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REASONABLE ROYALTY DAMAGES ACROSS DIFFERENT COUNTRIES AND THROUGH A LAW AND ECONOMICS LENS

THE IMPACT ON INNOVATION GOVERNANCE

Abstract

In most legal systems, a reasonable royalty represents the minimum compensation for patent infringement litigation, and it is undoubtedly the most used among the remedies at the courts' disposal. Therefore, its calculation is crucial in the intellectual property field and, more specifically, within the function of liability in this context to incentivise investments in R&D and promote innovation.

Nonetheless, some differences can be found between the methods used to calculate reasonable royalty awards in two largely developed countries, ie in the U.S., where judges are deemed to consider only the parties' *ex ante* information and in Germany, where *ex post* considerations are involved in calculation.

This article intends to analyse how these different approaches can affect investments in the field of technology and innovation. In this process, German and U.S. case law will be primarily investigated, but some references will also be taken from Chinese experience, a legal system for some aspects similar to civil law ones and in which patent infringement disputes are solved by specialised judges, such as in Germany, whose set of remedies, nonetheless, has been recently modified to include a measure that resembles much the treble or punitive damages of the U.S. Code.

JEL CLASSIFICATION: K13, O31, O34.

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1 Introduction

It is common knowledge that damage awarding in patent litigations is no easy task. This is due to several reasons, one of which is surely that reality, as in most cases, is far more complex than what appears in legislative provisions.¹

Among the parameters to take into consideration for damages liquidation in patent infringement cases, the “reasonable royalty” is often considered the most accessible one, thus generally the most used by courts.

This is the case in the U.S., where between 2007 and 2016, reasonable-royalty-only have been awarded in 61% of the judicial decisions, almost three times more than lost-profit-only awards;² even more in Germany where, dating back to 2005, they have reached a percentage of around 95%.³

In China, they are proposed as a (almost) last resort, when plaintiffs are unable to demonstrate a precise amount of damages through the lost profit approach or via restitutionary relief.

These considerations seem to suggest that reasonable royalty calculation is a relatively univocal and easy parameter to calculate damages.

Reality, once again, contradicts these impressions and the aim of this study will be to display the differences in assessing awards via reasonable royalty across two countries

¹ This statement is magisterially demonstrated in the example of the *12 Monkeys* movie in Roger D Blair and Thomas F Cotter, ‘An Economic Analysis of Damages Rule in Intellectual Property Law’ (1998) 39 (5) *William & Mary Law Review* 1586 at 1591 where it is affirmed that “*the analysis shows that any precise calculation of optimal damages is likely to be next to impossible in the real world*”.

² See Pricewaterhousecoopers, ‘2017 Patent Litigation Study: Change in the Horizon?’ (May 2017, PWC US) <https://www.ipwatchdog.com/wp-content/uploads/2017/05/2017-Patent-Litigation-Study_PwC.pdf> accessed 10 November 2023. Reasonable Royalty and lost profit combined provide for 19% of the cases in the same period. It is also shown that this trend was found in the previous time lapse, between 1997 and 2007, where reasonable-royalty-only were awarded in 60% of the cases, lost-profit-only accounted for a 26%, while a combination of the two for 14%.

³ Hans Marshall, ‘The Enforcement of Patent Rights in Germany’ in Christopher Heath and Laurence Petit (eds) *Patent Enforcement Worldwide: a Survey of 15 Countries: Writings in Honour of Dieter Stauder* (2nd edn, Hart Publishing 2005) at 136, for the period antecedent to this year. Also Marcus Schönknecht, ‘Determination of Patent Damages in Germany’ (2012) 43 (3) *International Review of Intellectual Property & Competition Law* 309, 332 attests that licence analogy remains the most commonly used methodology for damages award; nowadays, though, the percentage should have decreased, due to the growing relevance of the restitutionary relief, that allows to reach higher damages measures (in this regard, see eg Tobias Wuttke and Florian Henke commenting the Decision of the German Supreme Court dated 26 March 2019, docket no. X ZR 109/16 in ‘Patent Infringement in Germany - 10 years’ liability for infringer’s profits’ (Meissner Bolte Milestones 2019) <<https://www.meissnerbolte.com/en/meissner-bolte-newsletter/2019/german-patent-infringement-10-years-liability/>> accessed 10 November 2023). In addition, the latest amendment of the German Patentgesetz, ‘*Zweites Gesetz zur Vereinfachung und Modernisierung des Patentrechts*’ of 10 August 2021 has introduced §145a, whose *ratio* is to provide a higher level of confidentiality in infringement proceeding, where it is stated that “*All information introduced into the proceedings by the plaintiff and the defendant shall be deemed to be a trade secret within the meaning of [...] the Act on the Protection of Trade Secrets*”. In this way, the German legislator intends to spur the use of the lost sales methodology to calculate damages in patent disputes; but on the effectiveness of this measure and its relationship with the “Düsseldorf proceeding” see, critically, Luc Desauettes-Barbero and Reto Hilty, Daria Kim, Matthias Lamping, Peter R Slowinski and Hanns Ullrich, ‘Position Paper on the Envisaged Reform of the German Patent Act’ [2020] Max Planck Institute for Innovation & Competition Research Paper No. 20-05, part II.



where this parameter is mostly used, Germany and the U.S., to try to assess if these can account for the significant divergence of damages measures that can be detected between the two.⁴

A separate paragraph will be dedicated to China, a country where the urgent need to overcome the perceived underdeterrence in property rights protection clashes with the serious obstacles faced by plaintiffs to satisfy the burden of proof required by courts for damages awards in patent litigation.

This analysis will constitute the basis to confront the reality that emerges from case law with the legal and economic theory on the matter and to try to understand the way a reasonable royalty award can better serve the purpose of fostering innovation.

The article, as a consequence, will open with a first paragraph dedicated to the interests that intellectual property rights aim at protecting and how torts fit in this framework. Later, a comparison between, first, the letter of the law on damage in three countries and then, the judicial application will be presented. Lastly, an overview of the law and economics analysis on the matter, to conclude with a paragraph dedicated to the considerations that result from the previous comparisons.

2 Torts and innovation

2.1 Static inefficiencies and dynamic rationale of intellectual property rights

The standing point to comprehend the role of torts in the intellectual property system is to consider the latter as the intersection of public and private interests.

As a matter of fact, knowledge and innovation constitute a public good, because their use is non rivalrous and non-exclusive.⁵ In other words, from a static point of view, there are no marginal costs associated with the use of knowledge; therefore, ideally free distribution would be a more efficient solution than restricting its use. Indeed, the incremental character of inventions and of creative work in general⁶ means that their value can be properly acquired when made available for society, thus fostering further developments.

⁴ In the absence of a specific measure of the median average damage awards in Germany, this divergence can be deduced from WIPO, *An overview of patent litigation systems across jurisdictions*, Table “S1. Overview of the main characteristics of major patent litigation systems”, where the “Level of damages” of Germany is “Average”, while for the U.S. it is “High”. Also, it should be added that while a large sample of the literature considered expresses concerns about the risk of overdeterrence in the U.S. patent litigation, this does not seem a problem perceived in the German one.

⁵ Joseph E Stiglitz, ‘Economic Foundation of Intellectual Property rights’ (2008) 57 (8) *Duke Law Journal* 1693; Richard A Posner, ‘Intellectual Property: The Law and Economics Approach’ (2005) 19 (2) *The Journal of Economic Perspectives* 57. A more philosophical analysis of these characteristics has been conducted by Edwin C Hettinger, ‘Justifying Intellectual Property’ (1989) 18 (1) *Philosophy & Public Affairs* 31.

⁶ Richard A Posner (n 5), where this argument is made not only for patents, but more intensively for creative works whose protection falls under copyright law.

Nonetheless, from a dynamic point of view, failure to provide inventors an adequate remuneration is deemed to cause underinvestment in innovation in the long term, since the fixed costs to create the novelty are indeed large.⁷

As a result, an efficient patent system is deemed to be the one that create a static inefficiency, however justified in the light of a dynamic efficiency, thus aiming at creating incentives for further innovation. Its mechanisms should, therefore, allow knowledge to reach and enrich the public domain as soon as possible, thus exploiting the incremental character of innovation and, at the same time, guarantee the inventor to recoup investments in R&D. In other words, the aim is to maximise the difference between the social value of the invention and its costs.

The static inefficiencies inherent to a patent regime, deriving from the monopoly gains granted to the patentee, and its high costs have led a part of the literature to challenge the role of IP rights in fostering innovation and its impact on the economic growth. As a matter of fact, some have highlighted how similar - or even better results - can be reached by a combination of IP rights with other measures, in which government should play a central role in financing R&D.⁸

2.2. The importance of torts in innovation governance

In this complex scenario, torts play a fundamental role in the enforcement and protection of the exclusive right attributed to the patent holder, as well as the relative monopoly gains. Consequently, they have attracted a growing interest both in the economic literature, for their role in fostering innovation,⁹ and in the legal discourse, because the logic behind the patent damage award, in particular for what account of profits is concerned, seems to evade the strictly compensatory logic that pervades the ordinary torts system.¹⁰

⁷ Roberto Moro Visconti, 'Funzioni del brevetto e rilevanza della valutazione economica' (2007) 6 *Il Diritto Industriale* 513.

⁸ From the sharper position taken in Michele Boldrin and David Levine, *Against Intellectual Monopoly* (CUP 2008) to the more conciliatory solutions proposed in Joseph E Stiglitz (n 5), in particular, where the author proposes a mixed system, what he calls a "Portfolio approach to innovation", in which the remuneration for the inventor is not solely provided by intellectual property rights, but also by a prize system and innovation is fostered also by government funded research, in order to overcome the static inefficiency deriving from the patent system; see Thomas F Cotter, *Comparative Patent Remedies. A legal and Economic Analysis* (Oxford University Press 2013) 26,27, where the author, indeed, recognises that there are viable alternatives to patents, though not as efficient.

⁹ See G Colangelo, *La proprietà delle idee* (Il Mulino 2015), who highlights how an effective and efficient torts system is decisive to promote innovation; but also David Encaoua, Dominique Guellec, Catalina Martínez, 'Patent system for encouraging innovation: Lessons from economic analysis' (2006) 35 (6) *Research Policy* 1423.

