an SME with a dispute was hard. In the databases used to contact SME’s, no cases were found. Patent attorneys and the experts also said that they knew only very few cases that involved SME’s. In contrast to this, the patent lawyer indicated that cases by SME’s were not uncommon. This difference can be explained because of their professional interests. A patent lawyer focusses on the enforcement while a patent attorney focusses on the application. The patent lawyer indicated that the number of cases in the Netherlands is low, estimations were about 20. Cases that were held in multiple countries by SME’s were not found. SME’s did however prosecute against foreign competitors according to the patent lawyer. SME’s found it hard to estimate if the costs of patent litigation would in- or decrease with the UPC. They did not see the advantage of having your patent prosecuted for the whole of Europe because they barely engaged in
litigation at all. The local division probably meant that the costs did not increase that much.

For the analysis it would be good to have at least one SME involved in litigation in the results. After an extensive search and through the use of several blogs on patent litigation, a SME involved in a lawsuit was found. The case of the selected SME involved a patent infringement on a patent of one of their local competitors. Although the judge ruled in their favor, the SME indicated that they could not retrieve all the costs they made. The case was handled in summary proceedings, which should have reduced the costs significantly. Without mentioning any numbers, the SME said that they still thought that such a case was very expensive. The case had also cost a lot of time of several employees. These costs of not being able to use the personnel for their usual business, was perceived as a big costs as well. Their positive attitude towards the patent system did however not change.

An SME, without any patents, had encountered a small dispute with an UK competitor. After some letters they negotiated a deal consisting out a fee of maximum 0.5% of the turnover. The CEO of the company did not seem to worry about this practice. He said the companies rather agreed that they could learn from each other’s knowledge. Just to settle the case they agreed this minor licensing deal.

The patent lawyer, attorneys and experts indicated that the costs of a case in the Netherlands vary between €20,000 for summary proceedings, to over €100,000 in the case of first and second instance proceedings. These figures roughly match the secondary sources review, but the figures are hard to compare. All of them noted that these costs were high for SME’s. However one of the patent attorneys said that if a company could not pay these costs, it should reconsider its business model or it should not have applied for a patent at all. The value of patents is more than the costs of such a case. If the patent is worth less, the infringement is solved in another way. The costs of the UPC were likely to be more expensive than the current Dutch situation. Moreover, cases could be at some distance which could increase travel and accommodation costs. But as an advantage the patent lawyer mentioned that companies now could use their known solicitor, which could decrease costs.

6.1.6 Certainty about patent validity

*Interview Results*

The last of the direct costs that were discussed were those about uncertainties about patent validity. SME’s and experts were asked if changes in the structure of the Unitary Patent Package would increase or decrease their certainty about patent validity. Important is the question if the UPC would take away uncertainties about different outcomes in patent litigation in different countries.
Most SME’s and the experts first of all responded that patent disputes should not be solved in court. As most SME’s had no experience in court they found it hard to answer this question. Some of the larger SME’s had given this some thought and generally thought that this could be an improvement. More consistency among European courts was perceived as a good thing. One of the SME’s mentioned that this is a good thing, but that the execution could be problematic. He had some experience with patent litigation in the United States and feared that the same problems with forum shopping could arise here. Two SME’s also said that they expected that the court would work slowly. This would not increase the certainty about patent validity.

The patent attorneys and patent lawyer were optimistic about uniformity in patent litigation. They all expressed that it needs some time to come to uniform decisions, but this would be one of the bigger improvements of the Unitary Patent. The first decisions of the Court of Appeal are still some years ahead of us. Also the training of unexperienced judges could take some time. The differences between the local divisions could also be interpreted in a positive manner, as this would increase competition between the courts to attract cases. One patent attorney expected that would lead to a slightly more positive attitude towards patent owners, but also noted that they are still honest judges. Although acknowledging that these changes would not affect most SME’s, they concluded that this is an improvement in general.

6.1.7 Conclusion
This section has aimed to give a complete insight into the direct costs of patenting and compare these to the findings of the European Commission. The costs of applying, maintaining and enforcing a patent according to the European Commission come close to the findings of the secondary sources review presented here. However the European Commission makes the assumption that an average European Patent is validated in 13 countries. The Commission also presents various scenarios but takes the one involving 13 countries to base their conclusions on. The secondary sources review however showed that the numbers are much lower, rather around 5 to 6. More over the press releases by the European Commission show numbers that most likely only involve the validation of patents in 13 countries, which does not give a complete nor accurate image of patent costs.

The interview results show that SME’s are not aware of patent costs. They also have little idea of the Unitary Patent brings relief in patent costs. Most relief can be expected from a decrease in patent attorney costs in the validation and maintenance of the patent. They are however willing to adopt the Unitary Patent if the same costs leads to protection in more countries. Whether the UPC brings changes for their patenting behavior is really unknown. SME’s are hardly involved in (duplicate) patent litigation.
6.2 Indirect costs

Although the changes in direct costs are easier to grasp for most SME’s, changes in indirect costs can be important for them as well. These indirect changes affect the patent environment in which they act. This could affect the strategic behaviors of others towards them. This result section displays the expectations about these indirect changes by SME’s, patent attorneys, a patent lawyer and experts. The results are mainly based upon the interviews as very little secondary sources could be found on this subject.

The results in this section follow the lines of three sources of transaction costs. It first discusses issues on the number of patent validations in the Netherlands. The second source handles uncertainties about the validity of the patent. The indirect costs that arise from this can be found in the inability to commercialize the patent. This problem is split into issues on the differences between large and small companies in patent enforcement, the new regulation on the license-of-right and lastly encountering non-practicing entities. Then the results on infringement are discussed. Although not affected by the Unitary Patent, issues on disclosing information and inventing around by others were a serious matter for SME’s. Next, the concerns about bifurcation and forum shopping in the UPC are analyzed. In addition to the costs described in the theoretical model, the interviewees expressed other issues such as the added geographical scope of the Unitary Patent and the opt-out possibility in the transitional period. The last section deals with the effect on innovation of the Unitary Patent.

6.2.1 Increase in patent validations

In 2008 only 24% of the European patents are validated in the Netherlands (Straathof et al. 2012). If the Unitary Patent was widely adopted, there would be a large increase in the number of validated patents in the Netherlands. During the interviews the companies were asked if they saw any potential changes in their environment because of this. Most SME’s replied that they had not given this much thought. Those who had given it some thought said that those patents validated in the Netherlands were probably found to be valuable. If others wanted their patent to be valid here, they had already done so. They did not expect a lot of problems because of an increase in validations.

The patent lawyer and the patent attorneys did expect a small increase in litigation. They expected that an increase in the number of enforceable rights also meant that those rights would be enforced. However the degree of the increase in valid patents would not cause a similar degree of the increase in litigation. They also acknowledged that the patents that were already validated were probably the most important ones. Moreover patent attorneys agreed that most SME’s are not interesting enough for others to prosecute. They only have a small market segment and the costs of litigation are too high to be beneficial. An increase in patent litigation is not perceived as a negative thing by the patent lawyer and some of the patent attorneys. They said that patents are rights that can be enforced. If a company decides not to enforce its rights, it should reconsider the value of the patent. Patent litigation is therefore not per se a negative thing, but seen as using your legal rights.
6.2.2 Differences between large and small companies

The SME’s had little experience with patent disputes and therefore not with disputes against large companies. They did acknowledge that the patenting strategies of larger firms differed from those that they used. Especially the companies that did not apply for a patent, or only had a few patents, made the distinction between these different strategies. They felt that they could not apply a strategy that involved patenting by ‘the dozen’. They did not agree on whether they were at a disadvantage compared to larger companies. Some of them said that they acted in a niche market in which they did not encounter large companies and therefore were not disadvantaged. Others said that if they would encounter such a large company they probably would not stand a chance and would have to settle or let go of their patent. The SME’s did not expect their situation to change because of the Unitary Patent or the UPC.

One of the companies did experience a serious threat of a larger competitor. This was one of the main reasons for them to start patenting. Their larger competitor had several patents in a field they were moving into. On the moment they had not yet encountered problems because they were only a small player in the field but they expected problems if they would require a larger market share. Out of fear of the patents of their larger competitor, they filed for a patent. They wanted something to bargain with if the competitor would come after them. They did not expect that their competitor would start a ‘patent war’ with them, but if they would grow, action against them was not unimaginable. They thought their competitor would also like to solve this outside the courtroom, but if they ended up in court they probably would not stand a chance. The competitor would have more possibilities to fight them and they would probably have to settle.

Among the patent attorneys there was also a consensus that SME’s were at a disadvantage compared to larger companies. One of them stated that this was the largest problem in patenting for SME’s. SME’s were not able to defend themselves against larger companies. Others noted that it would only hold for the smaller companies. Medium sized companies would be able to defend themselves. According to the attorneys, as noted before, if these companies could not defend themselves they should not start patenting. The experts also saw that this was a problem, but they did not see this as one of the major problems of SME’s in patenting. The patent lawyer did see this as one of the main problems in the patenting system, although he noted that this mainly a problem in the United States. He did feel that the UPC did not improve this situation. Larger companies could focus their resources on one single case, which put SME’s at a disadvantage.

