

# PATENT LITIGATION IN CHINA: CHALLENGING CONVENTIONAL WISDOM

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## ABSTRACT

The People's Republic of China has become a world leader in both patent applications and patent litigation after the Chinese government enacted new policies to stimulate domestic innovation and patent activities. These major developments have made China an integral venue of international patent protection for inventors and entrepreneurs. However, due to the lack of judicial transparency before 2014, most people had virtually no access to Chinese patent litigation data and knew little about how Chinese courts adjudicated patent cases. Instead, outside observers were left with a variety of impressions and had to guess how the courts adjudicates these cases based on the plain texts of the Chinese Patent Law and the limited number of cases released by the press. However, starting January 1, 2014, China mandated public access to all judgments via a database called China Judgements Online (CJO), making empirical studies possible. This Article analyzes all publicly available final patent infringement cases decided by local People's Courts in 2014. Surprisingly, findings in this Article contradict the long-standing beliefs held by many people about patent enforcement in China. One prominent example is that foreign patent holders were as likely as domestic patent holders to litigate and foreign patent holders received noticeably better results—specifically, higher win rates, injunction rates, and average damages. Another example is that plaintiffs won in 80.16% of all patent infringement cases and automatically got permanent injunctions in 90.25% of cases where courts found patent infringement. These new findings indicate that patent protection in China is stronger than once believed.

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## I. INTRODUCTION

The number of patent applications filed with and granted by the State Intellectual Property Office (SIPO) of the People's Republic of China has increased dramatically as a result of recent policies to stimulate domestic innovation.<sup>1</sup> The SIPO received more than 1.33 million filings for invention patents in 2016—a 21.5% increase from 2015—and, for the sixth consecutive year, SIPO received more patent applications than any other patent office worldwide.<sup>2</sup> Moreover, China is becoming a more important and attractive venue for foreign parties to pursue patent cases. A notable example was in 2016, when a subsidiary of WiLAN, a Canadian-based company, filed a lawsuit against Sony, a Japanese electronics company, in Nanjing, a city situated in east China, for alleged patent infringement.<sup>3</sup>

All these major developments in the Chinese patent system have made China an integral venue of international patent protection for foreign inventors and entrepreneurs. In order to protect their intellectual property rights in China more effectively, stakeholders and their lawyers are eager to know how Chinese courts adjudicate patent cases. Due to the lack of judicial transparency in China prior to 2014, there had been virtually no access to patent litigation data. Before 2014, all public knowledge about Chinese patent lawsuits was obtained from either interpreting the plain text of Chinese law and regulations, or analyzing a limited number of published cases that the Supreme People's Court (SPC) considered to have significant social impact. The limited amount of information may not have reflected an accurate landscape of patent

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1. *Patents, Yes; Ideas, Maybe*, ECONOMIST (Oct. 14, 2010), <http://www.economist.com/node/17257940> [<https://perma.cc/G4UB-9H2C>] (“Anxious to promote domestic innovation, the Chinese government has created an ecosystem of incentives for its people to file patents. Professors who do so are more likely to win tenure. Workers and students who file patents are more likely to earn a *hukou* (residence permit) to live in a desirable city. For some patents the government pays cash bonuses; for others it covers the substantial cost of filing. Corporate income tax can be cut from 25% to 15% for firms that file many patents. They are also more likely to win lucrative government contracts. Many companies therefore offer incentives to their employees to come up with patentable ideas. Huawei, a telecoms-equipment manufacturer that craves both government contracts and global recognition, pays patent-related bonuses of 10,000-100,000 yuan (\$1,500-15,000).”).

2. Press Release, State Intellectual Prop. Office of China, *The Statistical Data of the State Intellectual Prop. Office's Work in 2016* (Jan. 19, 2017), [http://www.gov.cn/xinwen/2017-01/19/content\\_5161227.htm#1](http://www.gov.cn/xinwen/2017-01/19/content_5161227.htm#1) [<https://perma.cc/PN5L-B3YM>].

3. See Juro Osawa, *China's Patent-Lawsuit Profile Grows*, WALL ST. J. (Nov. 7, 2016), [www.wsj.com/articles/chinas-patent-lawsuit-profile-grows-1478535586](http://www.wsj.com/articles/chinas-patent-lawsuit-profile-grows-1478535586) [<https://perma.cc/EA4D-B93J>] (“WiLAN's lawsuit is a rare case of a foreign patent-holding entity suing a non-Chinese company in China. It is an indication of how China is becoming a more attractive place to seek legal action for companies that accumulate patents for litigation and licensing purposes.”).

litigation in China, which may have resulted in misleading impressions. For example, there was an impression that Chinese courts had a strong bias toward domestic companies over foreign ones to protect the local economy; that injunctions, either preliminary or permanent, were difficult to obtain under Chinese law; that monetary damages granted by Chinese courts were extremely low and insufficient to compensate patent holders; etc.

This Article aims to evaluate these impressions by exploring a critical question: whether and how the outcome of patent infringement cases in China—the finding of infringement, the granting of injunctions, and the award of damages<sup>4</sup>—can be explained on the basis of observable legal and extra-legal factors. The increase in judicial transparency in China, including the explosion in the public availability of its judicial documents, has made answering this question through concrete empirical data, instead of hearsay, feasible for the first time. On July 1, 2013, the SPC launched China Judgements Online (CJO) and required that all judicial opinions issued on and after January 1, 2014, with a few exceptions, be uploaded to the website.<sup>5</sup> So far, the number of judgments and other judicial documents published on CJO has reached 50,658,073.<sup>6</sup> Although it is still far from complete,<sup>7</sup> an empirical study of this unprecedentedly large volume of judgments will provide many valuable inferences regarding how Chinese courts adjudicate patent infringement to inventors, practitioners, scholars, and anyone who is interested in China and its patent system.

The statistics presented in this Article tell only half of the story of how

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4. Unless otherwise specified, case outcome always indicates these three measures in this Article.

5. See *Zuigao Renmin Fayuan Guanyu Renmin Fayuan zai Hulianwang Gongbu Caiban Wenshu de Guiding* (最高人民法院关于人民法院在互联网公布裁判文书的规定) [Provisions of the Supreme People's Court on the Issuance of Judgments on the Internet by the People's Courts] (promulgated by the Sup. People's Ct., Nov. 21, 2013, effective Jan. 1, 2014), art. 4, CLI.3.213603(EN) [hereinafter *ZUIGAO FAYUAN GUIDING*] <http://www.lawinfochina.com/display.aspx?id=15918&lib=law> [https://perma.cc/89CK-MVF6] (“An effective judicial document of a people's court should be issued on the Internet, except under any of the following circumstances: (1) It involves any state secret or individual privacy; (2) It involves any juvenile delinquency; (3) The case is closed by mediation; or (4) Any other circumstance under which it is inappropriate to issue the judgment on the Internet.”).

6. See CHINA JUDGEMENTS ONLINE, <http://wenshu.court.gov.cn> [http://archive.is/Mzj5t] (last visited Aug. 15, 2018).

7. See Chao Ma, Xiaohong Yu & Haibo He, *Da Shuju Fenxi: Zhongguo Sifa Caipan Wenshu Shangwang Gongkai Baogao* (大数据分析: 中国司法裁判文书上网公开报告) [Data Analysis: Report on the Publication of Chinese Judicial Decisions on the Internet], 12 CHINA L. REV. 195, 208 (2016) (listing the ratios of the number of judicial documents of each province publicly available on CJO to the number of cases adjudicated in each province, ranging from 15.17% to 78.14%).

Chinese courts adjudicate patent cases, because this Article only examines infringement litigation. China currently has a bifurcated patent litigation system, in which infringement and validity of a patent are brought in separate proceedings in different courts. Thus, the data presented in this Article depict an incomplete picture of patent enforcement in China and should always be viewed jointly with the information on patent validity cases.

Beyond the brief introduction Part I of this Article provides, Part II explores the contemporary knowledge in two existing academic bodies—the empirical study of patent litigation and the Chinese patent system. The literature review situates this Article at the intersection of these two areas, and demonstrates this Article’s unique contribution to these bodies of literature. Part III explains the methodology used, defines the population studied in this article, and presents legal and extra-legal factors implicated in the study. It specifies the potential limitations and challenges of this Article, and the efforts to manage them. Part IV enumerates all findings in the form of detailed descriptive statistics. It also tests hypotheses regarding the relationship between the legal and extra-legal factors, as well as the final case outcome. Lastly, Part V summarizes the key findings from the descriptive and inferential statistics and reaches a conclusion on the question as to which factors really matter in the case of a Chinese court finding infringement, granting injunctions, and determining damages.

## II. LITERATURE REVIEW

The research here focuses on producing empirical data to explore how courts adjudicate patent infringement cases in China. It builds on and contributes to two separate but theoretically overlapping bodies of academic scholarship: the empirical study of patent litigation and the Chinese patent system. This Part first summarizes the existing research in these two fields, then reviews an article that lies at the intersection of these two bodies of literature and is most relevant to the research presented here, and finally formulates a novel theoretical argument.

### A. THE EMPIRICAL STUDIES OF PATENT LITIGATION

Over the past twenty to thirty years, a rapidly growing body of empirical data has been developed to study patent litigation in the United States. Based on their various goals, these studies can be divided into three different types: research to provide basic facts, research to lift the veil on adjudication, and research to answer normative questions. A detailed literature review of each type is presented below.

In the early years of this period, research studies were quite general and simple. Their goals were usually to develop basic information about what a

court or a set of courts had done with regard to a particular issue. In his 1989 study, Ronald B. Coolley tried to establish what the Federal Circuit had done during the first six years of its existence by analyzing 322 judicial opinions.<sup>8</sup> His observations incorporated the number of opinions and dissents written by each judge, the number of judgments originally decided by each lower tribunal that were affirmed or reversed by the Federal Circuit, and the number of judgments involving different subjects of appeal that were affirmed or reversed by the Federal Circuit. In another article, Coolley conducted useful research focused on supplementing the well-understood legal theories behind damage awards by calculating the number, amount, and components of patent damages in 152 decisions.<sup>9</sup> Although this kind of pure counting work did not answer any specific normative questions, it assisted practitioners with making decisions regarding litigation and client counseling, and it benefited academic study by forming the foundation for more advanced empirical research in the future.

Subsequently, empirical studies became more sophisticated and question-focused. Some scholars began to use empirical techniques to explore how courts adjudicated cases, with a view to establishing what the relationship was between various identifiable factors and the final case outcome. John R. Allison and Mark A. Lemley examined how patents survived validity challenges.<sup>10</sup> They produced a database of 299 patents litigated in 239 lawsuits between 1989 and 1996 and used this database to develop descriptive statistics to test hypotheses. They proposed that patent validity may be influenced by factors such as the grounds for attacking validity, the finder of fact, subject matter of the invention, nationality of inventors, claim disaggregation, prior art citations, cited and uncited art, elapsed time, appeals, multiple patents in suit, and where the case is litigated.<sup>11</sup> Disappointingly, but not surprisingly, they found that only one factor—the finder of fact—displayed a significant predicative value to the final outcome.<sup>12</sup> Michael J. Mazzeo, Jonathan Hillel, and Samantha Zyontz undertook further important research to predict patent infringement awards.<sup>13</sup> They conducted a large-scale econometric analysis of

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8. See Ronald B. Coolley, *What the Federal Circuit Has Done and How Often: Statistical Study of the CAFC Patent Decisions - 1982 to 1988*, 71 J. PAT. & TRADEMARK OFF. SOC'Y 385, 385–86 (1989).

9. See Ronald B. Coolley, *Overview and Statistical Study of the Law on Patent Damages*, 75 J. PAT. & TRADEMARK OFF. SOC'Y 515, 515 (1993).

10. See generally John R. Allison & Mark A. Lemley, *Empirical Evidence on the Validity of Litigated Patents*, 26 AIPLA Q.J. 185 (1998).

11. *Id.* at 198–201.

12. *Id.* at 213.

13. See Michael J. Mazzeo, Jonathan Hillel & Samantha Zyontz, *Explaining The "Unpredictable": An Empirical Analysis of U.S. Patent Infringement Awards*, 35 INT'L REV. L. &

award values, together with certain characteristics of litigants and patents at issue, including identifiers,<sup>14</sup> dates,<sup>15</sup> location,<sup>16</sup> other case information,<sup>17</sup> general assignee,<sup>18</sup> NBER assignee,<sup>19</sup> assignee identifiers,<sup>20</sup> assignee patent identifiers,<sup>21</sup> SIC codes,<sup>22</sup> general patent,<sup>23</sup> and patent classification.<sup>24</sup> They

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ECON. 58 (2013).

14. *Id.* at 65 (defining “identifiers” as “[v]ariables including a unique ID assigned by the authors, the docket number of the case, and the full names of the first listed plaintiff and defendant in the case”).

15. *Id.* (defining “dates” as “[v]ariables including the year of the original award in district court, date the complaint for case was filed, the earliest start date of trial on validity, infringement, or damages, and the number of days between the trial start date and the complaint date”).

16. *Id.* (defining “location” as “[v]ariables including where the case was litigated, including state, circuit, and court”).

17. *Id.* (defining “other case information” as “[v]ariables determining if the case contained a summary judgment for the patent holder on validity and/or infringement, if the case involved an invalidated patent-at-issue, and if the patent holder was successful in its patent claims”).

18. *Id.* (defining “general assignee” as “[i]nclud[ing] number of patent assignees associated with the patents-at-issue in the case, the names of the assignees, if one of the assignee(s) is the first named plaintiff or defendant in the case (can be both), if the plaintiff name listed is an assignee (patent holder), and if the patent holder markets or manufactures its technology covered by the patent”).

19. *Id.* (defining “NBER assignee” as “[d]ummy variables from the 2002 NBER database which coded the Assignee(s) as ‘Unassigned,’ ‘US, Non-Government,’ ‘Non-US, Non-Government,’ ‘US, Individual,’ ‘Non-US, Individual,’ ‘US Government,’ or ‘Non-US, Government’”).

20. *Id.* (defining “assignee identifiers” as “[i]nclud[ing] the variables determining whether or not the first named plaintiff or defendant are an individual, private entity, public entity, university, part of the U.S. government, a domestic entity, foreign entity, part of the 2009 Fortune 500 list, part of the 2009 Fortune 1000 list, a subsidiary of a parent company”).

21. *Id.* (defining “assignee patent identifiers” as “[v]ariables for the parent companies of the plaintiff or defendant listed if it was a subsidiary that include whether or not the parent company is a private entity, public entity, domestic entity, foreign entity, part of the 2009 Fortune 500 list, part of the 2009 Fortune 1000 list, if the first named plaintiff or defendant is owned by a joint venture (2 parents or more)”).

22. *Id.* (defining “SIC codes” as “[v]ariables identifying the 2-, 3-, and 4- digit SIC codes for the potential infringers”).

23. *Id.* (defining “general patent” as “[v]ariables identifying the number of patent(s) at issue in the case and their type as either utility, reissue, design, or application number”).

24. *Id.* (defining “patent classification” as “[i]nclud[ing] variables for all patents-at-issue such as application year calculated for minimum and maximum (minimums and maxima differ for cases with multiple patents-at-issue and are the same for cases with only one patent-at-issue); grant date year calculated for minimum and maximum; grant date calculated for minimum and maximum; age of the oldest and youngest patent-at-issue in a case calculated for minimum and maximum; number of claims calculated for minimum, maximum, average and total; number of forward citations through 2002 from the NBER 2002 data, calculated for minimum, maximum and average; number of forward citations through 2010 if the 2002 forward citations were not available, calculated for minimum, maximum and average; the IPC4

carried out this work based on 340 cases decided by federal courts from 1995 to 2008, and found that infringement awards were not unpredictable, as was commonly thought.<sup>25</sup> Instead, such awards could be predicted on the basis of several critical *ex ante* identifiable factors collectively.<sup>26</sup>

Other scholars addressed normative problems via comprehensive empirical studies. In 2013, Brian J. Love conducted very interesting research to identify a way to destroy patent trolls without impairing actual inventors.<sup>27</sup> After analyzing the infringement claims of a group of recently expired patents, Love found product-producing companies and nonpracticing entities (NPEs) chose to enforce their patent rights at significantly different stages of infringement: producing companies usually commenced their enforcement activities soon after issuance and completed them in the middle of their patent term, while NPEs started relatively late and would not end enforcement until their patent expired.<sup>28</sup> Based on these findings, he then proposed that patent trolls could be eradicated by reducing patent terms.

No matter what particular category the aforementioned studies fall into, they are all tailored to the patent litigation system in the United States. The use of empirical data to analyze patent lawsuits in other jurisdictions, such as China,<sup>29</sup> could be regarded as untrodden territory. However, as China's patent system has become increasingly important to the whole international patent system, practitioners, scholars, and policymakers around the world are showing profound interest in whether and how courts in China protect patent rights. To fill this gap, this Article will follow the practice of producing empirical data—which U.S. scholars have used to reveal valuable insights about how courts adjudicate cases in the United States—to study patent litigation in China.

## B. THE CHINESE PATENT SYSTEM

The language barrier and an unfamiliar legal system impede most U.S. scholars and lawyers in their attempts to learn and understand China's patent

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classification listed first on the patent; and the PTO main classification for each patent listed in the case").

