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Business Method Patents in the US and Europe – Diverging Policies and the Effects on Competition

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Summary

The patentability of business methods has been debated over a long period of time, nevertheless the exact requirements for a business method to be patent eligible and their interpretation remain unclear both in the US and Europe.

Although the patent eligibility of business methods has not been an obvious matter in the US, the US courts and the US patent office has chosen to adopt a quite liberal stance towards this type of patents. The chief concern of the US courts has been to devise a standard that will allow the patenting of business methods without granting a patent on the abstract idea itself. Many different approaches have been debated in case law but one of the most prominent standards is the machine-or-transformation test. Hence the connection to a particular machine, or the transformation of an object into a different state or thing, has been two of the main preconditions discussed in US case law in regards to business methods.

Even though the standards applied in Europe to determine the patent eligibility of business methods have varied slightly, the term "technical" has always been central. The current test to assess the patentability of business methods is often referred to as the "any-hardware approach". Despite the fact that this standard has relaxed the requirement for a subject matter to be regarded as an invention, the precondition of inventive step, that can only be judged on the basis of the technical features of an invention, is still a great obstacle to patenting business methods in Europe. Hence, the EPO applies a more stringent policy, in relation to the regime implemented in the US, and the fundamentally different starting points of the US and European patent systems make them difficult to compare.

The impact that the diverging regimes regarding business method patents implemented in the US and Europe have on competition is an important matter to discuss. The main motivation for creating a patent system, and thereby restricting competition, is to further innovation. The notion is that greater inventiveness will benefit society in several ways and that the special characteristics of knowledge compel the government to intervene on the market, incurring certain costs. One of the great benefits of the patent system is the possibility to trade knowledge through e.g. licensing agreements. However, there may be other circumstances to consider than the traditional economic rationales when discussing the positive and negative effects that patents may have on competition. The quality of patents is a widely debated matter, especially in connection with business method patents which are often referred to as weak patents. Investigating the welfare implications of licensing weak patents is only one way to discuss some of the possible effects on competition that the diverging policies applied in the US and Europe concerning business method patents might produce.

Sammanfattning

Affärsmetoders patenterbarhet har diskuterats under en lång tid, dock är de exakta kraven för att en affärsmetod ska anses patenterbar och dessas tolkning inte tillräckligt klarlagda, varken i USA eller i Europa.

Även om patenterbarheten av affärsmetoder inte har varit en okomplicerad fråga i USA, har både de amerikanska domstolarna och det amerikanska patentkontoret uppvisat en förhållandevis liberal inställning till denna typ av patent. Det huvudsakliga spørsmålet i amerikansk rättspraxis har varit att hitta en metod som tillåter patentering av affärsmetoder men som ändå hindrar att patent på abstrakta idéer utfärdas. Många olika tillvägagångssätt för att uppnå detta mål har diskuterats i praxis men en av de mest frekvent tillämpade metoderna är maskin-eller-omvandlingstestet. Detta test fokuserar på huruvida patentansökan är kopplad till en viss maskin, eller om processen som ansökan beskriver inkluderar en omvandling av ett objekt till en annan form eller sak.

Trots att olika kriterier för att fastställa patenterbarheten av affärsmetoder har tillämpats i Europa så kretsar alla bedömningsgrunderna kring begreppet ”teknisk”. Den för tillfället aktuella metoden för att bedöma patenterbarheten av affärsmetoder kräver endast att en metod eller process är kopplad till en fysisk enhet för att betraktas som en uppfinning. Dock kan endast en uppfinnings tekniska komponenter ligga till grund för bedömning av objektets uppfinningshöjd, vilket utgör ett avsevärt hinder för patenteringen av affärsmetoder. Därmed uppställer det europeiska patentkontoret högre krav på patentansökningar som rör affärsmetoder än den amerikanska rättsordningen. Eftersom de amerikanska och europeiska patentsystemen har vitt skilda utgångspunkter rörande patent på affärsmetoder, blir en jämförelse av de kriterier som tillämpas vid bedömning av patenterbarheten av affärsmetoder svår att genomföra.

Effekterna som de olika möjligheterna att få beviljat patent på affärsmetoder i USA och Europa kan tänkas ha på konkurrensen är en viktig fråga. Den dominerande anledningen till att införa ett patentsystem, och därmed begränsa konkurrensen, är att främja innovation. Tanken är att större uppfinningsrikedom kommer att gynna samhället på flera sätt men att kunskap har vissa specifika egenskaper som gör att statlig intervention är nödvändig, även om detta ingripande också leder till vissa kostnader. En av de stora fördelarna med ett patentsystem är att kunskap kan överlåtas, genom till exempel licenser. Dock kan det finnas andra aspekter som bör belysas än de traditionella ekonomiska bevekelsegrunderna i en diskussion kring de positiva och negativa inverkningarna som patent kan medföra ur konkurrenshänseende. Patentkvalité är ett vida debatterat spørsmål, särskilt i förhållande till

patent på affärsmetoder som ofta anses vara svaga patent. Att undersöka välfärdsaspekterna av att licensiera patent av låg kvalité är därmed endast ett tillvägagångssätt för att diskutera de möjliga effekter på konkurrensen som de skilda möjligheterna att patentera affärsmetoder i USA och Europa kan tänkas medföra.

Abbreviations

Art.	Article
Board	The Technical Boards of Appeal and the Legal Board of Appeal of the European Patent Organisation
CCPA	United States Court of Customs and Patent Appeals
EPC	European Patent Convention
EPO	European Patent Office
Federal Circuit	United States Court of Appeals for the Federal Circuit
Patent Act	The United States Patent Act
Supreme Court	Supreme Court of the United States
US	United States of America
USPTO	United States Patent and Trademark Office

1. Introduction

1.1 Background

The emergence of business method patents that occurred in the US during the late 1990's caused a great stir in the patent debate and is still a controversial issue. While the US courts and the US patent office have adopted a liberal approach to this kind of patents, many commentators advance serious critique concerning the novelty and non-obviousness of business method patents and worry that the issuance of business method patents will stifle innovation. In Europe the patent office has chosen not to follow the regime implemented in the US and have instead put up strict requirements for patenting business methods.

The patent system is a tool for promoting innovation and social welfare, engendering both benefits and costs. The welfare impacts of patents are a key issue when discussing the patent eligibility of business methods and the constant tug of war between the granting of intellectual property rights and free competition is an important part of this debate. Moreover, the question if the benefits of the patent system always outweigh the costs is central. The diverging policies adopted in the US and Europe concerning business method patents create a platform for discussing the important matter of the impacts that the disparity of obtaining this type of patents have on competition.

1.2 Purpose

The purpose of this paper is to describe and compare how the US and European patent systems determine patent eligibility of business methods. I wish to explain and compare the basic legislation, case law and legal principles that have been applied to define patentable subject matter *vis-à-vis* business methods. My motivation for writing this essay is to compare the different approaches adopted in the US and Europe concerning business method patents and to discuss some of the plausible effects on competition that the diverging possibilities of obtaining business method patents in the US and Europe might engender.

1.3 Definitions

Defining business method patents is quite problematic since it is a very broad area, but in short terms these patents can be described as methods that seek to improve processes in the field of business.¹ Distinguishing business method patents from software patents and internet patents is a difficult task since most business method patent claims consist of business

¹ Duffy, *Why Business Method Patents?*, p 1248.

methods implemented on a computer through software or the web.² Business method patents can be divided into different categories including:

- Financial, such as derivatives, hedging programs, credit and loan processing, portfolio management, online banking, tax processing
- E-commerce, such as auctions, transactions, user interface arrangements
- Optimization, such as resource allocation
- Marketing, such as catalog systems and advertising management
- Information acquisition, such as accounting and human resource management³

Nevertheless, these subgroups are only to be seen as a point of reference since the possible areas of use of business methods are countless. Examples of well-known business method patents are Amazon's "one-click" patent⁴, enabling customers that have previously filled in their address and credit card details on the website to make online purchases with a single click, and Priceline's reverse auction patent⁵, instructing users to give their optimal price when buying e.g. airline tickets and then allowing sellers to bid for their business.

1.4 Delimitations

There are several requirements to obtain a patent on an invention, however this thesis will only concentrate on the preconditions that are the most relevant in relation to business methods. Furthermore, the focus of this paper is on the patent systems in the US, governed by the Patent Act, and Europe, implemented through the European Patent Convention. Hence, the national legislation of the different member states of the European Patent Organisation will not be discussed. Since most of the central issues regarding the patentability of business methods is debated in case law, only a brief introduction to the applicable legislation will be given. This is a thesis in law, thus the technical aspects of business method patents will only be explained to the extent necessary for the reader to grasp the main idea of the patent claim.

² Hall, *Business and Financial Method Patents, Innovation, and Policy*, p 445.

³ Hall, *Business and Financial Method Patents, Innovation, and Policy*, p 445, Lang, Redmann, *Patenting Business Methods and Systems*, p 144-145.

⁴ Patent no. 5,960,411.

⁵ Patent no 5,794,207.

1.5 Method and Material

Comparative legal method will be used in this thesis. Considering the limitations set forth above, this paper will be a micro comparison, focusing only on the issue of patent eligibility of business methods in the US and Europe. When conducting a comparative study it is of the utmost importance to respect the system and hierarchy of sources in the legal systems being treated. It is also essential to be aware of the translation problems that can occur when studying foreign law, it is not certain that a legal term used in two different countries have the same meaning in both states. The object must be to compare how different legal systems regulate a specific problem.⁶

In order to complete this paper I have used both US and European legislation, case law, academic articles, literature, studies and guidelines published by the EPO. Since there is a surplus of US case law regarding business methods and computer programs, I have chosen to describe only the judgements most important to understand the development of business method patents. In Europe the case law is more limited but I have still selected only the cases which are most cited regarding business method patents. The judgements will be presented in a chronological order to showcase the development that has taken place in case law. Regarding both the legal and economic articles and literature that I have referred to the goal has been to illustrate the many different opinions that have been given on the matter. Since I have chosen a subject that is widely disputed and still developing, I have been critical towards material that not only strives to convey the current legal situation or economic effects of business method patents but also wishes to convince the reader of a certain standpoint.

To be able to debate the competition aspects of the different policies applied in the US and Europe, I will explain some of the basic economic rationales of the patent system and patent licensing. Moreover, I will briefly address the issue of patent quality, a hot topic that is closely associated with business method patents and their potential economic impacts. Since much of the debate regarding business method patents focuses on their presumed inferior quality, I believe that assessing some of the welfare implications of licensing weak patents could be an appropriate way of determining the effects on competition of the diverging possibilities to obtain business method patents in the US and Europe.

Business method patents are computer-implemented and thereby closely linked to computer programs. Hence, case law concerning both business methods and computer programs are relevant to this paper. Nevertheless, the main focus of this paper will be on business method patents.

⁶ Bogdan, *Concise Introduction to Comparative Law*.

1.6 Disposition

In the second chapter of this paper I will describe the relevant legislation and case law concerning business method patents in the US. I will also account for some of the comments made by academics regarding different judgements and legal principles concerning business method patents. The third chapter explains the European legislation and case law concerning business method patents and presents some of the issues debated by commentators regarding the case law of the European Patent Office, mirroring the first chapter of this thesis. In the fourth chapter I will compare the different regimes adopted in the US and Europe and present my conclusions regarding this comparison.

In the fifth chapter of this paper I will explain the basic economics of the patent system and patent licensing. Furthermore, I will discuss the matter of patent quality – both the different general perspectives that can be applied to this question and the more specific debate concerning the quality of business method patents and some of the reasons for their assumed inferiority. In this chapter I will also account for a few of the different opinions regarding the economic effects of licensing weak patents.

In the final chapter of this thesis I will discuss some of the different possible effects on competition of the diverging possibilities to obtain business method patents in the US and Europe, focusing on the licensing of low quality patents.