6.2.3 License-of-right

License-of-right allows patent holders to declare that they are open for all licensees under fair conditions in exchange for a reduction in renewal fees. The license-of-right option was unfamiliar to almost all of the SME’s, but most of them sounded interested in this option. There was a clear division between companies that were open to license and those not. Those who did not grant licenses disregarded the option. The SME’s who already
granted licenses, or thought about doing so in the future, showed interest. The problem companies however faced is that they would want to grant exclusive licenses. The SME’s missed the opportunity to declare license-of-right for select countries. A declaration for the whole of Europe would be problematic, but the SME’s would consider the option if the patent would become older.

The patent attorneys were optimistic about this option and said that this could add value for SME’s. Whether they would start to use the system would depend on other factors. First of all, the system is unknown to Dutch market and is therefore not likely to be used. Also not all companies are willing to open up for licenses for everyone, they could be afraid that they would no longer be able to get an injunction. Possibilities would lie in patents that are older and therefore more expensive in renewal fees. A company might decide to drop the patent. However the license-of-right possibility could create an opportunity for these companies to maintain the patent at a lower price. Another possibility is patents that are part of a technological standard already have to be open licenses under the same conditions as the license-of-right requires. Filing for the license-of-right does therefore not change anything about their practice but they can profit from the reduction in renewal fees.

The patent lawyer thought the license-of-right would not become a big success. He expressed the same concerns as the SME’s. If they would want to grant a license this would often happen with some sort of exclusivity for the licensee. He was also aware of the fact that this is rather unknown among companies. He therefore expected that SME’s would only use the regulation if a patent attorney would advise them to use it.

6.2.4 Non-practicing entities (NPE)

Most SME’s had heard about NPE’s, in the form of patent trolls, usually via the news. Only one of the companies indicated that they could provide some significant problems. The smaller companies said that they were too small for patent trolls to come after them. Some expected that if the company would grow they could encounter some problems, but they did worry about this too much. They rather focused upon other business problems. They also did not know if the construction of the UPC would change anything about NPE behavior.

One CEO, of a company without patents, said that NPE’s are a threat to the company. In a previous company he had experienced a claim by a NPE. The company eventually had to settle because they could not fight the case. They had to agree to sign a licensing deal. The CEO feared something could happen again, especially because in the industry that the company operated patents were not common. They had received a letter of an NPE already but they had ignored it because the claim proved to have no foundation.

The patent attorney and patent lawyer did not expect any large changes in NPE behavior because of the Unitary Patent Package. They expected an increase in interest by NPE’s because the European market becomes much larger in the case of a Unitary Patent. However they indicated that the European judges carefully evaluate the need for an injunction. The Rules of Procedure also clearly stated on which grounds an injunction
should be ruled. Concerns about forum shopping and possible bifurcation, discussed in more detail in Section 6.2.6, were not suspected to increase cases by NPE’s.

6.2.5 Disclosing information and inventing around

One of the major obstacles in patenting observed during the interviews was the disclosure of information. Although this part of patenting is not affected by the Unitary Patent, it is still one of the major indirect costs. Almost all of the SME’s indicated that they used other appropriation techniques, such as secrecy, because of the disclosure of information in patents. The patenting of processes was not done by the SME’s. They felt that this would give away their competitive advantage. Copying the product is one thing, but the process was often considered more important. In addition it is also very hard to monitor the behavior of others. Processes happen in-house and are therefore hard to control. The SME’s rather want to invest money in keeping a competitive edge through innovation, than trying to block others.

Patent attorneys also agreed that SME’s should not be patenting everything. Especially patenting processes were mentioned as an ineffective way of protecting their intellectual property. They also advised their clients sometimes not to patent such processes.  

“**A good patent attorney also advises not to patent certain inventions**”

Patent attorney

6.2.6 Bifurcation and forum shopping

Bifurcation, splitting a case among two courts, was unknown among the interviewed SME’s. They found it hard to give an opinion on this matter. This was the same for forum shopping. SME’s shied away from patent litigation and therefore did not show interest in this topic, nor about forum shopping.

The patent attorneys, the patent lawyer and experts at the convention on the Unitary Patent all agreed that these practices were not likely to happen. First of all German judges had declared they were not positive about bifurcating but they were forced to do so sometimes by German law. They had indicated that they probably would not bifurcate in the UPC system. Only in the case of an exclusive license bifurcation is possible. If an exclusive licensee sues a company for infringement, the validity of a patent cannot be handled in such a case. A freestanding validity case would then have to be initiated which can only be done at the central division. The infringement case would however remain if there serious concerns about the patent validity. Concerns about forum shopping because of inexperienced judges were also dismissed. A foreign judge would sit at each local and regional division. These judges are most likely to be more experienced and could help in such cases. The concerns about bifurcation and forum shopping were low.

“**German judges are not likely to bifurcate in the UPC system**”

Patent Lawyer
6.2.7 Additional issues

Two other issues were often discussed that could not be placed directly under the theoretical framework. First of all, among the SME’s there was discussion on what the added value of the geographical scope of the Unitary Patent would be. Some SME’s did not see added value in patent protection outside the countries they already applied for. They indicated that this would be useless. Exporting to these countries would require overcoming many more hurdles than just patent protection. Finding the right distributor and the language obstacle were more important. They said that not having patent protection in a country would not withhold them from moving into that market. Others indicated that the added geographical scope could have benefits. Especially for a start-up company and those seeking to license their IP, the added scope could turn out to be a great benefit. For start-up companies patents often mean adding value to the company. This is interesting for venture capitalists and potential buyers. For companies licensing, the Unitary Patent means that they get more opportunities to license, often at a price similar or only slightly more than their current investment. They can also charge more for a license if this is valid across 24 countries, compared to the few countries in which their patent is often valid at this moment. For production companies there could be added value as well. Some of the SME’s and patent attorneys indicated that the success of an invention is hard to predict. The geographical markets in which the invention would become a success is difficult to estimate because the decision has to be made before the invention is put onto the market. The unitary made it easier for them to decide because this contained the most markets in Europe. Choices on which markets they want to protect no longer have to be made.

The second issue involved the opt-out possibility during a transitional period. Mainly pharmaceutical companies had expressed that they would opt-out of the system because they were afraid to lose their protection in one revocation action. The patent attorneys were asked if they would advise the SME’s to either opt-in or opt-out of the system. First of all the patent attorneys responded that it would depend on the fee that the EPO would charge. During the conference on the Unitary Patent, Margot Fröhlinger of the EPO said that this would likely be somewhere in between €50 and €100. Such a fee would not be an obstacle because SME’s generally only have a few patents according to the patent attorneys. For most SME’s it is not really important in which jurisdiction they would litigate. Only for medium sized companies with important patents to protect their business such a distinction would be necessary. They would advise to opt-out patents that are both important and weak. In that case protection would not be lost if a patent gets revoked in one of the courts.

6.2.8 Effect on innovation

The suggestion that the Unitary Patent would have a positive effect on innovation made one CEO laugh. He said that patents to his company were added value but never the reasons why they would innovate. Most SME’s said that patents were not the most important thing in their business and they likely could do without. One of the larger companies explained that patents were vital for them. They had encountered problems with an Asian competitor that had copied an innovation from them. Since the incident
they were very careful and patented before they let anyone see their invention. To them patents were vital parts of the business.

The Unitary Patent could help increase innovation when costs would go down. A CEO stated that for the same money they could also hire a person in their R&D department. A possible cost reduction due to the Unitary Patent could be reinvested into R&D. The patent attorneys and experts did however not expect a large cost reduction for SME’s. Many of the costs, application fees and patent attorney fees, are not changed by the Unitary Patent. Cost savings are therefore expected to be a very low and rare. This could have a minor positive effect on innovation in innovative SME’s.

6.2.9 Conclusion
The results on the indirect costs show that most SME’s do not worry about changes in indirect costs. For most SME’s patents are not the most important way to be competitive. Also changes in the judicial system do not worry SME’s that much. Only in rare cases SME’s think it might affect their business. Patent attorneys and experts indicated that these changes could affect SME’s more than they predict. When involved in litigation it could be harder to fight large companies at the UPC.

Other issues addressed that were addressed in the interviews did not go through large changes as well. SME’s expected to use adopt the Unitary Patent if costs were about equal but the added value of the geographical scope was predicted to be low or unknown. Companies licensing their IP could see an added value of the Unitary Patent. The effect on innovation however was predicted to be even lower.

“We would not, not having a patent, stop us, that would be a rather stupid thing to do”

CEO, In the field of Security Systems, 8 employees
7 Analysis
This chapter aims to provide more insights into the results of the previous chapter. It analyzes the results and compares them to the findings in the literature study. The analysis has three main topics. First, the general findings about patenting behavior of SME’s are analyzed. Are they indeed patenting for different reasons and in different patterns than larger companies? During the analyses three types of SME’s are identified which helps to further analyze the effects of the Unitary Patent. Secondly the effects of the Unitary Patent on the direct costs of patenting for SME’s in the Netherlands are analyzed. Thirdly the expected changes in indirect costs due to the Unitary Patent are assessed for the different types of SME’s. The analysis ends with a revision of the statements made in Section 4.3. To what extent do the results reject or accept these expected changes?