25. *Id.* at 69.

26. *Id.*

27. See generally Brian J. Love, *An Empirical Study of Patent Litigation Timing: Could a Patent Term Reduction Decimate Trolls Without Harming Innovators?*, 161 U. PA. L. REV. 1309 (2013).

28. *Id.* at 1331.

29. There are only a few scholarly works analyzing patent litigation lawsuits using empirical data. See, e.g., Brian J. Love, Christian Helmers & Markus Eberhardt, *Patent Litigation in China: Protecting Rights or the Local Economy?*, 18 VAND. J. ENT. & TECH. L. 713 (2016) (using five years of data, between 2006 and 2011, on patent suits litigated in Chinese intellectual property courts to analyze the patent system in China).

law and practice directly from Chinese documents. Therefore, research papers introducing the recent developments in patent law and regulations in China, as well as interesting Chinese cases, by authors with first-hand knowledge have been emerging to make Chinese patent law more accessible to English-speaking audiences. For example, soon after the revision of Patent Law of the People's Republic of China ("Patent Law of China") in 1992, David Hill and Judith Evans drafted a paper to illustrate the major changes adopted in this revision.<sup>30</sup> They concluded that the revision had strengthened patent rights in China and encouraged foreign patent holders to stimulate investment in China.<sup>31</sup> Xintian Yin undertook a similar analysis of how the patent system in China has been improved after the 1992 revision.<sup>32</sup> His work was distinguished from that of Hill and Evans by also addressing patent protection and the practice of patent application and examination in China.<sup>33</sup>

As basic knowledge of China's patent system increased, comparative research was conducted to compare and contrast specific patent policies in China to their counterparts in the western countries, such as the United States. In a 2013 article,<sup>34</sup> Timothy Lau explored the rationale for and against the prior art defense<sup>35</sup> based on the Chinese approach which ties the prior art defense to the doctrine of equivalents. He then suggested that the United States might benefit from introducing the prior art defense.<sup>36</sup> Other research, undertaken by Haitao Sun, compared the post-grant patent invalidation system in China with the relatively successful invalidation systems in the United States, the European Patent Convention, and Japan.<sup>37</sup> Sun found that the Chinese system closely resembled the others and predicted that Pfizer's case regarding its

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30. See David Hill & Judith Evans, *Chinese Patent Law: Recent Changes Align China More Closely with Modern International Practice*, 27 GEO. WASH. J. INT'L L. & ECON. 359 (1993–1994).

31. *Id.* at 392–93.

32. See generally Xintian Yin, *A Brief Introduction to the Patent Practice in China*, 9 DUKE J. COMP. & INT'L L. 253 (1998). Xintian Yin was the Deputy Principle Director of Administrative Department for Patent Examination at SIPO. His viewpoints on how much the patent system has been improved may be biased in light of his background.

33. *Id.* at 256–57.

34. See Timothy Lau, *Defensive Use of Prior Art to Exonerate Accused Act in U.S. and Chinese Patent Litigation*, 27 COLUM. J. ASIAN L. 51, 67–77 (2013).

35. The prior art defense is a defense to an assertion of patent infringement by arguing that the accused acts fall within the prior art. See *id.* at 55.

36. *Id.* at 78. ("We concluded that the United States would benefit from an introduction of the practicing the prior art defense, and that the Chinese linkage of the existing technology defense with equivalence is a well-calibrated approach.")

37. See generally Haitao Sun, *Post-Grant Patent Invalidation in China and in the United States, Europe, and Japan: A Comparative Study*, 15 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 273 (2004).

Chinese patent for Viagra might be fairly resolved in a Chinese court.<sup>38</sup>

The introductive and comparative research referred to above has enriched the knowledge of patent law in China for scholars who are not well-versed in Mandarin Chinese. However, empirical study, as a helpful tool to supplement these widely studied legal theories, has rarely been applied. This Article aims to fill this gap by transplanting the empirical techniques used by U.S. scholars to answer how courts in China adjudicate patent infringement cases.

### C. MOST RELEVANT RESEARCH

The research in this Article lies at the intersection of the two literature streams referred to above: the empirical study of patent litigation and the Chinese patent system. Although comparatively little research has been conducted in this area, it is not completely unexplored. There is, for example, an article co-authored by Brian J. Love, Christian Helmers, and Markus Eberhardt published in 2016 that evaluates the long-standing belief that patent litigation in China acts primarily to facilitate domestic industries at the expense of foreign firms.<sup>39</sup> After analyzing 471 patent suits in China, the authors found that Chinese patent litigation cases were frequently brought in several major urban areas instead of smaller inland cities where protectionism is alleged to occur. They also found that foreign companies often appeared as patent holders, rather than infringers, in Chinese patent lawsuits and had similar win rates to domestic Chinese companies. Their findings challenged the conventional belief of protectionism and suggested an opposite conclusion: China has created a system that benefits foreign interests at the expense of domestic ones.<sup>40</sup>

While the Love article provides new insights to this research, it has at least three clear drawbacks. First, the judgments it collected and analyzed—471 judicial opinions decided between 2006 and 2011—constitute only a small part of all patent litigation cases adjudicated in China and are rather out of date. Things have changed dramatically over the past six years. One prominent example is the increasing number of publicly available judicial opinions. Second, the article provided descriptive statistics only with regard to the cases it gathered, without making any predictions relating to the overall picture of patent litigation in China. This Article addresses these two problems by collecting a much larger number of written judgments, 1,663, decided in a more recent year, 2014, and using statistical testing to make predictions. Third, Love limited his research objectives to disputes over invention patents only. He did this on the basis of the legal convention that the term “patents” usually

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38. *Id.* at 330.

39. *See* Love et al., *supra* note 29.

40. *Id.* at 739–40.

refers to invention patents.<sup>41</sup> However, the two other types of patents recognized by Chinese patent law, utility model patents and design patents, comprise a much larger part of patent infringement litigation in China than invention patents. This Article covers all three patent types and aims to achieve a more comprehensive understanding of patent litigation in China.

#### D. THEORETICAL ARGUMENT

The reason empirical research was rarely conducted when studying China's patent litigation is obvious: publicly available judgments in China, a prerequisite for producing empirical data, were scattered because the collection and publication of judicial opinions was not customary in China prior to 2014. However, with the ongoing judicial reform in China, this obstacle has to some extent been removed. In 2013, the SPC took a groundbreaking step in launching CJO, an online database gathering and providing existing judicial opinions. It then mandated public access, via this database, to all judgments made on and after January 1, 2014.<sup>42</sup> Although it will take some time for this policy to be fully implemented, approximately half of the cases which should be made public can now be found on CJO.<sup>43</sup>

The research for this Article aims to take advantage of this unprecedentedly enormous number of available judgments to explore a basic but crucial question: how Chinese courts adjudicate patent infringement cases. It provides two major categories of information: descriptive statistics relating to the 1,663 patent infringement cases collected from CJO, and an examination of how patent infringement cases in general, based on the superpopulation of the 1,663 cases gathered, are decided in China. Based on the existing empirical literature of patent lawsuits, this Article assembles various sets of data, including both dependent variables—case outcomes, and independent variables—factors that could potentially explain those outcomes. A list of variables that have been considered important by existing literature, as well as variables discussed in this Article, is presented below. Some variables that have been considered important by existing literature are excluded in this Article based on the reasons provided below.

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41. *Id.* at 714 n.1.

42. *See* ZUIGAO FAYUAN GUIDING, *supra* note 5.

43. *See* Ma et al., *supra* note 7.

**Table 1: Variables Not Covered in This Research**

Variables	Sources	Reasons for Exclusion
Specific Judges	Coolley (1989)	Unlike Coolley's article, which studied a set of cases decided by a single court, this Article analyzes cases decided by all Chinese courts in 2014, meaning hundreds or even thousands of judges may be involved.
Subject of Appeal	Coolley (1989)	Since this Article only focuses on patent infringement cases, all appealed cases included in the superpopulation have the same subject: finding of infringement.
Breakdown of Damages	Coolley (1993)	These data are missing for some judgments.
Finder of Facts	Allison (1998)	There is no jury system in China.
Multiple Claims	Allison (1998)	Though claim disaggregation may make a difference in validity cases, it does not affect infringement cases that much.
Prior Art Citations	Allison (1998)	Though prior art citations may make a difference in validity cases, they do not affect infringement cases that much.
Cited vs. Uncited Prior Art		Though whether to invalidate a patent on the basis of cited or uncited prior art may make a difference in validity cases, it does not affect infringement cases that much.
Multiple Patents in Suits	Allison (1998)	As a technical issue, Chinese courts usually draft multiple judgments, with different docket numbers for multiple patents brought in one infringement suit. Thus, this variable cannot be directly recognized from written judgments.

**Table 2: Variables Covered in This Research**

	Variables	Previous Research <sup>44</sup>
Dependent Variables	Ruling	Coolley (1989), Allison (1998), and Love (2016)
	Damages	Coolley (1993) and Love (2016)
	Injunctions	Love (2016)
Independent Variables	Subject Matters	Allison (1998), and Love (2016)
	Inventors	Allison (1998)
	Assignees	Love (2016)
	Elapsed Time	Allison (1998), and Love (2016)
	Appeals	Allison (1998) and Love (2016)
	Locations	Coolley (1989), Allison (1998), Love (2016)

This Article will contribute both to the existing empirical literature on patent litigation by focusing on a new and attractive jurisdiction, China, and to the current study of Chinese patent law system by adducing empirical insights. This Article aims to assist entrepreneurs and their lawyers to make better decisions when facing Chinese patent issues, as well as creating fertile ground for scholars around the world who are interested in the subject matter to conduct further empirical studies relating to patent litigation in China.

### III. STUDY DESIGN

This Part is organized as follows: First, it breaks the methodology used in this Article into four major steps. Then, it defines the population studied in this article and presents legal and extra-legal factors implicated in the study. Finally, this Part specifies the potential limitations and challenges of this Article and the efforts to manage them.

#### A. METHODOLOGY

The methodology used in this Article involves four major steps. In Step I,

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44. This Figure uses the last name of first author and the year published to identify which article considered a certain variable important. Coolley, *supra* note 8; Coolley, *supra* note 9; Allison & Lemley, *supra* note 10; Love, *supra* note 27.

I gather all the decisions included in the defined population from CJO and their corresponding patent files from SIPO's database. In Step II, I order the cases and variables to be studied by creating a data matrix and fill in the value for every case-variable combination. Incomplete cases, which are missing one or more variables, are not excluded from the data matrix in this step. However, they may have to be removed when presenting data, if such presentation requires a complete data matrix.

In Step III, I present the information in the data matrix by creating tables and graphs according to the levels of measurement to provide some basic ideas about how the 1,663 patent infringement cases included in the judgment pool were decided. In most cases, frequency tables are provided to illustrate how the values of a categorical variable, such as patent type, are distributed. For quantitative variables, such as elapsed time, I recode their values and build new ordinal categories.<sup>45</sup> These descriptive statistics may be reported one variable at a time. They may also be cross-tabulated in several different ways to emphasize certain interesting patterns.

In Step IV, I provide general predictions of how patent infringement cases are decided by Chinese courts. By taking the defined population as a subset of a superpopulation—all past and future final decisions of patent infringement cases in China—Step IV tests several hypotheses to evaluate the statistics produced in Step III. All hypotheses tested in this Article are in the null form, positing no relationship between a certain variable and a case's final outcome—the finding of infringement, the granting of injunctions, and the awarding of damages. If the p-value<sup>46</sup> is .05 or less,<sup>47</sup> then the hypothesis can be rejected with sufficient confidence, indicating that any relationships observed are statistically significant.

## B. POPULATION

The population for this Article contains all final patent infringement cases decided by local people's courts in 2014 and publicly available on CJO. By

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45. For example, to evaluate how elapsed time influences the final outcome of patent infringement cases in China, I recode quantitative time information collected into several intervals; that is, each piece of time information is arranged into one of two time intervals—"short" or "long"—based on whether it is shorter than the average time of its own category. Although some information may be lost in the recoding process, the process provides a better overview.

46. The p-value is a measure of the confidence with which a null hypothesis can be rejected.

47. This is called the significance level, i.e., how small the p-value needs to be to reject the null hypothesis. The most commonly used significance level is 0.05. *See, e.g.*, John R. Allison et al., *How Often Do Non-Practicing Entities Win Patent Suits?*, 32 BERKELEY TECH. L.J. 237, 259 nn.90–91 (2017).

including all cases within this definition, this Article constitutes a population study rather than a sample study.

### 1. *Units of Observation*

Data are collected and analyzed on a case-by-case basis. Here, a case is defined as a patent infringement lawsuit documented in one judicial opinion with a unique docket number and involved one disputed patent. Of all the cases downloaded from CJO, twenty-three did not comply with this definition, as they related to more than one docket number or disputed patent. Rather than attempting to divide cases by the included patent, this Article excludes these cases from the analyzed judgments.<sup>48</sup>

### 2. *Source of Cases*

There are several existing judicial databases in China. Theoretically, each could serve as the source of judgments for the purpose of this research. However, when taking authority, transparency, and accessibility into consideration, CJO stands out. Below is a table comparing and contrasting CJO to two major Chinese databases: CIELA<sup>49</sup> and IPHouse.<sup>50</sup>

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48. For cases with multiple patents at issue, the hardest part of breaking up those opinions is to divide damages. Taking *Lianyi Dianzi (Huizhou) Youxian Gongsi, Shenzhen Shiyuan Chuangshidai Keji Youxian Gongsi (联毅电子(惠州)有限公司诉深圳市元创时代科技有限公司)* [*Lianyi Electronics, Ltd. v. Shenzhen Shiyuan Chuangshidai Tech. Ltd.*], CHINA JUDGMENT ONLINE (Shenzhen Intern. People's Ct. June. 14, 2014) as an example, four different patents were involved, while only the total damages were given. For cases with multiple docket numbers, the hardest part is assigning defendants. For example, *Tang Yongzhu, Guilin Hongcheng Kuangshan Shebei Zhizao Youxian Zeren Gongsi (唐永竹诉桂林鸿程矿山设备制造有限责任公司)* [*Tang v. Guilin Hongcheng Kuangshan Equip. Mfg.*], CHINA JUDGMENT ONLINE (Shandong Higher People's Ct. July. 16, 2014) was brought against two defendants and have multiple docket numbers. There is no way to establish whether both of them were sued in all three cases.

49. CIELA is the database that other scholars, such as Professor Love, have used when drafting empirical work on Chinese patent litigation. See Love et al., *supra* note 29, at 723.

50. IPHouse is a commercial database providing statistics on IP-related litigation in China. See IPHOUSE, <http://en.iphouse.cn/> [<https://perma.cc/B2FC-A86U>] (last visited Sept. 26, 2018).

**Table 3: Comparison of Databases**

	<b>CJO</b>	<b>IPHouse</b>	<b>CIELA</b>
Owner	SPC	Private Company	Law Firm
Number of Judgments <sup>51</sup>	Available	Not Available	Available
Accessible Judgments <sup>52</sup>	All	Top 300	None

As the only database created and operated by the SPC, CJO collects judicial documents directly from all levels of People's Courts, making it more authoritative than commercial databases, which gather documents indirectly from other databases. Meanwhile, CJO shows a higher level of transparency and accessibility in its search function compared to IPHouse and CIELA. When an advanced search is executed, CJO provides both the number of judgments found and the full text of every single document satisfying the criteria. In contrast, IPHouse keeps the number of results found secret and displays only the first 300 judgments that satisfy the criteria. CIELA is a little different; it provides charts and tables of different characteristics of a group of cases and does not provide access to the texts of judgments.

### 3. *Patent Infringement Cases*

My research focuses on patent infringement cases decided by Chinese courts. Administrative appeals—whether resulting from the rejection of patent applications by SIPO, from patent validity decisions made by the Patent Reexamination Board of SIPO, or from administrative decisions concerning patent infringement actions made by local intellectual property offices—are beyond the scope of this Article. Nor are cases asking for non-infringement confirmation of others' patent rights or declaratory judgments included. This is not to say that administrative appeals and non-infringement confirmation cases are less valuable than infringement cases. Rather, they are so numerous that a separate, independent research project should be conducted. Expanding the current research to include these types of cases would render it too broad, and important details could be missed.

### 4. *Final Decisions*

“Final decisions” here refer to at least two things. First, only cases finally adjudicated by a court are included. Cases settled before a final judgment are not considered due to the lack of publicly available records. Second, with

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51. When an advanced search is conducted, this variable indicates whether the database provides the number of judgments found.

52. When an advanced search is conducted, this variable indicates how many judgments are accessible to the general public.

regard to cases not appealed, their first instance judgments are taken as their final decisions, whereas a second judgment following an appeal prevails.

It should be noted that in this Article, all first instance judgments whose second instance decisions cannot be found on CJO are regarded as not appealed. This definition may raise several problems (see Section III.D), but it seems to be the only choice with no available alternatives. Meanwhile, all second instance judgments downloaded directly from CJO are deemed to be final decisions.<sup>53</sup> Since second instance decisions usually summarize an inferior court's opinion in the first instance trial, it is not necessary to collect information from related first instance judgments—at least for the purpose of this Article.