¹⁰ This aspect was particularly discussed in civil law countries, where the compensatory logic is predominant in this sector: in Germany, see eg Maximilian Haedicke, 'Die Gewinnhaftung des Patentverletzers' (2005) 7 *GRUR* 529. In Italy see, *ex multis*, A Nicolussi, 'Proprietà intellettuale e arricchimento ingiustificato: la restituzione degli utili nell'art. 45 Trips?' (2002) 4 *Europa e Diritto Privato* 1003, 1036; C Castronovo, 'La violazione della proprietà intellettuale come lesione del potere di disposizione. Dal danno all'arricchimento' (2003) 1 *Il Diritto Industriale* 7, 16; A Plaia, *Proprietà intellettuale e risarcimento del danno* (Giappichelli 2005); P Pardolesi, 'La retroversione degli utili nel nuovo codice della proprietà industriale' (2005) 1 *Il Diritto Industriale* 37; P Sirena, 'La restituzione del profitto ingiustificato (nel diritto industriale italiano)' (2006) 3 *Rivista Del Diritto Civile* 305; M Barbuto, 'Il risarcimento del danno da



The relatively recent interest in this mechanism stems from the fact that literature has primarily focused its attention on optimality in relation to the duration and scope of a patent.¹¹ These are characteristics that highly influence the effectiveness of a patent, but they are usually not disposable by parties: the first factor is generally fixed by legislators, while the second mainly involves an administrative control.

The result - that somebody considers absurd¹² - is that a standardised measure of these factors is used for different sectors and extremely diversified types of inventions. A solution has shown its pitfalls, especially in recent times, for sequential inventions and in the software industry.

Torts only represent a fragment of the balance and the trade-offs described above, the one that intervenes when a breach has occurred. It is - nonetheless- a system in which the continuous dialogue between private and public interests is clearly expressed.

The role of damages award in these two levels will be analysed in para 5, by providing a brief description of a model that deals mainly with the private incentives involved in the dispute¹³ and one that intends to show its importance in attracting and fostering investments in innovation, thus benefiting the social welfare.¹⁴ Both these theories will be analysed to understand whether legal provisions and case law are in line with the result shown in the models and to potentially suggest improvement to align the legal practise with the innovation goals inherent to the patent system.

3 A comparison between three normative provisions

3.1 Introduction: the choice of the U.S., German and Chinese legislative systems

As mentioned above, a comparison between the U.S., German and, partially, Chinese systems will be provided in the following sections. According to recent WIPO reports, these

contraffazione di brevetto e la restituzione degli utili' (2007) 1 *Il Diritto Industriale* 177; A Plaia, 'Allocazione contrattuale del rischio e tutela civile della proprietà intellettuale' (2008) 5 *Danno e responsabilità* 499; M S Spolidoro, 'Il risarcimento del danno nel codice della proprietà industriale. Appunti sull'art. 125 c.p.i.' (2009) 3 *Rivista di diritto industriale* 157.

¹¹ Among the many who dealt with the matter, see William D Nordhaus, 'The Optimal Life of a Patent' [1967] *Cowles Foundation Discussion Papers* No. 474; Richard Gilbert and Carl Shapiro, 'Optimal Patent Length and Breadth' (1990) 21 (1) *The RAND Journal of Economics* 106; Nancy T Gallini, 'Patent Policy and Costly Imitation' (1992) 23 (1) *The RAND Journal of Economics* 52.

¹² See eg Ted Sichelman, 'Innovation Factors for Reasonable Royalties' (2018) 25 *Texas Intellectual Property Law Journal* 277.

¹³ See Roger D Blair and Thomas F Cotter (n 1); Thomas F Cotter (n 8).

¹⁴ Nikolaos Papageorgiadisa and Wolfgang Sofka, 'Patent enforcement across 51 countries - Patent enforcement index' 1998-2017' (2020) 55 *Journal of World Business*, where the authors explain how enforcement can affect the trust in the patent system of a country; Keith N Hylton and Mengxi Zhang, 'Optimal remedies for patent infringement' (2017) 52 *International Review of Law and Economics* 44.

three countries present a high number of patented inventions per year and relatively high innovation rate.¹⁵

For what IP enforcement is concerned, judicial applications in these countries have led to very different results. Some authors claim that damages awarded in U.S. court for patent infringement are extremely high, leading to a risk of overdeterrence;¹⁶ contrarily, the European and the U.S. Congress have often lamented the tangible underdeterrence stemming, among other factors, from the low damages awarded by Chinese courts.¹⁷ Germany is also particularly interesting because of its relatively fast proceedings and the level of its highly trained judges, who contributed to a high general efficiency of the IP enforcement system.

Also, Chinese IP system is relatively recent and takes its cue from both other countries: patent infringement disputes are solved by specialised judges, such as in Germany, but at the same time the set of remedies has been recently modified to include a measure that resembles much the treble damages of the U.S. Code.

The first part of the comparison here proposed will be focused on the analysis of the respective normative texts, to verify if any difference can be detected at this level.

Even though the rules that deal with patent infringement remedies - *ie* U.S. Code, Title 35, §284;¹⁸ Art. 71, of the recently amended Patent Law of the People's Republic of

¹⁵ World Intellectual Property Organization (WIPO), *Global Innovation Index 2023: Innovation in the face of uncertainty* (Geneva 2023); for the number of patent filed and registered in each country: <<https://www.wipo.int/en/ipfactsandfigures/patents>> accessed 10 November 2023.

¹⁶ See Roger D Blair and Thomas F Cotter (n 1).

¹⁷ See eg, European Commission, 'Report on the Protection and Enforcement of Intellectual Property Rights (IPR) in third countries' SWD(2023) 153 final, <https://policy.trade.ec.europa.eu/news/commission-releases-its-report-intellectual-property-rights-third-countries-2023-05-17_en> accessed 10 November 2023 at 16; Congressional Research Service, 'China-U.S. Trade Issues' (updated 30 July 2018), <<https://crsreports.congress.gov/product/pdf/RL/RL33536/156>> accessed 10 November 2023 at 39; Congressional Research Service, 'Intellectual Property Violations and China: Legal Remedies' (report No R46532, 2020), and also World Trade Organization (WTO) 'Panel report: China - measures affecting the protection and enforcement of intellectual property rights' (WT/DS362/R 2009) <[https://www.worldtradelaw.net/document.php?id=reports/wtopanels/china-iprights\(panel\).pdf](https://www.worldtradelaw.net/document.php?id=reports/wtopanels/china-iprights(panel).pdf)> accessed 25 July 2023.

¹⁸ 35 US Code §284, *Damages*:

"Upon finding for the claimant the court shall award the claimant damages adequate to compensate for the infringement, but in no event less than a reasonable royalty for the use made of the invention by the infringer, together with interest and costs as fixed by the court.

When the damages are not found by a jury, the court shall assess them. In either event the court may increase the damages up to three times the amount found or assessed. Increased damages under this paragraph shall not apply to provisional rights under section 154(d).

The court may receive expert testimony as an aid to the determination of damages or of what royalty would be reasonable under the circumstances".



China;¹⁹ and Division 9, Section 139 of the German Patentgesetz²⁰ - do not dramatically differ from one another, the analogies and differences that emerge can be useful to individuate some of the traits that play a decisive role in damages determination.

3.2 The main analogies: vagueness of the terms and reasonable royalty's place in the remedial systems

For what here is more of interest, the letter of the laws is not particularly detailed when referring to the values, which parties must provide evidence for, and judges are supposed to take into consideration when awarding damages.

Indeed, there is no further explanation of the criteria to be included or else excluded in the liquidation phase, so that judges are left with quite an ample space for interpretation. Incidentally, this is particularly true for the “reasonableness” of the royalty that should constitute a parameter to measure the legality of the judicial damage award. Nowhere in the law a detailed definition can be found, so that it is necessary to search for it between the various courts' decisions and the literature on the matter.

Secondly, even if it is not expressly stated in the German law, the reasonable royalty award constitutes in all three countries a residual measure, the one to be used when no other means conducted to a clear measure of damages.

¹⁹ Art. 71, Patent Law of the People's Republic of China:

“The amount of compensation for patent right infringement shall be determined on the basis of the actual losses suffered by the right holder as a result of the infringement or the profits earned by the infringer as a result of the infringement. Where it is difficult to determine the losses suffered by the right holder or the profits earned by the infringer, the amount shall be reasonably determined by reference to the multiple of the amount of the royalties for the patent license. For intentional infringement of a patent right, if the circumstances are serious, the amount of compensation may be determined at not less than one time and not more than five times the amount determined in accordance with the above-mentioned method.

Where it is difficult to determine the losses suffered by the right holder, the profits earned by the infringer and the royalties for the patent license, the people's court may determine the amount of compensation, which is not less than RMB 30,000 Yuan and not more than RMB 5,000,000 Yuan, in light of such factors as the type of the patent right, the nature and the circumstances of the infringing act.

The amount of compensation shall also include the reasonable expenses of the right holder paid for putting an end to the infringement [...]”.

²⁰ Division 9, Section 139, Patentgesetz (“Patentgesetz in der Fassung der Bekanntmachung vom 16. Dezember 1980 (BGBl. 1981 I S. 1), das zuletzt durch Artikel 1 des Gesetzes vom 30. August 2021 (BGBl. I S. 4074) geändert worden ist”):

“Any person who uses a patented invention contrary to sections 9 to 13 may, in the event of the risk of recurrent infringement, be sued by the aggrieved party for cessation and desistance. This right may also be asserted in the event of the risk of a first-time infringement. This right is ruled out if asserting it would, based on the particular circumstances of the individual case and the principle of good faith, lead to disproportionate, unjustified hardship for the injurer or third parties which is not justified by the exclusive right. In such cases, the aggrieved party is to be granted reasonable monetary compensation. The claim for compensation under subsection (2) remains unaffected thereby.

Any person who performs such act intentionally or negligently is obliged to compensate the aggrieved party for the damage caused. When assessing the compensation, consideration may also be given to the profit which the infringer has obtained by infringing the right. The claim for compensation may also be calculated on the basis of the amount which the infringer would have been required to pay as equitable remuneration if the infringer had obtained permission to use the invention. [...]”.

Chinese law is particularly strict on the matter, since it allows the court to assess damages based on a reasonable royalty only when the other two parameters, namely the patentee's lost sales and the infringer's profit are difficult to determine, so that no clear damage figure can be achieved with the other two methods.

As a matter of fact, art. 71 of the Chinese Patent Act provides for a clear hierarchy between the possible means of damages calculation: firstly, as alternative measures, patent losses and infringer's profits; secondly, in the event that the previous ones are difficult to determine, "*the amount shall be reasonably determined by reference to the multiple of the amount of the royalties for the patent license*". Lastly, when even this parameter does not lead to a clear result, statutory damages can be awarded.