2. Business Method Patents in the US

2.1 Legislation

According to section 101 of the Patent Act the following are considered to be patent- eligible subject matter:

*” Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.”*⁷

As stated by the above mentioned provision, it is mandatory that an invention constitutes a process, machine, manufacture or composition of matter to be patentable.⁸ This very broad definition has been limited by the Supreme Court, claiming that laws of nature, physical phenomena and abstract ideas cannot be protected under the Patent Act.⁹ The four categories can be divided into two groups; processes and products. The first group includes processes which are intangible and can be described as a series of steps taken to achieve a certain result. An account of a chemical process that will result in a new drug is only one example of a patent eligible process. The second group comprises machines, manufactures and composition of matter which are all defined as products. Manufactures can be characterized as any fabricated products and composition of matter is any composition of materials, e.g. the end product of a chemical process.¹⁰

In addition to the above mentioned requirements an invention must also be new, useful and nonobvious.¹¹ Starting with the utility condition, an applicant needs to demonstrate a single, operable use of the invention that is credible to persons of ordinary skill in the art. The bar is set quite low, only demanding minimal proof that the invention is able to produce a pragmatic outcome. Neither is it necessary that the invention exceeds previous products or processes in performance, quality or in any other way to be considered patentable subject matter.¹²

Regarding the prerequisite set out in section 102 of the Patent Act, that the invention should be new, two different assessments must be made. Firstly, the current art must be investigated to determine its dimensions. To perform this task, it must be decided

⁷ July 19, 1952, ch. 950, 66 Stat. 797.

⁸ Miller, Davis, *Intellectual Property 4th Ed.*, p 22.

⁹ E.g. *Diamond v. Chakrabarty*, 447 U.S. 303, 309 (1980).

¹⁰ Miller, Davis, *Intellectual Property 4th Ed.*, p 22.

¹¹ *Id.* at p 25.

¹² Schechter, Thomas, *Principles of Patent Law*, p 61-62.

which sources of knowledge that are relevant for judging the novelty of the invention. Section 102 lists certain references that can be taken into consideration when evaluating novelty, e.g. previously granted patents and publications. Secondly, the prior art, i.e. the references in section 102, must be investigated and compared with the invention so that the novelty can be determined.¹³

The last requisite, found in section 103, refers to nonobviousness, meaning that a skilled person in the same field and familiar with its subject matter should not have been able to develop the invention with ease.¹⁴ Similar to the inquiry regarding novelty, first the technology pertinent for the investigation must be distinguished and then the invention must be deemed nonobvious in comparison with previous references.¹⁵

2.2 US Case Law

2.2.1 The Business Method Exception

Previously, the general view was that business methods were not patentable *per se* according to the "business method exception" that is considered to have been created in *Hotel Security Checking Co. v. Lorraine Co.*¹⁶ In this case the defendant wanted to obtain a patent on a "method of and means for cash-registering and account-checking" that was intended to hinder the staff at restaurants and hotels from stealing.¹⁷ The court deemed the patent to be invalid because of lack of novelty but also added that "a system of transacting business disconnected from the means of carrying out the system is not, within the most liberal interpretation, an art".¹⁸

Regardless of this judgement and other case law¹⁹ opposing the patenting of business methods, some argue that the USPTO has granted numerous patents on what can be seen as business methods.²⁰ Hansmann maintains that many of the cases that are normally cited in support of the "business method exception" do not resolve the question of the patentability of business methods, instead they are focused on the question of novelty. To demonstrate his point, Hansmann uses a quote from *Hotel Security*:

¹³ *Id.* at 73-74.

¹⁴ Miller, Davis, *Intellectual Property 4th Ed.*, p 71.

¹⁵ Schechter, Thomas, *Principles of Patent Law*, p 143.

¹⁶ 160 F. 467 (2d Cir. 1908).

¹⁷ *Id.* at 467.

¹⁸ *Id.* at 469.

¹⁹ See e.g. *Ex parte Abraham* 1869 Dec. Comm'r Pat. 59.

²⁰ Tew, *Method of Doing Business*, Hansmann, *Method of Doing Business*.

”If at the time of Hicks’ application, there had been no system of any kind in restaurants, we would be confronted with the question of whether a new and useful system of cash-registering and account-checking is such an art as is patentable under the statute. *This question seems never to have been decided by a controlling authority and its decision is not necessary now unless we find that Hicks made a contribution to the art which is new and useful.* We are decidedly of the opinion that he has not...”.²¹

2.2.2 The Mental Steps Doctrine

However, the ”business method exception” was not the only obstruction for business method patents. Another principle, called the mental steps doctrine, hindered the patenting of computer-related inventions. According to the mental steps doctrine, processes that could be performed by the human mind are not patentable.²² Supposedly first formulated in a Patent Office Board of Appeals decision²³, the doctrine was later mentioned in e.g. *In re Heritage*²⁴, concerning a claim for a method of coating porous, sound-reducing fiber board. The court rejected the claim holding that the method was simply a mental process and therefore not patentable.²⁵

Following *Heritage*, the CCPA in *In re Musgrave*²⁶ strongly disapproved the use of the mental steps doctrine, calling it ”something of a morass”. The court argued that the doctrine was a vague term that gives little certainty to the law.

Still, the Supreme Court upheld the principle in *Gottschalk v. Benson*.²⁷ In this case, the applicant claimed a patent on a method for converting binary-coded decimal numerals into pure binary numerals. The claim was all-encompassing, covering any use of the method in a computer and the abstract process of the method without connection to any specific mechanism.²⁸ The court rejected the application, stating that allowing the claimed method to be patented would be to preempt the algorithm itself.²⁹ Instead the court argued that ”transformation and reduction of an article `to a different state or thing’ is the clue to the patentability of a process claim that does not include particular machines.”³⁰ The judges also

²¹ 160 F. 467 (2d Cir. 1908) at 472 (emphasis added).

²² Schechter, Thomas, *Principles of Patent Law*, p 41.

²³ *Ex parte Read*, 123 U.S.P.Q (BNA) 446 (Pat. Off. Bd. App. 1943).

²⁴ 150 F.2d 554, 66 USPQ 217 (CCPA 1945).

²⁵ *Id.*

²⁶ 431 F.2d 882, 167 USPQ 217 (CCPA 1970).

²⁷ 409 U.S. 63, 93 S.Ct. 253, 34 L.Ed.2d. 273 (1972).

²⁸ *Id.* at 64.

²⁹ *Id.* at 71-72.

³⁰ *Id.* at 70.

concluded that whether computer programs should be patentable is a question for the Congress to decide³¹ but did not discuss the CCPA's decision in *Musgrave*.

A few years later the Supreme Court again debated the issue of software patents in *Parker v. Flook*.³² The claimed patent described a method for updating alarm limits for certain industrial processes with the only new addition to the prior art consisting of the application of a mathematical formula to adjust alarm rates.³³ The court chose not to apply the same reasoning as in *Benson* but instead held that the proper way of examining this type of process claims is to disregard the novelty of the mathematical formula and treat the algorithm as part of the prior art. Instead it is the process itself that should be new and useful for an applicant to obtain a patent.³⁴ The applicant criticized this new approach, arguing that it forces examiners to assess the claim's inventiveness under § 101, when it should rightfully be considered under §§ 102 and 103.³⁵ In rejecting this line of argumentation, the court stated that the "respondent's process is unpatentable under § 101, not because it contains a mathematical algorithm as one component, but because once that algorithm is assumed to be within the prior art, the application, considered as a whole, contains no patentable invention." Hence, patentability cannot be based solely on non-patentable subject matter.³⁶

Despite the outcome in *Benson* and *Flook*, the USPTO became more benevolent towards computer-related inventions during the 1980's³⁷ and in 1981 the Supreme Court reinforced this new attitude with their judgement in *Diamond v. Diehr*.³⁸ The focus of this case was whether a process for molding raw, uncured synthetic rubber into cured precision products could be patented. Although the process itself was known in the industry, the applicant held that it had not previously been possible to measure the temperature inside the press which made it troublesome to estimate the proper cure time. The applicant's addition to the art consisted of "the process of constantly measuring the temperature inside the mold and feeding the temperature measurements into a computer that repeatedly recalculates the cure time by use of the mathematical equation and then signals a device to open the press at the proper time".³⁹ The court approved the patent and stated that the claimed method is the type of process that has historically been patent eligible since it describes the transformation of a

³¹ *Id.* at 73.

³² 437 U.S. 584, 98 S.Ct. 2522 U.S.(1978).

³³ *Id.* at 586.

³⁴ *Id.* at 591-592.

³⁵ *Id.* at 592.

³⁶ *Id.* at 594.

³⁷ Schechter, Thomas, *Principles of Patent Law*, p 50.

³⁸ 450 U.S. 175, 101 S.Ct. 1048, 67 L.Ed.2d 155 (1981).

³⁹ *Id.* at 175.

subject matter into a different state or thing,⁴⁰ thereby applying the machine-or-transformation test.⁴¹ Concerning *Benson* and *Flook*, the court argued that these claims were attempts to patent an algorithm but that the respondents in this case are rather seeking to "foreclose from others the use of that equation in conjunction with all of the other steps in their claimed process".⁴² The court also addressed the reasoning in *Flook*, concerning the division of claims into new and old elements when assessing the patentability of subject matter, deeming it inappropriate to dissect applications in this manner. Instead the novelty of parts of a process, or the process itself, should not be a factor when determining if the claim should be considered patentable subject matter. Thus the court rejected the approach used in *Flook* and instead stressed the importance of judging the claim as a whole.⁴³

Following this case the USPTO and the lower courts became more willing to grant protection to computer-related inventions and the CCPA created the *Freeman-Walter-Abele* test.⁴⁴ The test was first formulated in *In re Freeman*,⁴⁵ and later revised two times, in *In re Walter*⁴⁶ and *In re Abele*.⁴⁷ An example of a judgement where the test was applied is *Arrhythmia Research Technology, Inc. v. Corazonix Corp.*⁴⁸ The claimed patent, called "the Simson invention", included both a method and an instrument for analysing electrocardiographic signals. Certain victims of heart attacks are especially vulnerable to a specific type of heart arrhythmia, called ventricular tachycardia, that makes the heart beat abnormally fast. Although there are drugs that can treat and prevent this condition, this medication has undesirable and sometimes dangerous side effects. Therefore, Dr Simson developed a way of determining which patients are at high risk for this special type of heart arrhythmia. The victim of a heart attack is basically monitored and if certain signals are detected, these are processed by an apparatus using a mathematical formula to ascertain if the patient is predisposed to ventricular tachycardia.⁴⁹ The court gave the following definition of the *Freeman-Walter-Abele* test:

"It is first determined whether a mathematical algorithm is recited directly or indirectly in the claim. If so, it is next determined whether the claimed invention as a whole is no more than

⁴⁰ *Id.* at 184.

⁴¹ *Id.* at 192.

⁴² *Id.* at 187.

⁴³ *Id.* at 188-189.

⁴⁴ Schechter, Thomas, *Principles of Patent Law*, p 44.

⁴⁵ 573 F.2d 1237, 197 USPQ 464 (CCPA 1978).

⁴⁶ 618 F.2d 758, 205 USPQ 397 (CCPA 1980).

⁴⁷ 684 F.2d 902, 214 USPQ 682 (CCPA 1982).

⁴⁸ 958 F.2d. 1053, 22 USPQ2d 1033 (Fed.Cir. 1992).