#### 5. *Cases Decided by Local People's Courts*

Since cases decided by the SPC have been widely examined before and are better studied on a case-by-case basis, this Article focuses only on cases decided by local People's Courts. As most cases are solved at the lower court level, I believe that cases decided by local courts are as important as, if not more important than, cases adjudicated by the SPC. "Local People's Courts" here refer to the first three levels of courts in China's four-level court system: (1) Basic-level People's Courts (at the level of counties and municipal districts), (2) Intermediate People's Courts (at the level of cities), (3) Higher People's Courts (at the level of the provinces), and (4) the Supreme People's Court (at the highest level of the court system whose cases this Article will not address).<sup>54</sup>

#### 6. *Date Range*

In order to achieve the highest level of inclusiveness, the time range of the cases analyzed is limited to the year 2014. In accordance with the SPC's decision, only cases decided after the date when the decision came into force—January 1, 2014—are mandated to be published on CJO.<sup>55</sup> The vast majority of judgments in 2013 and preceding years were not reported since Chinese courts had no tradition of disclosing their decisions on a regular basis.<sup>56</sup> Meanwhile, it takes two years for courts of every level to upload their judicial opinions.<sup>57</sup> Thus when the judgments were collected for the purpose of this

53. See *Minshi Susong Fa* (民事诉讼法) [Law on Civil Procedure] (promulgated by the Standing Comm. Nat'l People's Cong., April 9, 1991), art. 175 ("The judgments and rulings of a people's court of second instance shall be final.").

54. As may be surmised, the fourth level of court in China is the Supreme People's Court in Beijing.

55. See *supra* note 5.

56. See Ma et al., *supra* note 7, at 207 fig.5 (showing that the number of judicial opinions available on CJO consistently increased from 2001 to 2013, then jumped from 2013 to 2014).

57. See *id.* at 224 tbl.31 (showing that 92.73% of decisions were uploaded within a year

research in 2016, it was reasonable to infer that only cases decided in 2014 would be completely published.

Studying cases decided in one calendar year also makes it possible to observe trends across time. By conducting further research on cases adjudicated in subsequent years and comparing the data to the statistics produced in this Article, many interesting and important questions may be answered, such as whether patent protection in China has been strengthened over time, or whether foreign patent holders are more willing to enforce their rights in China as legal transparency is growing.

### C. DATA COLLECTED

For every single case included in the population defined above, this Article collects information both legal and extra-legal variables, which can be categorized into three major types. The first type includes the dependent variables this Article tries to explain: infringement found, injunctions granted, and damages awarded. The second type represents independent variables that comprise several potentially explanatory factors that can be used to explain a court's decisions in patent infringement lawsuits. The third type contains data that have nothing to do with the explanatory relationship, but are technically indispensable.

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of being made; 7.18% of decisions were uploaded after a year but within two years of being made).

**Table 4: Variables Covered in This Research**

Variables	Explanation	Notes
<b>Dependent Variables</b>		
Infringement	Whether there was a finding of infringement by the court.	Always explicitly stated in the judgments.
Injunctions	Whether there was an injunction granted by the court after infringement was found.	This variable is limited to permanent injunctions, since whether a preliminary injunction was granted cannot be determined from a written judgment.
Damages	Whether damages were awarded by the court after infringement was found and in what amount.	Includes compensation for infringement and compensation for reasonable expenses paid by patent holder, such as attorney fees, to stop infringement activities.
<b>Independent Variables/Explanatory Factors</b>		
Subject Matter	To which International Patent Classification class the litigated invention patent or utility model belongs; To which Locarno Classification class the litigated design patent belongs.	Identified by the International Patent Classification number <sup>58</sup> or Locarno Classification number <sup>59</sup> listed on patent files.
Patent Types	Whether the patent concerned is an invention patent, utility model, or design patent. <sup>60</sup>	Always explicitly stated in the patent files.

58. See *International Patent Classification (IPC)*, WORLD INTELLECTUAL PROP. ORG., <http://www.wipo.int/classifications/ipc/ipcpub> [https://perma.cc/M8TK-ZNCK] (last visited Aug. 17, 2018).

59. See *Locarno Classification*, WORLD INTELLECTUAL PROP. ORG., <http://www.wipo.int/classifications/locarno/locpub> [https://perma.cc/VB5A-A6T5] (last visited Aug. 17, 2018).

60. There are three types of patents available in China: invention patent, utility model, and design patent. See *infra* note 84.

Residency of the Plaintiff	Whether the plaintiff resides in mainland China or in a foreign country.	The addresses of plaintiffs who are patentees of the patent concerned are always recorded in the patent files; The addresses of plaintiffs who are assignees of the patent concerned can be found in the assignment record in SIPO's database.
Elapsed Time	How long the patent concerned spent in each phase, including the length of time it spent in prosecution, the length of time elapsed between issuance and the final court decision, and the overall time from filing to final decision.	The dates of filing and issuance of the patent concerned are listed in patent files. The date of the final decision by the court can be discerned from the judgment. Calculations are needed.
Jurisdiction	In which province the case was litigated.	Can be identified directly from the final judgments.
<b>Other Variables</b>		
Identifier	The docket number of the case.	Starts with a four-digit number indicating the year, and ends with a Chinese character Hao ("number"). Usually appears at the beginning of a judicial opinion right under the title Min Shi Pan Jue Shu ("civil judgment").

#### D. LIMITATIONS

This project involves several major limitations and challenges. This Section demonstrates what those potential limitations might be and how they are managed in the course of this research.

### 1. *Population Biases*

Perhaps the most controversial part of this Article's study design is its definition of the population. Ideally, to answer the questions of whether and how legal and extra-legal factors influence the final outcomes in Chinese patent lawsuits, the population should be defined as all patent infringement cases ever adjudicated by local People's Courts in China. However, this is not feasible due to the huge numbers of missing judicial documents from cases adjudicated in China before 2014 and the post-2014 judicial reform, which has yet to fully achieve its goal.<sup>61</sup>

Another population bias may be introduced by limiting the population to final decisions. If there is no second instance judgment of a case from CJO, this study assumes the case was never appealed and includes its first instance judgment in the judgment pool as its final decision. However, this may not be the case when missing documents are taken into account. There might be certain appealed cases for which no second instance documents are publicly available and whose first instance results are wrongfully treated as final results. Nevertheless, based on the affirmance and reversal data illustrated in Table 35, the appellate courts affirmed lower courts' verdicts in a significant portion (85.03%) of second instance cases. Therefore, it might be reasonable to conclude that the missing documents will not bring strong bias to this research.

### 2. *Inherent Limitations*

The variables this Article tests are limited to legal and extra-legal factors that can be identified in written judgments and patent files. However, there might be other variables that cannot be observed directly from such printed documents yet affect the final case outcome. An obvious example is the numerous characteristics of people involved in a case, including but not limited to the competence of each party's lawyers and the personal background and experience of judges. This does not imply that the study design of this research project is problematic, however. It simply means that further research is needed to tell the whole story of how Chinese courts adjudicate patent infringement.

Meanwhile, making predictions about the superpopulation based on the previously defined population rests on the assumption that all conditions remain the same and will continue to be the same. This is not always the case. Science and technology are developing extremely rapidly, as are people's perceptions and social norms. Laws and regulations, while they always take time to respond, are changing over time as well. This research project, by its very nature, cannot reflect these important changes when making predictions

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61. See Ma et al., *supra* note 7.

of how patent infringement cases are generally decided in China. However, the goal of this research is not to provide exact predictions regarding what happened in a certain historical period or what will happen in the future. I merely aim to offer some basic material on the basis of which people can make their own, more accurate, predictions when taking these changes into consideration.

Finally, some people might question the subjectivity problem inherent in coding. When converting written judgments into hard numbers by reading and analyzing natural language, personal judgments are often involved, which might cause bias. I adopt at least three different strategies to reduce this risk. First, I code by myself without hiring any outside coders, which raises no inter-coder reliability issue. Second, I code the judgments by writing a computer program and generating patterns to scrape the data, which diminishes personal inconsistency that might occur with time. Third, I use concrete rules, especially existing rules, to delimit different subcategories. For example, I use the International Patent Classification number shown on patent documents, rather than subjective judgments, to characterize litigated patents into different subject matter areas.

At minimum, this Article is a statistical analysis report on patent infringement cases currently available on CJO. All the descriptive statistics can serve as a great aid for those who are trying to get a deeper understanding of patent litigation in China.

#### IV. OBSERVATIONS

This Part presents the information in the data matrix by discussing how various factors influence the outcome of patent infringement cases in China. It also tests several interesting hypotheses to identify potential explanatory variables of infringement, injunctions, and damages.

##### A. DEPENDENT VARIABLE I—INFRINGEMENT

Of the 1,663 cases included in the population, infringement was found in 1,333 (80.16%) decisions by the court and non-infringement was found in 330 (19.84%) decisions. Table 5 below lists the detailed results:

**Table 5: Infringement**

	Total	No. Infringed	No. Not Infringed
Total	1,663 (100%)	1,333 (80.16%)	330 (19.84%)
1st Instance	1,055 (100%)	856 (81.14%)	199 (18.86%)
2nd Instance	608 (100%)	477 (78.45%)	131 (21.55%)

For the 1,055 cases whose first instance judgments were included in the judgment pool as their final decision, infringement was found in 856 (81.14%) decisions and non-infringement was found in 199 (18.86%) decisions. For the 608 second instance judgments included, infringement was found in 477 (78.45%) decisions and non-infringement was found in 131 (21.55%) decisions.<sup>62</sup> These startlingly high win rates<sup>63</sup> might be the result of the gradual maturity of China's judicial patent enforcement system. That is, when such system was weak in the past, patent holders refrained from pursuing litigation. Thus, a great amount of high quality patents piled up and were not litigated until the patent enforcement system in China matured to some extent. Another possible explanation is that the parties err significantly in estimating case outcome due to the long history of lack of judicial transparency in China. According to the Priest-Klein hypothesis, plaintiff victories will eventually converge to 50% as both party's error in estimating the outcome diminishes.<sup>64</sup>

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62. These similar win rates among first and second instance cases indicate that the potentially missing second instance judgments may not cause significant biases, at least for this variable.

63. "Plaintiff win" here is defined as cases terminated with infringement found for at least one claim. Plaintiff win rates in China were higher than those in many major countries. For example, from 2006 to 2012, the average plaintiff win rates in first instance patent infringement litigations in Germany, another bifurcated country, was sixty-six percent. The win rate for unified patent lawsuits in the United States was sixty percent. See BLOOMBERG BNA, ANNUAL GLOBAL PATENT LITIGATION REPORT 2014 (2015), <https://www.darts-ip.com/newsletter/201508/AnnualGlobalPatentLitigationReport2014.pdf> [<https://perma.cc/QN3P-ZXXA>]. It should be emphasized that this Article focuses on final written judgments only. In other words, cases in which actions were dismissed by plaintiffs are not included due to the lack of publicly available records. Based on the White Paper released by China's Supreme Court, more than seventy percent of intellectual property cases filed in China in 2014 were ended by voluntary dismissal. See WORLD INTELLECTUAL PROP. ORG., WHITE PAPER ON THE STATUS OF THE JUDICIAL PROTECTION OF INTELLECTUAL PROPERTY RIGHTS IN CHINESE COURTS IN 2014 (2015), <http://www.wipo.int/wipolex/en/details.jsp?id=15689> [<https://perma.cc/4XE8-FT2N>].

64. See George L. Priest & Benjamin Klein, *The Selection of Disputes for Litigation*, 13 J. LEGAL STUD. 1, 18–22 (1984).

If this proves to be the case,<sup>65</sup> plaintiff win rates after 2014 should drop as entrepreneurs' and lawyers' experience with patent infringement litigation in China accumulates.

#### B. DEPENDENT VARIABLE II—INJUNCTIONS

According to relevant articles in the General Principles of the Civil Law of the People's Republic of China ("General Principles")<sup>66</sup> and Tort Law of the People's Republic of China ("Tort Law"),<sup>67</sup> together with practical observations, the remedies granted by Chinese courts in patent infringement cases can be divided into three major categories: injunctions, damages, and other remedies, including destroying infringing products and apologies.

Injunctions are often considered as falling into two categories: preliminary and permanent. However, preliminary injunctions, a powerful weapon in patent infringement litigation which sometimes leads to early resolution, are excluded from this Article for two reasons. First, whether a preliminary injunction was granted cannot be inferred from written final judgments. Second, preliminary injunctions are rarely requested and granted in patent infringement lawsuits in China.<sup>68</sup> Therefore, the term "injunctions" in this

65. See generally Jason Rantanen, *Why Priest-Klein Cannot Apply to Individual Issues in Patent Cases* (Univ. Iowa Legal Studies Research Paper No. 12–15, 2012), [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2132810](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2132810) [https://perma.cc/5PH7-2WBE] (criticizing the application of the Priest-Klein hypothesis to individual issues in patent law).

66. See Minfa Tongze (民法通则) [The General Principles of Civil Law] (promulgated by the Standing Comm. Nat'l People's Cong., April 12, 1986, effective Jan. 1, 1987), art. 118 ("If the rights of authorship (copyrights), patent rights, rights to exclusive use of trademarks, rights of discovery, rights of invention or rights for scientific and technological research achievements of citizens or legal persons are infringed upon by such means as plagiarism, alteration or imitation, they shall have the right to demand that the infringement be stopped, its ill effects be eliminated and the damages be compensated for"); *Id.* at art. 134 ("The main methods of bearing civil liability shall be: (1) cessation of Infringements; (2) removal of obstacles; (3) elimination of dangers; (4) return of property; (5) restoration of original condition; (6) repair, reworking or replacement; (7) compensation for losses; (8) payment of Breach of Contract damages; (9) elimination of ill effects and rehabilitation of reputation; and (10) extension of apology . . .").

67. See Qinquan Zeren Fa (侵权责任法) [Tort Law] (promulgated by the Standing Comm. Nat'l People's Cong., Dec. 26, 2009, effective July 1, 2010), art. 15 ("The methods of assuming tort liabilities shall include: (1) cessation of infringement; (2) removal of obstruction; (3) elimination of danger; (4) return of property; (5) restoration to the original status; (6) compensation for losses; (7) apology; and (8) elimination of consequences and restoration of reputation . . .").

68. See Benjamin Bai, *Preliminary Injunctions in China: The Pendulum Has Swung Back!*, KLUWER PAT. BLOG (Apr. 30, 2014), <http://kluwerpatentblog.com/2014/04/30/preliminary-injunctions-in-china-the-pendulum-has-swung-back> [https://perma.cc/MFN6-S5P5] (arguing "most IP suits in China do not involve an application for a PI" by providing

article refers to permanent injunctions unless otherwise specified.

Among the 1,333 decisions in which infringement was found by courts, injunctions were granted in 1,203 (90.25%) cases. For the 856 first instance final decisions included, courts granted injunctions in 766 (89.49%) cases. For the 477 second instance decisions included, courts granted injunctions in 437 (91.61%) cases.

**Table 6: Injunctions Granted<sup>69</sup>**

	Total	No. Injunctions	No. Non-Injunctions
Total	1,333	1,203 (90.25%)	130 (9.75%)
First Instance	856	766 (89.49%)	90 (10.51%)
Second Instance	477	437 (91.61%)	40 (8.39%)

According to relevant articles in General Principles,<sup>70</sup> and Tort Law,<sup>71</sup> and the statistical observations above, injunctions are automatically granted in most cases based on a finding of infringement in China. Unlike in the United States, where plaintiffs have to prove that the issue satisfies a four-factor test,<sup>72</sup> plaintiff-brought patent infringement cases in China merely have to demonstrate infringement in order to receive a permanent injunction. Table 7 below illustrates why injunctions were not granted in 130 cases.

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a snapshot of PI statistics for 2010–2013).

69. Only cases in which infringement was found by courts are included.

70. See Minfa Tongze, *supra* note 66, art. 118 (“If the rights of authorship (copyrights), patent rights, rights to exclusive use of trademarks, rights of discovery, rights of invention or rights for scientific and technological research achievements of citizens or legal persons are infringed upon by such means as plagiarism, alteration or imitation, they shall have the right to demand that the infringement be stopped, its ill effects be eliminated and the damages be compensated for.”).

71. See Qinquan Zeren Fa, *supra* note 67, art. 15 (“The methods of assuming tort liabilities shall include: (1) cessation of infringement; (2) removal of obstruction; (3) elimination of danger; (4) return of property; (5) restoration to the original status; (6) compensation for losses; (7) apology; and (8) elimination of consequences and restoration of reputation . . .”).

72. eBay Inc. v. MercExchange, L.L.C., 547 U.S. 388, 392 (2006) (holding that after a finding of patent infringement, an injunction should not be automatically granted, and the plaintiff bears the responsibility of demonstrating that their suit satisfies the four-factor test to receive an injunction).