Art. 27 of the *Interpretation (III) of the Supreme People's Court on Several Issues Concerning the Application of the Law in the Trial of Disputes over Infringement of Patent Rights*²¹ further specifies that "*actual losses*" (the patent holder's lost profits) constitute the primary parameter and only subordinately parties and judges may resort to the infringer's profit measure.

It is likewise notable Chinese provisions allow judges to compensate the patentee with an award not equal to a reasonable royalty, but to a multiple of it. Similarly, Section 35 of the U.S. Code, § 284 states that damages ought to be "*adequate to compensate for the infringement, but in no event less than a reasonable royalty*"; so that the latter is thought to only represent the minimum compensation to be awarded in patent litigation.

It is indeed the lost profits method alone which is usually considered as the one that can effectively put the patentee in the same place he would have been absent the breach, with the implicit consequence that - taken alone - damages in the amount of royalties do not encompass the entire damages suffered by the patentee.²² It will be interesting to see how this is expressed in judicial application as well as in the law and economics analysis.

3.3 Disgorgement of profits

The first main difference, immediately perceivable, is that U.S. legislation does not include the disgorgement of profits among the remedies available to calculate damages. As a matter of fact, the provision that contemplated the restitutionary relief was eliminated in 1946, due to the time, expenses and complexity that such a measure required.²³

²¹ Released on 1 January 2021.

²² This is especially clear in U.S. case law, see *Rite-Hite Corp v Kelley Co Inc* 56 F. 3d 1538 (Court of Appeals Fed Circ 1995); *Del Mar Avionics Inc v Quinton Instrument Co* 836 F. 2d 1320 (Court of Appeals Fed Circ 1987).

²³ See Thomas F Cotter (n 8) 95, 96, in the context of a wider and comprehensive analysis of the major reforms in the U.S. patent system. The restitutionary relief remains for design patent cases, where it is expressly contemplated by the law.



This is particularly interesting, since the common law systems are the ones where the disgorgement of profits theory was first elaborated and fully developed,²⁴ while this remedy is not so popular in civil law systems, where it is seen as quite incompatible with the compensatory nature of damages.²⁵

It must be considered, though, that this provision was firstly introduced in civil law countries and in China on the thrust of the TRIPs agreement, an international treaty on intellectual property rights protection, whose art. 45 allowed adherent States to articulate their respective legislation as to include infringer's profit award in their remedy set.²⁶

Actually, this measure, as we will see, is almost never used in China and less used than the *Lizenzanalogie* in Germany, even though it is becoming increasingly more popular in the latter. Recent judicial decisions have indeed affirmed the equivalence of account of profit and reasonable royalty award, since neither of them is designed to compensate the patentee for the harm suffered and have given a legal justification to this measure, to be functioned together with the rendering of accounts necessary to substantiate the claim.²⁷

3.4 Intentional or negligent conduct: injunction and punitive damages

German law explicitly states that damages may be awarded whether infringement is the result of an intentional or negligent conduct²⁸ (Section 139, para 2 of the German Patent Act). This can be explained if we think, firstly, about the central role of injunctions

²⁴ Conceived as an equity remedy, mainly for fiduciary contracts in England, it has then found great fortune in the U.S. within the unjust enrichment doctrine. See J Edelman, 'Gain-Based Damages: Contract, Tort, Equity and Intellectual Property' (2002) 2 (2) Oxford University Commonwealth Law Journal 291.

²⁵ See Weoud Hondius, Andre Janssen (eds), *Disgorgement of profits: gain-based remedies throughout the World* (Springer 2015).

²⁶ World Trade Organization, Trade-Related aspects of Intellectual Property Rights, 15 April 1994, Art. 45:

1. *The judicial authorities shall have the authority to order the infringer to pay the right holder damages adequate to compensate for the injury the right holder has suffered because of an infringement of that person's intellectual property right by an infringer who knowingly, or with reasonable grounds to know, engaged in infringing activity.*

2. *The judicial authorities shall also have the authority to order the infringer to pay the right holder expenses, which may include appropriate attorney's fees. In appropriate cases, Members may authorize the judicial authorities to order recovery of profits and/or payment of pre-established damages even where the infringer did not knowingly, or with reasonable grounds to know, engage in infringing activity.*

²⁷ Firstly, the BGH Urteil vom 24.07.2012 X ZR 51/11 - Flaschenträger gave some general principles profits deriving from infringement, that as this stage is largely referred to the free judgement of the interpreter; while with the following BGH Urteil vom 26.03.2019 X ZR 109/16 the German Supreme Court gives a more solid bases to justify and to substantiate the account of profit claim.

²⁸ Section 139 at para 1, as lastly amended in 2021, now contemplates a hypothesis of damages award for unintentional conducts, in cases where an injunction cannot be granted for the disproportionality exception introduced. For a comment on the reform on the matter see, Martin Stierle and Franz Hofmann, 'The Latest Amendment to the German Law on Patent Injunctions: The New Statutory Disproportionality Exception and Third-Party Interests' (2022) 71 (12) GRUR International 1123; Ansgar Ohly and Martin Stierle, 'Unverhältnismäßigkeit, Injunction Gap und Geheimnisschutz im Prozess. Das Zweite Patentrechtsmodernisierungsgesetz im Überblick' (2021) 10 GRUR 1229.

and specific remedies not only in patent infringement cases,²⁹ but also in the general liability system of the country.³⁰

Indeed, the first paragraph of Section 139 of the German Patentgesetz deals with the order of cessation and desistence that can be issued when a risk of infringement occurs and when the infringement is unintentional, so irrespectively of the subjective status.

Also, the injunction of the first paragraph can be issued at the end of the first phase of patent litigation - the one that precedes the damage award one - in which the infringement is ascertained (the declaratory judgement). Therefore, the damage award takes place after this phase is concluded and the subsequent actions adopted by the court (eg at the end of the declaratory judgement, an order to access records can be issued as well).

In the U.S., the subjective status of the infringer is one of the factors to be taken into consideration for treble damages that is to say to allow the court to increase actual or compensatory damages up to three times.³¹

Something that resembles this last provision has been introduced in China in 2021,³² to react and remedy to the worldwide accusations of underdeterrence and inefficiencies of the enforcement system. As it will be illustrated below in para 4.4, in order to embitter the sanctions against infringers and in light of the apparent difficulties in Chinese patent litigation to make use of the “traditional” methods, a provision has been introduced, to allow the judge to enhance by one to five times the damages assessed with the traditional methods, in case of intentional infringement and “*if circumstances are serious*” (Art. 71, Patent Law of the Republic of China).

3.5 Statutory damages

The latter also allows that, when the traditional methods are not suitable to satisfy the burden of prove for the losses directly deriving from the patent infringement, the judge can resort to a statutory measure of damages. It is indeed the law that establishes a minimum and a maximum, within which the court can determine the sum to be attributed to the patentee as compensation for the harm suffered. These values have been increased pursuant to the Fourth Amendment of 2021.

²⁹ The absolute primacy of the injunctive relief in IP rights litigation has been highlighted by WIPO, *An international Guide to Patent Case Management for Judges*, 2023 <<https://www.wipo.int/patent-judicial-guide/en/full-guide>> accessed 10 November 2023.

³⁰ Where the *Unterlassungsanspruch* in §1004 has not only assumed the role of a general provision in the system, to protect primary rights.

³¹ See eg *Halo Elecs Inc v Pulse Elecs Inc* 579 US 93 103-04 136 SCt 1923 195 LEd 2d 278 (2016).

³² With the Fourth Amendment that becomes effective on 1 July 2021.



This is something that is not allowed in neither of two other countries, where courts are supposed to award damages in the amount of a reasonable royalty, even if the plaintiff fails to produce evidence of it.³³

4 The law in practice

When awarding damages by means of a reasonable royalty, courts are required to conduct an investigation on the amount two rational operators would have agreed upon in a licence negotiation.

If this constitutes a common basis for damages calculation, the circumstances that surround the negotiation and their terms can vary in the judicial applications, with the result that widely different results can be obtained.

Something that clearly emerges from a comparison between the values of damage awards in Germany and the U.S., two great economies that attract patent seekers and holders.³⁴

4.1 The German Lizenzanalogie

The main feature of German patent litigation is the unrivalled predictability of the decisions.³⁵

Being the parameter that is mostly used by courts, the acquired experience in assessing damages via reasonable royalty and the clarity of the principle set by jurisprudence on the matter represent some of the factors that contribute to this primacy.

Other main characteristics of German patent litigation are: a) specialised courts; b) a bifurcated system, that is to say that IP rights validity and infringement judgements are carried out in separate trials, often coordinated by a suspension of the infringement one, while waiting for the decision on validity of the patent; c) the relatively shortness of infringement proceedings (at least compared to the validity ones); d) a separation between the part of the declaratory judgment, in which the infringement is ascertained, and an order to render accounts can be released and the one where damages are awarded, with a high percentage of settlements after the first decision.³⁶

³³ In the U.S., this is clearly affirmed in the famous *Apple Inc v Motorola Inc* 757 F 3d 1286 (Court of Appeals Fed Circ 2014).

³⁴ See note 4.

³⁵ Julia Schönbohm and Bolko Ehlgen, 'Germany' in Trevork Cook (ed), *The Patent Litigation Law Review* (6th edn, Law Business Research Ltd 2022) 67.

³⁶ Katrin Cremers and Paula Schliessler, 'Patent litigation settlement in Germany: why parties settle during trial' (2015) 40 *European Journal of Law and Economics* 185; Katrin Cremers, 'Determinants of Patent Litigation in Germany' [2004] ZEW (Centre for European Economic Research) Discussion Paper No. 04-072, <<http://dx.doi.org/10.2139/ssrn.604467>> accessed 10 November 2023.

These factors and, in someone's opinion,³⁷ the "patentee-oriented" tendency registered in German patent litigation are some of the reasons that made this country particularly attractive to patent seekers and holder.

As initial approximation, it can be said that in German case law the reasonable royalty (or, better said, the *Lizenzanalogie*) represents the remuneration for the transfer of the invention exclusive use, object of a fictitious agreement between two reasonable parties.³⁸ Courts, indeed, refer to the objective value of the presumed right of use,³⁹ when setting what is considered to be the reasonable and customary royalty.

From the analysis of some of the recent decisions that engaged both the district and the federal courts in intellectual property litigation, there are some recurrent features, relevant to the discourse here developed.

The first interesting element to take into consideration is the perimeter of damages that can be awarded. As a matter of fact, it was recently stated⁴⁰ that the object of compensation to the patentee ought to equate the economic value of the invention.