⁴⁹ *Id.* at 1055.

the algorithm itself; that is, whether the claim is directed to mathematical algorithm that is not applied to or limited by physical elements or process steps. Such claims are nonstatutory. However, when the mathematical algorithm is applied in one or more steps of an otherwise statutory process claim, or one or more elements of an otherwise statutory apparatus claim, the requirements of section 101 are met.”⁵⁰

After having concluded that the process claim included a mathematical formula, the court proceeded to determine whether the invention was still patentable. To answer this question, the court examined what the claimed steps do, independent of how they are implemented. The decision was that the claimed process was physical steps that transformed one tangible, electrical signal into another and the patent was therefore upheld.⁵¹

Only two years after the *Arrhythmia* case, the Federal Circuit seemed to discard the *Freeman-Walter-Abele* test in *In re Alappat*.⁵² Alappat’s invention featured an oscilloscope, an electronic test instrument that allows observation of continuously varying signal voltages, and the claim was in lay terms ”an improvement in an oscilloscope comparable to a TV having a clearer picture”.⁵³ The court did not apply the *Freeman-Walter-Abele* test, instead it focused on *Diehr* and argued that the proper way to deal with the so called mathematical subject matter exception is to examine if the claimed subject matter *as a whole* is a disembodied mathematical concept. Even though all of the elements cited in the claim performed mathematical calculations, the court held that the invention as a whole was not an abstract idea, but rather a specific machine to produce a useful, concrete and tangible result.⁵⁴ The PTO’s concern that the patent would cover a general purpose computer that used software to perform the claimed mathematical algorithm was also rejected by the court. The court stated that since the claimed patent creates a new machine, ”a general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software”.⁵⁵

⁵⁰ *Id.* at 1058.

⁵¹ *Id.* at 1059.

⁵² 33 F.3d 1526, 31 USPQ2d 1545 (Fed.Cir. 1994).

⁵³ *Id.* at 1537.

⁵⁴ *Id.* at 1544.

⁵⁵ *Id.* at 1545.

2.2.3 The Turning Point for Business Method Patents

*State Street Bank v. Signature Financial Group*⁵⁶ is argued to be the first case where the Federal Circuit openly rejected the application of the "business method exception". The patent held by Signature can be categorized as a data processing system for implementing an investment structure called "Hub and Spoke". In short terms, the system enables individual mutual funds, called Spokes, to pool their assets in an investment portfolio, called Hub, organized as a partnership. The benefits of this arrangement are that the administrator of a mutual fund is afforded with the advantageous combination of economies of scale in administering investments coupled with the tax advantages of a partnership. Signature and State Street had negotiated concerning a possible license for State Street to use Signature's data processing system but no deal was struck. State Street brought a declaratory judgment action against Signature, with the goal to invalidate Signature's patent.⁵⁷ The Federal Circuit explained that for a mathematical algorithm to be patentable it must be applied in a "useful" way, and not solely represent an abstract idea constituting disembodied concepts and truths. Signature's patent was seen as a practical application of a mathematical algorithm since it produces "a useful, concrete and tangible result" consisting of a final share price.⁵⁸ Regarding the "business method exception" the court held that they wanted to "take the opportunity to lay this ill-conceived exception to rest" and stated that business methods have been subjected to the same legal requirements for patentability as applied to any other process or method since the 1952 Patent Act.⁵⁹

The Federal Circuit continued with the same line of argumentation in *AT&T Corp. v. Excel Communications, Inc.*,⁶⁰ where the "useful, concrete and tangible result" standard reappeared. The patent in this case was a method, including a mathematical formula, for obtaining information about long-distance callers that could later be used for billing purposes.⁶¹ Concerning the *Freeman-Walter-Abele* test, the court stated that the test was questioned in *State Street* and that "whatever may be left of this earlier test, if anything, this type of physical limitations analysis seems of little value" after *Diehr* and *Alappat* where the useful, concrete and tangible standard was introduced.⁶²

⁵⁶ 149 F.3d 1368, 47 USPQ2d 1596 (Fed.Cir. 1998).

⁵⁷ *Id.* at 1370.

⁵⁸ 149 F.3d 1368, 47 USPQ2d 1596 (Fed.Cir. 1998) at 1373.

⁵⁹ *Id.* at 1375.

⁶⁰ 172 F.3d 1352, 50 USPQ2d 1447 (Fed.Cir. 1999).

⁶¹ *Id.* at 1353-1354.

⁶² *Id.* at 1359.

Regardless of the Federal Circuit's positive approach to business method patents, the Supreme Court expressed a more reserved view of the matter in *eBay Inc v. MercExchange, L.L.C.*⁶³ In this case justices Kennedy, Souter, Stevens and Breyer held that some business method patents are vague and of suspect validity.⁶⁴ The judgement in *State Street* and the "useful, concrete and tangible" standard was also criticized by justices Breyer, Stevens and Souter in *LabCorp v. Metabolite Laboratories*.⁶⁵ The three justices argued that the Supreme Court has never approved the "useful, concrete and tangible" standard and "if taken literally, the statement would cover instances where this court has held the contrary".⁶⁶

The Federal Circuit got the opportunity to respond to these comments in *In re Bilski*.⁶⁷ The claim was for a method of hedging risk in the field of commodities trading involving three steps. The method focused on the risk aversion of buyers and sellers on the energy market and suggested a solution to this problem by using an intermediary that would sell and buy at a fixed price based upon historical averages.⁶⁸ To answer the question whether the claim in this case was a patentable process under section 101, the court took guidance from *Diehr* and *Benson* and found that the issue at hand was if the patent recites a fundamental principle and if so, whether it would pre-empt all uses of that principle.⁶⁹ The court found that the Supreme Court had devised a test to determine if a claim is narrow enough, namely the machine –or- transformation test. This test was articulated in *Benson* and according to the Federal Circuit a process is definitely patentable if it is tied to a particular machine or apparatus or if it transforms a particular article into a different state or thing.⁷⁰ The Federal Circuit even held that the machine – or -transformation test was "the sole test governing section 101 analyses."⁷¹ After having examined the claim, the court concluded that it was a purely mental process of performing mathematical calculations without the help of a computer or any other physical apparatus and deemed the invention unpatentable.⁷²

The Federal Circuit's decision was criticized first by academics,⁷³ and later by the Supreme Court in *Bilski v. Kappos*.⁷⁴ In this case, the Supreme Court asserted that the

⁶³ 547 U.S 388, 126 S.Ct. 1837 (U.S 2006).

⁶⁴ *Id.* at 397.

⁶⁵ 584 U.S 124, 126 S.Ct. 2921 (U.S 2006).

⁶⁶ *Id.* at 137.

⁶⁷ 545 F.3d 943, 955-56 (Fed. Cir. 2008).

⁶⁸ *Id.* at 950.

⁶⁹ *Id.* at 952-953.

⁷⁰ *Id.* at 954.

⁷¹ *Id.* at 955-956.

⁷² *Id.* at 966.

⁷³ See e.g. Filmar, *A Critique of In re Bilski*, Fusco, *Is In re Bilski a Déjà Vu?*

⁷⁴ 130 S.Ct 3218 (U.S 2010).

machine – or –transformation test is not the sole test for patentability under section 101, although the standard might be useful and an important clue. Instead the court held that guidance should be sought in its previous judgements in *Benson*, *Flook* and *Diehr*, but also added that the Federal Circuit is free to devise other limiting criteria that are in concord with the Patent Act.⁷⁵ The court also clarified that section 101 ”precludes a reading of the term ”process” that would categorically exclude business methods.” Regarding the patent claim, the Supreme Court held that the applicant is trying to patent both the concept of hedging risk and the application of that concept to energy markets. According to the court these are unpatentable abstract ideas, just like the algorithm in *Benson*.⁷⁶

Following *Bilski*, which gave limited guidance on how to judge patent eligibility under section 101, the Federal Circuit issued *Ultramercial, LLC v. Hulu, LLC*.⁷⁷ The patent in question claimed ”a method for distributing copyrighted products (e.g., songs, movies, books) over the Internet where the consumer receives a copyrighted product for free in exchange for viewing an advertisement, and the advertiser pays for the copyrighted content”.⁷⁸ The court discussed the difficulty of defining the non-patentable category of abstract ideas and held that although the machine- or- transformation test was useful during the industrial age, the test has a much more narrow application in the information age. Continuing, the Federal Circuit argued that although an abstract idea is not patent eligible subject matter, an application of an abstract idea may well be patentable.⁷⁹ Concerning the claim at hand, the court stated that even if the idea that advertising as a form of currency is too abstract to be patented, the patent claim described a practical application of the idea. The method required complex computer programming, which according to the court contributed to the claim being patent eligible. The claim also fulfilled the machine – or –transformation test since ”programming creates a new machine, because a general purpose computer in effect becomes a special purpose computer once it is programmed to perform particular functions pursuant to instructions from program software”.⁸⁰

One of the most recent cases dealing with business method patents decided by the Federal Circuit is *CLS Bank v. Alice Corp*.⁸¹ The patents in this judgement were described as follows: ”these patents cover a computerized trading platform for exchanging obligations

⁷⁵ *Id.* at 3231.

⁷⁶ *Id.* at 3221-3222.

⁷⁷ 657 F.3d at 1326 (C.A. Fed. 2011).

⁷⁸ *Id.* at 1324.

⁷⁹ *Id.* at 1327.

⁸⁰ *Id.* at 1328-1329.

⁸¹ 685 F.3d 1341 (C.A. Fed 2012).

in which a trusted third party settles obligations between a first and second party so as to eliminate 'settlement risk'. Settlement risk is the risk that only one party's obligation will be paid, leaving the other party without its principal. The trusted third party eliminates this risk by either (a) exchanging both parties' obligations or (b) exchanging neither obligation."⁸² Noting that the "abstract ideas" test has become a pressing issue,⁸³ the court argued that an abstract idea will not become patent eligible subject matter simply because that idea is implemented on a computer. However, after quoting several cases⁸⁴, the Federal Circuit stated that "it can, thus, be appreciated that a claim that is drawn to a *specific way* of doing something with a computer is likely to be patent eligible whereas a claim to *nothing more than the idea* of doing that thing on a computer may not. But even with that appreciation, great uncertainty remains, and the core of that uncertainty is the meaning of the 'abstract ideas' exception."⁸⁵ Only after a full examination of the claim with the result that it is manifestly evident that the patent is nothing more than an abstract idea, can a claim be rejected as inadequate under section 101.⁸⁶ Regarding the patent claim in this case, the court argued that even though the computer implementation of the patent probably would satisfy the machine – or- transformation test, this is not sufficient. Nevertheless, the computer limitations are significant for the process and the claims are restricted to a particular application of the concept of employing an intermediary to benefit trade between parties. Hence the court approved of the patent claim and stated that "the limitations of the *claims as a whole*, not just the computer implementation standing alone, are what place meaningful boundaries on the meaning of the claims in this case."⁸⁷

Shortly after the *CLS Bank* case, the Federal Circuit issued another judgement concerning business method patents, *Bancorp Services LLC v. Sun Life Assurance of Canada*.⁸⁸ The claim was for systems and methods for administering and tracking the value of life insurance policies in separate accounts.⁸⁹ The court declared that "to salvage an otherwise patent-ineligible process, a computer must be integral to the claimed invention, facilitating the process in a way that a person making calculations or computations could not." In spite of the claimed method being computer implemented, the Federal Circuit held that the computer was

⁸² *Id.* at 1343.

⁸³ *Id.* at 1349.

⁸⁴ E.g. *Dealertracker Inc. v. Huber*, 647 F.3d 1315, 1333 (Fed. Cir. 2012), *CyberSource Corp v. Retail Decisions, Inc.*, 654 F.3d 1366, 1375 (Fed.Cir. 2011), *In re Alappat* 33 F.3d 1526, 31 USPQ2d 1545 (Fed.Cir. 1994).

⁸⁵ 685 F.3d 1341, 1351 (C.A. Fed 2012).

⁸⁶ *Id.* at 1352.

⁸⁷ *Id.* at 1355.

⁸⁸ 687 F.3d 1266 (C.A. Fed 2012).

⁸⁹ *Id.* at 1269.

only used to perform the most basic functions and therefore did not limit the claim in any meaningful way. The patent claim was therefore rejected as simply an abstract idea.⁹⁰ The court also addressed their decision in *CLS Bank*, which may seem to contradict the judgement in *Bancorp*, arguing that the difference between the two cases is that in *CLS Bank* the computer limitations played a significant part, unlike the computer limitations in *Bancorp*. In addition the Federal Circuit declared that the claim in *CLS Bank* was directed to a very specific application, but the patent claims in *Bancorp* were too broad and abstract.⁹¹ After the judgement in *Bancorp* was issued the Federal Circuit granted a petition by CLS Bank for rehearing *en banc* and vacated the court's decision in *CLS Bank*.⁹²

2.3 Summary

The patent-eligibility of business methods is a long running debate in the US, the question was first addressed in case law in the early nineteen hundreds. Initially business methods were excluded from the patent system on two grounds; the business method exception that declared business methods as unpatentable *per se*, and the mental steps doctrine that barred any process that could be performed by the human mind from being patented. From the beginning the application of these two principles has been unclear with some judgements rejecting them as vague and troublesome, while others defended their use.