**Table 7: Reasons for Not Granting Injunctions**

Rank	Reason	No. Cases	Percentage
1	Not Requested by Plaintiff	50	38.46%
2	Patent Expired	38	29.23%
3	Equity & Public Interest	20	15.38%
4	Not Mentioned	9	6.92%
5	Infringing Activities Stopped	5	3.85%
5	Already Issued by Previous Procedure	5	3.85%
7	Wrongly Drafted	2 <sup>73</sup>	1.54%
8	Patentee Changed	1	0.77%

The two most common reasons explaining why the court did not grant an injunction were that an injunction was not requested by the plaintiffs (38.46%) and that the asserted patent had expired at the time of adjudication (29.23%). Such expiration can result from the patent term's natural termination or non-payment of maintenance fees. Therefore, when considering cases where plaintiffs request injunctions and the patents at issue are not expired, the rate of injunctions granted are higher, at 96.85%. This reveals that under Chinese law, permanent injunctions are given in almost all cases of infringement.

Courts sometimes refused to grant injunctions due to equity and public interest considerations (15.38% of non-injunctions). Most cases in this category involved an infringing product that was a part of a building or other construction. Because dismantling the infringing product might lead to safety issues and waste of resources, courts usually ordered royalties instead of injunctions in such cases. Courts also rejected requests for injunctions when infringing activities had stopped (3.85%) or when previous judicial or administrative procedures had already offered such remedies (3.85%). For nine judgments in which no discussion of injunctions was offered (6.92%) and the two judgments which display discrepancies with regard to reasoning and

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73. In these two cases, courts mentioned that injunctions should be granted in the reasoning section, but did not say anything about injunctions in the decision part. *See* Lelingshi Meiyitian Shipin Youxian Gongsi, Lelingshi Huachang Tiaowei Shipin Youxian Gongsi (乐陵市美亿天食品有限公司诉乐陵市华畅调味食品有限公司) [Leling Meiyitian Foods Ltd. v. Leling Huachang Flavored Foods Ltd.], CHINA JUDGMENT ONLINE (Jinan Interim. People's Ct. Nov. 24, 2014), Luoyang Yixing Shihua Dianqi Yibiao Shebei Youxian Gongsi, Xinxiangshi Shengda Guolv Jinghua Jishu Youxian Gongsi (洛阳毅兴石化电器仪表设备有限公司诉新乡市胜达过滤净化技术有限公司) [Luoyang Yixing Petrochemical Elec. Appliance & Instrumentation Co. v. Xinxiang Shengda Filtration Technique Co.] CHINA JUDGMENT ONLINE (Henan Higher People's Ct. July 23, 2014).

conclusion, the reason that injunctions were not granted cannot be discerned.

### C. DEPENDENT VARIABLES III—DAMAGES

In addition to injunctions, damages are another major remedy for infringement provided by Chinese patent law. In the 1,333 decisions in which infringement was found by courts, damages were awarded in 1,281 (96.17%) cases. For the 856 first instance final decisions included, damages were awarded in 820 (95.79%) cases. For the 477 second instance decisions included, damages were awarded in 462 (96.85%) cases.

**Table 8. Damages Awarded<sup>74</sup>**

	Total	Damages Awarded	Damages not Awarded
Total	1,333	1,282 (96.17%)	51 (3.83%)
First Instance	856	820 (95.79%)	36 (4.21%)
Second Instance	477	462 (96.86%)	15 (3.14%)

When compared to the rates of injunctions granted, 90.25% for all cases in which infringement was found, and 93.76% for those excluding the cases in which the plaintiffs did not request a permanent injunction, damages appear to be an even more frequently granted remedy by Chinese courts. The table below sets out the reasons that plaintiffs were not awarded damages in the other 51 (3.83%) cases.

**Table 9. Reasons for Not Awarding Damages<sup>75</sup>**

Rank	Reason	No. Cases	Rate
1	Infringing products were obtained from a legitimate source.	42	82.35%
2	Damages were already awarded in a previous procedure.	5	9.80%
3	The plaintiff did not request damages.	4	7.84%
4	The infringers did not acquire profits from their infringing activity.	2	3.92%
5	The plaintiff could not prove infringing activities.	1	1.96%

Unlike the diverse reasons given for not granting injunctions, the courts'

74. Only cases with a finding of infringement are included.

75. The sum of the percentages in Table 9 exceeds 100% because three cases are double counted due to more than one reasons for not awarding damages involved.

explanations for awarding no damages after infringement was found were more concentrated.<sup>76</sup> The large majority of decisions with no damages awarded (82.35%) were because defendants raised the “legitimate source” defense successfully. In terms of Article 70 of the Patent Law of China, a defendant shall not be liable for damages if the defendant obtained the infringing products from a legitimate source, without knowing that such products were infringing products.<sup>77</sup>

Table 10 below reports the mean and median of all damages awarded to first and second instance cases respectively.<sup>78</sup>

**Table 10: Damages Awarded<sup>79</sup>**

	No. Cases	Mean	Median
All	1,281 <sup>80</sup>	¥ 75,853.83 (\$12,354.04)	¥ 30,000.00 (\$4,885.99)
First Instance	819 <sup>81</sup>	¥ 52,596.07 (\$8,566.14)	¥ 22,000.00 (\$3,583.06)
Second Instance	462	¥ 117,329.04 (\$19,108.96)	¥ 50,000.00 (\$8,143.32)

76. The concentration here might be a result of the smaller number of cases (51 for damages versus 130 for injunctions).

77. See *Zhuanli Fa* (专利法) [Law on Patent] (promulgated by the Standing Comm. Nat’l People’s Cong., Dec. 27, 2008, effective Oct. 1, 2009), art. 70 (“Where any person, for the purpose of production and business operation, uses, offers to sell or sells a patent-infringing product without knowing that such product is produced and sold without permission of the patentee, he shall not be liable for compensation provided that the legitimate source of the product can be proved.”).

78. As many decisions did not distinguish between compensation for infringement and reasonable expenses, damages in this Article are defined as including both compensation for infringement and reasonable expenses.

79. Only cases in which damages were awarded by courts are included. All damages awarded in Chinese yuan (CNY) are changed into U.S. dollars (USD) based on the average exchange rate (1.00 USD to 6.14 CNY) in the year of 2014. See *China Statistical Yearbook 2015*, NAT’L BUREAU OF STATISTICS OF CHINA, <http://www.stats.gov.cn/tjsj/ndsj/2015/indexeh.htm> [https://perma.cc/9ERP-SAFY] (last visited Sept. 29, 2017).

80. An outlier case has been removed from the calculation for exceedingly low damage award (8 CNY). See *Cao Liantao v. Shi Bin* (曹连涛诉石滨), CHINA JUDGMENT ONLINE (Shandong Province Jinan Interm. People’s Ct. Sept. 26, 2014). Besides that, all damages awarded were above 1,000CNY.

81. See *id.*

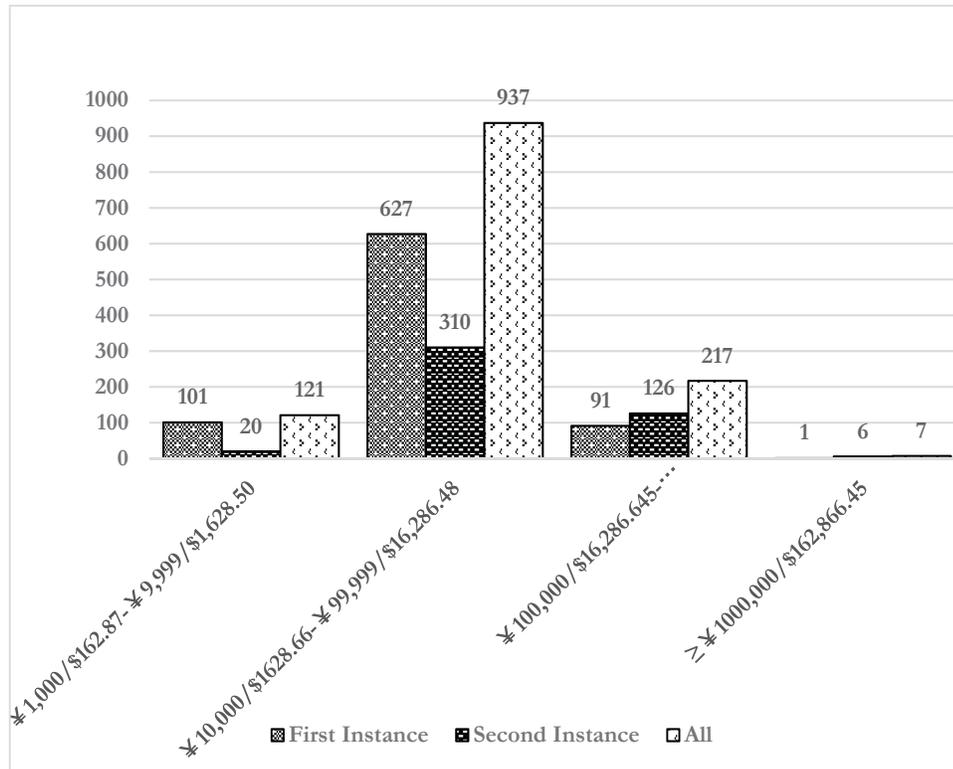
The average damages awarded to plaintiffs by the Chinese courts was ¥ 75,853.83 (approximately US\$12,354.04). The median was even lower, at approximately ¥ 30,000.00 (US\$4,885.99). Though second instance courts tended to award higher damages than first instance courts,<sup>82</sup> the above figures confirmed the commonly held view that damages awarded by the Chinese courts are frustratingly low. According to statistics released by PricewaterhouseCoopers, the median damages awarded in 2014 by the U.S. courts—although the second-lowest figure in 20 years—was US\$2.0 million, which is hundreds of times larger than the median damages awarded by the Chinese courts.<sup>83</sup> Figure 1 below summarizes the distribution of the damages awarded by the Chinese courts.

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82. One potential explanation is that only cases with significant damages are worth appealing.

83. *See* PRICEWATERHOUSECOOPERS, 2015 PATENT LITIGATION STUDY: A CHANGE IN PATENTEE FORTUNES 4 (2015), <https://www.pwc.com/us/en/forensic-services/publications/assets/2015-pwc-patent-litigation-study.pdf> [<https://perma.cc/M8D2-48VK>].

Figure 1: Range of Damages Awarded by Chinese Courts



Damages awarded in most cases (937, or 73.09%) fell in the range of between ¥ 10,000 (approximately US\$1,628.66) and ¥ 99,999 (approximately US\$16,286.48). While there were some decisions (217, or 16.93%) with higher damages of between ¥ 100,000 (approximately US\$16,286.64) and ¥ 999,999 (approximately US\$162,866.29), the Chinese courts awarded damages in excess of ¥ 1 million in only seven cases (0.55%). For the sake of interest, these seven cases are listed in Table 11 below.

**Table 11: Cases with Damages in Excess of ¥1 Million**

Rank	Plaintiff	Defendant	Damages
1	Keihin Thermal Tech. Corp.	FAW-Valeo Climate Control Sys. Co. Ltd., et al.	¥ 4.84M (\$0.79M)
2	Hunan CHINASUN pharm. Mach. Co., Ltd.	Shandong Xinhua Med. Apparatus and Instruments Co., Ltd., et al.	¥ 2.05M (\$0.34M)
3	Buluke (Chengdu) Eng'g Co., Ltd.	Hengshui Qijia Eng'g Materials Co., Ltd., et al.	¥ 2M (\$0.33M)
4	ZTE Corp.	Huawei Tech. Co., Ltd., et al.	¥ 1M (\$0.16M)
4	Hangzhou Grascent Co., Ltd.	Hangzhou Youbang Flavors & Fragrances Co., Ltd., et al.	¥ 1M (\$0.16M)
4	ZTE Corp.	Huawei Tech. Co., Ltd., et al.	¥ 1M (\$0.16M)
4	Huawei Tech. Co., Ltd.	ZTE Corp., et al.	¥ 1M (\$0.16M)

#### D. INDEPENDENT/EXPLANATORY FACTOR I—PATENT TYPES

The Chinese patent law provides protection for three distinct types of patents: invention patents, utility model patents, and design patents.<sup>84</sup> Invention patents<sup>85</sup> and design patents<sup>86</sup> in China are respectively comparable to utility patents and design patents in the United States. Utility model patents (“utility models”), while sounding similar to utility patents, are totally different from the latter. Chinese patent law defines “utility models” as “new technical solutions proposed for the shape and structure of a product”<sup>87</sup>—these are

84. See Zhuanli Fa (专利法) [Law on Patent] (promulgated by the Standing Comm. Nat'l People's Cong., Dec. 27, 2008, effective Oct. 1, 2009) art. 2 (“For the purposes of this Law, invention-creations mean inventions, utility models and designs.”).

85. *Id.* (“Inventions mean new technical solutions proposed for a product, a process or the improvement thereof.”).

86. *Id.* (“Designs mean, with respect to a product, new designs of the shape, pattern, or the combination thereof, or the combination of the color with shape and pattern, which are rich in an aesthetic appeal and are fit for industrial application.”).

87. *Id.* (“Utility models mean new technical solutions proposed for the shape and

commonly known as “petty patents” and are more similar to the European or Japanese style utility patents.

The vast majority of the 1,660 cases included in the population (1,022, or 61.57%) were design patents. The second most common type of patents involved were utility models (420, or 25.30%). Cases relating to invention patents constituted only a very small proportion (218, or 13.13%). Meanwhile, first and second instance cases did not share a similar patent type distribution. The percentage of design patents involved in second instance cases, (48.27%), was notably smaller than in first instance cases (69.23%). By contrast, the proportions of utility models and invention patents involved in second instance cases (34.10% and 17.63%, respectively) were much larger than those involved in first instance cases (20.23% and 10.54%, respectively). These figures may to some extent reflect that utility model and invention patent cases have higher appeal rates than design patent cases do.<sup>88</sup>

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structure of a product, or the combination thereof, which are fit for practical useFalse”).

88. Again, this discrepancy of case distribution by patent types may be caused by potentially missing judgments.

**Table 12: Patent Types**

	Total	Invention Patents	Utility Models	Design Patents
Total	1,660 <sup>89</sup>	218 (13.13%)	420 (25.30%)	1,022 (61.57%)
First Instance	1,053 <sup>90</sup>	111 (10.54%)	213 (20.23%)	729 (69.23%)
Second Instance	607 <sup>91</sup>	107 (17.63%)	207 (34.10%)	293 (48.27%)

As illustrated in Figure 2 below, the comparison between the above data and the distribution of patents in force was quite illuminating.<sup>92</sup> Surprisingly, the largest category of litigated patents, design patents (61.57% of all litigated patents), constituted only 24.87% of the patents in force by the end of 2014. Conversely, invention patents and utility models accounted for a much larger portion of patents in force than litigated patents. One possible explanation for these differences might be that design patent owners are more likely to enforce

89. Only 1,660 cases are used in this Section. *See infra* notes 94, 95.

90. Only 1,053 cases are included. Two cases are excluded because the title of the patents and the number assigned to the applications do not match. *See* Guangdong Aofei Dongman Wenhua Gufen Youxian Gongsi, Qingzhen Jiahui Chaoshi Youxian Zeren Gongsi (广东奥飞动漫文化股份有限公司诉清镇佳惠超市有限责任公司) [Alpha Grp. v. Qingzhen Jiahui Market LLC] CHINA JUDGMENT ONLINE (Guiyang Interm. People's Ct. Nov. 14, 2014) and Guangdong Aofei Dongman Wenhua Gufen Youxian Gongsi, Wang Liangming (广东奥飞动漫文化股份有限公司诉王亮明) [Alpha Grp. v. Wang] CHINA JUDGMENT ONLINE (Guiyang Interm. People's Ct. Nov. 11, 2014) are excluded since the title of the patents and the number assigned to the applications do not match.

91. Only 807 cases are counted in this part. Zhangzhoushi Dongqing Jinshu Zhipin Youxian Gongsi, Xiamen Wansheng Wujin Zhipin Youxian Gongsi (漳州市东庆金属制品有限公司诉厦门万晟五金制品有限公司) [Zhangzhou Dongqing Metal Prod. Ltd. v. Xiamen Wansheng Hardware Co.] CHINA JUDGMENT ONLINE (Gujian Higher People's Ct. Dec. 20, 2014) is excluded since based on the information revealed in the opinion, the patent at issue cannot be found in SIPO's database.