7.1 Patenting behavior by SME’s
The incentives of the SME’s in the research sample indicated that protection from others copying their technology is their main reason to apply for a patent. This is in line with the results from the literature study. Along with protection against copying behavior the SME’s indicated a variety of reasons to patent. These include possible (cross-) licenses, attracting venture capital and showcasing their innovative capacities. One company also explained that they used the patent as shield in case of an attack by a competitor. For this research only SME’s were asked about their incentives, therefore the behavior of larger companies can only be drawn on statement of the SME’s about them. Some SME’s said that they had the idea that they patented for different reasons than large companies. According to them large companies used patents as bargaining chips and the contents of a patent was less important.

All SME’s indicated that they also use informal appropriation strategies to safeguard their intellectual property. The most named strategy was secrecy followed by keeping on innovating hoping to have a lead time advantage. One company had considered publishing information so that competitors could not patent the idea but had not done so. Some companies use formal rights such as trademarks and copyright. The use of design rights was not found in this study. The companies indicated that disclosing information and the costs of patenting were the main reasons for them not to apply for a patent. Another reason not to patent is that not all inventions would pass the patentability criteria. A few companies, that were not interviewed but responded to the request, indicated that they felt that patents did not provide any protection or that the costs of enforcing your patent were too high for them.

*Types*

For the analysis of the effects of the Unitary Patent on the costs of patenting it is useful to divide the SME’s into three types. The SME’s are divided in these types on their reasons to patent. During the study of the results of the interviews, it became clear that these three types had different ideas about what the Unitary Patent would mean for them. Presenting the results for SME’s as one group would mean that important differences within SME’s
would be ignored. During the last interviews patent attorneys, a patent lawyer and one expert were asked about their opinion on this division. All replied that this would be a good way to classify the SME’s. Table 16 displays the three types and some of their main characteristics.

<table>
<thead>
<tr>
<th>Type of SME</th>
<th>Venture Capital backed</th>
<th>Licensors</th>
<th>Producers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reasons to patent</td>
<td>Protecting IP</td>
<td>Protecting IP</td>
<td>Protecting IP</td>
</tr>
<tr>
<td></td>
<td>Attracting venture capital</td>
<td>Granting licenses</td>
<td>Possible cross-licenses</td>
</tr>
<tr>
<td></td>
<td>Adding value to the company</td>
<td></td>
<td>Patent as a shield</td>
</tr>
<tr>
<td>Patent filing strategy</td>
<td>Protecting strategic areas</td>
<td>Trying to predict were possible licensors have interests</td>
<td>Protecting markets and production facilities</td>
</tr>
<tr>
<td></td>
<td>Gaining as much protection at a low price</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Added value of Unitary Patent</td>
<td>Added value through larger protection at a comparable price</td>
<td>More options for licenses</td>
<td>Costs reduction if protection in a lot of countries</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No longer predicting were interests lie</td>
<td>No thoughts about future markets</td>
</tr>
</tbody>
</table>

Table 20 Analyses of three types of SME’s

The three types that were identified among the SME’s were venture capital backed companies, companies seeking to license their technology and producing companies. For each of the types the main reasons to patent were identified. Table 16 shows what they took into account when determining their patent strategy and where the possible added value of the Unitary Patent lies. Each of the three types is discussed in more detail below.

Venture Capital backed
Companies that were backed by venture capital are often young and do not produce, or only produce small quantities. Because they do not produce yet, or enough to make a lot of profit, they rely on venture capital to further develop their product. These companies often seek to sell the company or their idea to a larger firm. They have three main reasons to patent. The first is protecting their IP, as otherwise the company would have less worth. Secondly venture capitalists often seek a safe investment. Patents give a guarantee that the company is innovative and in case of bankruptcy, something of value is still left. Thirdly they try to add value to the company by applying for patents. Good patent protection adds value to company in case the company gets sold. The SME’s that were interviewed in this category said that they patented in strategic areas were they expected that larger firms would need protection in the future. These strategic areas can be important markets but also countries where possible production facilities are established. They also try to add value to the company by acquiring as much protection as possible for a low price. One of the companies for example only patented in countries
where the patent could be filed in English. The Unitary Patent could provide added value in this respect, as the company gets a larger geographical scope for similar or slightly higher costs.

**Licensors**

The second type of companies that was identified, were companies that are mainly interested in licensing. They also use patents to protect their ideas but they are interested in patents because they can make money out of possible licenses. The companies interviewed did not solely rely on the income from licenses but they saw licensing patents a possibility to increase their revenue. Some companies that did not have any patents on the moment also said that this was a possible reason to apply for a patent. Companies only relying on licensing were not in the case selection, but can for example be found in the biotech industry (Kern & Van Reekum, 2012). Companies seeking to license their patent are trying to predict in which markets their potential licensee would have interest. They found this hard to predict as especially at the start of the invention it could be unclear where the invention would be applied. The Unitary Patent could help as they, at least for Europe, no longer have to make choices about which countries to select. The Unitary Patent also gives them more possibilities to grant licenses as the patent can still be licensed per country.

**Producers**

The last group that was identified were producing companies. These companies already have their product on the market and are trying to make money by selling these products. They mainly patent out of defensive reasons. This can be to protect their ideas from being copied or to protect them from an attack from a competitor. In case of such an attack, the patent could be cross-licensed in order to avoid going to court. Companies also hope that having a patent will mean that competitors refrain from taking any action. In their patenting strategy these companies mainly look at what their markets were and in which countries they produce. Especially in the semi-conductor industry, a SME noted, a lot of the production takes place in South-East Asia, protection in these countries could prove even more important than in the markets that the SME wants to reach. The Unitary Patent provides a cost reduction if the SME patents in a larger number of countries in Europe. Among the SME’s that were interviewed in this group, non of the companies could achieve large cost reductions. Another possible advantage, mainly pointed out by the patent attorneys, is that companies no longer have to choose in which countries they want patent protection as almost all of them are included in the Unitary Patent. Companies often found it hard to predict in which countries the invention could become a success in the early stages when a patent is filed. The Unitary Patent makes this choice obsolete.

### 7.2 Direct costs in the Unitary Patent

The expected effects of the Unitary Patent are assessed for these three types of SME’s. In this section the direct costs are discussed for each group followed by a general conclusion.
**Venture Capital backed**

The results showed that the venture capital backed companies used a patent strategy with the least costs. They seek to optimize their protection for the money they invest. As noted before the Unitary Patent can improve their value for money. Venture capitalists do not look at the various costs of patenting as separate things. They are well aware of the different aspects of the costs but they are more interested in what the added value to their company is if they invest more. If the renewal fees are slightly higher than their current average, they are likely to choose for the Unitary Patent. The increase in geographical scope will exceed the increase in costs. They like to see the renewal fees as low as possible. They already keep translation costs as low as possible to optimize their value for money. In this respect the Unitary Patent does not mean a cost reduction for venture-backed companies. The venture-backed companies in the interviews did not have experience with litigation. They explained that they were too small to fight. They had not thought about cases were their patent was infringed. They however said that they had to invest the money they were given wisely. Possible increases or decreases in litigation costs therefore do not affect them that much.

**Licensors**

For licensors the Unitary Patent could mean an improvement in two aspects. First, they do not have to predict in which European countries the invention could be licensed. Secondly, protection in 24 countries means that they also have more opportunities to license or they ask more for a license. Licensors also like to see the renewal fees as low as possible, but just as venture capital backed companies they would not back away from the Unitary Patent if they turn out slightly higher than they had hoped for. For licensors the increased possibilities for licensing would justify the increased investment compared to their current situation. The current situation of the interviewed companies in this group is difficult to determine because they either did not have any patents or information available on the costs of renewal fees. It is however not likely that these companies choose to patent in many more countries than the other SME’s. This is because of the costs that go along with it. Difficulty predicting in which countries the invention can become a success also plays a role. More likely is that they choose a least-cost filing strategy. This also means that they keep their translation costs as low as possible. Only occasionally the Unitary Patent could provide some relief. The interviewed licensors are not interested in litigation. In case one of their patents is infringed they would ask the licensee to if they were willing to take action against the infringer. Therefore the costs and risks of litigation would not affect them in this way.