Nevertheless, the attitude of the US courts has been quite open towards these kinds of patent claims and new tests to determine patentable subject matter have continuously been devised. One of the key issues for the US courts has been to prevent business method patents from pre-empting the use of an algorithm since the applicant would then basically hold a monopoly on the abstract idea. Designing a practice that obstructs the patenting of pure mathematical formulas, but still allows business methods to gain protection, has nonetheless proved to be a difficult task. The machine-or-transformation test is one approach that the US courts often seem to fall back on. Already in *Benson* the Supreme Court mentions the transformation of an object into a different state or thing as an important component when determining if a method claim is patentable subject matter. This line of thought was further developed in *Diehr*, where the claimed process did include the transformation of an article. One of the deciding factors for the court's decision to grant the applicant with a patent seems to have been the fact that the algorithm was an integral part of a traditional industrial process

⁹⁰ *Id.* at 1278.

⁹¹ *Id.* at 1280.

⁹² DiBernardo, Donner, Renov, *Patentability of Business Methods*, p 3.

that produced an end product, thereby limiting the scope of the patent to encompass the mathematical formula only in conjunction with all the other components of the claimed process. After disappearing from the limelight for a period of time, the machine-or-transformation test reappeared in *Bilski* with full strength. The court held this approach as the sole viable test for determining patent eligible subject matter under section 101. However, this statement was soon discarded by the Supreme Court, who would only agree to classify the test as a useful and important clue, not the single practice for examining business method claims.

Another method used by the US courts to try to define patentable subject matter is the useful, concrete and tangible standard. First articulated in *Alappat*, and later also applied in *State Street*, the test focuses on the the claim as a whole and seeks to determine patentability by examining if the method produces a useful, concrete and tangible result. Hence, a practical application of the algorithm is required and mathematical formulas that solely represent disembodied, abstract ideas should be rejected. In *State Street* the useful, concrete and tangible result that the practical application of the algorithm produced was a final share price. Nevertheless, this standard was criticized by justices of the Supreme Court and later discarded in *Bilski*.

Several other tests have been created by the US courts to try to solve the problem of business method patents, e.g. the Freeman-Walter-Abele test, but none of them have survived for any longer period of time. The latest verdict from the Supreme Court in *Bilski* dictates that the US courts are to apply the machine-or-transformation test and that they should find guidance in *Benson*, *Flook* and *Diehr*. However, the Supreme Court also encouraged the lower courts to develop other limiting standards that are in line with the Patent Act. Consequently, which circumstances that determine the patent eligibility of business methods have still not been sufficiently clarified, however it is manifest that certain business methods are regarded as patentable subject matter in US case law.

3. Business Method Patents in Europe

3.1 Legislation

According to article 52 of the European Patent Convention (EPC) the following are patentable inventions:

(1) European patents shall be granted for any inventions, in all fields of technology, provided that they are new, involve an inventive step and are susceptible of industrial application.

(2) The following in particular shall not be regarded as inventions within the meaning of paragraph 1:

(a) discoveries, scientific theories and mathematical methods;

(b) aesthetic creations;

(c) schemes, rules and methods for performing mental acts, playing games or doing business, and programs for computers;

(d) presentations of information.

(3) Paragraph 2 shall exclude the patentability of the subject matter or activities referred to therein only to the extent to which a European patent application or European patent relates to such subject-matter or activities as such.⁹³

To be granted a patent article 52 EPC states that an invention must be new. To be regarded as new the invention cannot be part of the state of the art, i.e. "everything made available to the public by means of a written or oral description, by use, or in any other way, before the date of filing of the European patent application".⁹⁴

Furthermore, the invention should be susceptible of industrial application meaning that it can be made or used in any kind of industry, comprising agriculture.⁹⁵ The term "industry" should be extensively interpreted including all physical activity of "technical character", e.g. manufactures, machines and processes.⁹⁶ Regarding the condition that the invention should be of "technical character", it is stated that the applicant must be able to show that the invention relates to a technical field, is concerned with a technical problem and has technical features.⁹⁷

Another requirement is that the invention must involve an "inventive step". This condition entails that, considering the state of the art, the invention should not be obvious to a

⁹³ Art 52 EPC.

⁹⁴ Art 54 EPC.

⁹⁵ Art 57 EPC.

⁹⁶ EPO Guidelines Chapter G-III, 1.

⁹⁷ Rule 42(1) (a) and (c), Rule 43(1).

person skilled in the art.⁹⁸ In case law a person skilled in the art is described as "a skilled practitioner in the relevant field of technology, who is possessed of average knowledge and ability and is aware of what was common general knowledge in the art at the relevant date."⁹⁹

Although programs for computers and business methods are excluded from patentability according to art 52(2), the expression "as such" in art 52(3) is considered to establish that if the subject matter has a technical character it is still patent eligible.¹⁰⁰

3.2 European Case Law

3.2.1 Technical Contribution

The first case that concerned computer-implemented inventions and the term technical contribution that was reviewed by the Technical Boards of Appeal was *Vicom*.¹⁰¹ The applicants wanted to obtain a patent for a method and apparatus for improved digital image processing. The Board discussed whether the claim was simply a mathematical method as such and stated that if a process is carried out on a physical object, which could be a material entity but also an image stored as an electric signal, by some technical means implementing the method and resulting in a change in that object, the mathematical algorithm has then been applied in a technical process. The technical means could involve a computer comprising suitable hardware or a programmed general purpose computer.¹⁰² Thereby the Board stated that "even if the idea underlying an invention may be considered to reside in a mathematical method a claim directed to a technical process in which the method is used does not seek protection for the mathematical method as such".¹⁰³ The conclusion of the Board was that in general an invention should not be regarded as non-patentable simply because modern technology is needed for its application and that the determining factor should be what technical contribution the invention as a whole makes to the prior art.¹⁰⁴

Following *Vicom*, only a few years later the Board elaborated further on the interpretation of the condition that the invention should be of technical character in *Koch & Sterzel*.¹⁰⁵ The claim concerned an X-ray machine incorporating a computer program which controls and produces a technical effect in the X-ray apparatus.¹⁰⁶ Siemens and Philips

⁹⁸ Art 56 EPC.

⁹⁹ See T 4/98, T 143/94, T 426/88.

¹⁰⁰ EPO Guidelines Chapter G-II 3.6.

¹⁰¹ T-208/84.

¹⁰² *Id.* at 5.

¹⁰³ *Id.* at 6.

¹⁰⁴ *Id.* at 16.

¹⁰⁵ T-26/86.

¹⁰⁶ *Id.* at 3.1.

opposed the patent, stating that the machine and the program should be evaluated separately since there was not continuous communication between the two and the technical contribution occurred only at the end of the process. However, the Board disagreed and held that it is irrelevant when the technical effect is produced, the deciding factor is that there is a technical contribution to any extent.¹⁰⁷ A non-patentable computer program produces electrical signals that are no more than a duplication of information. Consequently these programs do not create a technical effect. A patent eligible program technically modifies the function of a general purpose computer by managing the operation of the computer. The computer and the program thereby create a patentable unit.¹⁰⁸ Moreover, the Board argued that inventions should be judged as a whole and that the EPC does not prevent the patenting of inventions that consist of both technical and non-technical components.¹⁰⁹

3.2.2 Further Technical Effect

In the late 1990's the Board developed a slightly different requirement called the "further technical effect" approach. In two very similar cases,¹¹⁰ IBM had made several claims to patent programs, e.g. a computer program product directly loadable into the internal memory of a digital computer. Previous case law dealt with claims concerning machines, processes or methods,¹¹¹ but IBM's applications were direct claims to computer software.¹¹² In *IBM I* the Board concluded that art 52(2) and (3) EPC confirm that the legislator did not intend to prohibit all patenting of computer programs, but only programs for computers "as such".¹¹³ To interpret the expression "as such" the Board employed rules 27 and 29 EPC and held that the technical character of an invention is a fundamental precondition for a subject to be patent eligible.¹¹⁴ Regarding computer programs, it is not sufficient that the invention is a program for a computer to be considered to have a technical effect. The Board explained that the physical alterations of the hardware that computer programs control and execute cannot *per se* constitute the technical character mandatory for patentable subject matter since "they are a common feature of all those programs for computers which have been made suitable for being run on a computer".¹¹⁵ Instead there is a need for a program to produce a "further technical

¹⁰⁷ *Id.* at 3.2.

¹⁰⁸ *Id.* at 3.3.

¹⁰⁹ *Id.* at 3.4.

¹¹⁰ T-1173/97, T-935/97.

¹¹¹ T-208/84, T-26/86.

¹¹² Marsnik, Robert, *Drawing a Line in the Patent Subject matter Sands*, 283-284.

¹¹³ T-1173/97 at 4.1.

¹¹⁴ *Id.* at 5.1.

¹¹⁵ *Id.* at 6.2-6.3.

effect” to be deemed patentable. The Board held that:

”Where said further effects have a technical character or where they cause the software to solve a technical problem, an invention which brings about such an effect may be considered an invention, which can, in principle, be the subject matter of a patent. Consequently a patent may be granted not only in the case of an invention where a piece of software manages, by means of a computer, an industrial process or the working of a piece of machinery, but in every case where a program for a computer is the only means, or one of the necessary means, of obtaining a technical effect within the meaning specified above, where, for instance, a technical effect of that kind is achieved by the internal functioning of a computer itself under the influence of said program”.¹¹⁶

Hence, if a computer program is able to produce a further technical effect, it is to be considered as patent eligible subject matter.¹¹⁷

According to some, the IBM rulings marked a shift in the Board’s approach to computer program patents. Previously the EPO tried to apply the same framework for computer implemented inventions as for physical machines, but after *IBM I* the Board instead turned to the vague term ”further technical effect”.¹¹⁸

3.2.3 Any Hardware

Shortly after the Board had presented the ”further technical effect approach”, new case law was issued that again changed the requirements for patenting computer-implemented inventions. In *PBS Partnership*¹¹⁹ the claimed patents consisted of a machine and a method that used certain standard factors to calculate pensions. The Board began by reaffirming previous case law regarding the requirement of technical character for a subject matter to be patentable.¹²⁰ Regarding the method claim, the Board rejected the application holding that the invention was simply a business method as such since ”all the features of this claim are steps of processing and producing information having purely administrative, actuarial and/or financial character”. The applicant had argued that the data processing and computer means included in the method claim provided a technical effect but the Board disagreed and stated

¹¹⁶ *Id.* at 6.4-6.5.

¹¹⁷ *Id.* at 6.5.

¹¹⁸ Leith, *Software and Patents in Europe*, p 29-31.

¹¹⁹ T-931/95.