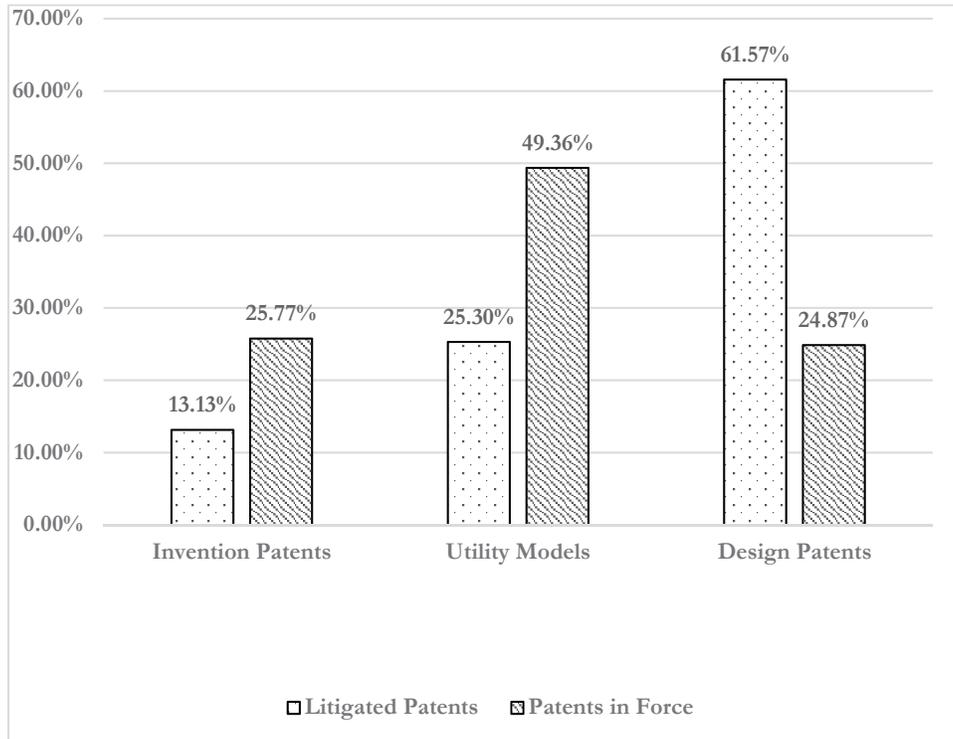
92. The number and percentage of patents of each type in force by the end of 2014 are listed below:

Patents in Force, by Patent Types			
Total	Invention Patents	Utility Models	Design Patents
4,642,506	1,196,497 (25.77%)	2,291,326 (49.36%)	1,154,683 (24.87%)

*See* STATE INTELLECTUAL PROP. OFF., GUONEIWAI SANZHONG ZHUANLI YOUXIAO ZHUANGKUANG (国内外三种专利有效状况) [DISTRIBUTION OF PATENTS IN FORCE FOR THREE KINDS RECEIVED FROM HOME AND ABROAD] (2015), <http://www.sipo.gov.cn/tjxx/jianbao/year2014/c/c1.html> [<https://perma.cc/J6FU-577C>].

their issued patents than the owners of invention patents and utility models. Alternatively, these differences may imply that less infringement occurs for the other two types of patents than design patents because they are easier to design around.

**Figure 2: Percent of Patents Litigated and In Force by Patent Type**



In an attempt to examine how different types of patents fared in patent infringement litigation in China, this study collects data on the number and the percentage of cases where infringement was found, an injunction was granted, and the amount of damages awarded by patent type, as summarized below:

**Table 13. Cases Where Infringement Was Found, by Patent Type<sup>93</sup>**

Patent Type	All Cases	Winning Cases	Percentage
Invention Patents	218	157	72.02%
Utility Models	420	325	77.38%
Design Patents	1,022	848	82.97%

**Table 14. Injunctions Granted in Winning Cases, by Patent Type<sup>94</sup>**

Patent Type	Winning Cases	Injunctions	Percentage
Invention Patents	157	148	94.27%
Utility Models	325	275	84.62%
Design Patents	848	779	91.86%

The likelihood of the Chinese courts finding infringement and granting injunctions displayed notable differences between patent types. For both first and second instance cases, the win rates on infringement were between 71% and 84% respectively, with invention patents having the lowest infringement

93. A breakdown of win rates across different instances of trial is presented below:

Win rates on Infringement, by Patent Type II						
Patent Type	1 <sup>st</sup> Instance			2 <sup>nd</sup> Instance		
	All Cases	Winning Cases	%	All Cases	Winning Cases	%
Invention Patents	111	81	72.97%	107	76	71.03%
Utility Models	213	169	79.34%	207	156	75.36%
Design Patents	729	604	82.85%	293	244	83.28%

94. A breakdown of injunction rates across different instances of trial is presented below:

Injunctions in Winning Cases, by Patent Type II						
Patent Type	1 <sup>st</sup> Instance			2 <sup>nd</sup> Instance		
	Winning Cases	Injunctions	%	Winning Cases	Injunctions	%
Invention Patents	81	75	92.59%	76	73	96.05%
Utility Models	169	145	85.80%	156	130	83.33%
Design Patents	604	546	90.40%	244	233	95.49%

rate (72.02%) and design patents the highest (82.97%). This discrepancy indicates that cases involving invention patents are more challenging and unpredictable for both parties than those of utility models and design patents, due to the complex technologies patented. Meanwhile, the rates of granting injunctions after infringement was found fell between 83% and 97%, with invention patents and design patents both having high injunction rates above 90%, and utility models having a slightly lower injunction rate of approximately 84%.

**Table 15. Damages, by Patent Type<sup>95</sup>**

Patent Types	Mean	Median	Minimum	Maximum
Invention Patents	¥ 259,154.64 (\$42,207.60)	¥ 120,000.00 (\$19,543.97)	¥ 6,000.00 (\$977.20)	¥ 4,840,000.00 (\$788,273.62)
Utility Models	¥ 83,620.94 (\$13,619.05)	¥ 50,000.00 (\$8,143.32)	¥ 1,000.00 (\$162.87)	¥ 670,000.00 (\$109,120.52)
Design Patents	¥ 39,167.20 (\$6,379.02)	¥ 30,000.00 (\$4,885.99)	¥ 1,000.00 (\$162.87)	¥ 900,000.00 (\$146,579.80)

The amounts of damages awarded by the Chinese courts differed significantly based on patent type. Invention patent holders enjoyed the highest amount of average damages (¥ 259,154.64, or US\$42,207.60), which was approximately three times higher than the average damages awarded to utility model holders and seven times higher than those awarded to design patent holders. These numbers confirm the conventional wisdom that the value of an invention patent is generally higher than the value of the other two types of patents due to a higher inventiveness requirement<sup>96</sup> and a mandate

95. Only cases in which damages were awarded by courts are included.

96. *See* Zhuanli Fa (专利法) [Law on Patent] art. 22, § 3. (“Creativity means that, compared with the existing technologies, the invention possesses prominent substantive features and indicates remarkable advancements, and the utility model possesses substantive features and indicates advancements.”); *id.* at art. 23, § 2 (“Designs for which the patent right is to be granted shall be ones which are distinctly different from the existing designs or the combinations of the features of existing designs.”).

substantive examination,<sup>97</sup> which warrants a longer protection term.<sup>98</sup>

To make predictions about the superpopulation, this Article tests the following hypotheses:

Hypothesis I-A: There is no difference between the likelihood that infringement will be found by a Chinese court in patent infringement cases involving an invention patent, a utility model, and a design patent. (Rejected)

Hypothesis I-B: There is no difference between the likelihood that injunctions will be granted after infringement is found by a Chinese court in patent infringement cases involving an invention patent, a utility model, and a design patent. (Rejected)

Hypothesis I-C: There is no difference between the average amount of damages awarded by a Chinese court in patent infringement cases involving an invention patent, a utility model, and a design patent. (Rejected)

The G-square p-values<sup>99</sup> for the above three tests were .0004, .0003, and .0000<sup>100</sup> respectively—all smaller than .001.<sup>101</sup> The results of patent infringement cases in China can therefore be predicted with great confidence<sup>102</sup>

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97. *See id.* at art. 35 (“Within three years from the date an invention patent application is filed, the patent administration department under the State Council may, upon request made by the applicant at any time, carry out substantive examination of the application. If the applicant, without legitimate reasons, fails to request substantive examination at the expiration of the time limit, such application shall be deemed to have been withdrawn. The patent administration department under the State Council may carry out substantive examination of its own accord, as it deems it necessary.”); *id.* at art. 39 (“If no reason for rejection is discerned after an invention patent application is substantively examined, the patent administration department under the State Council shall make a decision on granting of the invention patent right, issue an invention patent certificate, and meanwhile register and announce the same. The invention patent right shall become effective as of the date of announcement.”); *id.* at art. 40 (“If no reason for rejection is discerned after preliminary examination of a utility model or design patent application, the patent administration department under the State Council shall make a decision on granting of the utility model or design patent right, issue a corresponding patent certificate, and meanwhile register and announce the same. The utility model patent right and the design patent right shall become effective as of the date of announcement.”).

98. *See id.* at art. 42. (“The duration of the invention patent right shall be 20 years and that of the utility model patent right and of the design patent right shall be 10 years respectively, all commencing from the date of application.”).

99. I test the hypotheses using both G-square p-values (the “likelihood-ratio statistic”) and chi-square p-values (the “Pearson statistic”). While I report the results of both in Appendix A, for brevity, I refer to G-square p-values in the Observation part. They provide approximately the same results.

100. To make the numbers shorter and simpler, I round all decimals to the nearest ten-thousandth when calculating p-values.

101. This indicates that we can reject each null hypothesis with 99.999% confidence.

102. The choice of significance level at which the hypothesis can be rejected is arbitrary.

based on the type of patents litigated. That is, owners of invention patents are less likely to win than owners of utility models and design patents when they bring a patent infringement lawsuit to a Chinese court. Owners of invention patents are also more likely to get injunctions and higher damages after infringement is found.

E. INDEPENDENT/EXPLANATORY FACTOR II—SUBJECT MATTER

Since different classification standards apply when classifying invention patents, utility models, and design patents, based on the technologies involved, this study divides the 1,660 cases included in the population into two data sets and measure the patents litigated in each data set by subject matter separately.<sup>103</sup>

1. *Subject Matter of Invention Patents and Utility Models*

The data set to be studied in this Section covers 218 cases of invention patents and 420 cases of utility models. For each case included, the International Patent Classification (IPC) number from each patent file was discerned, and then the case was assigned to one of three mutually exclusive subject matter areas—mechanical (or “general”), electrical, and chemical—based on my own evaluation of the IPC-Subject Matter concordance. If more than one IPC number was identified in a patent, only the main IPC number was considered. The classification results are summarized in Table 16 below.

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Conventionally, statisticians treat  $p < 0.05$  as indicating statistical significance, and  $p < 0.001$  as indicating high statistical significance.

103. See *supra* note 92. Only cases whose disputed patents can be clearly identified and found in SIPO's database are included.

**Table 16: Patent Subject Matter**

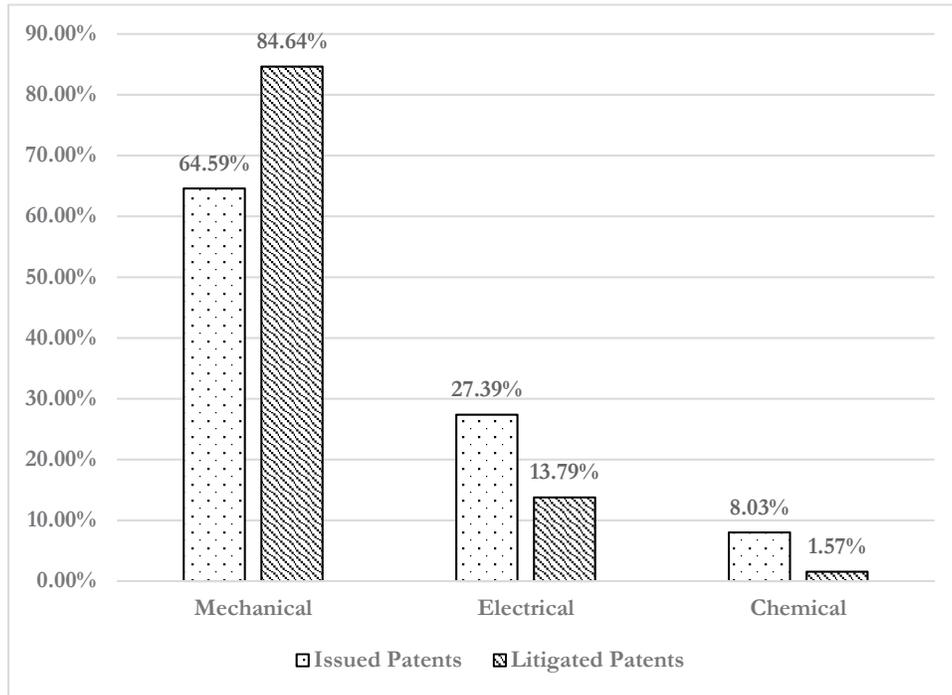
Subject Matter	Number and Percentage of Cases	IPC Class	Number and Percentage of Cases
Mechanical (General)	540 (84.64%)	A. Human Necessities	143 (22.41%)
		B. Performing Operations	135 (21.16%)
		D. Textiles	23 (3.61%)
		E. Fixed Constructions	133 (20.85%)
		F. Mechanical Engineering	106 (16.61%)
Electrical	88 (13.79%)	G. Physics	31 (4.86%)
		H. Electricity	57 (8.93%)
Chemical	10 (1.57%)	C. Chemistry	10 (1.57%)

It is surprising to find that the overwhelming majority of decisions involved mechanical patents (540, or 84.64%). Whereas electrical (88, or 13.79%) and chemical (10, or 1.57%) patents, which provide protection for leading-edge technologies, such as biotechnologies, pharmaceuticals, and software-related inventions, made up a rather small portion of patent infringement lawsuits. These counterintuitive observations may be explained by several potential reasons.

First, the number of electrical and chemical patents issued might only make up a small portion of all patents issued,<sup>104</sup> which is consistent with the following graph that contrasts the percentage of patents litigated with the percentage of patents issued in each subject matter area. Though electrical and chemical patents accounted for a higher percentage of issued patents than of litigated cases, they constituted a significantly smaller portion of all patents issued in 2014, when compared to mechanical patents.

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104. Though it might make more sense to compare litigated patents to all patents in force in 2014, no such statistics are publicly available. The best alternative data available relate to the number of invention patents and utility models of each IPC class issued in 2014.

**Figure 3: Issued Patents vs. Litigated Patents by Subject Matter**

Second, the counterintuitive phenomenon referred to above may be caused by the dynamic nature of electrical and chemical technologies. Rapid development and iteration might cause patents in these leading-edge fields to lose value before their protection terms expire. On one hand, because there is certainly no incentive for patent holders to pay maintenance fees for worthless patents, the number and percentage of patents in force in these two areas could drop significantly over time. Therefore, that could account for the low number and percentage of patent litigation in these subject matter areas. On the other hand, due to time concerns, companies holding electrical and chemical patents might prefer settling disputes to litigating in courts. Time-consuming litigation could block their development process and lead to significant losses.

Third, the huge amount of attention paid to electrical and chemical patents may have less to do with the number of cases litigated than with the value these patents represent. Table 17 below summarizes the patent types of litigated patents by subject matter areas. It indicates that the percentage of invention patents litigated in electrical and chemical cases was much higher than in mechanical cases and demonstrates that cases in leading-edge fields frequently

involved higher value patents than normal cases.

**Table 17: Patent Types, by Subject Matter**

Subject Matter	No. of Cases	No. and Percentage of Cases involving Invention Patents	No. and Percentage of Cases involving Utility Models
Mechanical	540	169 (31.30%)	371 (68.70%)
Electrical	88	41 (46.59%)	47 (53.41%)
Chemical	10	8 (80.00%)	2 (20.00%)

Turning to the comparison between the final outcomes of cases in different subject matter areas, summarized in Table 18, all three measures—win rates, injunction rates, and average damages—were fairly constant for mechanical and electrical cases. Chemical cases, however, had a significantly lower win rate (50.00%) and a slightly lower injunction rate (80.00%). Chemical patent holders also received noticeably higher average damages (¥ 239,000.00, or US\$38,925.08) than mechanical (¥ 137,338.00, or US\$22,367.75) and electrical (¥ 165,457.56, or US\$26,947.49) patent holders, which might provide additional evidence in favor of the third explanation above—that patents belonging to leading-edge fields receive greater attention because they are more valuable than general patents. However, since the number of cases in the chemical field was so small, no robust conclusions should be drawn from the difference identified.

**Table 18: Case Results, by Subject Matter**

Subject Matter	No. Cases	Infringed	Injunctions	Avg. Damages
Mechanical	540	408 (75.56%)	357 (87.50%)	¥ 137,338.00 (\$22,367.75)
Electrical	88	69 (78.42%)	62 (89.86%)	¥ 165,457.56 (\$26,947.49)
Chemical	10	5 (50.00%)	4 (80.00%)	¥ 239,000.00 (\$38,925.08)

The differences observed above are not statistically significant. That is, none of the hypotheses below can be rejected with confidence:

Hypothesis II-A: There is no difference between the likelihood that infringement will be found by a Chinese court in patent infringement cases involving a mechanical patent, an electrical patent, and a chemical patent. (Not Rejected)

Hypothesis II-B: There is no difference between the likelihood that injunctions will be granted after infringement is found by a Chinese court in patent infringement cases involving a mechanical patent, an electrical patent, and a chemical patent. (Not Rejected)

Hypothesis II-C: There is no difference between the average amount of damages awarded by a Chinese court to patent infringement cases involving a mechanical patent, an electrical patent, and a chemical patent. (Not Rejected)

Therefore, although inventors, companies, practitioners, and scholars have been devoting much attention to patents in certain subject matter areas, no statistical evidence can be found regarding the relationship between the subject matter and the outcome of infringement cases.

## 2. *Subject Matter of Design Patents*

This study also examines whether and how different subject matter areas of design patents influence the final outcomes of infringement lawsuits in China. The data set studied in this Section includes 1,022 design patent cases. Every case is categorized into one of 32 Locarno Classification (“LOC”) classes based on the LOC number listed in each file. The win rates, injunction rates for cases where infringement was found, and average damages were then calculated for each LOC class. Table 19 below summarizes these categorization and calculation results.

