The Effect of Fee Shifting on Litigation: Evidence from a Policy Innovation in Intermediate Cost Shifting

Christian Helmers[†]   Yassine Lefouili[‡]   Brian J. Love[§]   Luke McDonagh[¶]

January 29, 2021

ABSTRACT

We study the effect of fee shifting rules on litigation. First, we build a model to study the theoretical effect of a change in cost-recovery rules on case filings, (post-filing) settlement, win rates, and plaintiffs' average litigation expenditures. We then undertake an empirical analysis of the introduction of an intermediate cost shifting rule that falls between the English and American Rules: a reform that limits the size of fee awards to successful litigants in cases decided by the Intellectual Property Enterprise Court (IPEC), one of two venues where IP cases may be filed in England and Wales. Our empirical analysis takes advantage of heterogeneity among case types and compares IPEC cases with intellectual property cases litigated at the High Court of England and Wales, which was not subject to this reform. We find that patent case filings increased following the IPEC's shift from a pure English Rule to a rule that caps costs awards. Consistent with our model's predictions, we also find evidence that smaller plaintiffs both won less often and settled more often post-reform, as well as evidence that larger plaintiffs spent less on litigation post-reform.

Keywords: Litigation, fee shifting, court reform, intellectual property, UK

JEL Classification: K10, K30, K41

[†]Santa Clara University. E-mail: chelmers@scu.edu
[‡]Toulouse School of Economics, University of Toulouse Capitole. E-mail: yassine.lefouili@tse-fr.eu
[§]Santa Clara University. E-mail: blove@scu.edu
[¶]London School of Economics, E-mail: l.t.mcdonagh@lse.ac.uk

1 Introduction

When studying the allocation of litigation costs incurred by the parties to a lawsuit, economists generally assume a binary choice between the "American Rule" on one hand and the "English Rule" on the other. Under the American Rule, each party is expected to bear its own litigation costs whether or not it wins the case – a practice that reflects the usual treatment of costs in U.S. litigation. Under the English Rule, by contrast, a party that loses a lawsuit is expected to bear not only its own litigation expenses, but also those of the winning party. This practice, which is based on the traditional treatment of costs in the UK, in effect shifts the cost of litigation (principally attorneys' fees) from the victorious party to its opponent and, thus, is alternatively known as "fee shifting."[1] In this paper, we extend the literature on litigation cost allocation beyond these two binary choices to include intermediate regimes that allow the winning litigant to recover some, but not all, of its litigation expenses.

The existing theoretical literature on the distinction between the American and English Rules suggests that the practice of fee shifting has four primary effects.[2] First, existing models predict that fewer suits will settle in a legal environment where the English Rule applies. Assuming that the parties have asymmetric information about the likely outcome of a case, the English Rule will tend to exaggerate their disagreement about the expected value of their respective recovery or payout by adding litigation costs to the total amount at stake in the case. Second, with similar reasoning, the literature predicts that the English Rule will tend to increase the overall rate of litigation. For the same reason that fewer cases will settle once filed, fewer disputes will settle before a lawsuit is filed. Third, the literature shows that the English Rule can affect the types of cases that are filed. When the parties share relatively symmetric information, the English Rule will tend to deter the filing of weak, i.e., low-probability-of-winning, cases by reducing the plaintiff's total expected recovery and, conversely, under the same circumstances, the English Rule will tend to encourage the

---

[1]Neither the UK nor the U.S. legal systems actually enforce rules as rigid as those assumed in traditional economic analyses. In the UK, a successful party is likely to recover a good deal less than its actual total costs. For example, prevailing parties in UK patent cases generally recover about half to two-thirds of their actual costs (Forsyth and Watts, 2011). Similarly, in the U.S. various common law rules and statutory provisions permit fee awards under certain circumstances, especially when a litigant has acted in bad faith (see, for example, Cohen, 2008).

[2]For an overview, see Spier (2007).

filing of strong, i.e., high-probability-of-winning, cases by increasing the plaintiff's expected total award.[3] In effect, the risk of paying the defendant's costs acts as a potential penalty for bringing weak claims, while the prospect of having one's own costs covered by the defendant serves as a reward for bringing strong claims. Finally, the literature predicts that the English Rule will lead parties to litigate their cases more intensely. Because the prospect of fee shifting raises the stakes of litigation, it likewise raises the marginal benefit of additional spending. At the same time, the potential for a cost-recovery award decreases the marginal cost of devoting additional resources to litigation by introducing some likelihood that one's opponent will eventually reimburse that additional cost.