**Producers**

For the last group, the producers, it is harder to make general conclusions. As said before SME’s are more specific in their patent strategy than larger companies. This especially holds for companies in the producers group. They for example pick their countries on the markets that they are active, or want to be in the future. The location of the production facility is also important when choosing the geographical scope of protection. These companies therefore vary a lot in which countries they choose when patenting. This is reflected in the costs that they make. The Unitary Patent could provide a cost reduction if the companies validates its patents in more than the average number of countries, which
is around five to six. These reductions could lie in the renewal fees and also in the fees paid to the patent attorney for maintaining the patent. In some specific cases translation costs could go down as well if they patent in countries which have not signed the London agreement. Although not all companies have higher costs than the expected fees of the Unitary Patent, patent attorneys expect that they will choose for the Unitary Patent anyway. This means they no longer have to think about future markets and protection in the whole of Europe could be used as advertising. Patent litigation is also uncommon among these SME’s but not unthinkable. The figures have shown that the chances of a conflict ending up in court are small and that in those cases duplication is not likely for SME’s. An expected increase in litigation costs compared to the Dutch system would not be a positive for producing SME’s in the Netherlands. However as the patent attorneys noted, if the patent is not worth that much the SME would not go to court over it.

**Conclusion**

In general it can be concluded that the cost reduction in renewal fees and translation costs is minimal and only applies in specific cases. Yet the expectation is that all three groups widely adopt the Unitary Patent as a replacement for the current European patent. The direct costs compared to the current situation are not lower in most of the cases in this research. However the costs normalized to the market size are lower than in the current situation. This means that SME’s are willing to invest slightly more in their patents to get a much larger geographical scope of protection. For changes in litigation costs it is visible that only very few SME’s are involved in litigation. Therefore the costs in litigation do not seem to be important to the SME’s in all three groups.

**7.3 Indirect costs in the Unitary Patent**

The indirect costs of the Unitary Patent are also analyzed for all of the three different types of SME’s. This is followed by a conclusion for all groups.

**Venture Backed**

Venture capital backed SME’s are not likely to be affected by changes in the indirect costs caused by the Unitary Patent. The SME’s in this group that were interviewed said they are even less likely than other SME’s to end up in court. This is because these companies are very small and have a small or no market share. Changes in the structure of the court therefore do not affect them. The license-of-right option is not very useful for them as they are not seeking to grant licenses. The increase in the number of validations of European patents in the Netherlands does not mean much to these SME’s. For most SME’s of this category that were interviewed the Dutch market was not the most important. They were seeking for larger European markets or markets outside the European continent.

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55 Although not included in our analysis, the ratio between costs and market size proved to be important for SME’s. On the IPcopy blog ipcopyemily provides an interesting and more detailed analysis on this ratio and some estimates about the renewal fees of the unitary patent. There is also a comparison between the European, American and Chinese situation. The blog post was last accessed on 21 March 2014 on https://ipcopy.wordpress.com/2014/03/10/speculation-on-the-unitary-patent-renewal-fees-graphs-graphs-graphs-and-a-prediction/
Licensors

Licensors, just as the SME’s in general, do not expect the UPC to affect them a lot. They are not involved in litigation and are not likely to have an offensive patent strategy. If the patent would end up in a dispute they would leave the action to the licensee. These licensees could be affected by the structure of the UPC. In case the licensees sue someone for infringing the patent, it is not possible to handle this infringement and the validity of the patent in one trail. The validity should be tried in a freestanding case at the central division of the UPC. The option of license-of-right sounded interesting to many of the interviewed SME’s. However they pointed to the fact that they often granted some sort of exclusivity to their licensors. This is not possible in the case of license-of-right. The licensors feel that an increase in the number of validations of European patents would not affect them very much. They thought that the most important patents are already validated and this therefore does not decrease their freedom to operate.

Producers

The last group of producers is characterized by larger differences between small and medium sized companies. For the medium sized companies patent litigation is more likely. These companies do not seek to actively defend their patents but could defend their patents if necessary. They think in general that the UPC does not worsen their situation but that the improvements are small as well. Their behavior could involve some more strategic considerations towards the Unitary Patent.

For these medium sized companies certain patent strategies can be more important in the Unitary Patent system. Especially during the transitional phase this could be important. Figure 11, presented at a conference which was mainly focused on patent strategies for larger companies, shows the choices a patentee can consider when filing for a patent. The patentee can think about the strength and the importance of its patent. In case of filing for a strong and less important patent, the Unitary Patent is the best option. If the patent is not so important and not so strong, the patentee has to take the costs into consideration when choosing between the two systems. If the company has a strong patent that is important it should take into account whether it wants to take an offensive or defensive strategy. Lastly in case of weak but important patents it is better to choose a European patent that is opted out. This makes it easier to protect your interests. In case a company wants maximum protection it can choose to file a European patent for patents with a broad claim. A so called divisional, which has a smaller scope of protection, can then be filed in the Unitary Patent system. This is however more expensive and most likely applies to larger SME’s or very important patents.
These strategies only hold for medium sized companies. The smaller SME’s in the production category are more influenced by direct costs. Smaller SME’s are defensive in their strategy and want to avoid litigation as much as possible. Changes in the judicial system did not influence their practice that much. Also an increased number of validations did not mean much to them. Often other factors than patents played a bigger role in their daily business.

**Conclusion**

In general are the effects of the Unitary Patent Package on the indirect costs are small. In this case the effects can be very different depending on the type and size of the SME. In general no big negative or positive effects are to be expected. In the transitional phase medium-sized producers do have to think about their patent strategy as this can affect their position.

**7.4 Conclusion and revisiting the statements**

This section evaluates the statements in Section 4.3. These statements are predicted answers to the research questions posed in Chapter 1. This section therefore also answers the questions in Chapter 1.
The main research question is:

What are the expected effects of the introduction of the Unitary Patent on innovative Small and Medium Enterprises in the Netherlands?

This question has many aspects to it and is therefore divided into different sub-questions. In general it can be said that the consequences are very case specific. SME’s more than large companies, have varying patent strategies. Even within the company this can vary from patent to patent. In the analysis three different types of SME’s were identified which had similarities in their attitude towards the Unitary Patent. But within these groups varieties are possible. To address the question in more detail the various statements are evaluated.

S1: In some specific cases SME’s wil profit financially from the Unitary Patent. Those that profit are a minority.

The statement is partially correct. The financial effects can split into two stories. First, the direct reduction in costs is small and only applies to a few SME’s. This is because most SME’s do not patent in a lot of countries. The only reduction that could be found that applies to all cases is the reduction in the compensation paid to patent attorneys to pay the renewal fees. To this extent the statement is correct. The second side of the story has a more positive approach to the costs. This side deals with the ratio between costs and protection. The Unitary Patent improves this ratio significantly. This means that the cost of protection per country decrease. SME’s indicated that they are likely to choose the Unitary Patent because they would only need to pay slightly more to get a much larger area of protection.

S1A: The renewal fees of the Unitary Patent bring some relief but are dependent on the level set by the EPO.

For the renewal fees the same answer applies as for Statement 1. In addition to this it should be noted that the Unitary Patent leaves no possibility to play with the renewal fees. Currently most countries have a progressive fee level. Companies can drop the less significant countries to able to control the costs which is no longer possible with the Unitary Patent.

S1B: Translation costs after the transitional period is likely to go down, but this is only minimal.

The results for the translation costs reflect the statement made in Chapter 4. Due to the London agreement the most of the popular countries no longer require a full translation. Only Italy and Spain of those countries require a translation, but these countries are also not participating in the Unitary Patent. Only in rare cases the costs of translation are reduced.
**SIC: Litigation costs are not likely to change a lot for Dutch SME’s.**

The results and analysis come to the same conclusion as the statement. Patent litigation among SME’s, especially across several jurisdictions, is very rare. Most SME’s use a defensive strategy and try to avoid going to court. For those SME’s that end up in court prosecuting in several countries is often not an option because of the costs. The expectation is that prosecuting at a local division of the UPC is going to become more a bit more expensive than Dutch summary proceedings. This could mean a disadvantage for Dutch SME’s. For other jurisdictions such as in the UK, the costs can be reduced.

**S2: Dutch SME’s are not likely to be affected by changes in legislative procedures**

As holds for the costs of litigation the changes in legislative procedures do not affect SME’s that much. SME’s are barely involved in patent litigation and if they litigate they are most likely to do so in the Netherlands. The local division of the UPC resembles the Dutch system at various points. Some of the more specific details are discussed below.

**S2A: The construction of the UPC mainly creates more threats than opportunities for SME’s.**

The structure of the UPC does not influence patent litigation by SME’s a lot. Those SME’s that get involved in a case are most likely to do so at the Dutch local division. The threats that were named in the statement are considered very small by patent experts. The system holds both small advantages and disadvantages but these are not expected to influence patent trails.

**S2B: The license-of-right option provides opportunities for SME’s but these are not likely to be seized.**

The license-of-right option was perceived by many SME’s as interesting. Especially the licensor type sounded interested. The problem with the option is however that exclusive licenses are not possible. For licensors this is often an important feature. The option is further interesting for SME’s that like to keep patents alive at the end of their lifetime. Renewal fees become expensive and the license-of-right option provides a way to cut costs. A last group for which this option can be interesting is for companies having patents in standards. These patents already have to be licensed under similar conditions and the option only reduces costs. The adaptation of this option is also very much dependent on how often the patent attorney advises this to its clients.