This means that, at least in theory, courts should investigate the economic exploitability of the manufacture or process and assess damages according to it. However, continues the Hamburg District Court, measuring the economic utility of an invention can be quite demanding, therefore judges use proxies of this value. Amongst these, the *Lizenzanalogie* is considered to be particularly suitable to this end, because it mimics a remuneration which the two parties that are now in dispute, would have agreed upon. The value derived from these setting needs, then, to be adjusted, in order to adapt the figure to the specificities of the present controversy.⁴¹

In addition to this, courts have determined the moment at which this hypothetical negotiation should be placed, namely when parties would have concluded an agreement for a licence, therefore before the breach has occurred.

However, it is generally accepted that some subsequent factors should be accounted for, namely the extent of the infringement and its duration,⁴² so that what judges consider is what the parties who entered in negotiation could have foreseen as future development.

³⁷ See Brian P Biddinger, Paul M Schoenhard and Karen I Leyva-Drivin, 'International Patent Strategy: a focus on Germany and China' (*Bloomberg Law*, 21 June 2016) <<https://news.bloomberglaw.com/ip-law/international-patent-strategy-a-focus-on-germany-and-china>> accessed 10 November 2023, which deals with China and Germany attractiveness for patent application, while specifically on Germany: Martin Stierle, 'Provisional measures and the risk of patent invalidity—Phoenix Contact and the German approach to interlocutory injunctions' (2022) 17 (11) *Journal of Intellectual Property Law & Practice* 962; Michael C Elmer and Stacy D Lewis, 'Where to Win: Patent-Friendly Court Revealed' [2010] *Managing Intellectual Property Magazine*.

³⁸ This is the general definition of the *Lizenzanalogie* parameter for damage awards that can be found in virtually all the decisions in which it is used. See, *ex multis*, for trademarks litigation LG Hamburg Urteil vom 14.03.2019 327 O 289/17; OLG Stuttgart 2021 Urteil vom 14.01.2021 2 U 34/20 2021.

³⁹ See OLG Stuttgart (n 38), OLG Düsseldorf Urteil vom 13.04.2017 I-2 17/15 and the judicial decision there cited.

⁴⁰ LG Hamburg Teilurteil vom 07.05.2020 - 327 O 146/18.

⁴¹ The District Court of Hamburg for this part of the reasoning cites, as relevant precedent, BGH GRUR 2002 801,802 - Abgestuftes Getriebe; BGH GRUR 2010 223 marginal no. 13 - Türinnenverstärkung. In addition to these, OLG Karlsruhe Urteil vom 09.12.2020 6 U 103/19 states that judges must take into account all circumstances of the individual case.

⁴² This is clearly declared in OLG Karlsruhe (n 41) and OLG Düsseldorf, Urteil vom 13.04.2017 I-2 17/15, both citing BGH GRUR 1992 597, 598.



A step that, according to case law, is necessary guarantee that the infringer is placed in a position that is neither better nor worse with respect to the bona fide licensee,⁴³ meaning that the advantages of the licensee must be counterbalanced with the respective disadvantages, both deriving from the infringement.

The latter reasoning assuming also a decisive role also in the faculty, grant to judges, to put a “surcharge” to the reasonable and customary royalty, subordinately to the ascertainment of extraordinary circumstances, therefore in cases in which the correlation between advantages and disadvantages for the infringer is unbalanced in his favour.⁴⁴

The main parameter to calculate the royalty rate, both for trademarks and patent rights litigation, is the return on sale that can generally be achieved in the respective industry⁴⁵, since it is what normally influence the measure of a licence royalty as well. In this respect, reference should be made not to the actual profit deriving from the infringement, but to the prospective return, the one the parties would expect from the licence agreement.⁴⁶

The normal rate of return of the industry is usually just the starting point to determine the reasonable royalty rate to be applied to the infringer’s turnover, since subsequent adjustment can be made by judges to reflect the circumstances of the case at law.

Specifically for patent litigations, factors that influence royalty rate calculation can be: the technical advantages of the inventions compared to the same or similar artifacts; the eventual monopoly position of the IP right holder and the presence of economically reasonable substitutes in the market, which would have allowed the infringer to avoid using the protected manufact.

Also, the amount resulting from a *Lizenzanalogie* can be influenced by the strength of the parties’ respective negotiation power.

The measure of the reasonable royalty damages has to be assessed by the court in accordance with § 287 ZPO, taking into account all circumstances of the individual case according to its free conviction. Usually, though, German Courts use as main reference the existing licences, the ones conceded by the IP right holder - if any exist - and/or those usually practised in the respective market.

Even if this may vary across industries, Courts tend to refer to standard intervals, at which the royalty rate is generally fixed.⁴⁷ It is, therefore, the plaintiff that asks for a higher rate who is deemed to prove that a sufficient number of licence agreements have been concluded at that amount, even if it does not constitute the customary and reasonable rate of the specific market.⁴⁸

⁴³ OLG Karlsruhe (n 41); OLG Düsseldorf (n 42).

⁴⁴ OLG Karlsruhe (n 41).

⁴⁵ See OLG Stuttgart (n 38) and OLG Karlsruhe (n 41).

⁴⁶ OLG Stuttgart (n 38).

⁴⁷ The damages award can be a lump-sum or a percentage on the net profits derived from the infringement, the latter more common. For trademark infringement it is set between 1-5% of the infringer’s net turnover.

⁴⁸ OLG Düsseldorf (n 39) and LG Hamburg (n 38).

This figure is, then adjusted to the specificities of the case, when all the other factors are considered.

Recently, the BGH⁴⁹ has excluded as valid licence agreement, to take as a reference in a patent litigation, the ones concluded during a settlement or, equally, when the infringement has already occurred, pending possible legal actions. In this case, the price the parties agreed upon in the contract reflects not only the value of the future right of use, but other factors, that should not be considered when negotiating a license and when setting the appropriate contractual consideration. In particular, the royalty will include an amount corresponding to the waiver to the right to bring legal actions.

Therefore, highlights the BGH the licence agreements that should be taken as references when awarding damages are the ones that are concluded in the market.⁵⁰

The method used by German courts to calculate reasonable royalty mainly relies on objective values arising from a market analysis (such as the market normal rate of return or comparable licenses), with the result of a high predictability of the damages measures.

4.2 U.S. hypothetical and analytical reasonable royalty

Recent literature decries the overdeterrence deriving from damage awards in patent litigation and attributes this effect mainly to the relatively high compensations that come from jury decisions.⁵¹

U.S. patent litigation system is indeed characterised by the fact that jury may be involved in the damages award proceeding,⁵² so that their members are entrusted with the calculations involved. Also, judges called to decide patent infringement controversies are not specialised, an issue that probably is less relevant that it may appear, given the high sophistication and attention to the law and economics literature shown in some decisions.

Other important features to be mentioned are the wide discovery, typical of common law systems, for which parties are deemed to produce the evidence necessary to render

⁴⁹ BGH Urteil vom 18.06.2020 I ZR 93/19.

⁵⁰ See also, BGH Urteil vom 13.09.2018 I ZR 187/17.

⁵¹ See Wei Hu, Tohru Yoshioka-Kobayashi and Toshiya Watanabe, 'Determinants of patent infringement awards in the US, Japan, and China: A comparative analysis' (2020) 60 World Patent Information <<https://doi.org/10.1016/j.wpi.2019.101947>> accessed 10 November 2023. The difference between bench and jury damages award is also shown in 2018 Patent litigation study (n 2), with median damages award of \$ 1.9 for the first and \$ 10.2 for the second in the years 2013-2017. The values of the previous periods' testimony that the gap is narrowing but remains significant. Others point out that, apart from this, it is also the availability of punitive damages that influences the measure of damages in patent litigations.

⁵² It is instead excluded from the preliminary injunction judgment, being this an equity court proceeding, reserved to bench.



a decision,⁵³ as well as the length of the proceedings and their high costs, that some consider decisive in the high rate of settlement that has been registered.⁵⁴

As for reasonable royalty calculation, two separate theories have been elaborated by courts: a) the “hypothetical” - which takes into consideration an “arm’s length negotiation between a willing-licensor and a willing-licensee”,⁵⁵ at the moment of the infringement and which is mainly based on the 15th *Georgia-Pacific* criteria;⁵⁶ and the “analytical” one, which actually derives from a further elaboration of the hypothetical one,⁵⁷ but has then acquired some kind of autonomy. It requires judges to calculate the infringer’s expected profits at the time of the breach, and then decrease this result of the medium profit of the respective market.

⁵³ This is particularly relevant in patent litigation since parties may be asked to produce the accounting records and all the documents that might be necessary to assess damages.

⁵⁴ Around 95%, according to Branka Vauleta, ‘25 Patent Litigation Statistics - High-Profile Feuds about Intellectual Property’ (*Legaljobs*, 20 May 2023) <<https://legaljobs.io/blog/patent-litigation-statistics/>> accessed 10 November 2023.

⁵⁵ See e.g. *TWM Mfg Co Inc v Dura Corp* 789 F 2d 895 (Court of Appeals Fed Circ 1986); *Hanson v Alpine Valley Ski Area Inc* 718 F2d 1075 (Court of Appeals Fed Circ 1983); *Tektronix Inc v United States* 552 F2d 343 (Ct Cl 1977).

⁵⁶ *Georgia-Pacific Co v US Plywood Co* 318 F Supp 1116 (SDNY 1970), modified 446 F2d 295 -(2d Cir 1971), 121-23 135n239. The 15 factors that courts can take into consideration in the calculation of the hypothetical reasonable royalty are:

1) *The royalties received by the patentee for the licensing of the patent in suit, proving or tending to prove an established royalty.*

2) *The rates paid the licensee for the use of other patents comparable to the patent in suit.*

3) *The nature and scope of the license, as exclusive or non-exclusive; or as restricted or non-restricted in terms of territory or with respect to whom the manufactured product may be sold.*

4) *The licensor’s established policy and marketing program to maintain his patent monopoly by not licensing others to use the invention or by granting licenses under special conditions designed to preserve monopoly.*

5) *The commercial relationship between le licensor and licensee, such as, whether they are competitors in the same territory in the same line of business; or whether they are inventor and promoter.*

6) *The effect of selling the patented specialty in promoting sales of other products of the licensee; the existing value of the invention to the licensor as a generator or sales of his non-patented items; and the extent of such derivative or conveyed sale.*

7) *The duration of the patent and the term of the license.*

8) *The established profitability of the product made under the patent; its commercial success; and its current popularity.*

9) *The utility and advantages of the patent property over the old modes or devices, if any, that have been used for working out similar results.*

10) *The nature of the patented invention; the character of the commercial embodiment of it as owned and produced by the licensor; and the benefits to those who have used the invention.*

11) *The extent to which the infringer has made use of the invention; and any evidence probative of the value of that use.*

12) *The portion of the profit or the selling price that may be customary in the particular business or in comparable businesses to allow for the use of the invention or analogous inventions.*

13) *The portion of the realizable profit that should be credited to the invention as distinguished from non-patented elements, the manufacturing process, business risks, or significant features or improvements added by the infringer.*

14) *The opinion testimony of qualified experts.*

15) *The amount that a licensor (such as the patentee) and a licensee (such as the infringer) would have agreed upon (at the time the infringement began) if both had been reasonably and voluntarily trying to reach an agreement; that is, the amount at which a prudent licensee-who desired, as a business proposition, to obtain a license to manufacture and sell a particular article embodying the patented invention - would have been willing to pay as a royalty and yet be able to make a reasonable profit and which amount would have been acceptable by a prudent patentee who was willing to grant a license.*

⁵⁷ Mark Glick and David Mangum, ‘The Economics of Reasonable Royalty Damages: The Limited, Proper Role of the So-Called “Analytical Method”’ (2015) 49 (1) *J. Marshall Law Review*.