Despite general consensus in the theoretical literature that the English Rule should have these four effects, relatively little empirical evidence has been collected in an effort to confirm (or refute) their existence in real-world litigation.[4] The lack of empirical analysis is likely explained by the difficulty inherent in making comparisons of litigation behavior across jurisdictions, combined with a general lack of (quasi-)experimental data in the area of litigation that would allow such analysis. Indeed, much of the available empirical evidence focuses on litigation in two idiosyncratic U.S. states: Alaska, the only state that routinely awards attorneys' fees to prevailing parties, (Di Pietro et al., 1995; Rennie, 2012) and Florida, which applied the English Rule in medical malpractice cases between 1980 and 1985 (Snyder and Hughes, 1990; Hughes and Snyder, 1995; Helland and Yoon, 2017). Most other studies have been limited to contributing experimental results (Anderson and Rowe, 1995; Rowe and Anderson, 1996; Inglis et al., 2005; Massenot et al., 2021), survey data (Kritzer, 1984; Pfennigstorf, 1984; Genn, 1987; Shapard, 1995), or examinations of similar, but distinct, cost-recovery rules such as one-way fee shifting provisions available in certain types of U.S. cases (Schwab and Eisenberg, 1988), offer-of-judgment statutes enacted in some U.S. jurisdictions (Yoon and Baker, 2006), the shifting of 'success fees' owed pursuant to conditional fee arrangements (Fenn et al., 2017), or the cumulative effect of multiple heterogeneous fee shifting regimes aggregated across causes of action and

---

[3]As Polinsky and Rubinfeld (1998) show, the English Rule can also have the opposite effect when the parties have asymmetric information.

[4]For an overview of the relevant empirical literature, see Kritzer (2002).

jurisdictions (Williams, 2001; Fournier and Zuehlke, 1989).

We advance the literature, both by generalizing existing theoretical models to cover a more realistic spectrum of fee shifting regimes and by offering empirical evidence on the impact of an intermediate fee shifting regime on litigation. Specifically, we model and measure the impact of a reform that caps the amount of litigation expenses that a successful litigant may recover in a jurisdiction that heretofore followed the English Rule. Such a cap limits the extent to which fees are shifted from the losing party to the winning party, and thus establishes what is effectively an "intermediate" fee shifting rule that sits on a spectrum between the English and American Rules and shares characteristics of each.

We first build a theoretical model in which heterogeneous potential plaintiffs decide whether to file a case against a privately informed defendant. If the case is filed, the plaintiff makes a settlement offer to the defendant which can be accepted or rejected, in which case a judgment is handed down by the court. Our model extends the seminal litigation model by Bebchuk (1984) in three respects. First, while Bebchuk deals with the case of a single plaintiff (or, equivalently, homogeneous plaintiffs), we consider a set of heterogeneous potential plaintiffs who must decide whether to file a case in court, and we assume that it is costly to do so. This feature of our model is crucial for the investigation of the effect that the costs cap (and, more generally, any change in the cost-recovery rule) has on the number of cases filed. Second, our model focuses on post-filing settlements, which we are able to observe, while Bebchuk (1984) deals with pre-trial settlements, which are generally unobservable because they take place on a confidential basis before a lawsuit is filed. Therefore, unlike Bebchuk (1984) and other models of pre-trial settlement, our model can be mapped onto observable empirical patterns of settlement. Third, we consider a general class of cost-recovery rules, which allows us to study the effect of any one-sided or two-sided fee-shifting rule and, in particular, a cap on recoverable costs that produces an intermediate fee shifting rule.