**Table 19: Design Patents, by Subject Matter<sup>105</sup>**

LOC Classes	No. Cases	% Infringed	% Injunctions	Avg. Damages
2. Articles of Clothing and Haberdashery	17	88.24%	100.00%	¥ 37,978.57
3. Travel Goods, Cases, Parasols and Personal Belongings, not Elsewhere Specified	7	85.71%	100.00%	¥ 29,333.33
4. Brushware	3	66.67%	100.00%	¥ 35,000.00
5. Textile Piecegoods, Artificial and Natural Sheet Material	53	92.45%	100.00%	¥ 18,777.14
6. Furnishing	100	83.00%	100.00%	¥ 45,790.71
7. Household Goods, not Elsewhere Specified	51	70.59%	100.00%	¥ 50,934.29
8. Tools and Hardware	83	85.54%	98.59%	¥ 38,033.01
9. Packages and Containers for the Transport or Handling of Goods	98	81.63%	95.00%	¥ 23,086.02
10. Clocks and Watches and Other Measuring Instruments, Checking and Signaling Instruments	37	56.76%	95.24%	¥ 58,850.00
11. Articles of Adornment	21	66.67%	100.00%	¥ 20,000.00
12. Means of Transport or Hoisting	24	91.67%	86.36%	¥ 95,000.00
13. Equipment for Production, Distribution or Transformation of Electricity	26	73.08%	100.00%	¥ 45,000.00
14. Recording, Communication or Information Retrieval Equipment	64	85.94%	92.73%	¥ 47,878.76

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105. Only the LOC classes with at least one categorized case are included.

15. Machines, not Elsewhere Specified	20	55.00%	72.73%	¥ 46,795.45
16. Photographic, Cinematographic and Optical Apparatus	10	90.00%	44.44%	¥ 36,114.29
19. Stationery and Office Equipment, Artists' and Teaching Materials	14	78.57%	100.00%	¥ 31,636.36
20. Sales and Advertising Equipment, Signs	9	100.00%	100.00%	¥ 57,833.33
21. Games, Toys, Tents and Sports Goods	147	95.24%	70.71%	¥ 19,584.32
23. Fluid Distribution Equipment, Sanitary, Heating, Ventilation and Air-Conditioning Equipment, Solid Fuel	75	78.67%	96.61%	¥ 49,144.07
24. Medical and Laboratory Equipment	1	0.00%	NA	NA
25. Building Units and Construction Elements	46	78.26%	91.67%	¥ 58,075.43
26. Lighting Apparatus	97	84.54%	97.56%	¥ 50,170.56
27. Tobacco and Smokers' Supplies	3	100.00%	100.00%	¥ 30,000.00
28. Pharmaceutical and Cosmetic Products, Toilet Articles and Apparatus	9	88.89%	100.00%	¥ 41,000.00
31. Machines and Appliances for Preparing Food or Drink, not Elsewhere Specified	7	100.00%	100.00%	¥ 49,674.00

It is difficult to distinguish general patterns from the above table. Design patents in patent infringement lawsuits covered 25 of the 32 LOC classes,<sup>106</sup>

106. The LOC classes with no categorized cases are the following: Class 1—Foodstuffs; Class 17—Musical instruments; Class 18—Printing and office machinery; Class 22—Arms, pyrotechnic articles, articles for hunting, fishing, and pest killing; Class 29—Devices and

indicating that the Chinese IP system has been very good at protecting a diverse array of subject matters. Since the number of cases categorized into each LOC class is relatively small, no robust conclusion should be drawn from the above data regarding the relationship between different subject matter areas and the final case outcomes. Therefore, no hypotheses are tested in this Section because the results would be unreliable.

F. INDEPENDENT/EXPLANATORY FACTOR III—FOREIGN VS. DOMESTIC PLAINTIFFS

The Chinese judicial system has gained international notoriety for its local protectionism and lack of impartiality. Many in the West believe that the patent system established in China serves primarily to facilitate domestic industry at the expense of foreign companies. For example, a European patent attorney, Andreas Bieberbach, wrote that Chinese patent law was continuously adjusted to benefit Chinese companies since its establishment in 1984.<sup>107</sup> PricewaterhouseCoopers, in its report, *China Strategy: Refining yours could open new doors*, also pointed out that actions taken by the Chinese government to bring in intellectual property as a new incentive scheme to promote the development of certain industries and regions “have inevitably heightened Western concern about Chinese protectionism, regulatory discrimination, and continued infringement of IP rights.”<sup>108</sup>

In an effort to evaluate this widely held belief, this Article produces statistics to test the following two assumptions: (1) foreign patent holders are less likely to litigate in China than domestic patent holders; (2) foreign patent holders often receive worse results during such litigation. This Article breaks down 1,663 decisions in the data set into two categories, “foreign” and “domestic,” based on the residency of the plaintiff.<sup>109</sup> If a case contains more than one plaintiff, it is labeled as “foreign” as long as one of the plaintiffs resides outside mainland China. Table 20 below indicates how many patents are litigated by residency of the plaintiff.

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equipment against fire hazards, for accident prevention and for rescue; Class 30—Articles for the care and handling of animals; and Class 32—Graphic symbols and logos, surface patterns, ornamentation. *See supra* note 60.

107. *See* Andreas Bieberbach, *IP Strategies in Business Operations with China*, 9 J. BUS. CHEMISTRY 161, 161 (2012).

108. PRICEWATERHOUSECOOPERS, *CHINA STRATEGY: REFINING YOURS COULD OPEN NEW DOORS* 6 (2011), <http://www.pwc.com/us/en/private-company-services/publications/assets/gyb-63-china-strategies.pdf> [<https://perma.cc/KY6D-69YZ>].

109. Plaintiffs residing in Hong Kong, Macao and Taiwan are categorized as “foreign” due to different jurisdictions.

**Table 20: Residency of Plaintiff**

	No. Domestic P.	Percentage	No. Foreign P.	Percentage
Total	1,548	93.08%	115	6.92%
1st Instance	990	93.84%	65	6.16%
2nd Instance	558	91.78%	50	8.22%

Not surprisingly, the overwhelming majority of patent infringement cases in China (1,548, or 93.08%) were litigated by domestic patent owners or licensees. Foreign plaintiffs accounted for only 115 (6.92%) of 1,663 decisions included in the population.<sup>110</sup> This percentage—although seems low—represents the ratio of patents granted by SIPO to international patent applicants. According to statistics released by SIPO, 93,285 patents were issued to foreign individuals and entities in 2014, making up approximately 7.16% of all 1,302,687 patents granted by SIPO that year.<sup>111</sup> This consistency indicates that foreign patent holders are as likely to enforce their patents in the Chinese courts as domestic patent owners, clearly rejecting the first assumption stated to above.

For the sake of interest, this study also examined how frequently foreign and domestic patent owners litigate different types of patents. It was found that foreign patent holders litigated far more frequently in cases involving invention patents than in cases involving utility models and design patents. Approximately 28.44% of invention patent cases in the data set were brought by foreign owners, while the figures for utility models and design patents were only slightly above 3%. This discrepancy may be attributed to the fact that foreign inventors often overlook utility models and design patents when

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110. The percentage could be even higher when taking into consideration the possibility that some foreign patentees might disguise their foreign identity by introducing their lawsuit under the name of their Chinese subsidiaries. *See* Tansa Tugong Hecheng Cailiao (Zhongguo) Youxian Gongsi Su Sanmingshi Shuili Shuidian Gongcheng Youxian Gongsi (坦萨土工合成材料(中国)有限公司诉三明市水利水电工程有限公司) [Tansa Tugong Hecheng Material (China) Ltd. v. Sanming Water Conservancy and Water Power Engineering Ltd.] CHINA JUDGMENT ONLINE (Fuzhou Interm. People's Ct., Apr. 30, 2014). The plaintiff, Tansa Tugong Hecheng Material (China) Limited Company, a company located in China, is owned by a British company, Tensar Group Limited.

111. *See supra* note 95. This percentage is much lower than the percentage of patents in force held by foreigners. According to SIPO's data, 610,144 (13.14%) patents were held by foreigners among all 4,642,506 patents in force by the end of 2014. But this inconsistency may be caused by the lag that part of these valid patents may be litigated in the future.

seeking patent protection in China.<sup>112</sup> However, these two types of patents, especially utility models, offer excellent opportunities for potential patentees to gain faster patent protection<sup>113</sup> and to reduce filing costs.<sup>114</sup> Foreign inventors should give more attention to these types of patents when building their Chinese patent strategies.

**Table 21: Patent Type, by Residency of Plaintiff**

	No. Domestic P.	Percentage	No. Foreign P.	Percentage
Total	1,545	93.07% <sup>115</sup>	115	6.93% <sup>116</sup>
Invention Patents	156	71.56%	62	28.44%
Utility Models	406	96.67%	14	3.33%
Design Patents	983	96.18%	39	3.82%

Cases brought by domestic and foreign plaintiffs are also broken down into different subject matter areas. As illustrated in Table 22, cases litigated by

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112. The percentage of invention patents granted to international applicants is much higher than the percentage of utility models and design patents granted, as illustrated below: Annual Patent Issuance to Foreign Applicants, by Patent Type

Year	Invention Patents	Utility Models	Design Patents
1985-2009	330,276 (56.30%)	11,425 (0.83%)	96,981 (8.60%)
2010	55,343 (40.96%)	2,216 (0.64%)	16,646 (4.97%)
2011	59,766 (34.72%)	3,024 (0.74%)	13,862 (3.65%)
2012	73,258 (33.74%)	4,425 (0.77%)	14,229 (3.05%)
2013	64,153 (30.89%)	6,637 (0.96%)	13,797 (3.34%)
2014	70,548 (30.25%)	7,912 (1.12%)	14,825 (4.10%)

*See supra* note 92.

113. Utility models and design patents require preliminary examination only and are often granted much more rapidly than invention patents. *See* CHINA IPR SME HELPDESK, GUIDE TO PATENT PROTECTION IN CHINA (2013), [http://www.china-iprhelpdesk.eu/sites/all/docs/publications/China\\_IPR\\_Guide-Guide\\_to\\_Patent\\_Protection\\_in\\_China\\_EN-2013.pdf](http://www.china-iprhelpdesk.eu/sites/all/docs/publications/China_IPR_Guide-Guide_to_Patent_Protection_in_China_EN-2013.pdf) [<https://perma.cc/TZ8F-WATR>].

114. Patent applicants must pay both an application fee (¥900, or US\$146.58) and an examination fee (¥2,500, or US\$407.17) for invention patent applications. However, for utility model and design patent applications, applicants pay only an application fee (¥500, or US\$81.43). *Schedule of Fees*, STATE INTELLECTUAL PROP. OFF. (Dec. 30, 2005), [http://english.sipo.gov.cn/application/howtopct/200804/t20080416\\_380500.html](http://english.sipo.gov.cn/application/howtopct/200804/t20080416_380500.html) [<https://perma.cc/Z4VF-TQEW>].

115. The percentage of cases whose plaintiffs reside in China in Table 20 is slightly different from the figure listed in the above Table 21 because only 1,660 cases are counted in this part. *See supra* note 92.

116. *See id.*

foreign patentees constituted a higher percentage of leading-edge technologies, electrical and chemical patents, than cases litigated by their domestic counterparts.

**Table 22: Subject Matter, by Residency of Plaintiff**

	Total	Mechanical Patents	Electrical Patents	Chemical Patents
Total	638	540 (84.64%)	88 (13.79%)	10 (1.57%)
Domestic P. <sup>117</sup>	562	480 (85.41%)	75 (13.35%)	7 (1.25%)
Foreign P. <sup>118</sup>	76	60 (78.95%)	13 (17.11%)	3 (3.95%)

To test the second assumption referred to above—that foreign patent holders often receive worse results due to the local protectionism prevalent in the Chinese judicial system—data were collected on the outcomes of litigation brought by foreign and domestic plaintiffs.

**Table 23: Case Results, by Residency of Plaintiff**

	Decisions	Infringed	Injunction	Avg. Damages
Total	1,663 (100%)	1,333 (80.16%)	1,203 (90.25%)	¥ 75,942.39 (\$12,368.47) <sup>119</sup>
Foreign P.	115 (6.92%)	97 (84.35%)	90 (92.78%)	¥ 201,620.45 (\$32,837.21)
Domestic P.	1,548 (93.08%)	1,236 (79.84%)	1,113 (90.05%)	¥ 66,217.93 (\$10,784.68) <sup>120</sup>

The comparison between the case outcomes generally received by foreign and domestic plaintiffs was illuminating. Contrary to widely held beliefs, foreign plaintiffs were more likely to have infringement found and injunctions granted than their Chinese counterparts in patent infringement cases brought in China. Moreover, damages awarded to foreign patent owners ( ¥ 201,620.45, or US\$32,837.21) were almost three times higher than those awarded to the Chinese patent owners ( ¥ 66,217.93, or US\$10,784.68). These

117. These percentages add to 100.01% due to rounding.

118. *See id.*

119. *See supra* note 80 & 81.

120. *Id.*

striking results provided a credible explanation as to why foreign patentees did not fear enforcing their patent rights in China—the conventional wisdom notwithstanding. The important implication here is that the Chinese courts, while not preferring foreign parties to domestic ones, certainly did not protect the local economy at the expense of foreign companies in practice.<sup>121</sup>

The predictive significance of the above data for the superpopulation was uneven. When conducting hypothesis testing, there was no statistically significant difference between the likelihood of having infringement found (G-square p-value = .2836) and injunctions granted (G-square p-value = .4725) for domestic and foreign plaintiffs. Therefore, the following two hypotheses could not be rejected.

Hypothesis III-A: There is no difference between the likelihood that infringement will be found by a Chinese court in a patent infringement case brought by a domestic patentee or licensee, and a patent infringement case brought by a foreign patentee or licensee. (Not Rejected)

Hypothesis III-B: There is no difference between the likelihood that injunctions will be granted after infringement is found by a Chinese court in a patent infringement case brought by a domestic patentee or licensee, and a patent infringement case brought by a foreign patentee or licensee. (Not Rejected)

However, for damages awarded to domestic and foreign plaintiffs, the following hypothesis was rejected with great confidence (G-square p-value = .0000):

Hypothesis III-C: There is no difference between the damages awarded to a domestic patentee or licensee and the damages awarded to a foreign patentee or licensee by a court in a patent infringement case in China. (Rejected)

#### G. INDEPENDENT/EXPLANATORY FACTOR IV—ELAPSED TIME

In this Section, the extent to which time elapsed between the patent application and the final judgment influences patent infringement cases in the Chinese courts is tested. The measures tested include “prosecution length,” “patent age from date of issuance,” and “patent age from date of application.” “Prosecution length” is defined as the time elapsed from the filing of a patent application to the date of issuance. “Patent age from date of issuance” and

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121. Another possible reason for the better results obtained by foreign patentees might be that foreign patentees were very cautious about litigating in China. They litigated only when there was a rather high probability of their winning. It is also possible that there is some protection of the local economy where the SIPO holds international patents to a higher standard.

“patent age from date of filing,” as the terms suggest, are defined as the time elapsed from the date of issuance and filing respectively to the date when the court made a decision.<sup>122</sup> “Patent age from date of filing” is simply the sum of “prosecution time” and “patent age from date of issuance.” Table 24 below presents the mean and median of these three measures for cases involving different types of patents.

**Table 24: Prosecution Length (in Years), by Patent Types**

	Mean	Median
Invention Patents	3.50	3.105 <sup>123</sup>
Utility Models	0.91	0.90
Design Patents	0.66	0.60

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122. A more precise definition of “patent age from date of issuance” would be the total time elapsed between the date a patent was issued and the date a patent infringement lawsuit was filed. However, since the filing details are missing for a significant number of decisions, it is not practical to apply this definition. Instead, I use the date of decision, which is always explicitly written in the judgments, as the last day to calculate patent age.

123. The value here and several values below are rounded to three decimal points because when there is an even number of results, the median is calculated by determining the mean of the two central numbers.