**S2C: Bifurcation could have a small negative effect on SME’s**

Although it was predicted that bifurcation could have a small negative effect, this will not likely lead to any major problems. German judges, who use this system right now, have declared they do not like the system either but are forced to use it right now. Bifurcation of a lot of cases is therefore not likely to happen.
S3: A larger number of validated patents do not affect Dutch SME’s as much as other European SME’s.

Most SME’s do not expect to feel the threat of more validations due to the Unitary Patent. They thought that companies already validated their most important patents and this would therefore not affect them. Patent experts however do think this would lead to more litigation. More rights means that these rights are enforced. This is not necessarily a bad thing. The statement also mentions SME’s in different European countries, but the research has not focused upon those differences. What the effects of an increasing number of validations is could well be country but also industry specific. This could be a suitable topic for further research in the field of the Unitary Patent.

S4: The Unitary Patent has a small positive effect on innovation among Dutch SME’s

The statement made in Chapter 4 can be verified but for different reasons. The statement was drawn up with the thought that small cost savings could be reinvested into R&D. However it is more likely that companies are investing more into patenting than they do now. This does create new business opportunities for companies. How and if these opportunities are seized is hard to predict. The SME’s indicated that patent rights only play a minor role in expanding their business into other countries. The increased opportunities are most likely seized by SME’s that are backed by venture capital and those that are granting licenses. For them there are fewer obstacles in seizing these opportunities.
8 Conclusions

8.1 Conclusions

The goal of this master thesis was to map the effects on the Unitary Patent Package on Dutch SME’s. The motivation for this research was the critique on the statements from the European Commission about the potential costs savings of the Unitary Patent. From this starting point this thesis has taken a broad approach on the costs of patenting using a theoretical framework based upon transaction cost theory. After a literature review several statements were drawn up and these were evaluated during empirical research. This research consisted out of a secondary sources review for the direct costs and interviews with SME’s and patent experts for the direct and indirect costs of patenting.

The main conclusion that this thesis draws is that SME’s are most likely to adopt the Unitary Patent. Although the potential financial benefits are small there are reasons for SME’s to adopt the Unitary Patent. The main benefit is the increased ratio between the monetary investment and the geographical scope of patent protection. SME’s get more protection for the same investment into patents. Other potential benefits can be different for various types of SME’s of which three are identified in this thesis. These three types are venture capital backed SME’s, licensors and producers. Each of these three types has different motivations to patent and therefore the Unitary Patent also means different opportunities and threats to them. Venture capital backed SME’s profit from the Unitary Patent as it covers a larger market and therefor an increase in the patent’s worth. Licensors can grant a larger number and more valuable licenses. Producers no longer have to think about were any potential future markets may lay.

For the monetary costs this thesis has also shown that the claims made by the European Commission are close to the truth. In their reports they provide accurate estimates according to the findings in this thesis. They do however assume that an average European patent is validated in many more countries than what is the case. Furthermore the press releases only contain numbers about the validation of European patents and also assume a validation in more countries. These figures could be misleading as patenting in Europe is not likely to become much cheaper for a large group of patentees.

This thesis, in its analysis of the indirect costs of patenting, also confirmed that SME’s are not likely to be involved in patent litigation. Duplication of cases in Europe, a problem that the UPC can solve, is even rarer among SME’s. Patent litigation at a local division of the UPC is most likely to become more expensive than at a Dutch court. This will not benefit the small group of SME’s that is involved in litigation. Other indirect costs are not affected by the Unitary Patent Package or only cause minor changes. For certain types of SME’s such as the licensors, some changes, such as the license-of-right, can create new opportunities.

Lastly, with transforming the classical transaction cost theory into one that is useful to analyze patenting decision, this thesis has provided a useful tool for academics and
companies to assess whether or not companies should take the decision to patent. With this theory it also becomes clear that the costs of patenting are not only restricted to direct, often monetary, costs but that indirect costs, affected by the patent environment and the behavior of others, also can play a large role. The theoretical model helped to look for potential opportunities and threats when evaluating the literature and the empirical results.

8.2 Implications
This research has provided insights into the patenting behavior of SME’s and their expectations for the Unitary Patent. The findings have implications for different actors in this field. For the three most important groups in this field the implications are below.

SME’s
For SME’s this thesis can help in their awareness about patents and patent strategy. This thesis has shown that SME’s are not well aware about their patent strategy although they require a specific approach. Also a lot of SME’s do not use patents because of barriers that they experience or due to unawareness. More interest into patenting could help them to save costs or see more business opportunities. The Unitary Patent could help unlock even more of these potential savings or opportunities if used wisely. SME’s should not be ignorant and just opt for the Unitary Patent. The European patent or a national patent could be a cheaper option that fulfills their needs in patent protection.

Although SME’s are only involved occasionally in patent litigation it would not be wise to neglect the changes that the UPC brings. If SME’s get involved in a case it is more likely that they end up at the UPC. This could bring some significant changes compared to for example the Dutch summary proceedings. This thesis does not encourage SME’s to go to court, patent disputes can solved in many other ways, but an increase in the awareness about the issues can do them no harm.

Patent attorneys and lawyers
This thesis could help patent attorneys and patent lawyers to gain some insights into the specific behavior of SME’s. The patent attorneys indicated that the needs of a SME vary a lot on a case to case basis. This idea is confirmed in the research but the Unitary Patent could lead a more general approach for SME’s. Furthermore the thesis can help them understand the problems that SME’s face in patenting. Additionally this thesis gives a good oversight of the costs in patenting. The different scenarios can be used for advising their clients. Moreover patent attorneys face a decrease in income because the business of paying renewal fees for clients is reduced. Potential compensation can come from non-European patentees which now see the European market as a more viable option in which they can patent. Patent attorneys need to think about how to adapt their business models to these changes.

For patent lawyers a lot will change. Although some of the biggest worries among business, such as bifurcation and NPE’s, are not likely to cause a lot of problems, patent lawyers do have to adapt to changes. Patent lawyers are faced with challenges because
many determining factors are hard to predict. Patent lawyers have to be aware of changes for SME’s. Chances have grown that they have to fight for their patent somewhere abroad. This could increase the obstacles for SME’s to go to court. An advantage here is that a Dutch patent lawyer can also plead at any local division of the UPC.

Policy makers
For policy makers this thesis again proves that there is a lot of IP-ignorance among SME’s. Especially the smaller SME’s are often not aware of their patent position. The SME’s that were interviewed are probably more aware about patents than the average SME because many of them already applied for a patent. Even here awareness about the Unitary Patent was very low. Spreading information about the Unitary Patent should not be left to patent attorneys alone. Many SME’s perceive the information provided by patent attorneys as biased, as they have an incentive to do so. Policy makers have to look carefully on how to make SME’s more IP-aware.

For policy makers at the EPO and the European Commission this thesis can provide more insight into the expectations of SME’s for the Unitary Patent. This can help them set the level of renewal fees. The policy makers have to be aware that SME’s are willing to invest slightly more in their patent to obtain a Unitary Patent but that charging too much might cause them to reject the system.

8.3 Further research
Research on the Unitary Patent is very new as the plans have only been formulated for a few years. It also takes a few more years before quantitative research on the subject can be done as the first Unitary Patents are not yet issued. Further research should therefore focus on the expected effects of the Unitary Patent. During the interviews, the ratio between the costs and the geographical scope of protection proved to be important for SME’s. In the secondary sources review an analysis of this difference is missing. Further research in this field for SME’s and larger companies could provide more insight into the incentives for companies to choose the Unitary Patent.

One of the reasons for the Polish government to not sign the agreement for the UPC was that an increased number of valid patents would do harm to Polish businesses. To my knowledge other countries have not performed such a research. It could be interesting to investigate the effects of increased validations for different types of countries. The results for innovation leaders, followers and those lagging could turn out to be very different.

Due to the research design of this thesis it was very hard to compare different types of industries. The sample size is too small to make any comparisons between these different groups. Industry differences are however present in patenting behavior. A more quantitative approach could identify potential different approaches in industry towards the unitary. There are for example indications that opportunity cost in the pharmaceutical industry could be a reason not to opt for the Unitary Patent. Quantitative research methods could identify possible other differences in SME’s such as size and age.
8.4 Limitations

There are two important limitations to this research of which both were clear from the start. First there is the limited number of interviews that could be conducted. The trade-off between more rich and in-depth information obtained during the interviews and more generalizable data from a survey was not that easy to make. Interviews were chosen as the research method because then the participants were able to stress the important issues they faced in patenting. This does mean that it is hard to generalize the findings and that there is a possible strong sampling bias. Most of the interviewees are already involved in patenting which could influence the results. This selection was however needed to identify several groups of SME’s. The expectations of non-users were tried to be taken into account but this turned out to be difficult.

The second limitation deals with the timing of this research. Because the first Unitary Patent has not yet been issued, and it is not expected until 2015 or 2016, the results are predictions. The answers in the interviews were made on the basis of what the interviewees thought would happen given the limited amount of data they had. A clear example of this was the missing information on the renewal fees. The level of these fees could determine for a large part whether or not businesses choose to opt for the Unitary Patent. That the Unitary Patent is new phenomena was also experienced during the interviews. For many of the SME’s the regulations were new or they had only head vaguely about them. Even the patent experts were still trying to grasp all the changes that the Unitary Patent would bring.