Our theoretical analysis concludes that a shift away from a pure English Rule to an intermediate regime (e.g., due to the imposition of a costs cap) has an ambiguous effect on case filings in general. This results from the existence of two opposite effects: a decrease in

plaintiffs' recoverable costs weakens their incentives to file a case, while a decrease in defendants' recoverable costs strengthens those incentives. We also establish that a costs cap's effect on the settlement rate, plaintiffs' win rate, and plaintiffs' average litigation spending can be decomposed into a direct effect (i.e., the effect for a *given* set of plaintiffs) and an indirect effect resulting from the impact of the costs cap on the set of plaintiffs. While the direct effect is similar to the effect identified in models with a single plaintiff or homogeneous plaintiffs (such as Bebchuk, 1984), the indirect effect has been overlooked in the existing literature on litigation and settlement.[5] Our analysis shows that the indirect effect of a costs cap on the settlement rate, plaintiffs' win rate, and plaintiffs' average litigation spending has the same sign as its direct effect whenever the costs cap generates an increase in case filings. In that scenario, our model predicts that a costs cap leads to a higher settlement rate, a lower win rate for plaintiffs, and a lower average litigation expenditure among plaintiffs. While this result extends to the scenario in which the costs cap does not affect case filings or reduces them slightly, the overall impact of the costs cap becomes ambiguous if the costs cap leads to a substantial decrease in case filings.

Next, we take an empirical look at the impact of a 2010 court reform implemented in the UK.[6] The reform introduced a £50,000 cap on the total amount of costs that a victorious litigant may recover in an intellectual property (IP) suit decided by the IP Enterprise Court (IPEC),[7] one of just two venues for litigating IP disputes in England and Wales.[8] Post-reform, litigants in IP suits assigned to the other court – the High Court of England and Wales (PHC)[9] – may continue to pursue full recovery of their litigation expenses without restriction, while parties in cases assigned to the IPEC can hope to recover at most £50,000

---

[5]Note that this indirect effect is not specific to the screening model we consider. It exists in any model in which a change in the parties' recoverable costs induces a change in the set of cases filed.

[6]The UK comprises separate legal systems: England & Wales, Scotland, and Northern Ireland. Our data focus on England & Wales where the overwhelming majority of cases occur.

[7]Prior to October 2013, the IPEC was known as the Patents County Court (see Online Appendix B). The change was made to clarify that the court may hear a range of IP cases, not just those relating to patents. For the sake of simplicity, we refer to the court as the IPEC for the entire period covered by our data, 2007-2013.

[8]For a more detailed description of the UK IP litigation system see Cremers et al. (2017).

[9]In addition to the IPEC, UK IP cases are heard by the Chancery Division of the High Court, either in the general High Court, which hears cases concerning copyright, trademarks (UK/Community) and passing off, and unregistered designs (UK/Community), or at the specialist Patents Court, which hears cases that involve patents and registered designs (UK/Community). For simplicity, we refer to the general High Court and Patents Court as PHC.

(and in practice generally much less) and thus commonly must bear a portion of their own expenses despite winning.

Using data hand collected from more than 2,000 physical IP case files, we track and compare IP litigation initiated in both courts over the period 2007-2013, and in the process, leverage two helpful characteristics of our data set. First, because the PHC was not directly impacted by the reforms, we treat IP litigation in that venue as a control group to isolate the causal effect of the IPEC costs cap from unobservable time-varying factors. Second, we take advantage of heterogeneity among case types: because the costs cap is more likely to be binding in patent cases (due to the relative complexity and cost of such cases), our analysis additionally distinguishes between patent cases and cases involving other types of IP – i.e., trademarks, copyrights, designs, and database rights.

The results of our empirical analysis suggest that the number of patent cases increased following the IPEC's shift from a pure English Rule to a rule that caps costs awards. We find robust evidence for an increase in patent case filings both within the IPEC, comparing patent cases to all other IP cases, and between the IPEC and PHC, comparing patent cases and all other IP cases across these two venues. Further, consistent with our theoretical predictions (in a scenario where a costs cap increases case filings), we find evidence that smaller plaintiffs both won less often and settled more often post-reform, as well as evidence that larger plaintiffs spent less on litigation post-reform.

Our analysis contributes directly to a number of policy debates concerning the design of litigation systems and the question of how to allocate litigation costs optimally. Particularly in the last two decades, the cost of litigation has played a prominent role in legal policy discussions, including those concerning access to justice and tort or other civil justice reforms. Among other policy innovations, intermediate cost shifting rules have played an important role in these debates. In addition to the costs cap adopted by IPEC, similar rules now apply in a few niche areas of U.S. law, including a cap on fees that legal representatives can claim after successfully litigating claims for social security disability benefits (Hoynes et al., 2016). Despite this, no studies to date have attempted to analyze the effect of such caps on litigation behavior.