¹²⁰ *Id.* at 2.

that "the feature of using technical means for a purely non-technical purpose and/or for processing purely non-technical information does not necessarily confer technical character to any such individual steps of use or to the method as a whole".¹²¹ However, the Board was more receptive to the apparatus claim that consisted of a computer system programmed to control a pension benefits system. The Board asserted that even if a machine is programmed to be used in a certain sector, e.g. the field of business, the apparatus is still a physical object and thereby patentable according to art 52 EPC. Since the terms "apparatus" or "product" are not mentioned among the exceptions in art 52(2) EPC, the Board reasoned that the distinction between a method for doing business and a machine designed to execute such a method is justified. According to the Board the physical features of an apparatus programmed to perform a business method could constitute the technical effect necessary for patentability.¹²² The Board concluded that the arguments that were previously considered under the invention test according to the "technical contribution" approach should instead be assessed when evaluating inventive step.¹²³ Even if the claim was regarded to be an invention, it was not considered to be non-obvious in relation to the prior art, distinguished as the existing private pension plans accounted for in the application.¹²⁴ According to previous case law, only features of the invention that contribute to the solution of a technical problem by providing a technical effect should be taken into consideration when determining inventive step.¹²⁵ Since the improvements of the claimed invention were primarily of an economical nature, these could not contribute to inventive step.¹²⁶ This new stance is called the "any hardware approach", an expression introduced by Lord Justice Jacobs in *Aerotel*.¹²⁷ According to Jacobs, examiners should ask "whether the claim involves the use of or is to a piece of physical hardware, however mundane (whether a computer or a pencil and paper). If yes, Art.52(2) does not apply."¹²⁸

Following *PBS Partnership* the "any hardware approach" was further cemented in *Hitachi/Auction Method*¹²⁹ where the claims concerned an automatic auction method, an apparatus for executing an automatic auction via a network and a computer program that

¹²¹ *Id.* at 3.

¹²² *Id.* at 5.

¹²³ *Id.* at 6-7.

¹²⁴ *Id.* at 7-8.

¹²⁵ T-641/00 at 6.

¹²⁶ T-931/95 at 8.

¹²⁷ Case No: A3/2006/1007 and A3/2006/1067.

¹²⁸ *Id.* at 26.

¹²⁹ T-258 /03.

performs the claimed method.¹³⁰ The Board began by reviewing earlier case law and discussing the requirements of the EPC. That a subject is an invention according to art 52 EPC, i.e. a subject matter having technical character, is a condition to continue to discuss novelty, inventive step and industrial application of the invention since these latter prerequisites are settled only for inventions according to art 54(1), 56 and 57 EPC. Henceforth, it should be possible to assess the patentability of a subject under art 52(2) EPC without any knowledge about the prior art.¹³¹ The previously applied technical contribution test demanded that "the invention involves some contribution to the art in a field not excluded from patentability".¹³² Consequently, the technical contribution approach required that the examiner also estimated the novelty and inventive step of the subject matter to be able to judge whether an invention according to art 52 EPC was submitted in the claim.¹³³ The Board pointed out that in later decisions this opinion changed and it was stated in case law that "there is no basis in the EPC for distinguishing between 'new features' of an invention and features of that invention which are known from the prior art when examining whether the invention concerned may be considered to be an invention within the meaning of Article 52(1) EPC. Thus there is no basis in the EPC for applying this so-called contribution approach for this purpose."¹³⁴ It was considered more appropriate to examine the technical contribution that an invention makes to the prior art within in the framework of the novelty and inventive step assessment.¹³⁵ The Board also claimed that since it is possible for a patent eligible invention to have both technical and non-technical features, and because these different aspects can be difficult to separate, the examination of the technical effect of the invention is better suited to be carried out when assessing the inventive step requirement.¹³⁶ Based on these arguments the Board argued that the apparatus claim fulfilled the invention condition in art 52 EPC since it includes technical features such as "server computer", "client computer" and "network".¹³⁷ Regarding the method claim, the Board substantially departed from previous case law when it argued that a method involving technical means is an invention according to art 52 EPC.¹³⁸ In *PBS Partnership* it was argued that "a feature of a method which concerns the use of technical means for a purely non- technical purpose and/or for

¹³⁰ *Id.* at V.

¹³¹ *Id.* at 3.1.

¹³² T 38/86.

¹³³ T-258 /03 at 3.2.

¹³⁴ T 931/95.

¹³⁵ T 1173/97.

¹³⁶ T-258 /03 at 3.6.

¹³⁷ *Id.* at 3.7-3.8.

¹³⁸ *Id.* at 4.1 and 4.7.

processing purely non-technical information does not necessarily confer a technical character to such a method.”¹³⁹ Nevertheless, the Board explained that since the technical contribution approach is viewed as inappropriate for assessing the invention requirement in art 52 EPC, and because the above accounted for discussion is valid for all categories of claims, there is no need to further examine the technical aspects of a claimed method to define the technical character of that method.¹⁴⁰ The board declared that ”what matters having regard to the concept of "invention" within the meaning of Article 52(1) EPC is the presence of technical character which may be implied by the physical features of an entity or the nature of an activity, or may be conferred to a non-technical activity by the use of technical means.” Accordingly, only purely abstract ideas lacking of any technical aspects should be regarded as non-patentable subject matter.¹⁴¹ The Board confessed that this wide interpretation of the term ”invention” means that even the most ordinary activities will be included, e.g. the act of writing using pen and paper, but considered that the prerequisites of novelty, inventive step and industrial application prevents patentability of all methods including technical means.¹⁴² Although this approach significantly eases the applicants burden to prove technical character, the requirement of inventive step has instead become the chief obstacle to a successful patent claim.¹⁴³ When assessing inventive step, the EPO uses a ”problem-and-solution approach” which consists of three main steps:

1. determining the "closest prior art",
2. establishing the "objective technical problem" to be solved, meaning the identification of the technical features of the subject matter and their technical effect, and
3. considering whether or not the claimed invention, starting from the closest prior art and the objective technical problem, would have been obvious to a skilled person.¹⁴⁴

Regarding computer programs and business method patents, the most problematic part of the inventive step assessment is to prove technical effect.¹⁴⁵ In the current case, the invention solved the problem of delay between bidders and the server by adapting the auction method

¹³⁹ T 931/95.

¹⁴⁰ T-258 /03 at 4.3.

¹⁴¹ *Id.* at 4.5.

¹⁴² *Id.* at 4.6.

¹⁴³ Rees, Fox, *A European Perspective on Business Method Patents*, p 32.

¹⁴⁴ EPO Guidelines, chapter G-VII 5.

¹⁴⁵ Rees, Fox, *A European Perspective on Business Method Patents*, p 32.

so that it could be executed automatically, which according to the applicant rendered the invention technical effect.¹⁴⁶ The Board disagreed and stated that the solution did not contribute to the technical character of the invention and can thereby not be taken into consideration when determining inventive step. Thus the Board held that "method steps consisting of modifications to a business scheme and aimed at circumventing a technical problem rather than solving it by technical means cannot contribute to the technical character of the subject matter claimed."¹⁴⁷ The Board recognized the fact that a method can have technical character if it is designed in a way as to be specifically suitable for computer-implementation and that the claimed invention might have a technical feature that does not correspond to how a human being would perform an auction without computer support. Nevertheless, the programming measures needed to perform the claimed method was according to the Board obvious to a skilled person.¹⁴⁸

The development of the "any hardware approach" continued in *Microsoft/Clipboard formats*¹⁴⁹ where the Board examined a claim for a method that improved the function of Windows 3.1 and a computer program that performed the claimed method.¹⁵⁰ Referring to *Hitachi*, which states that a method using technical means is an invention according to art 52 EPC, the Board held that a computer system comprising a memory is a technical means and thereby patent eligible subject matter. To clarify matters the Board explained that "a method implemented in a computer system represents a sequence of steps *actually* performed and achieving an effect, and not a sequence of computer-executable instructions (i.e. a computer program) which just have the potential of achieving such an effect when loaded into, and run on, a computer."¹⁵¹ Therefore a method of operating a computer may include a computer program, but the claim to the method is not a claim to the computer program "as such".¹⁵² The computer program was also viewed to have technical character "since it relates to a computer-readable medium, i.e. a technical product involving a carrier."¹⁵³ Regarding the requirement of inventive step, the Board identified Windows 3.1 as the closest prior art and maintained that the claimed method solved the issue of facilitating data exchange across different data formats.¹⁵⁴ Since the invention was not seen as obviously

¹⁴⁶ T-258 /03 at 5.5.

¹⁴⁷ *Id.* at 5.7.

¹⁴⁸ *Id.* at 5.8.

¹⁴⁹ T-424/03.

¹⁵⁰ *Id.* at IV.1.

¹⁵¹ *Id.* at 5.1 (emphasis added).

¹⁵² *Id.*

¹⁵³ *Id.* at 5.3.

¹⁵⁴ *Id.* at 7.1.

deriving from the previous operating system, the Board concluded that the condition of inventive step was fulfilled.¹⁵⁵

The judgement of the Board in *Microsoft* has been much debated since commentators believe that the Board did not follow the same approach concerning the assessment of inventive step in this case as they did in *PBS Partnership* and *Hitachi*. Scholars argue that the Board did not apply the "problem-and-solution approach" but found the invention new and non-obvious on conventional grounds. Moreover, the Board did not exclude the contribution of the non-patentable subject matter when examining if the invention included an inventive step. In both *PBS Partnership* and *Hitachi* features of the method claim that contributed to the subject matter fulfilling the invention test were later omitted as excludable prior art when the Board evaluated inventive step. In *Microsoft*, the Board did not disregard the unpatentable computer program when assessing the non-obviousness of the claimed invention. Henceforth, it has been argued by academics that any computer program is patentable under this approach, while business methods must meet higher demands to be considered patent eligible.¹⁵⁶

However, there are academics who contest this conclusion, e.g. Wagner claims that it is a great misconception that business methods are not patentable subject matter in Europe. Wagner basis his argument on the assumption that any computer-implemented invention fulfills the requirement of technical character imposed by the EPC, thus making the precondition of novelty and inventive step the decisive factors in patent claims. In his paper, Wagner has also conducted an empirical study of business method patents granted in Europe and their strategical use, based on data collected in 2004.¹⁵⁷ Nevertheless, a more recent study made by Komulainen and Takalo shows that the fact that only the technical features of an invention will be considered by the EPO when evaluating the inventive step of the invention is a significant obstacle for patenting business methods. According to Komulainen and Takalo only three percent of patent applications including a business method lead to a valid patent.¹⁵⁸

The most recent significant case concerning business method patents is *Duns Licensing*.¹⁵⁹ The case concerned a method for estimating sales activity of a product at sales outlets using a data processing system and an apparatus for maintaining inventory based on

¹⁵⁵ *Id.* at 7.3-7.5.

¹⁵⁶ Ballardini, *Software Patents in Europe*, p 567.

¹⁵⁷ Wagner, *Business Method Patents in Europe and their Strategic Use*, p 75-76, 79-81.

¹⁵⁸ Komulainen, Takalo, *Does State Street Lead to Europe?*, p 32-34.

¹⁵⁹ T-154/04.

the result of the method.¹⁶⁰ The Board decided to summarize the previous case law concerning patentability under art 52 EPC and held that "having technical character is an implicit requisite of an "invention" within the meaning of Article 52(1) EPC."¹⁶¹ Continuing the review, the Board stated that "it is legitimate to have a mix of technical and "non-technical" features appearing in a claim, in which the non-technical features may even form a dominating part of the claimed subject matter."¹⁶² Regarding the term "invention", the Board argued that despite the fact that it may cause problems that there is no common definition of "invention", the EPO has good reasons for not giving an exact definition since this allows a flexible interpretation.¹⁶³ The key component of a patent eligible subject matter is technical character, henceforth any product, method etc, even if mentioned in the exceptions in art 52(2) EPC, can be deemed patentable on the condition that technical character is present.¹⁶⁴ The Board maintained that the new wording of art 52 EPC, that holds that patents should be granted "in all fields of technology", also demonstrates the importance of technical character or "technical teaching", "ie an instruction addressed to a skilled person as to how to solve a particular technical problem using particular technical means."¹⁶⁵ The Board emphasized that the requirements of patentability, i.e. invention, novelty, inventive step and possibility of industrial application, should be judged separately. The precondition that the subject matter is an invention should be initially assessed and seen as an absolute requirement, while the other conditions should be regarded as relative.¹⁶⁶ The distinction between the different prerequisites for patentability are also in line with the legal term of "invention" as it has been applied by the EPO. The Board stresses the difference between the legal concept of "invention" and the layman definition, meaning a subject matter that is both novel and brings an inventive contribution to the prior art. According to the Board, an application of the "technical effect approach" would entail a use of the layman definition of the term "invention" and is thereby not consistent with the EPC. Moreover, there is no definition of the prior art that should be applied in the context of art 52(2) EPC and since the Board deems it impossible that the contracting states should have overlooked such an essential point, any reference to the prior art regarding art 52 and 53 EPC would lead to "insurmountable difficulties".¹⁶⁷ Finally, the "technical effect approach" should also be regarded as conflicting with the EPC because it

¹⁶⁰ *Id.* at IV.