8.5 Personal reflection

The Unitary Patent deals with a lot of unknowns. This has made this research rather difficult. Patent awareness among especially small SME’s is low, which did not contribute to the process. Yet getting a clear view on how the Unitary Patent affects SME’s is valuable. Those who I spoke in interviews or on conferences showed great interest in my work, showing that there is a need for this analysis. To my personal opinion patent awareness is too low among SME’s. Those having a patent can also extract more value out of it. The case-by-case approach that SME’s use however appealed to me. SME’s have to keep this approach even though the Unitary Patent could make the choice slightly easier. These innovative SME’s are not abusing the patent system, they are often busier with other problems facing their business.

The Unitary Patent itself has a long way to go before being fully operational. It has faced many obstacles and has to overcome even more. The end result might not be the optimal solution, but to my opinion it can change things in a positive manner. The Unitary Patent is surprisingly criticized by the same industry that requested the patent. Widespread adoption by larger and smaller companies would be the best option to face the problems. Policy makers have done their best to incorporate the concerns of industry into the regulations. The time seems to be here to make the next step. I do not think that the Unitary Patent will give a boost to innovation but it definitely puts Europe back on the patent map.
This research has been balancing on trying to generalize its findings while needing the depth of the interviews performed. In performing the research and analyzing the results this has often been a challenge and a struggle. It has not been easy to draw results from the interviews that were performed. In the beginning each company provided new insights, which added to the depth of results but also made it difficult to generalize. In the end the results do provide valuable information on the expected effects of the Unitary Patent on innovative SME’s. Perhaps this research could have benefited from an approach that both used a quantitative and a qualitative approach. The qualitative approach used here using interviews has provided a lot of useful insights and stories which would not have been able with a quantitative method. Yet for more insights in for example differences between industries, a quantitative would have been useful as well. A survey from which interesting cases could have been selected for an interview would have provided additional interesting insights.
Appendices

A. Bibliography


Spain and Italy vs The Council, C-274/11 (European Court of Justice April 16, 2013).


IPcopy. (2013, June 19). The Unitary Patent and the Fee-saving Myth: Time to put that misleading £20,000 figure back in its box, please. Retrieved from IPcopy:


http://www.finnegan.com/resources/articles/articlesdetail.aspx?news=9de32004-658e-41d3-bcd4-12158ca0e8c5

B. Interview lay-out SME’s

Company Name

Information retrieved beforehand and checked during the interview
Number of employees: xx
Number of patents: xx
Industry: xxxxx
Year of establishment: xxxx
Any additional information (Patents from previous owner, collaborations etc.)

Patenting behavior
What are the reasons to patent?
In which geographical markets do you operate?
Is someone responsible for the IP management and how much time is invested?
Do you protect your intellectual property in other ways than patents (formal/informal)
Do you make use of a patent attorney?

Disputes
Do you make use of the information from other patents and in what way?
Did you have any disputes with other companies (possible focus on large companies)?
Do you monitor the behavior of possible infringers?

Patent costs
How do you experience patent costs and can you name the various aspects?
How do you estimate the time investment of R&D and management staff?
If applicable: What were the costs of patent litigation?
Do you experience the disclosing of information as an added cost?
Do you experience any other costs?

Unitary Patent package
What is your first impression of the unitary patent?
Do you think the unitary patent is able to reduce your patent costs?
Is there any added value in the added geographical scope?
What is your first impression of the UPC?
Do you grant/are you thinking about granting licenses and can the LOR option help with this?
Do you think that the unitary patent could lead to more innovation?
C. Interview lay-out Experts

Name company/Interviewee

General information
What is the Number/percentage of SME’s as a client?

Costs
In how many countries does a SME on average validate its European patent?
Where are the bulk of the costs in patenting?
Do SME’s experience a lot of translation costs or does the London Agreement help a lot?
What are the costs of a patent attorney for an average patent?
How are renewal fees handled? What does a patent attorney charge?
Does the unitary patent bring a cost reduction?

Unified Patent Court
Are you aware of litigation cases among SME’s (possible multiple jurisdictions)?
What do you think about the proposed structure of the UPC?
Could this structure lead to possible forum shopping among the local divisions?
Do you think bifurcation is likely to occur?
If yes, what could be the consequences of bifurcation?
Do you think NPE’s are likely to increase their interest in the European Market?
Do you foresee a decrease or increase in litigation costs?
Does the UPC change the position of SME’s compared to larger companies?

Other issues
Is the geographical scope of the unitary patent added value?
Is the LOR option a possibility for SME’s? Would you recommend it?
Should SME’s opt-in or opt-out of the UPC with their current European patents?
Does an increase in added validations cause trouble for the SME’s?
### D. Results SME interviews – General information and appropriation strategies

<table>
<thead>
<tr>
<th>Industry</th>
<th>Number of employees</th>
<th>Age company</th>
<th>Number of patents</th>
<th>IP Management</th>
<th>Reasons patenting</th>
<th>Patent attorney</th>
<th>Use of patent information</th>
<th>Other appropriation strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Embedded systems</td>
<td>16</td>
<td>2007</td>
<td>2</td>
<td>CEO, but leaves most of the work to the patent attorney. CEO claims it is not necessary for a start-up to invest a lot of time into patents.</td>
<td>Adding value to the company, defense against other companies, possibility of cross-licensing, Safeguard for venture-capitalists</td>
<td>Yes, but costs were low because staff had experience with writing patents. Patent attorney only used as check and for the formal application part</td>
<td>Product was quite unique. Could be used when writing the patent to see what was prior-art.</td>
<td>Secrecy was possible. But the main way to stay ahead of competitors was to keep on innovating.</td>
</tr>
<tr>
<td>2 Semiconductor</td>
<td>65</td>
<td>2006</td>
<td>14(Espacenet) 5 granted in US, 3 Europe. Still some pending. From merger also 1 patent from Belgian partner</td>
<td>Interviewee is IP manager because of his experience. Answers attorney questions, because sometimes inventors are already gone or he has more experience than the inventor.</td>
<td>Venture capitalists safeguard. Defensive strategy at the moment, too small to do something with them.</td>
<td>Yes, NLO</td>
<td>n.a</td>
<td>Publishing of information has been considered, not yet done.</td>
</tr>
<tr>
<td>3 Optics</td>
<td>100</td>
<td>2006 (Spin-off Philips)</td>
<td>14</td>
<td>They have to patent, in this innovative businesses you will soon be bankrupt if you don't</td>
<td>They use one, but patent searches and a lot of writing is done themselves to keep the costs down and the patent attorney might not understand the technical details</td>
<td>Yes, to see if they don't infringe, what their competitors do and to come up with some good ideas.</td>
<td>Trade secrets are important to the company. Not everything can get patented or it would be too expensive</td>
<td></td>
</tr>
<tr>
<td>Industry</td>
<td>Number of employees</td>
<td>Age company</td>
<td>Number of patents</td>
<td>IP Management</td>
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<td>Patent attorney</td>
<td>Use of patent information</td>
<td>Other appropriation strategies</td>
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</tr>
<tr>
<td>4 Video systems</td>
<td>90</td>
<td>1987</td>
<td>1 lapsed in 2010</td>
<td>Management</td>
<td>They don't, most of their business is applied. Industry does not use a lot of patents, only a few big companies. They do have a lot of standards. Sometimes used as marketing tools</td>
<td>x</td>
<td>Only occasionally, no structured used.</td>
<td>Trade secrecy is their main appropriation strategy. Furthermore they use software codes that are very hard to reverse engineer. Publishing could also be used to prevent others from patenting</td>
</tr>
<tr>
<td>5 Automobile</td>
<td>116</td>
<td>1993</td>
<td>3, on the name of INDOPAR</td>
<td>Yes, one person on trademarks and one on patents</td>
<td>n.a</td>
<td>Yes</td>
<td>n.a</td>
<td>Secrecy</td>
</tr>
<tr>
<td>6 Medical systems</td>
<td>5</td>
<td>2010, spin off, dräger</td>
<td>1</td>
<td>CEO handles the patents</td>
<td>Mainly defensive, but it also comes in handy for commercial reasons</td>
<td>Yes, NLO</td>
<td>Yes, they do so for freedom-to-operate. Had one search 8.5K</td>
<td>Secrecy, not everything can be patented or it is too expensive</td>
</tr>
<tr>
<td>7 Heating systems</td>
<td>20</td>
<td>1990</td>
<td>40+</td>
<td>R&amp;D manager handles patents. Invests roughly 1 month a year in this</td>
<td>Defensive but also for sales and licensing</td>
<td>Yes, been with this one for a long time</td>
<td>Yes, checking to see if they work around patents with their own inventions</td>
<td>No, if things could be patented they would do it</td>
</tr>
<tr>
<td>8 Power conversion</td>
<td>20</td>
<td>2009</td>
<td>0, have only performed a dump application but have not gone on with this</td>
<td>No patents, only trademark handled by the CEO</td>
<td>If they would, for defensive purposes</td>
<td>Yes, when applying for the dump</td>
<td>Yes, they check what others are doing, especially to not infringe their patents</td>
<td>Secrecy, innovation speed</td>
</tr>
<tr>
<td>Industry</td>
<td>Number of employees</td>
<td>Age company</td>
<td>Number of patents</td>
<td>IP Management</td>
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<td>--------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>High tech/medical/systems/automotive/maritime</td>
<td>120</td>
<td>1976</td>
<td>0</td>
<td>The company provides R&amp;D for other companies. They leave the option to patent to their clients. But Tegema remains to have access to all IP</td>
<td>If they would, they idea would have to be really good and developed by themselves and not for a client. The idea would then be sold to a bigger party</td>
<td>No patents</td>
<td>Yes, they can show how new technologies develop. But are patents are also there to work around</td>
<td>Secrecy is important</td>
</tr>
<tr>
<td>Mechatronics</td>
<td>30</td>
<td>2007</td>
<td>1 in espacenet, aangeven ongeveer 3 per jaar aan te vragen</td>
<td>1 persons handling the applications. Works on R&amp;D department</td>
<td>Protection (For them and costumers, possible new licenses) and advertising as we do this for you but also as look how innovative we are.</td>
<td>Yes, does almost everything for them</td>
<td>Hardly, the costs of a patent search are almost equal to the search report of the Dutch office.</td>
<td>Secrecy (NDAs), time constraints are also not a reason to patent</td>
</tr>
<tr>
<td>Power conversion</td>
<td>20</td>
<td>2009</td>
<td>0, have only performed a dump application but have not gone on with this</td>
<td>No patents, only trademark handled by the CEO</td>
<td>If they would, for defensive purposes</td>
<td>Yes, when applying for the dump</td>
<td>Yes, they check what others are doing, especially to not infringe their patents</td>
<td>Secrecy, innovation speed</td>
</tr>
<tr>
<td>Components industry</td>
<td>20</td>
<td>1991</td>
<td>2, samenwerking met Philips. 1 Dutch patent</td>
<td>CEO</td>
<td>Protection of their knowledge, especially application</td>
<td>With Philips and via a patent attorney.</td>
<td>x</td>
<td>Secrecy especially for processes</td>
</tr>
<tr>
<td>Medical systems</td>
<td>70</td>
<td>2010</td>
<td>1 application. Can make use of Philips patents. But most patents in this field are expired.</td>
<td>Done by two researchers</td>
<td>Protection of product. If others come to them, they have a better negotiation position. Possible licenses</td>
<td>Yes</td>
<td>Yes to see if they infringe upon others</td>
<td>Secrecy especially for processes. Employees do not walk away.</td>
</tr>
</tbody>
</table>
### E. Results SME interviews – Patenting costs