For a long time, courts and experts also referred to the so-called “rule of thumb”, by which it was presumed that a reasonable royalty should correspond to the 25% of the infringer’s profits deriving from the breach.⁵⁸ Such a rule was found to lack valid economic rational⁵⁹ and was finally rejected by the Federal Court,⁶⁰ so that no relevant traces can be found nowadays in judicial decisions.

It must be outlined that, irrespectively of the merits that some literature has found in this reasoning,⁶¹ even before *Uniloc USA, Inc. v. Microsoft Corp.*,⁶² the analytical approach was, in fact, seldom used in reasonable royalty calculations.

Nonetheless, a specific discourse on the matter may be useful, since it involves some market considerations and in order to highlight the differences with the German system.

The first traces of this theory can be found in the same *Georgia-Pacific Co. v. U.S. Plywood Co.* case, when revised by the Second Circuit,⁶³ and in *Tektronix, Inc. v. United States*,⁶⁴ but it was only later, in *TWM Mfg. Co., Inc. v. Dura Corp.*⁶⁵ that it was first isolated from the hypothetical negotiation scheme and specifically called “analytical approach”, so that the greatest part of the literature prefers to trace back the origins of this methodology to the latter decision.⁶⁶

In these first judgments, the courts use the analytical approach in order to correct the measure of the reasonable royalty award resulting from the hypothetical one, while later it acquired autonomy. In both cases, the measure of damages was the result of the subtraction from the infringer’s projected net profits (therefore, the ones that the infringer expects to get thanks to the infringing item at the time of the infringement) the normal rate of return of the market. This theory lays on the assumption that the extra rate of return is attributable to the patent, therefore must be allocated to the damaged part. In this way, everything that falls above the standard return on sale is to be awarded to patentee, irrespectively of its actual sources. It is, in fact, possible that part of the profits is attributable to infringer’s efficiency, and it is contrary to any efficiency consideration to disgorge this portion to the patentee, who will be unjustly overcompensated.

⁵⁸ See Robert Goldscheider, ‘The Classic 25% Rule and the Art of Intellectual Property Licensing’ (2011) 10 Duke Law & Technology Review.

⁵⁹ Thomas F Cotter (n 8) 122, 123.

⁶⁰ See *Uniloc USA Inc v Microsoft Corp* 632 F3d 1292 -(Fed Cir 2011).

⁶¹ BGH (n 50).

⁶² See note 53.

⁶³ The Second Circuit, as a matter of fact, revised the royalty rate determined by the Southern District Court of New York, finding that no reasonable licensee would have agreed upon an agreement that would have left him with virtually no profit margin, therefore in appeal the GP considered the normal margin profit of the market and corrected the amount of damages in order to leave the infringer with that return.

⁶⁴ *Tektronix Inc v United States* 552 F2d 343 (Ct Cl 1977).

⁶⁵ *TWM Mfg Co Inc v Dura Corp* (n 85).

⁶⁶ See Thomas F Cotter, ‘The Economics of Reasonable Royalty Damages: the Limited, Proper Role of the So-called “Analytical Method”’ (2015) 49 J. Marshall Law Review: it is in *Polaroid Corp v Eastman Kodak Co* No 76-1634-MA WL 324105 (D Mass Oct 12 1990) that the author finds the first assessment that the analytical approach constituted a different, separate and alternative methodology to the hypothetical one.



In Germany, courts, as well, consider the normal rate of return on sale of the market amongst as factor that influences the most the measure of reasonable royalty. Differently from the U.S., though, this constitutes the basis of the calculation, because it is presumed that the infringer would have been able to make an analogous profit from the breach. In this way, any return deriving from the infringer's efficiency should remain in his sphere, at least in great part. This solution seems to be much more in line with the compensatory logic of damages than the U.S. "analytical approach".

This highly neglected approach, though, has recently called increasing attention from the literature; in particular it has been thought as a solid parameter to put a cap on the excessive reasonable royalty damages awarded by courts.⁶⁷

Another methodology is far more common in U.S. courts and has been subject to different interpretations and applications, thus leading to a large variance of results and strong critiques from the literature.⁶⁸

In addition to *Georgia-Pacific Co. v. U.S. Plywood Co.*,⁶⁹ many precedents contributed to delineate profile and bounds of the hypothetical negotiation. In this section, we intend to look at some relevant judgements, in order to analyse how courts make use of the principles crystallised in previous decisions.

Prima facie, what emerges from these judgements is, on the one side, the acknowledgement of the difficulties in setting a reasonable royalty award, when it is affirmed that "any reasonable royalty analysis necessarily involves an element of approximation and uncertainty";⁷⁰ on the other hand, it is considered to be the duty of the judge to ascertain that the methodology used to determine the reasonable royalty is, in fact, sound.⁷¹ Case law, therefore, mainly concerns the methodology to be used and the factual aspects of the controversy to be valued.

In determining the relevant factors in the reasonable royalty analysis, courts have distinguished it from the lost profit analysis. The latter, as a matter of fact, involves the reproduction of the so-called "but-for" market, that it to say judges are supposed to reconstruct how the market would have developed, absent the infringing product.⁷²

On the contrary, the reasonable royalty theory seeks to compensate the patentee for its lost opportunity to obtain a reasonable royalty that the infringer would have been

⁶⁷ BGH (n 50).

⁶⁸ Thomas F Cotter (n 8), at 122-123 provides an overview of the major critiques to this approach, as it has been used by courts; but also, Michael Risch, ' (Un)Reasonable Royalties' (2018) 98 Boston University Law Review 187, at 218.

⁶⁹ Some courts underline how these criteria have been distorted in expert testimonies, but more importantly how most of these factors "*simply are not relevant*" in case involving RAND-encumbered patents, see *Ericsson Inc v D-Link Sys* 773 F3d 1201 1226 (Fed. Circ 2014). This is particularly interesting, since it opens to the possibility to see an evolution in the future, as for reasonable royalty awards is concerned.

⁷⁰ *Unisplay SA v Am Elec Sign Co* 69 F3d 512 517 (Fed. Circ 1995).

⁷¹ *Trustees of Boston University v Everlight Electronics Co Ltd* (Fed Circ 2018).

⁷² *Grain Processing v Am Maize-Products* 185 F3d 1341 (Fed Circ 1999).

willing to pay if it had been barred from infringing.⁷³ Therefore, the “but-for” analysis is something that courts consider extraneous to the reasonable royalty award calculation.

The latter, instead, ought to be done by courts by means of the hypothetical negotiation approach, whose main feature resides in the *ex ante* perspective,⁷⁴ clearly stated in the 15th Georgia-Pacific criteria and further specified in the principle stated in *Lucent Techs, Inc. v. Gateway, Inc.*,⁷⁵ to which courts nowadays often refer:⁷⁶ the hypothetical negotiation approach “*attempts to ascertain the royalty upon which the parties would have agreed had they successfully negotiated an agreement just before infringement began*”.

This means that courts, when awarding damages, should mimic the conduct of reasonable licensors and licensees at the moment of the infringement and, more importantly, relying only on the information available to the parties at that moment, therefore irrespectively to the subsequent events, first of all the circumstances of the infringement itself, its extent and duration.

Among the information at the parties’ disposal, recent decisions⁷⁷ have again recalled *Lucent Techs, Inc. v. Gateway, Inc.* where it is stated that “*The hypothetical negotiation also assumes that the asserted patent claims are valid and infringed*”, so that, when mimicking the license agreement between the willing parties, the terms of the fictitious negotiation should not be influenced by the probability of the patent to be found invalid or of its use to be considered non-infringing.

Also, another important factor that can influence the reasonable royalty calculation is the presence of non-infringing alternatives, so that the user could have “designed around” the patented item in order to avoid the breach. When a non-infringing alternative exists, the royalty rate is normally reduced, for the value of the invention is limited.⁷⁸

Another aspect that emerges from recent case law concerns the object and limits of the reward via reasonable royalty. What, in fact, should be compensated to the patentee is the incremental value of the invention, which can be determined by considering “*what the infringer, in a hypothetical pre-infringement negotiation under hypothetical conditions, would have anticipated the profit-making potential of use of the patented technology to be, compared to using non-infringing alternatives*”.⁷⁹ In other words, the reasonable royalty should be calculated by comparing the infringer’s expected profit with or without the use of the patented item. This measure should as well constitute the

⁷³ *AstraZeneca AB v Apotex Corp* 782 F3d 1324 1334 (FedCirc 2015) and *Lucent Techs Inc v Gateway Inc* 580 FSupp2d 1016 (SDCal 2008).

⁷⁴ The *ex ante* perspective can be found in the “analytical approach” as well and constitutes the main difference with the German approach.

⁷⁵ *Lucent Techs Inc v Gateway Inc* (n 73).

⁷⁶ *Aptiv Services 5 US Llc v. Microchip Technology Inc* No 19-1537 (Fed Circ 2020).

⁷⁷ See eg *Trustee of Boston University v Everlight Electronics Co Ltd et al* (n 71), *Astrazeneca AB v Apotex Corp* (n 73).

⁷⁸ *Grain Processing v Am Maize-Products* (n 72) and *Riles v Shell Exploration & Prod Co* 289 F3d 1302 1312 (Fed Circ 2002), but also in *Astrazeneca AB v Apotex Corp* (n 73).

⁷⁹ *AquaShield Inc v Inter Pool Cover Team* 830 FSupp2d 1285 (2011).



maximum of the reasonable royalty award since no rational party would have entered in an agreement if the difference between the two values is negative.