¹⁶¹ *Id.* at 5(b).

¹⁶² *Id.* at 5(f).

¹⁶³ *Id.* at 6.

¹⁶⁴ *Id.* at 7.

¹⁶⁵ *Id.* at 8.

¹⁶⁶ *Id.* at 5(d) and 10.

¹⁶⁷ *Id.* at 12.

presupposes that "novel and inventive purely excluded matter does not count as a 'technical contribution'". The Board strongly opposes this standpoint and claims that "a non-technical feature may interact with technical elements so as to produce a technical effect, e.g. by its application for the technical solution of a technical problem".¹⁶⁸ Concerning novelty and inventive step, the Board stated that these two prerequisites can only be established on the basis of the technical features of the claimed invention.¹⁶⁹ The invention must also include a solution to a technical problem according to the "problem-and-solution approach". Furthermore, when assessing inventive step regarding claims that include both technical and non-technical features, it is vital to exclude any unpatentable subject matter since the invention must be in a technical field.¹⁷⁰ Regarding the method claim the Board stated that gathering information concerning sales activities and using mathematical formulas to assess the acquired information are to be seen as business research methods that do not seek to resolve a technical problem relevant to any technical field. Methods of business research are excluded from patentability "as such".¹⁷¹ Continuing with the system claim, the Board concluded that the claimed subject matter is an invention according to art 52 EPC since it involves a processor.¹⁷² Even so, the claimed system did not include an inventive step since the only addition that the invention made to the prior art was the use of a new algorithm, excluded from the assessment of inventive step, since it does not solve any technical problem.¹⁷³

3.3 Decision of the Enlarged Board of Appeal

In 2008 the former President of the EPO, Alison Brimlow, referred a number of questions to the Enlarged Board of Appeal in an attempt to clarify certain matters regarding the patentability of computer programs.¹⁷⁴ The previous President considered that the Boards of Appeal had given different decisions concerning patent claims for computer-implemented inventions and therefore held it to be of fundamental importance that the Enlarged Board of Appeal should shed some light to the issue of software patents.¹⁷⁵ After a lengthy discussion, the Enlarged Board reached the conclusion that the referral was inadmissible since it did not

¹⁶⁸ *Id.* at 13.

¹⁶⁹ *Id.* at 14.

¹⁷⁰ *Id.* at 16.

¹⁷¹ *Id.* at 19.

¹⁷² *Id.* at 22.

¹⁷³ *Id.* at 27-28.

¹⁷⁴ G 0003/08.

¹⁷⁵ *Id.* at I.

fulfill the requirements of art 112(1)(b) EPC.¹⁷⁶ The Enlarged Board then went on to consider the questions referred by the former President and found that the case law of the Board was consistent concerning all matters but one, namely if a computer program can only be excluded as a computer program as such if it is explicitly claimed as a computer program. On this topic, the Enlarged Board held that although there is a difference between the reasoning in *IBM I* and *Microsoft*, this divergence is simply a reflection of the development that has taken place in case law.¹⁷⁷

In dismissing the referral and deeming the previous decisions of the Board as convergent, the Enlarged Board supported the current approach of the EPO regarding the question of patentability of computer-implemented inventions.¹⁷⁸ Many had hoped that the decision of the Enlarged Board would clear up the many uncertainties that exist concerning software patents and the decision has been criticized by several scholars.¹⁷⁹

3.4 Summary

From the beginning much of the debate in Europe has focused on the term "technical." In early case law, technical contribution to the prior art was necessary for a subject matter to qualify as an invention. Later on, the Board introduced the "further technical effect" requirement, which was subsequently discarded for the currently prevailing "any hardware" approach. One of the most important changes in the EPO's practice is that the assessment of patentability is no longer performed in connection with the invention prerequisite, but instead executed when examining inventive step. This shift in methodology is marked by the introduction of the "any hardware" approach, which recognizes any subject matter as an invention provided that the patent claim includes some kind of physical entity. Hence, the main focus of the patent process is now on fulfilling the requirement of inventive step. Nevertheless, the term "technical" remains vital to the European patent system since inventive step can only be determined on the basis of the technical features of an invention. The current approach in Europe is therefore that a business method could qualify as an invention if the claim includes a physical feature, e.g. a computer, but the business method will still not be deemed as patentable since it does not solve any technical problem and thus does not fulfill the requirement of inventive step.

¹⁷⁶ *Id.* at 7.3.8.

¹⁷⁷ *Id.* at 10.12.

¹⁷⁸ Nettleton, *Software Patentability Ruling from the European Patent Office's Enlarged Board*, p 269.

¹⁷⁹ See e.g. Pila, *Software Patents, Separation of Powers, and Failed Syllogisms* and Cockbain, *Sterckx, A Sun-Tanned or 3D Smurf?*

Although the EPO seems reluctant to abandon the condition of technical character, there are several scholars who argue that this would be a possible solution to some of the problems that the European patent system struggles with. It has been suggested that including all of the features of an invention when assessing inventive step would engender a more coherent practice and would free the examiners from the burdensome task of separating technical and non-technical elements of an invention. Moreover, this change could be seen through without any legislative changes since the EPC does not literally require inventive step to be based on only technical features.¹⁸⁰

¹⁸⁰ Ballardini, *Software Patents in Europe*, p 574-575.

4. Conclusions

The US has for a long time been a pioneer regarding intellectual property law and has undoubtedly influenced the development of intellectual property law in the rest of the world.¹⁸¹ However, the case of business method patents has not been an easy matter to deal with, the inconsistent case law in both the US and Europe being the most obvious indication of the conundrum that these method claims cause. As of today, the two legal systems have fundamentally different views on how to react towards business method patent claims. The US has chosen to adopt a liberal attitude towards business methods and software, regarding both of these categories as patent eligible subject matter. In Europe, on the other hand, the possibility to patent business methods has been blocked since these kinds of processes do not solve any technical problem.

After having examined the legislation and case law concerning business method patents in the US and Europe, it is evident that these two legal systems are difficult to compare since their point of departure are manifestly different. Even though the patentability of business methods in the US has not been an obvious matter, the courts have still embraced the subject with a fairly positive stance and have tried to create standards for dealing with this type of patent claims that focus on the special characteristics of business methods. The main issue in US case law has been to devise a test that will allow patenting business methods without preempting the abstract idea itself.

On the contrary, the European case law is characterized by a more doubtful attitude towards business method patents. The EPO applies the same requirements for business methods as for other categories of subject matter that have traditionally been regarded as deserving of protection, namely the condition of technical character. Trying to fit business methods into this preconceived model of patentable subject matter has proved to be an impossible task, mainly because business methods do not aim to solve technical problems. The European patent system is, simply put, not designed for including non-technical subject matter such as business methods. Some might dispute the statement that business methods do not possess the technical character necessary to be considered patentable subject matter and it is true that the EPO has never offered any definition of the term "technical". Perhaps it would be possible for the EPO to develop the current terminology to also include certain business methods, however the current case law demonstrates that the technical character requirement excludes business methods from the patent system. Even if the standards applied in the US are

¹⁸¹ Liu, *Patenting Business Methods in the United States and Beyond Globalization of Intellectual Property Protection is Not Always an Easy Game to Play*.

more readily adapted to business methods, the US courts also seem more confident when the patent claim includes an algorithm incorporated in an industrial process which is traditionally considered as patentable subject matter. Thus, there is no doubt that both legal systems have had great difficulty in approaching this new form of patent claims. However, the flexibility of the US system and the liberal standpoint of the US courts have turned business method patents into a reality. Despite the fact that the EPO has changed their method of examining patent claims, with the effect that business methods may be regarded as inventions if a physical entity is included in the claim, the fact still remains that business methods will not fulfill the inventive step requirement. Unless the EPO changes its practice, it seems that the debate concerning business method patents has reached the end of the road in Europe. My conclusion is therefore that the US and European patent systems have such fundamentally different approaches regarding business method patents that a comparison of the two legal systems is fruitless.

5. The Effects of Business Method Patents; an Economic Approach

5.1 The Economics of the Patent System

From an economists' perspective, the rationale of the patent system centers around the incentive to innovate and social welfare.¹⁸² It is in the interest of society that innovation takes place and that knowledge is diffused, however a market that is characterized by free competition will not provide an optimal rate of innovation since knowledge is "non-rival". Knowledge can be utilized by several people at the same time, without it disappearing or decreasing in value from its use. Hence, knowledge is different from tangibles and is defined as "non-rival" or a "public good". These characteristics result in the need for special considerations when examining the economy of knowledge.

Because the marginal cost of exploiting knowledge is zero, the cost of the invention is labelled as a sunk cost that is incurred before the production of the invented product. Social welfare is created when a developed invention is made public and since the cost of the invention has been incurred already, the most advantageous to society would be free and unrestricted access to the invention. Furthermore, only new inventions are beneficial to society, the duplication of inventions are a waste of social resources. Inventions can lead to "positive spillover", meaning that an invention is not only useful to the inventor but also to others who can utilize the invention concurrently without being forced to incur once more the cost of invention. The fact that the social return on inventions is superior to the private return is one of the core motives for restraining free competition. The private return on certain inventions might be too low to justify the investment, but the social return of those inventions could be high enough to legitimize the costs. Free competition will thereby not produce the optimal rate of inventions. Moreover, innovators acting on a competitive market could risk bankruptcy since an inventor is forced to charge a price high enough for the inventor to compensate his costs while competitors could charge customers only their marginal cost. The threat of ruin will deter investments in research. Another possible effect of these circumstances could be that companies keep their inventions secret, forcing others to re-invent the same piece of knowledge and thereby wasting social resources.

The situation described above asserts the need for government intervention and the creation of intellectual property rights. The patent system is a privatization of knowledge, allowing the inventor to block others from exploiting the invention or to grant access to the new invention under the condition that economic compensation will be rewarded. The

¹⁸² Harrison, *Law and Economics*, p 341-344.

granting of exclusive rights thereby gives incentives to innovate by promoting personal gain. Nevertheless, costs are also incurred from the employment of intellectual property; restricted access to inventions will curtail the positive spillover effects of innovation. Academics refer to these circumstances as a trade-off between benefits and costs. The benefit of the patent system is the creation of incentives for research and development of new inventions and the cost is the reduced diffusion of knowledge due to the exclusivity granted to the inventor.¹⁸³

A slightly different approach to the costs-and-benefits analysis has also been advanced, focusing on the granting of exclusionary rights in return for the disclosure of knowledge. According to this theory the benefits of patents include both the promotion of innovation and the diffusion of knowledge, while the costs are the temporary monopolies created by exclusionary rights. Furthermore, competition benefits from the patent system since it facilitates the entrance of new companies with limited resources on the market by allowing trading of knowledge and creation of markets for technology. However, patents also incur costs for subsequent inventors who wish to combine new ideas with already existing inventions, a very common scenario since most inventions build on discoveries made in the past.¹⁸⁴

5.2 Economic Effects of Licensing

From a general point of view, the effects of licensing agreements on the economy are diversified. One of the positive impacts of licenses is the fact that the invention is distributed to more people and thereby promoting a more effective diffusion of knowledge.¹⁸⁵ By obtaining access to a superior technology, licencees will benefit from lower costs. Furthermore, cost reduction does not only serve the private interests of licencees but also produces social benefits in terms of an increase in industry output. More providers on the market will also force companies to lower their prices to the advantage of consumers.¹⁸⁶ Moreover, licensing advances a stronger vertical specialization among corporations, resulting in improved product efficiency. While certain companies are better suited to perform research and development, some firms are better qualified to perform manufacturing activities. Hence, the option of licensing agreements allow all parties to maximize efficiency in their area of

¹⁸³ Guellec, Van Pottelsberghe de la Potterie, *The Economics of the European Patent System*, p 49-50, Encaoua et al, *Patent Systems for Encouraging Innovation*, p 1425.