**Table 25: Patent Age from Date of Issuance (in Years), by Patent Types<sup>124</sup>**

	Mean	Median
Invention Patents	6.13	4.975
Utility Models	5.65	5.30
Design Patents	3.89	3.52

124. Fourteen cases are excluded when calculating patent age due to the lack of exact decision date: Zhushihuishe Bailida, Guangzhoushi Junyu Jiayong Dianzi Hengqi Youxian Gongsi (株式会社百利达诉广州市君宇家用电子衡器有限公司) [Tanita Co. v. Guangzhou Junyu Home Scale Co.] CHINA JUDGMENT ONLINE (Guangzhou Interm. People's Ct. June \_\_, 2014), Chen Chujia, Guangdong Aodi Dongman Wanju Youxian Gongsi (陈楚佳诉广东奥迪动漫玩具有限公司) [Chen v. Guangdong Aodi Toys Co.] CHINA JUDGMENT ONLINE (Guangdong Higher People's Ct. Jan. \_\_, 2014), Luo Yonglan v. Guo Guibo (罗永兰诉郭贵伯) CHINA JUDGMENT ONLINE (Guangdong Higher People's Ct. 2014), Jiangmenshi Xinhuiqu Daze Baiqing Wujin Guijiao Zhipinchang, Qiu Zhiwen (江门市新会区大泽柏庆五金硅胶制品厂诉周庆兵) [Jiangmenshi Xinhuiqu Hardware Silicon Gel Mfg. v. Zhou] CHINA JUDGMENT ONLINE (Guangdong Higher People's Ct. 2014), Dongguanshi Jingneng Zhengche Jixie Youxian Gongsi, Qixiang Zhenche (Shanghai) Youxian Gongsi (东莞市精能针车机械有限公司诉启翔针车(上海)有限公司) [Dongguan Jingneng Sewing Mach. Co. v. Qixiang Sewing Mach. (Shanghai) Co.] CHINA JUDGMENT ONLINE (Guangdong Higher People's Ct. 2014), He Qiansheng v. Hubei Quanyuan Dianli Gongcheng Youxian Gongsi (何乾生诉湖北泉源电力工程有限公司) [He v. Hubei Quanyuan Elec. Eng'g Co.] CHINA JUDGMENT ONLINE (Wuhan Interm. People's Ct. Aug. \_\_, 2014), Dongguanshi Zhigao Wenju Youxian Gongsi, Xu Zhelin (东莞市智高文具有限公司诉徐哲琳) [Dongguan Zhigao Stationary Co. v. Xu] CHINA JUDGMENT ONLINE (Jiangxi Higher People's Ct. Apr. \_\_, 2014), Xiamen Minghe Weiyu Shebei Youxian Gongsi, Zhang Zhijie (厦门明合卫浴设备有限公司诉张智杰) [Xiamen Bright Showers Co. v. Zhang] CHINA JUDGMENT ONLINE (Quanzhou Interm. People's Ct. Mar. \_\_, 2014), Guangzhou Ailite Guangdian Keji Youxian Gongsi, Guangzhou Liangmeiji Dengshi Youxian Gongsi (广州艾丽特光电科技有限公司诉广州亮美集灯饰有限公司) [Guangzhou Ailite Optoelectronic Co. v. Guangzhou Liangmeiji Lighting Ltd.] CHINA JUDGMENT ONLINE (Guangdong Higher People's Ct. Mar. \_\_, 2014), Guangzhou Liangmeiji Dengshi Youxian Gongsi, Guangzhou Ailite Guangdian Keji Youxian Gongsi (广州亮美集灯饰有限公司诉广州艾丽特光电科技有限公司) [Guangzhou Liangmeiji Lighting Ltd. v. Guangzhou Ailite Optoelectronic Co.] CHINA JUDGMENT ONLINE (Guangdong Higher People's Ct. Mar. \_\_, 2014), Gan Ruifeng v. Su Zhaohong (范锐丰诉苏钊洪) CHINA JUDGMENT ONLINE (Guangdong Higher People's Ct. Apr. \_\_, 2014), Foshanshi Nanhaijia Kemei Huayuan Yongpin Youxian Gongsi, Cheng Bin (佛山市南海家可美花园用品有限公司诉程兵) [Foshan Nanhai Kemei Garden Supplies Co. v. Cheng] CHINA JUDGMENT ONLINE (Guangdong Higher People's Ct. 2014), Liu Xiaotao, Jieyangshi Zhidi Chaju Youxian Gongsi (刘晓涛诉揭阳市值的茶具有限公司) [Liu v. Jieyang Zhidi Tea Supplies Co.] CHINA JUDGMENT ONLINE (Shantou Interm. People's Ct. Dec. \_\_, 2014).

**Table 26: Patent Age from Date of Application (in Years), by Patent Types<sup>125</sup>**

	Mean	Median
Invention Patents	9.63	8.855
Utility Models	6.56	6.155
Design Patents	4.55	4.11

The average prosecution length for invention patents was 3.50 years. Due to mandatory substantive examination,<sup>126</sup> it was much longer than the average prosecution time for utility models (0.91 years) and design patents (0.66 years). Meanwhile, though both utility models and design patents are required to pass preliminary examination only, the average prosecution length for the former was approximately 37.88% longer than for the latter.

The average patent age between issuance and adjudication for invention patents, utility models, and design patents was 6.13 years, 5.65 years, and 3.89 years respectively. Together with the time spent in prosecution, patent owners had, on average, waited for approximately half of the protection term of their patents (48.15% for invention patents, 65.60% for utility models, and 45.50% for design patents) before enforcement. More surprisingly, utility models—which have been regarded as an effective tool to obtain faster patent protection in China—were enforced relatively later than both invention and design patents.<sup>127</sup>

These statistics imply that, for some reason, patent owners often did not litigate in the early years of the patent protection term. One possible explanation is that companies might obtain patents with no immediate intention of enforcement. Instead, they plan to use patents to scare competitors and exercise market power. Another explanation might be that patent enforcement in China was relatively weak, and many patent owners would therefore rather wait until the system reaches a certain level of maturity before enforcing their patents.<sup>128</sup>

125. *Id.*

126. According to Chinese patent law, utility models and design patents only receive preliminary examination with no substantive prior art search, while invention patents receive both preliminary and substantive examination, which is more detailed and takes much longer.

127. I compare the ratios of the average ages from date of application of litigated invention patents, utility models, and design patents to their own patent protection terms here, instead of the pure figures relating to the average patent ages.

128. Further research is needed to test this hypothesis. If the average age of litigated patents drops when the patent age trend is monitored for several years in a row, it is more likely that weak enforcement is the reason for the rather old technology reported in this Article.

To evaluate how the above measures of elapsed time influence the final outcome of patent infringement cases in China, the quantitative time information was recoded into several intervals; that is, each piece of time information is arranged into one of two time intervals—“short” or “long”—based on whether it is shorter than the average time of its own category. The processed results are set out in Tables 27–29 below.

**Table 27: Case Results, by Prosecution Length**

	Decisions	Infringed	Injunction	Avg. Damages
Total	1,660 (100%)	1,330 (80.12%)	1,202 (90.38%)	¥ 76,078.01 (\$12,390.56)
Short	924 (55.66%)	725 (78.46%)	668 (92.14%)	¥ 72,451.92 (\$11,799.99)
Long	736 (44.34%)	605 (82.20%)	534 (88.26%)	¥ 80,539.43 (\$13,117.17)

**Table 28: Case Results, by Patent Age from Date of Issuance**

	Decisions	Infringed	Injunction	Avg. Damages
Total	1,646 (100%) <sup>129</sup>	1,317 (80.01%)	1,191 (90.43%)	¥ 76,116.29 (\$12,396.79)
Short	923 (56.08%)	710 (76.92%)	671 (94.51%)	¥ 80,810.11 (\$13,161.26)
Long	723 (43.92%)	607 (83.96%)	520 (85.67%)	¥ 70,529.18 (\$11,486.84)

129. Fourteen cases are excluded when calculating delay time due to the lack of exact decision date. *See supra* note 124.

**Table 29: Case Results, by Patent Age from Date of Application**

	Decisions	Infringed	Injunction	Avg. Damages
Total	1,646	1,317 (80.01%)	1,191 (90.43%)	¥ 76,116.29 (\$12,396.79)
Short	906	690 (76.16%)	653 (94.64%)	¥ 71,620.84 (\$11,664.63)
Long	740	627 (84.73%)	538 (85.81%)	¥ 81,137.96 (\$13,214.65)

It is difficult to discern patterns from the above figures. However, some interesting findings arise from the predictive significance of the above. This Section tests nine hypotheses regarding the relationship between elapsed time—prosecution time, patent age from date of issuance, or patent age from date of application—and case outcomes—infringement, injunction, or damages. In five scenarios the time elapsed resulted in a statistically significant change in likelihood of success.

Hypothesis IV-B-1: There is no difference between the likelihood that infringement will be found by a Chinese court in a patent infringement case brought shortly after issuance and a patent infringement case brought a relatively long time after issuance. (Rejected)

Hypothesis IV-C-1: There is no difference between the likelihood that infringement will be found by a Chinese court in a patent infringement case brought early during its protection term and a patent infringement case brought late during its protection term. (Rejected)

The G-square p-values were .0005 and .0000 respectively, indicating that the above hypotheses can be rejected with great confidence. The relationship between patent age from date of issuance/application and infringement rate may result from the participation of NPEs. Professor Love found in his article “An Empirical Study of Patent Litigation Timing: Could a Patent Term Reduction Decimate Trolls without Harming Innovators” that practicing companies usually litigate soon after issuance and complete in the middle of their patent term, while NPEs start relatively late and would not end enforcement until their patent expired.<sup>130</sup> If that was also applicable to what happened in China, the lower infringement rate of cases with short patent age

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130. Professor Love’s finding might not apply to Chinese infringement cases, and further research is required to test this hypothesis. See Love et al., *supra* note 29.

than cases with long patent age might lead to the conclusion that practicing entities were not as successful as NPEs in the Chinese courts.

The following two hypotheses can also be rejected with great confidence (G-square p-value = .0000).

Hypothesis IV-B-2: There is no difference between the likelihood that a patent infringement case brought shortly after issuance and a patent infringement case brought a relatively long time after issuance will be granted injunctions by a Chinese court. (Rejected)

Hypothesis IV-C-2: There is no difference between the likelihood that a patent infringement case brought early during its protection term and a patent infringement case brought late during its protection term will be granted injunctions by a Chinese court. (Rejected)

The reason that cases brought shortly after issuance/early during the protection term enjoy a higher possibility of getting injunctions is quite obvious, because litigations brought relatively late sometimes end after the litigated patent has expired, thus making injunctions no longer necessary. Of the 87 cases with a long patent age from date of issuance in which no injunctions were granted, 32 were due to patent expiration.

The following hypothesis can also be rejected with a fair degree of confidence (G-square p-value = .0222).

Hypothesis IV-A-2: There is no difference between the likelihood that an infringement case involving a patent with a short prosecution time and a patent infringement case involving a patent with a long prosecution time will be granted injunctions by a Chinese court. (Rejected)

#### H. INDEPENDENT/EXPLANATORY FACTOR V—JURISDICTIONS

In terms of Article 28 of the Civil Procedure Law of the People's Republic of China (amended in 2012), litigants can have their patent infringement cases heard in courts located either at the place where one of the defendants resides, or where the infringing activities occurred.<sup>131</sup> The table below provides a breakdown of the jurisdiction in which each of the 1,663 cases was heard.

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131. See *Minshi Susong Fa* (民事诉讼法) [Law on Civil Procedure] (promulgated by the Standing Comm. Nat'l People's Cong., April 9, 1991), art. 28 ("An action instituted for a tort shall be under the jurisdiction of the people's court at the place where the tort occurs or at the place of domicile of the defendant.").

**Table 30: Case Counts by Jurisdictions**

Rank	Jurisdiction	No. Cases	Percentage
1	Guangdong	530	31.87%
2	Zhejiang	280	16.84%
3	Shandong	96	5.77%
4	Beijing	82	4.93%
5	Jiangsu	80	4.81%
6	Fujian	79	4.75%
7	Henan	66	3.97%
8	Hebei	61	3.67%
9	Shanghai	55	3.31%
10	Yunnan	52	3.13%
11	Hunan	50	3.01%
12	Sichuan	35	2.10%
13	Hubei	32	1.92%
14	Anhui	27	1.62%
15	Guizhou	26	1.56%
16	Jilin	25	1.50%
17	Liaoning	20	1.20%
18	Chongqing	16	0.96%
19	Shaanxi	14	0.84%
20	Xinjiang	9	0.54%
21	Jiangxi	7	0.42%
22	Guangxi	5	0.30%
23	Heilongjiang	4	0.24%
23	Ningxia	4	0.24%
25	Gansu	3	0.18%
25	Tianjin	3	0.18%
27	Inner Mongolia	2	0.12%

Of the 31 provincial-level administrative divisions in mainland China (“provinces” unless otherwise specified),<sup>132</sup> 27 were selected at least once by patent holders as the jurisdiction in which to bring patent infringement

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132. Hong Kong and Macau are excluded here because their legal systems are independent of the legal system in mainland China.

lawsuits.<sup>133</sup> However, the number of cases litigated in each province varied greatly. Provinces with better economic development heard significantly more cases than less economically developed provinces. For example, Guangdong, a province located in southern China, and with the highest GDP nationwide, heard over 30% of all patent infringement lawsuits in 2014 and approximately 50% of the lawsuits together with Zhejiang, a province located on east coast, with the fourth highest GDP.<sup>134</sup> The correlation between the level of economic development and the number of litigated cases makes a lot of sense. Economically developed provinces in China generally have more developed manufacturing industries, and more activities are likely to result in both litigation and infringement.

The National Bureau of Statistics of China divides mainland China's 31 provinces into 4 economic regions, based on their location and level of economic development.<sup>135</sup> Table 31 below lists the number and percentages of patent infringement cases heard within these various economic regions.

**Table 31: Case Counts by Economic Regions**

Rank	Economic Region	No. Cases (Percentage)	No. Provinces	No. Cases Per Province
1	East Coast <sup>136</sup>	1,266 (76.13%)	10	126.60
2	Central China <sup>137</sup>	182 (10.94%)	6	30.33
3	Western China <sup>138</sup>	166 (9.98%)	12	13.83
4	Northeast China <sup>139</sup>	49 (2.95%)	3	16.33

133. The fact that no patent infringement suits were litigated in the other four provinces in 2014 might be due to the incompleteness of CJO's data.

134. See *National Data*, NAT'L BUREAU OF STATISTICS OF CHINA, <http://data.stats.gov.cn/english/easyquery.htm?cn=E0103> [<https://perma.cc/G9HB-2JN5>] (last visited Aug. 15, 2018).

135. See *Division of Economic Regions*, NAT'L BUREAU OF STATISTICS OF CHINA, [http://www.stats.gov.cn/ztc/zthd/sjtr/dejtjkr/tjkr/201106/t20110613\\_71947.htm](http://www.stats.gov.cn/ztc/zthd/sjtr/dejtjkr/tjkr/201106/t20110613_71947.htm) [<https://perma.cc/FYN8-SLYU>] (last visited Oct. 4, 2017).

136. This includes ten provinces: Beijing, Tianjin, Hebei, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, and Hainan.

137. This includes six provinces: Shanxi, Anhui, Jiangxi, Henan, Hubei, and Hunan.

138. This includes twelve provinces: Inner Mongolia, Guangxi, Chongqing, Sichuan, Guizhou, Yunnan, Tibet, Shaanxi, Gansu, Qinghai, Ningxia, and Xinjiang.

139. This includes 3 provinces: Heilongjiang, Jilin, and Liaoning.

On the basis of these data, patent infringement cases were highly concentrated in the East Coast region—the most economically developed part of China. The nine provinces from this region, including Beijing, Tianjin, Hebei, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, and Guangdong, heard more than three quarters of all patent infringement lawsuits in 2014. Eight of them were among the ten provinces with the most litigated cases. However, the other 22 provinces from the other three economic regions heard only approximately a quarter of all litigated cases.

Case outcomes measured by economic regions are set out in Table 32 below.

**Table 32: Case Results by Economic Regions**

	No. Cases	No. Infringed	No. Injunctions	Avg. Damages
Total	1,663	1,333 (80.16%)	1,203 (90.25%)	¥ 75,942.39 (\$12,368.47)
East Coast	1,266	1,016 (80.25%)	952 (93.70%)	¥ 84,136.61 (\$13,703.03)
Central China	182	141 (77.47%)	127 (90.07%)	¥ 38,947.60 (\$6,343.25)
Western China	166	136 (81.93%)	105 (77.21%)	¥ 61,491.49 (\$10,014.90)
Northeast China	49	40 (81.63%)	19 (47.50%)	¥ 35,193.68 (\$5,731.87)

The win rates across economic regions were remarkably consistent. Plaintiffs tended to obtain a verdict of infringement in approximately 80% of cases, no matter where the case was litigated. Injunction rates, however, were different in each region. Contrasting with injunction rates of higher than 90% in East Coast (93.70%) and Central China (90.07%), courts in Western China and Northeast China granted injunctions only in 77.21% and 47.50% of cases respectively. However, based on these figures, the conclusion that plaintiffs were more likely to receive injunctions in East Coast and Central China should not be drawn, because injunction rates in this Article are calculated by dividing the number of cases in which injunctions were granted by the number of cases in which infringement was found. The variance in injunction rates would be much smaller if the number of cases in which injunctions were requested and

necessary<sup>140</sup> was taken as the denominator.

The average damages awarded in the four economic regions were not consistent. On average, plaintiffs who litigated in the East Coast region received the highest amount in damages (¥ 84,136.61, or US\$13,703.03), while plaintiffs who litigated in the Northeast region received the lowest (¥ 35,193.68, or US\$5,731.87). One explanation for the higher rate of damages in the East Coast may be that sophisticated parties holding patents of higher value elected to litigate in that region.

The results of hypothesis testing support what is observed from the above descriptive statistics. Hypothesis V-A, testing the relationship between win rates and economic regions cannot be rejected (G-square p-value: .7508). In contrast, the relationship between injunction rates (G-square p-value: .0000) and damages (G-square p-value: .0288), and economic regions can be rejected with a different degree of confidence.