This reasoning has been summarised in *Dowagiac Mfg. Co. v. Minnesota Plow Co.*⁸⁰ by affirming that “As the exclusive right conferred by the patent was property and the infringement was a tortious taking of a part of that property, the normal measure of damages was the value of what was taken”. “The value that was taken”, is the brocard used in recent case law to express this idea that only the value attributable to the invention should be compensated and that this value is to be calculated by comparing the profit deriving from patented item and the best-next alternative.

These considerations also played an important role in the apportionment theory (and its exception, the entire market rule), a subject of great interest in recent case law, due to the fact that technological advancement most of the time involve only small components and only rarely an entire product or process.

A complete dissertation of this theory will deviate from the aim of this study; therefore, we will focus on the reasonable royalty determination, when the patented item is only part of the entire product.

Case law seems to agree on the fact that the correct method requires the judge not to deduct the value of the single component by subtracting the value of the other components from that of the entire product, but to autonomously individuate and isolate it and from that calculate the reasonable royalty award.⁸¹

In this way, courts avoid the possible interferences that may derive from factors other than the effective incremental value of the invention.⁸²

In reconstructing the hypothetical negotiation of the parties, similarly to what happens in Germany, one of the most reliable methods is to consider a so-called “comparable licence”.

This can be done, according to courts,⁸³ when a prior agreement between the parties has been reached. In the absence of such an agreement, “courts permit reasonable royalty damages only if the evidence provides sufficient reliable basis to calculate such damages”.⁸⁴

The reliability of this method, therefore, lies on the particular attention U.S. courts have shown in selecting the previous license agreement to be used as a proxy for damage calculation.⁸⁵

⁸⁰ *Dowagiac Manufacturing Co v Minnesota Moline Plow Co* 235 US 641 648 (1915).

⁸¹ Amongst the many on the matter, *VirnetX Inc v Cisco Systems Inc* 767 F 3d 1308 (Fed Circ 2014) and *Laserdynamics Inc v Quanta Computer Inc* 694 F3d 51 (Fed Circ 2012), where the “smallest salable unit” principle is affirmed.

⁸² *Grain Processing v Am Maize-Products* (n 72).

⁸³ See *Fortinet Inc v Fortanix Inc* 3:20-cv-06900 (District Court ND Cal 2022), citing *Marketquest Group Inc v BicCorp* 316 F Supp 3d 1234 1300 (SD Cal 2018).

⁸⁴ *Lucent Techs Inc v Gateway Inc* (n 75).

⁸⁵ In *Ericsson Inc v D-Link Sys* (n 69), cited in *Mondis Technology Ltd v LG Electronics Inc* 6 F 4th 1379 (Court of Appeals Fed Circ 2021), where the carefulness emerges clearly: “Prior licenses, however, are almost never perfectly analogous to the infringement action” *VirnetX* 767 F3d at 1330. For example, allegedly comparable licenses may cover more patents than are at issue in the action, include cross-licensing terms, cover foreign intellectual property rights, or, as

The “comparability” of a previous licence (not between the parties) is considered as a factual circumstance, to be proven: “[T]here must be a basis in fact to associate the royalty rates used in prior licenses to the particular hypothetical negotiation at issue in the case” (*Uniloc USA, Inc. v. Microsoft Corp.*), where a “loose or vague comparability between different technologies or licenses does not suffice”, as it was affirmed in *LaserDynamics, Inc. v. Quanta Comput., Inc.*⁸⁶

From these remarks we can derive that the main parameters to consider are the affinity of the technology protected with the patent as well as the structure of the license agreement. This is confirmed in some recent case law, where judges consider the particular sector at which the invention and the agreement pertain, as well as the exclusive or non-exclusive nature of the licence.⁸⁷

4.3 The *ex post* and *ex ante* perspective: the U.S. “book of wisdom”

The preceding analysis highlighted the main difference between the hypothetical and the German approaches for reasonable royalty calculation, residing in the different time at which the negotiation is placed.

The *ex ante* perspective adopted by U.S. courts is justified in order to minimise the so-called “patent holdup” risk,⁸⁸ which can arise when royalties are based not exclusively on the patent value, but partly upon the infringer’s sunk costs. These are the costs that must be borne in order to make use of the patent and to include these in the damage award means in most cases to strongly deter efficient users, in a measure that is considered excessive to a large part of the literature on the matter.⁸⁹

On the other hand, *ex post* considerations allow for a more accurate estimation of the patent value, when used as index of the value that parties could have reasonably expected from the economic exploitation of the invention. To this end, courts start from the normal profit margin of the market and adjust it to the peculiarities of the case.

If this is the main difference between the case law approaches used, it must be outlined, however, that U.S. courts have recognised how in some cases it is more appropriate to include *ex post* considerations in the reasoning. This is what is called the

here, be calculated as some percentage of the value of a multi-component product. Testimony relying on licenses must account for such distinguishing facts when invoking them to value the patented invention. Recognizing that constraint, however, the fact that a license is not perfectly analogous generally goes to the weight of the evidence, not its admissibility.”; but also see *The Coleman Co v Team Worldwide Corp* United States District Court Eastern District of Virginia 2:20-cv-351 (ED Va 2022).

⁸⁶ *LaserDynamics Inc v Quanta Comput Inc* 694 F3d 51 67-68 (Fed Circ 2012).

⁸⁷ *Lucent Techs Inc v Gateway Inc* (n 75).

⁸⁸ On the patent holdup risk, see Thomas F Cotter, Eric Hovenkamp and Norman Siebrasse, ‘Demystifying Patent Holdup’ (2019) 76 *Washington & Lee Law Review*, 1501; Thomas F Cotter, ‘Patent Holdup, Patent Remedies, and Antitrust Responses’ (2009) 34 (4) *Journal of Corporation Law* 1151, 1207.

⁸⁹ *Dowagiac Manufacturing Co v Minnesota Moline Plow Co* (n 80), but also Thomas F Cotter (n 8).



“book of wisdom” theory, first elaborated in *Sinclair Refining Co. v. Jenkins Petroleum Process Co.*⁹⁰ and implemented in recent case law with alternate fortune.⁹¹

The “Book of Wisdom” doctrine allows judges to involve in the reasonable royalty calculation, post-hypothetical negotiation circumstances, with some important limitations. It is, in fact, specified that these post-infringement facts can only be used in order to correct the *ex ante* “prophecy”,⁹² shedding light on some factors that were already present at the time of the hypothetical negotiation, because “*it is incorrect to replace*” the hypothetical inquiry into what the parties would have anticipated, looking forward when negotiating, with a backward-looking inquiry into what turned out to have happened”.⁹³

This means that, contrarily to what happens in Germany, *ex post* facts can only be included in the reasoning if they were, in some way, already present in the hypothetical negotiation, so that it can be assumed that “*the hypothetical negotiators would have anticipated these later events and valued the technology accordingly during their negotiation*”.⁹⁴

It is, still, quite a big difference from what pacifically emerges in Germany case law, where courts are allowed to plainly consider the duration and the extent of the infringement, in order to reach an accurate estimate of the invention value.⁹⁵

Still, it seems rather unlikely that this difference alone can encompass the huge difference in the average median values in damage awards that can be observed between two countries.

4.4 Chinese patent litigation: why reasonable royalty is seldom used

The sub-paragraphs above show the vivacity of the judicial reasoning on intellectual property rights litigation and, in particular, on the remedies for their infringement. This is partly the result of a strong cultural background on the topic and fertile ground for a legal system designed to vehicle innovation and quality control overall.⁹⁶

⁹⁰ *Sinclair Refining Co v Jenkins Petroleum Process Co* 289 U.S. 689 (1933).

⁹¹ See eg *mSIGNIA Inc v InAuth Inc* US Dist (United States District Court for the Central District of California October 18 2018, Filed); *Aqua Shield v Inter Pool Cover Team* 774 F3d 766 US App 2 113 USPQ2D (BNA) 1347 (2014) WL 7239738 (United States Court of Appeals for the Federal Circuit December 22 2014, Decided).

⁹² *Sinclair Refining Co v Jenkins Petroleum Process Co* (n 90) cited in *mSIGNIA Inc v InAuth Inc* (n 91).

⁹³ *Opticurrent LLC v Power Integrations Inc* US Dist(2018), citing *Aqua Shield v Inter Pool Cover Team* (n 91) .

⁹⁴ *mSIGNIA Inc v InAuth Inc* (n 91).

⁹⁵ That the methodology used in Germany allows reaching a more accurate value of the patent, with respect to the next-best alternative see Cotter (n 8).

⁹⁶ Think about the fact that in the U.S. intellectual property rights are protected in the Constitution, where art. 8, Clause 8 states: [*The Congress shall have power*] “*To promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.*”

China is a different story, better still has a different history, one in which it has been necessary to justify the need of intellectual property rights in its economic system.⁹⁷ Also, the first legislation on the matter is relatively recent, since the Patent Law of the People's was promulgated in 1985, therefore after the Cultural Revolution, when Deng Xiaoping made his return to the public scene.

In order to make their market attractive to foreign investments and maintain competitiveness, it was indeed necessary to promptly and quite urgently catch up with the rest of the world on the matter and to, in some way, implant their intellectual property rights system and remedies in the country, mainly through the adherence to international agreements.⁹⁸

The result is that, even if art. 71 of the Chinese Patent Act contemplates three parameters suggested in art. 13 of TRIPs, which can also be found in the German legislation (therefore, both patentee's and infringer's profits and reasonable royalty), they are cumulatively used in just the 2% of all the patent litigation brought before the civil courts between 2006 and 2017, with reasonable royalty accounting for a 1%, corresponding to 33 cases.⁹⁹

This means, conversely, that statutory damages were used in 98% of the case. What is interesting to notice is that, presumably coupled with statutory damages, injunctions were awarded in 97% of the cases where infringement was ascertained (with a win rate of 77%, it means that an injunction was granted in approx. 75% of the total). Also, from the CIELA analysis it emerges that courts award an average of 33% of the claimed damages, even though it is not indicated the variance of the awards.

Other specific features of the Chinese judicial system to be mentioned are that the procedure is derived from civil law countries' systems and, such as in Germany, courts are highly specialised.

The reason for the almost exclusive use of statutory damages lies in the fact that it is extremely difficult for plaintiffs to prove actual damages "*given the courts' strict proof requirement and the lack of a generous discovery*".¹⁰⁰ In particular, reasonable royalty awards are only admissible when a previous agreement on the patent right at issue is presented as evidence, this being existent and performed. Also, it is not to be neglected the "reasonableness" attribute, which courts generally require this to be substantiated

⁹⁷ Mark L Wu-Holson, 'A Commentary on China's new Patent and Trademark Laws' (1986) 6 *Journal of International Law and Business* 86 gives an overview of the genesis of the Chinese patent and trademark legislation and its function in a Marxist economy.