<table>
<thead>
<tr>
<th></th>
<th>How do they see patent costs</th>
<th>Application fees</th>
<th>Attorney Fees</th>
<th>Translation costs</th>
<th>Renewal fees</th>
<th>R&amp;D Time</th>
<th>Management time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Costs were not seen as a major issue. Patents were seen as expensive but in the total process just a small part of the costs.</td>
<td>Fees were the major part of the costs made in patenting</td>
<td>Kept low due to experience with patenting and therefore keeping it low</td>
<td>Only filed in English</td>
<td>See application fees</td>
<td>It did cost some time to write the patent but this was not considered as expensive as a patent attorney</td>
<td>See R&amp;D time</td>
</tr>
<tr>
<td>2</td>
<td>Costs are high, but not seen as barrier as they add to value of the company.</td>
<td>Total costs of other fees 10.000 EUR</td>
<td>10.000 euro, writing done a lot at the company, also to record invention internally. Seen as expensive</td>
<td>UK, DE, FR filing so no translation costs</td>
<td>Part of the system, not a lot because number of companies is limited.</td>
<td>Writing of invention document. Part of the standard procedure.</td>
<td>On average 4 hours per week, only one person.</td>
</tr>
<tr>
<td>3</td>
<td>They see the several phases of the costs</td>
<td>Expensive in Europe</td>
<td>5000-7000 Euro</td>
<td>US and Asian market important. Yes large translation costs. Largest part of the costs. Up to 30.000 Euro</td>
<td>Yes, but not the bulk of the costs</td>
<td>Do write part of the patent themselves</td>
<td>See IP management</td>
</tr>
<tr>
<td>4</td>
<td>Is expensive as they act on a global market. They do see the several steps in the costs</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
<td>Yes definitely part of the costs</td>
</tr>
<tr>
<td>5</td>
<td>Most in application phase/patent attorney, total of about 10k</td>
<td>n.a</td>
<td>n.a</td>
<td>try to avoid by looking at language of countries</td>
<td>n.a</td>
<td>Yes, this is also part of the costs</td>
<td>Yes, especially in the lawsuit</td>
</tr>
<tr>
<td>6</td>
<td>Main costs are patent attorney</td>
<td>Yes are a part</td>
<td>Main costs</td>
<td>This is very expensive and therefore not likely to occur</td>
<td>Patent was still pending and therefore not yet an issue</td>
<td>Small</td>
<td>Small</td>
</tr>
<tr>
<td></td>
<td>How do they see patent costs</td>
<td>Application fees</td>
<td>Attorney Fees</td>
<td>Translation costs</td>
<td>Renewal fees</td>
<td>R&amp;D Time</td>
<td>Management time</td>
</tr>
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</tr>
<tr>
<td>7</td>
<td>Costs are seen as one bulk. They just get the bill from the patent attorney but do not know what the specific costs are. Total costs 5000-10000 euro</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
<td>1 month a year</td>
<td>n.a</td>
</tr>
<tr>
<td>8</td>
<td>It is extremely expensive, to expensive at the moment for the protection it offers</td>
<td>n.a</td>
<td>n.a</td>
<td>For them these are the main costs as their market is global they would like protection that is as broad as possible</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
</tr>
<tr>
<td>9</td>
<td>Patent costs are high, especially those when enforcing the patent</td>
<td>Yes, are a part but initial costs can be overcome</td>
<td>Yes, expensive</td>
<td>Yes, also a big part if European protection is sought</td>
<td>Yes</td>
<td>n.a</td>
<td>n.a</td>
</tr>
<tr>
<td>10</td>
<td>No patents, but if they would apply this would not be a problem. The idea would be worth much more than patent costs</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
<td>Yes, protection is needed on a global scale. Renewal costs therefore are high</td>
<td>n.a</td>
<td>n.a</td>
</tr>
<tr>
<td>11</td>
<td>No obstacle, because mainly Dutch patents.</td>
<td>€2000-3000 (Dutch)</td>
<td>€5000-6000 (European)</td>
<td>Not really aware of these costs, thought they had European wide protection</td>
<td>Only if they go into more countries.</td>
<td>Minor, they let the patent attorney write the patent. They do not have the capacity to do this themselves</td>
<td>n.a</td>
</tr>
<tr>
<td>12</td>
<td>Costs split with Philips, but costs are felt</td>
<td>18.000 split in two. Yes a substantive amount</td>
<td>A few thousand euro's.</td>
<td>costs in one bill are substantial especially because 'worldwide'</td>
<td>Yes, time is essential in that case</td>
<td>See R&amp;D time</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Still in application phase, no clear numbers yet</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
</tr>
</tbody>
</table>
### F. Results SME interviews – Expectations about the Unitary Patent