In the context of IP litigation, the topic of litigation costs has played a particularly prominent role in policy debates. In recent years, U.S. policymakers have proposed and debated multiple legislative reforms that would make fee awards routine in patent suits.[10] In addition, calls for the establishment of small claims courts for IP disputes – courts that would resemble the IPEC in many regards – have drawn the attention of U.S. policymakers multiple times in recent years.[11] Meanwhile, in Europe, policymakers continue long-standing efforts to establish a Unified Patent Court (UPC), the primary function of which would be to significantly reduce the cost of enforcing patent rights continent-wide (McDonagh, 2016). In addition, current UPC proposals would alter the way fee shifting rules apply in many patent cases by introducing costs caps that vary with the value of the case and, at the low end, establish ceilings on recovery even lower than the one applicable in the IPEC.[12]

The remainder of this paper is organized as follows. Section 2 describes the theoretical model and its implications for the empirical analysis. Section 3 describes the data used in our empirical analysis, Section 4 presents our analysis and results, and Section 5 offers concluding remarks.

2 Model

The theoretical literature on the comparison between the American Rule and the English Rule has focused on their effects on filing decisions, litigation spending, and settlement

---

[10]For a summary of patent reform legislation proposed in the U.S. Congress since 2013, including the Innovation Act and SHIELD Act, see Patent Progress (2019). In addition, in a pair of cases decided in 2014, the Supreme Court of the United States modified the test that U.S. courts apply when deciding whether to award attorneys' fees in patent suits. *Octane Fitness, LLC v. Icon Health & Fitness, Inc.*, 572 U.S. 545 (2014); *Highmark, Inc. v. Allcare Health Mgmt. Sys., Inc.*, 572 U.S. 559 (2014). Since these rulings, fee awards in U.S. patent suits (while still rare) have become more common (Flanz, 2016).

[11]In 2013, the Judiciary Committee of the U.S. House of Representatives commissioned a report on the topic of creating a small claims court for copyright disputes. The U.S. Copyright Office, which prepared the report, endorsed the idea. Corresponding legislation – the Copyright Alternative in Small-Claims Enforcement Act, or CASE Act – was first introduced in 2017 and passed into law in December 2020. The U.S. Patent and Trademark Office has also solicited public commentary on "whether the United States should develop a small claims proceeding for patent enforcement." 77 Fed. Reg. 243 (Dec. 18, 2012).

[12]If established, the UPC will make it possible for patent rights to be enforced across 24 European member countries with a single suit. Under current law, enforcement must take place separately in each country. In addition, the UPC's proposed rules for cost shifting awards include caps on the amounts recoverable (Preparatory Committee for the Unified Patent Court, 2016). Current rules propose a €38,000 cap for cases valued at or below €250,000 and a €2,000,000 cap for cases valued at or above €50,000,000, with eight additional intermediate caps for case value ranges in between.

behavior (see Spier, 2007). Following and extending this literature, we lay out a model that analyzes the effects of a costs cap on (i) the number of cases filed by potential plaintiffs, (ii) the settlement rate of cases after filing, (iii) the win rate of plaintiffs in cases that are not settled, and (iv) plaintiffs' litigation expenditures.

2.1 Setup

Consider a unit mass of potential plaintiffs (e.g., IP holders) and assume that each potential plaintiff is involved in a dispute with a single potential defendant (e.g., an alleged infringer). We suppose that each potential defendant has private information about his probability p of losing in court, which can be interpreted as her type.[13] The potential plaintiff does not know the defendant's type but only that it is uniformly distributed over an interval $\left[\underline{p}, \bar{p}\right]$.

Let $D \in (\underline{D}, \bar{D}]$ be the value of the damages that are awarded by the court to a potential plaintiff who files a case and prevails at trial.[14] D can be interpreted as the type of the potential plaintiff and is assumed to be common knowledge.[15] We assume that D is uniformly distributed over $(\underline{D}, \bar{D}]$ and, for the sake of simplicity, we suppose that D and p are independent variables.

Let c_p be the cost of filing a case and C_p the additional litigation costs that a plaintiff has to incur if he neither drops nor settles the case. Also, denote C_d a defendant's litigation costs. We consider a general cost allocation rule under which a winning plaintiff recovers an amount $R_p \in \left[0, c_p + C_p\right]$ while a winning defendant recovers an amount $R_d \in [0, C_d]$. The polar case where $R_p = R_d = 0$ corresponds to the American Rule, while the polar case where $R_p = c_p + C_p$ and $R_d = C_d$ corresponds to the English rule. Finally, we assume that litigation costs are common knowledge and that the potential plaintiffs and defendants are

---

[13]In IP litigation, which is the focus of our empirical analysis, it is likely that the defendant (i.e., the alleged infringer) possesses private information regarding the likelihood of infringement.