⁹⁸ Such as the already mentioned TRIPs, see note 26.

⁹⁹ CIELA report for 'Civil Infringement', 'Invention', 'All locations', 'All courts', 'All industries' <<https://www.ciela.cn/en/>> accessed 15 July 2023.

¹⁰⁰ Thomas F Cotter (n 8) 355; similarly see also Jingjing Hu, 'Determining Damages for Patent Infringement in China' (2016) 47 (1) *International Review of Intellectual Property and Competition Law* 5; Xiaowu Li and Don Wang, 'Chinese Patent Law's Statutory Damages Provision: The One Size That Fits None' (2017) 26 *Washington International Law Journal* 209.



with additional issues, such as the circumstances of the infringement, the comparability of the licence fee, and the analogies in the patent enforcement.

The restrictive interpretation, together with the absence of an extensive discovery, means that courts are unable to use one of the traditional remedies (lost profits, reasonable royalty and infringer's profit), with the result of a much-lamented underdeterrence.¹⁰¹

It is interesting to notice that the literature seemed inclined to work on the reasonable royalty theory to increase courts' capability to assess damages, but in the end the choice has been to introduce the possibility to increase the base damages from one to five times.¹⁰² A provision that much resembles the treble and punitive damages that are typical of a common law system, rather than the civil law ones, from which the Chinese legal order took inspiration. It will probably take time to fully appreciate the effect of this provision on the efficiency of the Chinese patent remedies, but it is indeed something to look out for.

4.5 The main findings to be tested in a law and economics perspective

From the previous analysis it can be inferred that similar premises guide judges in three countries since reasonable royalty award is considered residual and just the minimum compensation. This is explainable by considering that the reasonable royalty approach is detached from the measure of the harm suffered by the patentee but is based on a hypothetical negotiation between the latter and the infringer.

As a consequence, U.S. and German case law show that judges rely on market-based approaches to calculate this value and in particular on the return on sale of the patented invention. Moreover, in the U.S. courts seem to require the measure of the reasonable royalty to be calculated by comparing the return on sale of the patented item with the next-best alternative.

The main difference in the U.S. and German approach can be found in the moment at which the negotiation between the two parties is imagined, if *ex ante* or *post* infringement, with all the consequences in terms of the information available to the parties at those two moments.

As far as China is concerned, the difficulties in satisfy the burden of proof by parties lead to the generalised awarding of statutory damages, so that at present it is not possible to find a theoretical framework of reasonable royalty awards in this country. Another relevant feature is that it appears that statutory damages are often coupled with an injunctive order.

¹⁰¹ See note 17, but critically Chenguo Zhang and Jin Cao, 'How Fair is Patent Litigation in China? Evidence from the Beijing Courts' (2020) 241 *The China Quarterly* 247.

¹⁰² See Chung-Lu Shen, 'Reasonable Royalties and the Calculation of Patent Damages: Reflections and Recommendations for a fair and Adequate Calculating Basis of Reasonable Royalties in Terms of Harmonization of China-Taiwan Regional Patent Laws' (2013) 12(1) *Chicago-Kent Journal of Intellectual Property* 156.

5 The law and economics analysis as a tool to investigate the courts' rationale

In this section we will try to verify if both the remedies designed in legislative provisions and the reasonable royalty judicial applications described above fit the law and economics framework.

In doing so, we will consider two fundamental theories that have been elaborated on optimal patent damages¹⁰³ and we'll try to derive from these some parameters that will then be used as benchmark for an evaluation of the IP adjudications considered in the previous paragraphs.

Given the potential breadth of the discussion, after having outlined some basic concepts of the law and economics analysis, we will focus on some main points, *in species* the residuality of the remedy under scrutiny and the market-based approach to calculate its value.

In addition to this, a separate sub-paragraph will be dedicated to introducing the injunctive relief in the reasoning, to try to verify whether it is possible to find some sound rationale in the Chinese method described above.

Eventually, in the following paragraph these points will be used in order to draw some conclusions.

5.1 Normative law and economics theories of optimal patent remedies

While the majority of the studies on patent remedies concerns the scope and length of patents¹⁰⁴ or, when dealing with torts, they usually test the economic efficiency of the existing remedies,¹⁰⁵ the theories that will be analysed in this subsection provide for a general model of optimal patent remedies and, therefore, may represent a useful tool to give an evaluation of the reasonable royalty damages of the previous analysis.

The main difference between two theories is their background, since, as will be better explained herein after, one was constructed in the property/liability rule framework,¹⁰⁶ while the most recently elaborated derives from a social welfare objective function.¹⁰⁷

Amongst the main assumption from which it is necessary to start to comprehend the theory first elaborated by Cotter and Blair,¹⁰⁸ is that property rules - such as injunctions-

¹⁰³ Roger D Blair and Thomas F Cotter (n 1), and Thomas F Cotter (n 8); Band Keith N Hylton and Mengxi Zhang (n 14).

¹⁰⁴ Starting with the renowned William D Nordhaus (n 11) extensive literature can be found on the matter, see also note 11.

¹⁰⁵ See eg JJ Anton, DA Yao, 'Finding "Lost" profits: an equilibrium analysis of patent infringement damages' (2007) 23 (1) *Journal of Law, Economics and Organization* 186.

¹⁰⁶ The foundation of this theory can be found in Guido Calabresi and A Douglas Melamed, 'Property Rules, Liability Rules and Inalienability: One View of the Cathedral' (1972) 85 (6) *Harvard Law Review* 1089.

¹⁰⁷ See Keith N Hylton and Mengxi Zhang (n 14), where the authors explain why their study should be considered as the first to provide a general model for optimal patent remedies.

¹⁰⁸ Roger D Blair and Thomas F Cotter (n 1).



represent a more suitable remedy for patent infringements.¹⁰⁹ The ownership structure of IP rights and the exclusion faculty that they entail are indeed predominant factors, inevitably affecting the effectiveness of remedies. In addition to this, information on the value of a patent can be better assessed by parties (ie the patentee and the willing user) rather than a third one, such as courts.

Therefore, optimal damages award is the one that mimics the incentive structure that derives from a property rule, that is to say the one that leads to negotiations *ex ante* of the exclusive right, while at the same time preserving the innovative incentives for inventors.

In general terms and for what the measure of damages is concerned, it should be considered that patent value is relative. This means that the value of an invention can and should be measured in relation to the next-best alternative. It is, therefore, this surplus, directly attributable to the patent that should be awarded to the patentee via damages.

Given these premises and in the absence of: a) close substitutes to the patented item, b) price discrimination, c) transaction, litigation and information costs, this theory highlights how a reasonable royalty rate would indeed be the result of negotiations, in cases in which the infringer was more efficient than the patentee.

In the latter scenario, as a matter of fact, it is more efficient for the infringer to engage in the production of the patented item, since he is the more efficient of the two economic operators. If we then assume perfect information, the parties will reach an agreement for the use of the IP right by the infringer in exchange for a determined (and reasonable) royalty, rather than resort to litigation.¹¹⁰

The conditions sketched above are quite impossible to stand, let alone together, therefore to different conclusions leads the law and economic analysis when introducing such factors. Once these variables are introduced, though, reasonable royalty awards seem insufficient to give the right incentives to parties, so that the lost profit approach (whenever the infringer is more efficient) and the infringer's profit award (in the opposite situation) are considered as the respective optimal responses in infringement cases.

Apart from the strictly economic considerations, one of the reasons why these two remedies are considered preferable to a reasonable royalty award is that information regarding the patentee's lost profits or the infringer's profit are available to the parties, therefore should be more easily accessible.

As a consequence, a reasonable royalty award, in this context, is only justifiable when the less efficient patentee would have preferred to exclude the user from the market via injunction rather than licensing him, but proving the measure of lost profits is concretely difficult, so that reasonable royalty is an "imperfect substitute" for this figure.¹¹¹

¹⁰⁹ Roger D Blair and Thomas F Cotter (n 1) and Thomas F Cotter (n 8).

¹¹⁰ *ibid.*

¹¹¹ *ibid.*

It is particularly interesting to notice that in the development of this theoretical framework, the authors contemplated the possibility for the judge to award super- but also under-compensatory damages. In particular, when the surplus of the social benefit of the invention over the enforcement costs is very low or even non-existent, full restoration of the patentee is considered not adequate, since it would result in a cost for society.¹¹²

More recently, an alternative model of optimal patent remedies has been elaborated, one derived from a social welfare objective function, that present itself as an application of the theories concerning “*the trade-off between optimizing innovation incentives and minimizing the static monopolization cost of intellectual property*” to patent damages and a development of the literature on general tort theories.¹¹³

Patent infringement, as a matter of fact, presents strong peculiarities, that allow distinguishing this context from general torts. The main feature consists in the fact that an IP violation, on the one side, injures the patentee by decreasing his reward to the investment in innovation, while on the other benefits society, by subjecting the patented innovation to competition.¹¹⁴

The model then ties the optimal measure of patent damages to the social value of patented invention and presents its result both in a static scenario and in a dynamic one, where the latter includes the investment in innovation.

From the static scenario the authors derive that “*in the absence of substantial post-patent efficiencies, infringement necessarily enhances the innovation surplus*”,¹¹⁵ therefore social welfare may be optimised by avoiding some infringement litigation. On the contrary, it is indeed the presence of post-patent efficiencies that calls for some level of protection and enforcement.

By adding the investment in innovation and, therefore, shifting to a dynamic scenario, it emerges that optimal patent damages are those that balance the marginal cost of patent protection (ie litigation, taking care to avoid infringement costs) to the “dynamic” marginal social benefit of the patented innovation, where the latter is a formula that takes into consideration both the innovation rate of the invention and its social externalities.

As a consequence, an award greater than the sum of loss of profit (or reasonable royalty) damages and litigation costs is justified when the social value of the patent is sufficiently high for the patentee to internalise the expected social gain from the investment.

Being the social value of the patent the sum of the expected profit of the inventor and the expected consumer surplus from the invention, net of litigation and precautionary

¹¹² Thomas F Cotter (n 8) 47.

¹¹³ Keith N Hylton and Mengxi Zhang (n 14) 46.

¹¹⁴ *ibid* 45: “*the infringement not only injures the patentee but benefits society by subjecting the patented innovation to competition*”.