<table>
<thead>
<tr>
<th></th>
<th>First impression Unitary Patent</th>
<th>Cost reduction?</th>
<th>Impression UPC</th>
<th>Added value of larger area of protection</th>
<th>License-of-right</th>
<th>Incentive to innovate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Only interested about if software patents would be allowed with the Unitary Patent</td>
<td>Yes it could be, but US market was the most interesting.</td>
<td>n.a</td>
<td>Considered to be small, but costs reduction could be applicable. As well it could lead to an increase in value of the company when they decided to sell.</td>
<td>did not grant licenses</td>
<td>Laughed at this idea. Patents were not the goal of the company.</td>
</tr>
<tr>
<td>2</td>
<td>Positive</td>
<td>Yes, seems very interesting. They are wondering if UK, DE, FR is sufficient to protect their interests.</td>
<td>Has not thought about this. But can see benefits, has experience with forum shopping in the US</td>
<td>Is definitely an added value for the company. Could fill holes in their protection.</td>
<td>Do not grant licenses</td>
<td>n.a</td>
</tr>
<tr>
<td>3</td>
<td>Seems like a positive development, but is not really enthusiastic. They will not decide to move into Europe because of these developments</td>
<td>Cost reductions could be significant, but currently follow strategy of only 4 countries (UK,DE,FR,NL) But European patent remains too expensive</td>
<td>Positive development, looks like things will get easier. EUP, seems like a logical move</td>
<td>Yes, but currently Europe is not an important market.</td>
<td>Do not grant licenses, might do this in the future. But it is hard to say if LOR will be used. Also reduction of costs is minimum compared to the license deals</td>
<td>n.a</td>
</tr>
<tr>
<td>4</td>
<td>Positive</td>
<td>Yes, especially the producers were made more easy. They are more likely to consider a patent, but will not start to use the patent system heavily now.</td>
<td>Very positive, this is the greatest improvement. Bifurcation not seen as a big problem</td>
<td>Yes, this is handy, next to the usual countries which are patented. But also dangerous because of patent trolls</td>
<td>Could be used, but this depends on the case. If the patent would end up in a standard this is of course very useful.</td>
<td>n.a</td>
</tr>
<tr>
<td>5</td>
<td>Improvement but they operate on a worldwide market</td>
<td>Yes could be in general, but not for them</td>
<td>Slow, probably also due to experience with court</td>
<td>Yes, they see this</td>
<td>No, they also grant exclusive licenses</td>
<td>n.a</td>
</tr>
<tr>
<td>6</td>
<td>Positive, definately worthwhile for the company</td>
<td>Not really at the moment</td>
<td>Same issues as current court, no significant difference</td>
<td>Yes, but is was seen more as a bonus than really necessary at the moment</td>
<td>n.a</td>
<td>Won’t patent more because of it</td>
</tr>
<tr>
<td></td>
<td>First impression Unitary Patent</td>
<td>Cost reduction?</td>
<td>Impression UPC</td>
<td>Added value of larger area of protection</td>
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</tr>
<tr>
<td>7</td>
<td>Is ok, but not sure if it would improve their situation</td>
<td>Not certain. Currently they file in the UK, DE, FR, CH, AU, IT, US, CN. This case depends on the maintenance fees</td>
<td>Could be positive, depends on the case. Perhaps when working with one of their bigger clients</td>
<td>No, they only move into markets where there are opportunities. Did not depend on the patent protection.</td>
<td>This is an option in cases which they license.</td>
<td>No</td>
</tr>
<tr>
<td>8</td>
<td>Good</td>
<td>Definitely, as they would protection in as many countries as possible this would work. Because of the new regulation they might actually apply for a patent now.</td>
<td>Yes, but courts should be avoided anyway</td>
<td>Yes</td>
<td>Possible, but are not sure as they do not have a patent yet</td>
<td>“We would not let a patent stop us, that would be rather a stupid thing to do”</td>
</tr>
<tr>
<td>9</td>
<td>Reduces initial costs, as they would want a large European protection as this is their market. But is does not solve the major problem of the patent system</td>
<td>Yes</td>
<td>Seems like a good idea, but the costs still remain too high. Cases in several jurisdictions barely happen. European business also honor US patents.</td>
<td>If they would apply for a patent this would happen in Europe. They are in doubt about the added value of the larger area of protection.</td>
<td>Licenses are an option but unclear if LOR would help.</td>
<td>No, they would only patent a real important invention. Meanwhile they have different measures to stay in the market.</td>
</tr>
<tr>
<td>10</td>
<td>Could be beneficial. CEO thought such a system was already in place. But what does protection is bosnia or estonia bring?</td>
<td>when patenting, it happens on a global scale. Cost reduction therefore does not matter that much</td>
<td>You do not go to court. You settle things beforehand</td>
<td>See first impression</td>
<td>Licences can be important. LOR was not discussed</td>
<td>No</td>
</tr>
<tr>
<td>11</td>
<td>Positive</td>
<td>Yes possible cost reduction, but they do not make money out of patents.</td>
<td>No, opinion because they not involved in enforcement. Does not have any objections</td>
<td>Very much dependent on the costumer</td>
<td>is positive about this. They do not make any products themselves so this could be valuable. This could be even used as an advertising point. But problematic is that they want to grant exclusive licenses per industry.</td>
<td>No, is added value not an incentive to innovate</td>
</tr>
<tr>
<td>12</td>
<td>Really positive, could provide great costs reduction and even lead to more patent applications</td>
<td>Yes, they would like protection in the whole EU, this would make this more likely</td>
<td>n.a</td>
<td>Already want full protection in the EU</td>
<td>Possibility, but exclusive licenses and FRAND conditions are important in this case</td>
<td>n.a</td>
</tr>
<tr>
<td>13</td>
<td>Positive, for the same costs more countries.</td>
<td>Yes, they think that this would be a cost reduction</td>
<td>n.a</td>
<td>Have markets within several places. Also outside Europe. But they feel that the UP could help. Future markets</td>
<td>Licenses are possible, but depends on the company. If this is a strong competitor they won’t do it.</td>
<td>n.a</td>
</tr>
</tbody>
</table>
### G. Results SME interviews – Dealing with behavior of others

<table>
<thead>
<tr>
<th></th>
<th>Disclosing information</th>
<th>Monitoring other clients</th>
<th>Dispute with others</th>
<th>Resolving dispute</th>
<th>Experiences in court</th>
<th>Experiences with large companies</th>
<th>Patent trolls</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>This was a problem indeed, but the company saw that if people wanted they could invent around anyways. Patents were at least some kind of insurance for the venture capitalists</td>
<td>Not busy with other patent strategies as they were start-up</td>
<td>Not big enough yet to be attacked. Did not apply attacking strategy.</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
</tr>
<tr>
<td>2</td>
<td>Are well aware of what they publish or not. Have also withdrawn application to protect information. But patents in general make information stronger.</td>
<td>n.a</td>
<td>Only one warning from another company, but they let it pass. It felt like blackmail.</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
</tr>
<tr>
<td>3</td>
<td>Yes this is a problem, the company has seen competitors do this, especially from Asia</td>
<td>Yes, IP manager will look into other competitors</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
</tr>
<tr>
<td>4</td>
<td>This is definitely a consideration when patenting.</td>
<td>n.a</td>
<td>One dispute with a patent troll. CEO did have experience with previous places he worked. They did have to pay to the troll.</td>
<td>Negotiated a deal with percentages on the product</td>
<td>n.a</td>
<td>n.a</td>
<td>Biggest issue in their work with patents are patent trolls. They have a very negative view of them</td>
</tr>
<tr>
<td>5</td>
<td>Yes, definitely an issue. Sometimes it is better to keep things secret</td>
<td>n.a</td>
<td>Yes, with another company in Eindhoven</td>
<td>Won in court</td>
<td>happy to have won, but costs were high and difficult to retain</td>
<td>n.a</td>
<td>n.a</td>
</tr>
<tr>
<td>6</td>
<td>Yes, seen as one of the big reasons to choose secrecy over patenting. They saw how easy they could invent around and so could others</td>
<td>Yes, especially with regard to freedom to operate</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
</tr>
<tr>
<td>Disclosing information</td>
<td>Monitoring other clients</td>
<td>Dispute with others</td>
<td>Resolving dispute</td>
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<td>Patent trolls</td>
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<td></td>
</tr>
<tr>
<td>7</td>
<td>Yes, they know that others try to invent around them</td>
<td>n.a</td>
<td>From previous employer. If it was worth it they would pursue this. But first a risk assessment would be made. They have to be 80% sure at least they would win.</td>
<td>Court and settlement</td>
<td>See dispute</td>
<td>n.a</td>
<td>n.a</td>
</tr>
<tr>
<td>8</td>
<td>This would be a problem. But therefore they would rather invest in a patent on an application rather then on the technology behind it</td>
<td>n.a</td>
<td>Yes, had a problem with an owner of a patent in the UK. The companies said that they should strengthen each other in their knowledge. In the end they agreed a license of 0.25-0.5%</td>
<td>Settlement</td>
<td>n.a</td>
<td>n.a</td>
<td>Could be, perhaps if they get bigger</td>
</tr>
<tr>
<td>9</td>
<td>Yes, a problem. Therefore if they apply the patent should be really good</td>
<td>Yes, they look at patents of others</td>
<td>Yes, but they regarded the patent as weak. So they let it go</td>
<td>ignoring</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
</tr>
<tr>
<td>10</td>
<td>Yes, this is an important aspect. Some things are best kept secret. A patent would ruin your investments</td>
<td>No patents</td>
<td>No</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
</tr>
<tr>
<td>11</td>
<td>Not a problem. If they want to go around it, they would do it anyway. They also do not have an idea if others would violate their patent.</td>
<td>n.a</td>
<td>No experience with other suing them. Doubts heavily if they would ever go after someone else as this has enormous costs</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
</tr>
<tr>
<td>12</td>
<td>Philips does this for them</td>
<td>Not more than exchange of letters, done by Philips</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
<td>n.a</td>
</tr>
<tr>
<td>13</td>
<td>They don't patent processes, this is their advantage compared to others.</td>
<td>Impossible for processes</td>
<td>Not yet, but they notice that they don't get prototypes of competitors. Too small to be a threat on the moment</td>
<td>n.a</td>
<td>No experience but they are afraid of such companies. They have more money in case of lawsuit</td>
<td>n.a</td>
<td>n.a</td>
</tr>
</tbody>
</table>