¹⁸⁴ Hall, Harhoff, *Recent Research on the Economics of Patents*, p 546.

¹⁸⁵ Guellec, Van Pottelsberghe de la Potterie, *The Economics of the European Patent System*, p 49-50.

¹⁸⁶ Katz, Shapiro, *On the Licensing of Innovations*, p 510.

expertise, furthering the emergence of markets for technology.¹⁸⁷

In consequence, the rise of markets for technology engenders a surge in the demand for patents since the positive effects of licensing agreements and the prospective economical gains will induce companies to claim more patents with the intent of later licensing the invention to others. New entrants on the market, that are specialized in the research and development of new inventions, will benefit greatly from these circumstances and are also more prone to apply for patents than large, vertically integrated corporations that often employ their inventions in-house.¹⁸⁸ An increase in patent applications prompts the diffusion of knowledge, leading to an augmentation of innovation in general, because of the cumulative nature of inventions.¹⁸⁹

5.3 The Quality of Business Method Patents

There is an ongoing debate in both legal and economic literature concerning the quality of different patents.¹⁹⁰ However, there are several different approaches to discussing patent quality. From a legal point of view, the quality of a patent depends on the likelihood that the patent would be held as valid by a court. The thoroughness of the examination in regards to inventive step and prior art are emphasized as deciding factors of patent quality from a technical standpoint. It has been argued that the economic notion of patent quality encompasses both the legal and technical perspectives. Legal uncertainty is disadvantageous to competition and investment, while low technical quality is also to the detriment of competition and augments business risks.¹⁹¹ Most likely these three perspectives are all interdependent since patents of high technical quality that are truly new arguably have a higher probability of surviving the scrutiny of the courts and are therefore classified as high quality patents also from a legal point of view. Moreover, only new inventions further the economy since re-invention is a waste of social resources and creates market inefficiency in the form of monopoly. Patent quality is also an important matter from a social welfare point of view since the incertitude of the validity of a patent may engender several costs, e.g. underinvestment, both in the technology covered by the patent but also in competing

¹⁸⁷ Guellec, Van Pottelsberghe de la Potterie, *The Economics of the European Patent System*, p 49-50, Encaoua et al, *Patent Systems for Encouraging Innovation*, p 92-93.

¹⁸⁸ Arora, Ceccagnoli, *Patent Protection, Complementary Assets and Firms' Incentives for Technology Licensing*.

¹⁸⁹ Guellec, Van Pottelsberghe de la Potterie, *The Economics of the European Patent System*, p 49-50.

¹⁹⁰ See e.g. Jaffe, Lerner, *Innovation and Its Discontents*, Pottelsberghe de la Potterie, *The Quality Factor in Patent Systems*.

¹⁹¹ Guellec, Van Pottelsberghe de la Potterie, *The Economics of the European Patent System*, p 114-115.

inventions. Furthermore, costly litigation may be another consequence of low quality patents.¹⁹²

The chief criticism advanced towards business method patents are that they do not fulfill the requirements of novelty and non-obviousness and would therefore be invalidated if challenged. Hence, many business method patents are regarded as weak patents. Dreyfuss argues that most business method patents that are issued are simply implementations of processes long-known by the industry but not documented.¹⁹³ The lack of documentation poses a big problem to the patent offices since they are not able to efficiently examine the prior art to determine the novelty and non-obviousness of patent claims.¹⁹⁴ Lemley also believes that the patent offices simply do not allocate enough time to conduct detailed prior art searches,¹⁹⁵ while Merges maintains that the quality of examination is low due to the high turnover of employees at the patents offices.¹⁹⁶ The high number of patent applications, also known as a patent flood, is advanced by Meurer as one of the reasons for the low quality of business method patents.¹⁹⁷ Furthermore, Jaffe and Lerner claim that the independence of the patent office needs to be questioned, arguing that there is a general inclination among examiners to focus on satisfying applicants instead of guaranteeing the quality of patents being issued.¹⁹⁸ A combination of all the above mentioned circumstances and the absence of an opposition process are the main reasons for the low quality of patents being granted in the US according to van Pottelsberghe de la Potterie.¹⁹⁹

Empirical studies have been made concerning the litigation of business method patents, resulting in the conclusion that financial method patents are disputed two to three dozen times more frequently than patents as a whole. One of the reasons for this high rate of litigation is, according to Lerner, the weak character of business method patents.²⁰⁰

Another approach that has been advanced by Lunney is that there has been a shift in case law, claiming that the non-obviousness requirement has lost its importance after the Federal Circuit assumed jurisdiction over patent litigation. Based on an empirical study, showing that the percentage of patents held invalid because of non-obviousness dramatically declined post-Federal Circuit time, Lunney wishes to prove the court's pro-patent approach

¹⁹² Hall, *Business and Financial Method Patents, Innovation, and Policy*, p 461-462.

¹⁹³ Thomas, *The Patenting of the Liberal Professions*, p 1141, 1162.

¹⁹⁴ Dreyfuss, *State Street or Easy Street*, p 14-2.

¹⁹⁵ Lemley, *Rational Ignorance at the Patent Office*, p 1495-1497.

¹⁹⁶ Merges, *As Many as Six Impossible Patents Before Breakfast*, p 589-590.

¹⁹⁷ Meurer, *Business Method Patents and Patent Floods*, p 319-322.

¹⁹⁸ Jaffe, Lerner, *Innovation and Its Discontents*, p 137.

¹⁹⁹ Pottelsberghe de la Potterie, *The Quality Factor in Patents Systems*, p 1783.

²⁰⁰ Lerner, *The Litigation of Financial Innovations*.

but also the demise of the non-obviousness condition. The critique focuses on the assumption that the Federal Circuit has changed the approach of determining non-obviousness, concentrating more on secondary considerations, such as the commercial success of an invention, to decide its validity. The result of this change in case law is the facilitation of obtaining business method patents.²⁰¹

Even if there seems to be a rather striking consensus among commentators regarding the low quality of business method patents, there are some scholars that have presented a different opinion. Allison conducted an empirical study to contrast business method patents with other patents, focusing on prior art references among several variables. The result of these investigations were that business method patent claims did not receive less examination compared to other types of patents and that the holders of business method patents invested the same amount of resources as other patent owners to obtain patent protection. In fact, the empirical evidence in this research implies that the quality of business method patents is higher than the average.²⁰²

5.4 Effects of Licensing Weak Patents

There is certain discontent among scholars regarding the economic effects of licensing weak patents. One of the first to analyze the potential consequences was Lemley, who suggests that the system of granting low quality patents rests upon a form of rational ignorance. To build his thesis, Lemley first examined the costs of obtaining a patent and the patent prosecution process. Contrasting the heavy workload of examiners, who are e.g. forced to conduct both prior art searches and consider the technical matters of the patent claim, with the modest amount of eighteen hours that examiners in general spend on an application during the two -to three- years time of the patent prosecution process, it is no surprise that the quality of issued patents is low. Moreover, forty-six percent of patents that are challenged in court, where a final judgement is handed down, are invalidated.²⁰³

Even if it is clear that the amount of time spent by examiners on patent applications is insufficient to judge the quality of the patent claim, Lemley argues that to determine if investing more funds into the patent prosecution process would be the best solution, how patent holders exploit their patents needs to be investigated. According to Lemley, only a small amount of patents being issued are actually used for licensing

²⁰¹ Lunney, *E-Obviousness*.

²⁰² Allison, Tiller, *The Business Method Patent Myth*.

²⁰³ Lemley, *Rational Ignorance at the Patent Office*, p 1497-1500.

agreements (five percent) or litigated in court (two percent). However, patent litigation is very costly. Lemley estimates that the average annual amount spent on only legal fees that are attributable to the validity of patents is around \$1.05 billion.²⁰⁴ Despite the fact that there is no data regarding the percentage of patents being licensed for royalties, Lemley supposes that the number should be around five percent of issued patents. The reason for this very low estimation is that Lemley believes that most companies file patent claims for defensive purposes, i.e. to quickly claim an area of technology to later escape lawsuits. Moreover, most large corporations possess a large portfolio of patents and often agree to royalty free cross-licensing deals. Companies also choose to apply for as many patents as possible, both because it can be difficult to predict which patents will be valuable in the future and to attract investments, but most of these patents will never be licensed. Non-practicing entities that only own patents to gain revenue from licensing agreements may have some success in licensing their patents to others, but there are probably also businesses that prefer to challenge the patent in court. Since there is no data concerning patent licensing in the US, Lemley makes a rough calculation that the annual licensing costs is around \$525 million. The point that Lemley is trying to make is that since most patents are not used for licensing or litigation, their validity will never be questioned.²⁰⁵

To increase the quality of patents being issued, examiners would need to spend more time assessing every application. Consequently, more money would need to be spent both by the patent office and by applicants. Fewer patents would be granted and the number of applications would probably drop due to the more strict examination process. Lemley estimates that an improvement of the patent prosecution process would engender an increase in costs of \$1.52 billion. Litigation costs would drop by \$262 million, since fewer patents would be issued, however the amount of funds needed to improve the examination process is still significantly higher. Lemley also considers the costs of other alternatives to improve the patent prosecution process, e.g forcing applicants to conduct their own prior art searches. Nevertheless, all the alternatives generate higher costs than the current system. Considering that a very low number of patents are ever litigated or licensed, the majority of funds spent on ameliorating the examination process would be wasted on patents that will never be used or employed in situations where their validity is not of importance. Hence, from a cost perspective society should accept the current low quality of patents and instead try to resolve

²⁰⁴ *Id.* at 1501-1503.

²⁰⁵ *Id.* at 1503-1508.

the issue ex post if the validity of a patent is challenged in court.²⁰⁶

Farrell and Shapiro have also addressed the question of the effects of licensing low quality patents, examining the welfare economics of weak patents that are being licensed. They maintain that patents that are obviously invalid are harmless, while weak patents where the question of validity is uncertain and can only be determined in court, may pose a bigger problem to society. For the majority of patents their validity is never examined, even if they are being licensed-out, and when a patent is challenged in court most parties settle before a final judgement is decided. Farrell and Shapiro seek to investigate if a patent's market impact is proportional to its strength by using a model in which a patent owner offers licenses to downstream firms who can either choose to enter into a licensing agreement, avoid using the patented technology or infringe the patent, resulting in litigation. According to the model used by Farrell and Shapiro, weak patents that are licensed to downstream firms, that do not compete with each other or the patent owner, have a proportionally small impact on the market since only low royalties are commanded. However, when weak patents are licensed to downstream firms that are competitors, either to each other or to the patent holder, remarkably high royalty rates were commanded. The first contributing circumstance to this result is the fact that accepting a high per-unit royalty fee will increase the joint profits of both the patent owner and the licensees since the downstream price is brought closer to the monopoly price. The second basis for the outcome of the model used by Farrell and Shapiro is the low incentives for downstream firms to challenge the patent holder in court and perhaps invalidate the patent. Litigation and the possible invalidation of a patent will be a costly business for the downstream firm initiating the attack, but greatly beneficial to rival firms and consumers. Thus, the positive externality on competitors will hinder downstream firms from challenging patent owners and induce them to agree to surprisingly high royalty rates. Consequently, there is a discrepancy between the royalty rates being charged by the patent holder and the expected royalty fees that could be commanded if patent validity was determined prior to licensing. The conclusion is that the impact of weak patents on the market is disproportionate compared to their actual strength.²⁰⁷ These findings do not only have negative ex post implications, but can also stifle innovation. Companies will not invest funds in projects that produce groundbreaking patents but will prefer R&D that result in small innovations that give a high reward compared to the strength of the patent.²⁰⁸ Examining all patents before

²⁰⁶ *Id.* at 1508-1511.

²⁰⁷ Farrell, Shapiro, *How Strong are Weak Patents?*, p 1347-1349.