Hypothesis V-A: There is no difference between the likelihood that a court in the East Coast, a court in Central China, a court in Western China, and a court in Northeast China will find infringement in a patent infringement lawsuit. (Not Rejected)

Hypothesis V-B: There is no difference between the likelihood that a court in the East Coast, a court in Central China, a court in Western China, and a court in Northeast China will grant injunctions in a patent infringement lawsuit after infringement is found. (Rejected)

Hypothesis V-C: There is no difference between the damages awarded to a patentee or licensee in a patent infringement case by a court in the East Coast, a court in Central China, a court in Western China, and a court in Northeast China. (Rejected)

The Section below highlights several interesting characteristics of the patent infringement cases heard in different economic regions, for the sake of interest.

First, fewer invention patents and more utility models and design patents were litigated in Western and Northeast China than in East Coast and Central China (Table 33), indicating that the patents litigated in less developed regions were of lower quality than their counterparts litigated in more developed regions.

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140. Injunctions are not necessary if the patent at issue expires at the time of adjudication, or an injunction has already been issued in a prior proceeding.

**Table 33: Litigated Patent Types, by Economic Region**

	Total	Invention Patents	Utility Models	Design Patents
East Coast	1,265	171 (13.52%)	280 (22.13%)	814 (64.35%)
Central China	182	25 (13.74%)	38 (20.88%)	119 (65.38%)
Western China	164	17 (10.37%)	85 (51.83%)	62 (37.80%)
Northeast China	49	5 (10.20%)	17 (34.69%)	27 (55.10%)

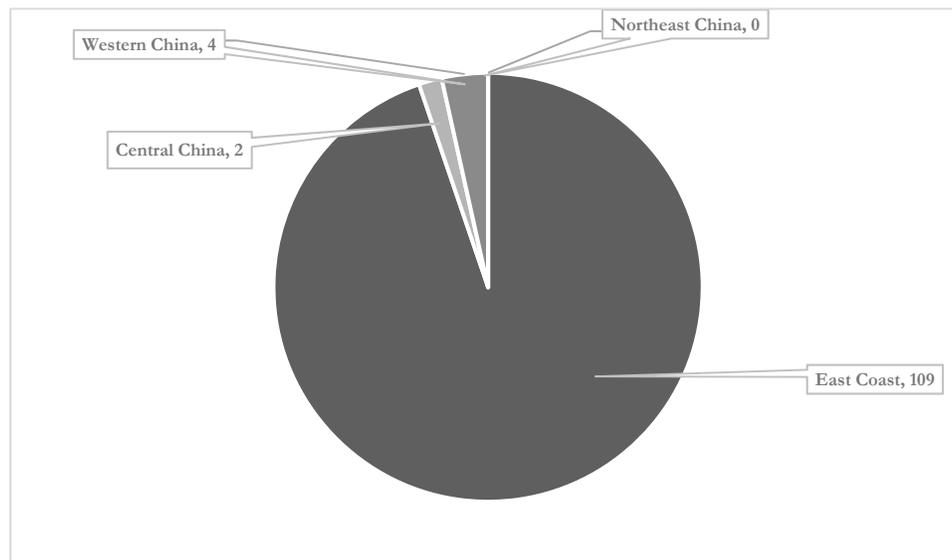
Second, fewer electrical and chemical patents were litigated in Western and Northeast China than in East Coast and Central China (Table 34), indicating that Western and Northeast China have a different industrial structure from the East Coast and Central China—focused primarily on run-of-the-mill mechanical inventions.

**Table 34: Subject Matters, by Economic Region**

	Total	Mechanical	Electrical	Chemical
East Coast	1,265	379 (84.04%)	64 (14.19%)	8 (1.77%)
Central China	182	48 (76.19%)	14 (22.22%)	1 (1.59%)
Western China	164	92 (90.20%)	9 (8.82%)	1 (0.98%)
Northeast China	49	21 (95.45%)	1 (4.55%)	0 (0.00%)

Third, an overwhelming majority of cases brought by foreign patentees or licensees were litigated in the East Coast (109, or 94.78%). Few such cases were litigated in the other three regions.

Figure 4: Foreign Plaintiffs



#### I. INDEPENDENT/EXPLANATORY FACTOR VI—APPEALS

The last explanatory factor tested in this study is the success of appeals. Of the 1,663 final judgments in the population, approximately 40% (608 out of 1,663) are second instance (appellate) opinions. The high percentage of appellate decisions might, on one hand, be the result of the inclusion of final judgments only. For cases that have second instance opinions, their first instance opinions were excluded to avoid overrepresentation/inaccuracies.<sup>141</sup> On the other hand, upper level courts that adjudicate second instance cases may have uploaded a larger number of judicial opinions to CJO than lower level courts.

**Table 35: Second Instance Judgments, Affirmance, and Reversal**

	No. of Decisions	Percentage
Second Instance Judgments	608	36.56%
Affirmed	517	85.03%
Reversed	91	14.97%

141. Due to this limitation, this Section will not provide the details of what types of cases are generally appealed.

Table 35 above also summarizes affirmance and reversal data for second instance decisions in the population. In a significant portion (85.03%) of second instance cases, the appellate courts affirmed lower courts' verdicts. It might therefore be reasonable to conclude that the decision to include final judgments only will not result in significant bias in this research, granted that part of the decisions was missing.

To test how appeals might affect case outcomes of patent infringement litigations in China, Table 36 below presents the case outcome data by instance of trial.

**Table 36: Case Results, by Instance of Trial**

	Decisions	Infringed	Injunctions	Avg. Damages
1st Instance	1,055	856 (81.14%)	766 (89.49%)	¥ 52,596.07 (\$8,566.14)
2nd Instance	608	477 (78.45%)	437 (91.61%)	¥ 117,329.04 (\$19,108.96)

The data in Table 36 suggest that the win rates on infringement and the injunction rates were relatively steady across different instances of trial, while the average damages awarded to first and second instance cases showed notable difference. The damages awarded by second instance courts were more than twice as high as those awarded by first instance courts. The hypothesis testing results bear out these observations.

Hypothesis VI-A: There is no difference between the likelihood that a first instance court and a second instance court will find infringement in a patent infringement lawsuit. (Not Rejected)

Hypothesis VI-B: There is no difference between the likelihood that a first instance court and a second instance court will grant injunctions in a patent infringement lawsuit after infringement is found. (Not Rejected)

Hypothesis VI-C: There is no difference between the damages awarded by a first instance court and a second instance court in a patent infringement lawsuit in China. (Rejected)

The G-square p-values for Hypothesis VI-A and Hypothesis VI-B were .2104 and .2419 respectively, meaning that neither of these hypotheses can be rejected with a fair degree of confidence. However, the G-square p-value for Hypothesis VI-C was .0000, indicating that patent holders tend to receive more damages on appeal. This discrepancy could be explained on the basis of common sense—that patentees holding valuable patents have stronger

incentive to appeal than those with less valuable patents.

## V. CONCLUSION

Some of the findings in this Article disprove the long-standing beliefs about patent enforcement in China. One prominent example is that although damages awarded by the Chinese courts were frustratingly low (US\$4,885.99 in median), patent protection in China is stronger than commonly thought. Plaintiffs were much more successful in China, with an 80.16% win rate, than in many major countries like Germany (approximately 66% win rate) and the United States (approximately 60% win rate).<sup>142</sup> Moreover, permanent injunctions were automatically granted in most cases (93.76%) based on a finding of infringement in China, which partially offsets the low damages awarded.

Another example is that foreign patent holders were as likely to litigate as domestic patent holders and received noticeably better results. Foreign patentees and assignees were more likely to win and get injunctions than Chinese patent owners. Meanwhile, damages awarded to foreign patent holders (¥ 201,620.45, or US\$32,837.21) were almost three times higher than those awarded to their Chinese counterparts (¥ 66,217.93, or US\$10,784.68). This might indicate that the Chinese courts, while not preferring foreign parties to domestic ones, certainly did not protect the local economy at the expense of foreign companies in practice. It might also be possible that foreign patentees were very cautious about litigating in China and only litigated when there was a high probability of winning.

Other observations are unrelated to the conventional wisdom, but are still valuable because they provide detailed data on several aspects of patent infringement litigation in China, and in some cases turn sheer conjecture relating to the Chinese patent system into concrete statements. For example, the overwhelming majority of patent infringement lawsuits in China involved mechanical patents (84.64%) instead of electrical (13.79%) and chemical (1.57%) patents; patent owners, on average, waited for approximately half of the protection term of their patents (48.15% for invention patents, 65.60% for utility models, and 45.50% for design patents) before enforcement; patent infringement cases were highly concentrated in the East Coast region—the most economically developed part of China; and etc.

These findings that patent protection in China is likely stronger than ever may seem striking and somewhat suspicious. However, China is currently

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142. See *supra* note 64.

adopting a bifurcated patent litigation system, which means that claims of patent infringement and validity are usually brought and decided in separate proceedings at different courts instead of in a single proceeding at the same court. Therefore, the data on patent infringement cases provided in this Article only tell half of the patent litigation story in China, and they should be viewed jointly with information on patent validity cases in subsequent research.

In addition to these descriptive statistics, this Article also tested several hypotheses in an effort to identify variables that can predict the outcome of patent infringement cases in China. The results were uneven. Patent types and patent age were the only variables that might influence the finding of infringement. The granting of injunctions was related not only to patent types and patent age, but also to prosecution length and jurisdictions. Patent type, plaintiff's residency, jurisdiction, and appeals were the factors that influenced the amount of damages awarded by a Chinese court.

The predictions made here were based on several important but controversial assumptions mentioned in Section III.D Limitations. Despite these assumptions, this Article may nevertheless serve as a statistical report on patent infringement cases decided in 2014 and currently available on CJO. All the descriptive statistics produced are still valid, and of great value for those who are trying to get a deeper understanding of patent litigation in China.

## APPENDIX A

**Hypothesis I-A:**

Total Cases: 1,660

Patent Type	Category	# Infringed	# Not Infringed
1	Invention Patents	157	61
2	Utility Models	325	95
3	Design Patents	848	174

**Test of Independence:**

Statistic	p-value
G-Square	0.0004
Chi-Square	0.0003

**Hypothesis I-B:**

Total Cases: 1,330

Patent Type	Category	# Injunctions	# Denied Injunctions
1	Invention Patents	148	9
2	Utility Models	275	50
3	Design Patents	779	69

**Test of Independence:**

Statistic	p-value
G-Square	0.0003
Chi-Square	0.0002

**Hypothesis I-C:**

Total Cases: 1,278

Patent Type	Category	Mean	Standard Deviation
1	Invention Patents	¥ 259,154.64	480622.69
2	Utility Models	¥ 83,620.94	105410.75
3	Design Patents	¥ 39,167.20	56940.93

**Test of Independence:**

Statistic	p-value
Damage Value	0.0000

**Hypothesis II-A:**

Total Cases: 638

Subject Matter	# Infringed	# Not Infringed
Mechanical	408	132
Electrical	69	19
Chemical	5	5

**Test of Independence:**

Statistic	p-value
G-Square	0.1803
Chi-Square	0.1406

**Hypothesis II-B:**

Total Cases: 482

Subject Matter	# Injunctions	# Denied Injunctions
Mechanical	357	51
Electrical	62	7
Chemical	4	1

**Test of Independence:**

Statistic	p-value
G-Square	0.7542
Chi-Square	0.7453

**Hypothesis II-C:**

Total Cases: 457

Subject Matter	Mean	Standard Deviation
Mechanical	¥ 137,338.00	310,548.39
Electrical	¥ 165,457.56	237,745.44
Chemical	¥ 239,000.00	382,000.00

**Test of Independence:**

Statistic	p-value
Damage Value	0.6114

**Hypothesis III-A:**

Total: 1,663

Residence of Plaintiff	# Infringed	# Not Infringed
Domestic	1236	312
Foreign	97	18

**Test of Independence:**

Statistic	p-value
G-Square	0.2836
Chi-Square	0.2951

**Hypothesis III-B:**

Total: 1,333

Residence of Plaintiff	# Injunctions	# Denied Injunctions
Domestic	1113	123
Foreign	90	7

**Test of Independence:**

Statistic	p-value
G-Square	0.4725
Chi-Square	0.4861

**Hypothesis III-C:**

Total: 1,281

Residence of Plaintiff	Mean	Standard Deviation
Domestic	¥ 66,217.93	133,629.77
Foreign	¥ 201,620.45	519,830.16

**Test of Independence:**

Statistic	p-value
Damage Value	0.0000

**Hypothesis IV-A-1:**

Total: 1,660

Prosecution Length	# Infringed	# Not Infringed
Short	725	199
Long	605	131

**Test of Independence:**

Statistic	p-value
G-Square	0.0658
Chi-Square	0.0667

**Hypothesis IV-A-2:**

Total: 1,330

Prosecution Length	# Injunctions	# Denied Injunctions
Short	668	57
Long	534	71

**Test of Independence:**

Statistic	p-value
G-Square	0.0222
Chi-Square	0.0219

**Hypothesis IV-A-3:**

Total: 1,278

Prosecution Length	Mean	Standard Deviation
Short	¥ 72,451.92	119,224.56
Long	¥ 80,539.43	256,178.61

**Test of Independence:**

Statistic	p-value
Damage Value	0.4569

**Hypothesis IV-B-1:**

Total: 1,646

Delay Time	# Infringed	# Not Infringed
Short	710	213
Long	607	116

**Test of Independence:**

Statistic	p-value
G-Square	0.0005
Chi-Square	0.0005

**Hypothesis IV-B-2:**

Total: 1,317

Delay Time	# Injunctions	# Denied Injunctions
Short	671	39
Long	520	87

**Test of Independence:**

Statistic	p-value
G-Square	0.0000
Chi-Square	0.0000

**Hypothesis IV-B-3:**

Total: 1,266

Delay Time	Mean	Standard Deviation
Short	¥ 80,810.11	225,999.56
Long	¥ 70,529.18	146,522.10

**Test of Independence:**

Statistic	p-value
Damage Value	0.3477

**Hypothesis IV-C-1:**

Total: 1,646

Patent Age	# Infringed	# Not Infringed
Short	690	216
Long	627	113

**Test of Independence:**

Statistic	p-value
G-Square	0.0000
Chi-Square	0.0000

**Hypothesis IV-C-2:**

Total: 1,317

Patent Age	# Injunctions	# Denied Injunctions
Short	653	37
Long	538	89

**Test of Independence:**

Statistic	p-value
G-Square	0.0000
Chi-Square	0.0000

**Hypothesis IV-C-3:**

Total: 1,266

Patent Age	Mean	Standard Deviation
Short	¥ 71,620.84	129,577.07
Long	¥ 81,137.96	246,506.80

**Test of Independence:**

Statistic	p-value
Damage Value	0.3836

**Hypothesis V-1:**

Total: 1,663

Economic Region	# Infringed	# Not Infringed
East Coast	1,016	250
Central China	141	41
Western China	136	30
Northeast China	40	9

**Test of Independence:**

Statistic	p-value
G-Square	0.7508
Chi-Square	0.7467

**Hypothesis V-2:**

Total: 1,333

Economic Region	# Injunctions	# Denied Injunctions
East Coast	952	64
Central China	127	14
Western China	105	31
Northeast China	19	21

**Test of Independence:**

Statistic	p-value
G-Square	0.0000
Chi-Square	0.0000

**Hypothesis V-3:**

Total: 1,281

Economic Region	Mean	Standard Deviation
East Coast	¥ 84,136.61	209,694.93
Central China	¥ 38,947.60	83,844.17
Western China	¥ 61,491.49	148,069.89
Northeast China	¥ 35,193.68	59,723.84

**Test of Independence:**

Statistic	p-value
Damage Value	0.0288

**Hypothesis VI-1:**

Total: 1,663

Instance	# Infringed	# Not Infringed
1st Instance	856	199
2nd Instance	477	131

**Test of Independence:**

Statistic	p-value
G-Square	0.2104
Chi-Square	0.2085

**Hypothesis VI-2:**

Total: 1,333

Instance	# Injunctions	# Denied Injunctions
1st Instance	766	90
2nd Instance	437	40

**Test of Independence:**

Statistic	p-value
G-Square	0.2419
Chi-Square	0.2464

**Hypothesis VI-3:**

Total: 1,281

Instance	Mean	Standard Deviation
1st Instance	52596.07	184422.862
2nd Instance	117329.0433	200457.3029

**Test of Independence:**

Statistic	p-value
Damage Value	0.0000

## APPENDIX B

Hypothesis Testing Results			
	Infringement	Injunctions	Damages
Patent Types	Rejected	Rejected	Rejected
Subject Matters (Invention Patents & Utility Models)	Not Rejected	Not Rejected	Not Rejected
Plaintiff's Residency	Not Rejected	Not Rejected	Rejected
Elapsed Time—Prosecution Length	Not Rejected	Rejected	Not Rejected
Elapsed Time—Patent Age from Date of Issuance	Rejected	Rejected	Not Rejected
Elapsed Time—Patent Age from Date of Application	Rejected	Rejected	Not Rejected
Jurisdictions/Economic Regions	Not Rejected	Rejected	Rejected
Appeals	Not Rejected	Not Rejected	Rejected