¹¹⁵ *ibid* 48.



costs, this means that super-compensatory damages should be awarded when the patentee expected profit and the consumer surplus are high and enforcement costs are low, so e.g. when the scope of the patent is clear. The sum of the lost profit (or the reasonable royalty) award and a surplus (the “additur”), which comprehends litigation costs and the entire social value of the innovation, constitutes the upper limit of the damage awards.

It is interesting to notice that *a contrario* we can derive that those inventions that do not carry a powerful innovation charge should have a correspondent protection, with a relatively small (even negative) additur.

Finally, the study highlights how efficiency is increased by a combination of injunctive relief and damages, rather than the two measures alone.

5.2 The compensatory logic of torts overcome...

The main findings of the theories - necessarily briefly - described above allow depicting some general considerations that could be then used to discuss the most evident features of the reasonable royalty award.

First of all, they highlight the importance of patent torts in driving innovation: since scope and duration of patents are either fixed or difficult to manage, torts represent a fundamental tool to affect parties’ incentives. Among these, incentives to invest in innovation seem directly linked to patent protection, since high level of protection not only increases the trust in the patent enforcement system,¹¹⁶ but strictly affects investment decision.¹¹⁷

Moreover, both models show the limits of the compensatory logic predominant in general torts, where they suggest both to award damages that surpass the actual loss suffered by the patentee when the social value of the invention is sufficiently high and below that measure in the opposite scenario, when it is not better to discourage litigation altogether.

It is interesting to notice that the justifications for allowing super-compensatory damages differ in the two theories: while in Cotter and Blair it depends on the relative efficiency of the two operators, for Hylton and Zhang it is strictly tied to the social value of the invention. This is indeed consistent with the different approach used in the two models, where the first is conceived to incentivise negotiation between the parties and the second one from a social welfare perspective.

In any case, both theories express the necessity to avoid litigation when the social value of the invention is not relevant. To this purpose, a proposed solution is to award low damages, presumably inferior to the loss suffered by the patentee.¹¹⁸

¹¹⁶ Nikolaos Papageorgiadisa and Wolfgang Sofka (n 14).

¹¹⁷ Keith N Hylton and Mengxi Zhang (n 14).

¹¹⁸ Indeed, *ibid* 53 suggest the damages award to be 0 when the social value of the invention is low.

5.3 ...and the residuality of reasonable royalty awards

Moreover, and for what here is of utmost interest, from the previous analysis emerges that reasonable royalty award, on the one side, does not always encompass for the entire damage suffered by the victim nor, on the other, it is enough when the social value of the invention is sufficiently high.

This seems consistent with the legislative approach described in para 2, where the residuality of the reasonable royalty award emerged quite clearly from all three legislative provisions. The same attitude was found in the relevant case law, notwithstanding the large use of this remedy.

In addition to this - it is expressly stated in the U.S. Code but can also be inferred from the other two systems -, this measure is supposed to constitute only the floor, the minimum compensation for patent infringement awards.

What emerges from practice, nonetheless, is that the other parameters (lost profit and disgorgement of profits) necessarily entice an information disclosure that the economic operators are not willing to subdue. Therefore, when we account for the unwillingness to disclose economic as well as technical information by the litigation parties, the probative difficulties and the uncertainties around an infringement incident, reasonable royalty becomes the primary method to calculate damages in patent infringement.

5.4 The market-based approach

Since it is the most used amongst the parameters at the courts' disposal, it has become increasingly important to follow the case law evolution on the matter, as well as the indications provided by the law and economics doctrine for reasonable royalty calculation.

What emerges from the studies and finds a validation in case law is that being patent value relative, the measure of the reasonable royalty should reflect this characteristic, by taking as basis for calculation the difference between the return on sales from the patented item and the one deriving from the next-best alternative, actualised at the moment at which negotiation is imagined. In this way, the reasonable royalty award functions as a proxy of the social value of the invention, that is to say - incidentally - an amount which is not directly relatable to the damage suffered by the patentee.

The results obtained from this operation represent the incremental profit attributable to the invention, therefore apportionable between the patentee and the willing user though a reasonably royalty.¹¹⁹

¹¹⁹ The law and economics analysis has proposed different methods for this apportionment (eg Nash and Rubinstein bargaining solutions), to provide an economic rationale for this process and try to account for the circumstances of the negotiations. Courts in the U.S. have required, though, that these methodologies, in principle admissible, find a justification in the facts of the dispute (see *Uniloc USA, Inc. v. Microsoft Corp.* (n 60)).



Both German and U.S. case law shows that courts try to reconstruct in a similar way the value of the right of use of the invention, by taking market-based parameters into consideration, but they differ in the moment at which the negotiation is placed in time.

In this sense, the literature examined has shown the advantages of taking an *ex post* perspective, since it allows to determine more accurately the value of the invention, that can be very uncertain at the moment when the infringement began and, therefore, through an *ex ante* evaluation.¹²⁰

5.5 The Chinese experience: is there a sound economic rationale?

More than one international organisation has expressed concerns for the Chinese courts predominant tendency to award statutory damages for infringement dispute, because these seem too low to deter efficiently the wrongful conduct. Something that is particularly condemnable in a word in which piracy and counterfeiting are considered as plagues.

In both models briefly described above *sub* 5.1, some space is dedicated to the analysis of a combination of remedies, injunctive relief and damages. In particular, Hylton and Zhang theory of optimal patent damages suggest that a combination of the two remedies is a more efficient solution, than damages or injunction only,¹²¹ while Cotter affirms that the measure of damages should be reduced, when coupled with injunction.¹²²

It is not uncommon nor unreasonable, in fact, that these two are awarded together by courts, since the first aims at eliminating the source of damage for the future and the second one at giving adequate restore for the past harm.

It was shown above that the CIELA statistics seem to suggest that an order to desist is grant by Chinese courts in 75% of the cases in which statutory damages are also awarded.

The interrogative is, therefore, if it is not possible to find an economic rationale in the Chinese experience.

To this end, it should be necessary to analyse a wide range of judgements, to try to understand if a predictability of the measure of damages can be found and if this can in some measure overcome the low amounts awarded; moreover, if the apparent underdeterrence is not - in fact - compensated by the conjoint action by means of an injunctive relief.

6 Conclusions

From the case law comparison proposed, it seems quite clear that, apart from the *ex ante* or *ex post* perspective, the methodology used by German and U.S. court does not

¹²⁰ Thomas F Cotter (n 8).

¹²¹ Keith N Hylton and Mengxi Zhang (n 14) 50.

¹²² Thomas F Cotter (n 8) 63.

dramatically differ. They also seem to be in line with the recent law and economics doctrine, which suggests courts to assess via reasonable royalty by referring to the incremental value attributable to the invention and to apportion this figure between the parties.

It, then, comes as a surprise to ascertain that the concrete figures differ so drastically in these two countries and that Chinese courts, on the other hand, seem not to make use of the reasonable royalty award in the slightest.

Also, considering that these three countries have shared the primacy in terms of number of patents issued and that this numbers have been constant for a while, the great divergence seems to suggest that enforcement does not severely impact investments in innovation.

This, in turn, seems to contradict the results reached by the recent studies in law and economics, which have contributed to outline a direct link between torts and investment decisions of the patentee, being the measure of damages award the primary tool for an adequate patent protection.

The apparent contradictions depicted above can be probably explained by considering the high influence of exogenous factors (such as eg the possibility to award punitive damages, juries involvement in the decision, judicial training and burden of proof) on the level of damages award, so that the a great part of the differences found in the judgements can be largely explained by taking these factors into consideration.

On the other hand, many studies have shown how the high number of patents does not always mean a high level of innovation, since the expected average value of a single patent is very low.¹²³

All in all, the differences in the judicial systems and the difficulty in assess innovation seem to explain in great part of the variance in the level of damages registered in the three countries, notwithstanding the analogies between their legislative provisions and, for Germany and the U.S., in the case law analysed.

For torts to gain a primary role in innovation governance, as the law and economics analysis seems to suggest so clearly, some obstacles need to be cleared.

First of all, then, it seems safe to say that the large space accorded to reasonable royalty in case law should be partially downsized or at least adjusted to a sounder economic rational.

The large use of reasonable royalty vouches for the elasticity of this parameter that seems to be able to incorporate a variety of data and circumstances.¹²⁴ Courts have then exploited this potentiality to respond to the need for property rights protection when no

¹²³ See G Colangelo (n 9) 21 ss.

¹²⁴ Interestingly, in the context of 2010 China-Tawain Agreement for property rights protection, some literature suggested courts to work on reasonable royalty and its basis, since it “*provides a flexible concept for accommodating damages*”, see Chung-Lun Shen (n 102) 156.



other parameters could satisfy the burden of proof, with the result of the large variance awards that has been illustrated above.

The latter, therefore, appears to be, at least partially, explainable by observing that courts the market-based data merely as a base, to be adjusted in light of the specificities of the case at law. In addition to this, both in the U.S. and in Chinese legal provisions, as well as for exceptional circumstances in German case law, the measure of damages can be enhanced by a multiplier, at the courts' partial discretion.

Contrarily, a reasonable royalty award appears economically suitable in those cases in which the value of the invention is relatively low, so when damages are not supposed to necessarily encompass the whole loss of the patentee.

In this sense, the strict burden of proof required by Chinese courts does not seem totally unjustifiable and some economic rationale might be found in coupling statutory damages (limited in amount by law) with injunctions, when adequate. Contrary to the other two countries, the risk that seems to emerge in Chinese enforcement system through statutory damages (plus injunction) is to excessively reduce the variance, so that damages become almost as a fixed measure (such as patent length), thus failing to have a significant impact on innovation incentives.

What appears then crucial is, then, a more tailored response in terms of damages award, that should not only stem from the impossibility to prove damages in other ways, but one that takes into account a comprehensive estimate of the incremental social value of the invention as well as the relative efficiencies of the parties.

To this end, some probative difficulties should be overcome, in particular those regarding the economic information of the parties, that can provide the interpreter with the tools necessary to correctly assess damages: very welcome, in this direction, the German reform briefly mentioned in note 3, that prescribe to maintain confidentiality on the firm's economic accounts produce in the proceeding.

In addition to this, a propensity for an *ex post* approach should be suggested to interpreters, since this methodology allows relying on a more precise account of the invention value, not only from a private, but also from a social perspective. In this way, the large uncertainties that have been registered in U.S. case law could be reduced, as well as the discretionary power of courts.

By relying on a larger and more precise set of information, it would also be easier to bespeak torts to a sound economic rationale, leaving little space for exogenous factors to influence the measure of damages and in such a way that patent protection can actively contribute to innovation incentives and to the social welfare.