²⁰⁸ *Id.* at 1354.

licensing would reduce the deadweight loss created by the monopoly pricing that licensing weak patents to competitors results in. However, this is a very costly alternative. Farrell and Shapiro instead suggest a system of reexamination for patents claiming valuable technology that is useful to multiple downstream firms that rival with each other or the patent owner.²⁰⁹

One of the latest contributions to the discussion concerning the effects of licensing weak patents is made by Encaoua and Lefouili. In their paper Encaoua and Lefouili use a model that is similar to the one designed by Farrell and Shapiro, however with some slight changes creating a more general framework. The results of the study confirms the outcome of Farrell and Shapiro's examination, that the optimal structure for licensing weak patents is dependent on the level of royalty rates that hinders licensees from challenging the validity of the patent. If the maximum level of royalty fees accepted by downstream firms is above a defined threshold, the patent will be licensed at this rate and litigation will be deterred. Nevertheless, if the royalty rate tolerated by downstream firms is below the threshold, the patent owner may choose to license the patent for a higher fee, thereby risking litigation over the validity of the patent.²¹⁰ Moreover, Encaoua and Lefouili question the conclusion drawn by Farrell and Shapiro that weak patents are always overcompensated, claiming that the expected maximal licensing revenues are a better measure than the expected maximal royalty rates when calculating the overcompensation of weak patents since it takes into consideration the number of downstream firms that accept the licensing agreement. Bearing this circumstance in mind, there are situations where weak patents are undercompensated if the royalty rate is low enough.²¹¹ The policy amendments proposed by Farrell and Shapiro are also challenged by Encaoua and Lefouili, who point out the informational constraints, i.e. the fact that the patent office has no information regarding which patents will be licensed to multiple rivals, making the suggestion presented by Farrell and Shapiro difficult to implement.²¹² Instead Encaoua and Lefouili believe that raising the incentives for downstream firms to dispute the validity of weak patents, by forbidding a patent holder to refuse licenses to defeated challengers and promoting a collective approach among potential licensees, would be a more successful approach to lowering the market impact of weak patents.²¹³

²⁰⁹ *Id.* at 1361-1362.

²¹⁰ Encaoua, Lefouili, *Licensing Weak Patents*, p 492-496.

²¹¹ *Id.* at 514-515.

²¹² *Id.* at 494.

²¹³ *Id.* at 516.

6. Analysis

The patent system rests on the notion that a privatization of knowledge is necessary to further innovation and social welfare. Hence, a fair assumption would be that any area of innovation that is included in the patent system will benefit from more ingenuity that will be of profit to society. The extension in the US of patentable subject matter to encompass business methods should mean that both companies and consumers in this area of innovation experience the positive effects that the patent system is meant to engender. Thus, there will be a greater diffusion of knowledge regarding business methods that would otherwise have been kept secret to hinder others from free riding. The creation of markets for technology that is prompted by the patent system will facilitate for new entrants on the market, making it possible for firms that do not have the financial strength to realize an invention to be able to capitalize on their idea. Furthermore, companies will gain access to superior technology, enabling firms to lower their prices. A stronger vertical specialization among corporations will allow companies to maximize their efficiency. The idea is that a rise in patents will lead to greater diffusion of knowledge and thereby more innovation. From this point of view, a patent flood is not necessarily a matter of concern.

However, there are also adverse effects of expanding the patent system. Since the costs of inventions are only incurred at the production stage, the most beneficial for society would be free and unrestricted access to all inventions. Henceforth, the exclusive right that is granted to the inventor in accordance with the patent system restricts society from taking full advantage of the invention. Moreover, the possible creation of a monopoly situation and the deadweight loss that this type of market failure creates could be a considerable cost of patents. Because of the cumulative nature of invention, the patent system can be seen as obstructing innovation since inventors can be forced to bare extra costs, e.g. licensing agreements, to be able to further develop already existing inventions. This circumstance can become especially problematic if the inventor wishes to combine several existing inventions and may hinder the development of new inventions.

Even if patents have certain unfavorable consequences, the motivation for the patent system relies on the assumption that government intervention is more advantageous for society than free competition. Therefore, one might conclude that the decision in Europe to bar business methods from the patent system is to the detriment of companies and consumers on the European market since they will not be able to enjoy all the beneficial effects that the patent system could engender in this area of innovation. The negative impacts of this policy may be strengthened by the fact that business method patents are granted in the US, creating a

difference in opportunities for firms based in the US and Europe that may effect competition. American companies are able to patent their business methods on a rather large scale, generating both the positive and negative effects discussed above. The strategic use of business method patents, such as licensing, defensive patenting and litigation, may afford American corporations with a competitive advantage over their European rivals. Considering the widespread and varying uses of business methods, a patent on such a process may be a forceful weapon, enabling the patent holder to e.g force competitors into licensing agreements under the threat of litigation. Amazon's "one-click" patent is a good example of a business method that has been widely implemented online and thereby allows Amazon to collect large licensing revenues. Companies on the market that are engaged in this area of innovation may prefer to locate their business in the US since the chances to commercialize their business methods can be seen as more promising there. Furthermore, since the patent system is supposed to promote innovation, a possible effect of the different policies regarding business method patents in the US and Europe could be that the US will enjoy greater innovative progress in regards to business methods, leaving Europe lagging behind.

Nevertheless, it may be possible that the disparity of policies could also have beneficial impacts in Europe. Since the patent system rests on a balance between costs and benefits, it is difficult to ascertain whether the profits of patents always surpass the expenses. The patent system's concrete impact on innovation is very problematic to measure, thus it is possible that patents are not the most efficient way of furthering inventions. The assumption that more patents prompt more innovation can be criticized since new inventions are often based on already existing inventions, hence patent thickets compel companies to incur extra costs for inventions. Non-practicing entities, or patent trolls, whose sole source of income is licensing agreements, can take advantage of the liberal attitude in the US towards business method patents to construct an arsenal of patents, ready to be used against anyone refusing to accept a licensing offer. Studies have shown that business method patents are litigated at a considerably higher rate than patents in general, resulting in large expenses for companies. Moreover, the articles by Farrell and Shapiro and Encaoua and Lefouili indicate that many downstream firms will prefer to pay surprisingly high royalty rates over challenging the validity of a weak patent and face the risk of costly law suits where the outcome is often difficult to predict. Hence the possibility to patent business methods in the US may stifle innovation in this area, while inventors in Europe are free from *in terrorem*-effects and costly licenses when developing new business methods.

Except these more general presumptions regarding the plausible effects of the

discrepancy regarding business method patents in the US and Europe, there may be consequences that are related to the special characteristics of business method patents. The quality of patents has been a much debated issue, especially in relation to business method patents, with many commentators criticizing the patent offices and the courts for having a much to applicant-friendly attitude. However, measuring the strength of patents is problematic. Empirical studies that have been made try to judge patent quality by focusing on e.g. the number of prior art references in each application and the amount of hours spent by examiners and applicants on the patent prosecution process. From my point of view, these variables may not be appropriate indicators to assess patent quality since they do not give much information concerning the actual content of the patent claim. My belief is that to make an accurate estimation of the strength of a group of patents the novelty and non-obviousness needs to be examined as if the validity of the patent was being scrutinized in court. Nevertheless, research using the above mentioned type of data can still give useful indications concerning the quality of different types of patents.

The reasons given for the presumed low quality of business method patents are abundant, ranging from a lack of available documentation of prior art to examiner's heavy workload and questioned neutrality. Assuming that the overall quality of business method patents granted in the US is inferior, the effects on competition could be troublesome. Dubious patent quality creates legal uncertainty, forcing firms to spend funds on litigation instead of R&D projects and thereby suppressing both innovation and competition. Furthermore, the low quality of business method patents can be perceived as an increased business risk, deterring firms from investing in this area of innovation. In addition, since only truly novel inventions are of profit to society, the granting of patents to insignificant or obvious inventions is a waste of social resources. Taking into account these circumstances, European companies and consumers may benefit from a more competitive market compared to the US.

To examine the effects that the diverging policies regarding business method patents have on competition in the US and Europe, investigating the impact of licensing weak patents could be enlightening. Applying Lemley's theory of rational ignorance, it can be argued that the EPO spends too much resources on assessing patent claims that will never have any impact on the market. Therefore, the US system of a more relaxed approach to patentability requirements is more cost efficient. The negative effects of low quality patents described above may not be of greater notice if only a very small number of business method patents are ever licensed or litigated. Thus, according to Lemley the US approach is more

beneficial to society and competition since it will engender lower costs. Nevertheless, Lemley's assumptions can be questioned for a number of reasons. The presumption that only an insignificant amount of patents are licensed is a pure estimation made by Lemley and can therefore be disputed. The motivations for the very low estimate given by Lemley are not supported by any empirical evidence. Even if Lemley's statement that a mere two percent of all patents being issued are ever litigated might be accurate, it is possible that this figure does not give the full picture of the situation. Lerner claims that financial method patents are litigated two to three dozen times more frequently than patents in general. Despite that Lemley's argument that patents as a whole are not often disputed could be correct, it is possible that business method patents are overrepresented in the category of patents under litigation and thereby create disproportionately large negative effects. Hence, the European market may profit from the absence of business method patents if it is correct that this type of patents more often instigate law suits.

Farrell and Shapiro have assessed the effects of licensing weak patents and conclude that low quality patents often have a disproportionately large impact on the market related to their strength if they are licensed to competing downstream firms. According to the study made by Farrell and Shapiro, the acceptance of surprisingly high royalty rates depends on both the opportunity to increase the joint profits of the patent owner and the licensees, but also the low incentives for downstream firms to initiate law suits because of the positive externalities that would follow from an invalidation of the licensed patent. Henceforth, weak patents are overcompensated which in turn will prompt companies to invest more funds in small inventions that will generate high returns compared to their quality. Moreover, monopoly pricing will create deadweight loss and have negative effects on competition. Considering the result presented by Farrell and Shapiro, the effects of business method patents on the US market may be much larger than suggested by Lemley. Thereby patent holders can gain disproportionate market power by using business method patents as a strategic tool. From a competition standpoint, this is an important circumstance since only companies with certain market power can have any noticeable impact on the market.

Encaoua and Lefouili chose to use a more general framework for their model and claim that the effects put forward by Farrell and Shapiro are exaggerated. Even if there are situations where weak patents are overcompensated, Encaoua and Lefouili question the method used by Farrell and Shapiro to come to this conclusion, claiming that the maximal licensing revenues accrued by the patent owner is a better measurement than the maximal royalty rate since this figure takes into account the number of firms that accept to enter into a

licensing agreement. Hence, Encaoua and Lefouili suggest that the effects of licensing weak patents are more mitigated than what the study made by Farrell and Shapiro show. The exact impact that licensing weak patents have on the market is impossible to determine, however two of the studies accounted for above indicate that licensing business method patents have negative effects on competition under certain circumstances. Considering this fact, European firms and consumers will benefit from the more stringent approach towards business method patents adopted by the EPO, while American companies will experience the adverse effects that overcompensated weak patents produce on a larger scale since business method patents are more easily obtained in the US.

The above discussion clearly demonstrates the diversified effects on competition that the different possibilities to obtain business method patents in the US and Europe may engender. The traditional costs and benefits of the patent system are of course important to consider, however the notion that patents always further innovation and social welfare can be questioned. In my opinion, other aspects than the customary motivations for the patents system's existence, such as patent quality, need to be considered. In a perfect world all issued patents would be iron-clad, however this is an unattainable scenario. The reality is that patents of inferior quality will always be granted and the reasons for this circumstance are many. The rate of business method patents that are of low quality is uncertain, nevertheless the storm of criticism that this kind of patents have caused at least gives reason to examine the effects of weak patents to try to determine the impact of business method patents on competition. I have chosen to closer assess the economic impacts of licensing weak patents to attempt to investigate the competition aspects of business method patents. Even though there is no obvious answer to this question, two of the more recent studies indicate that licensing low quality patents can have adverse effects on competition under certain circumstances. Hence, from this point of view, the more strict approach adopted by Europe concerning business method patents could mean that companies and consumers on the European market benefit from a more competitive market compared to American firms and consumers.

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