[14]The assumption that the plaintiff receives a payment D from the defendant can be interpreted more broadly as meaning that the benefit derived by a plaintiff who prevails in court is equal to the loss of the defendant. In Online Appendix C, we show that our model can be extended to the case of *asymmetric* stakes (i.e., the benefit of a plaintiff prevailing in court is different from the defendant's loss), which is relevant for instance if the court awards an injunction to the plaintiff.

[15]In patent cases, the patent holder is likely to be privately informed about the validity of the patent. However, the majority of cases in our dataset are related to non-patent IP rights the validity of which is not at stake. Therefore, we believe that a model featuring one-sided asymmetric information with a privately informed defendant is a reasonable fit for the empirical context we consider.

risk-neutral.

Let us consider the following game for each dispute:

- Stage 0: The potential plaintiff's type D and the potential defendant's type p are realized. D is observed by both parties while p is observed only by the defendant.

- Stage 1: The potential plaintiff decides whether to file a case (hence becoming a plaintiff). If he does not, the game ends. Otherwise, the game proceeds to the next stage.

- Stage 2: The plaintiff makes a take-it-or-leave-it settlement offer to the defendant.[16]

- Stage 3: The defendant decides whether to accept the settlement offer. If he does, the game ends.[17] Otherwise, the plaintiff incurs additional litigation costs C_p while the defendant incurs litigation costs C_d, and a decision regarding the infringement is issued by the court.

To ensure that the plaintiff's litigation threat in case settlement fails is credible[18] (as is implicitly assumed in Stage 3) we assume that[19]

$$\underline{p} \geq \frac{C_p + C_d}{c_p + C_p + C_d + \underline{D}}. \tag{1}$$

2.2 Equilibrium analysis

The subgame corresponding to Stages 2 and 3 is a straightforward extension of the standard screening game considered by Bebchuk (1984) to a general cost allocation rule (R_p, R_d).

---

[16]This implies that our litigation game is a screening game. Extending our analysis to a signaling game a la Reinganum and Wilde (1986) is outside the scope of this paper but would constitute an interesting robustness test for our theoretical results.

[17]The only two outcomes we allow for are the absence of settlement and full settlement. See Prescott and Spier (2016) for a discussion of partial settlement, and Spier and Prescott (2019) for an analysis of general contingent settlement contracts.

[18]In doing so we follow Bebchuk (1984) and the vast majority of screening models in the settlement literature (see Spier, 2007). A notable exception is Nalebuff (1987).

[19]To see why this condition implies that the plaintiff will never find it optimal to drop the case if settlement fails, note that his continuation value from not dropping the case is

$$p(D + R_p - C_p) - (1 - p)(C_p + R_d).$$

The latter is positive for any values $p \in [\underline{p}, \bar{p}]$, $D \in (\underline{D}, \bar{D}]$, $R_p \in [0, c_p + C_p]$ and $R_d \in [0, C_d]$ if Condition (1) is satisfied.

The next lemma characterizes the equilibrium settlement amount and the corresponding settlement probability when there is a non-zero probability that settlement fails for any cost allocation rule (R_p, R_d) and any plaintiff's type $D \in (\underline{D}, \bar{D}]$. A sufficient condition for this to hold is $\bar{p} - \underline{p} \geq \frac{C_p + C_d}{\underline{D}}$, which we assume throughout our analysis.

Lemma 1. *A plaintiff of type D offers to settle the case for an amount*

$$S^*(D, R_p, R_d) = \bar{p}(D + R_p + R_d) - C_p - R_d, \tag{2}$$

and a defendant accepts to pay such an amount if and only if her type p is above

$$p^*(D, R_p, R_d) = \bar{p} - \frac{C_p + C_d}{D + R_p + R_d}. \tag{3}$$

Proof. See Online Appendix C. □

Considering now Stage 1, a potential plaintiff's expected gain from filing a case is given by

$$\Pi^*(D, R_p, R_d) \equiv \frac{\bar{p} - p^*}{\bar{p} - \underline{p}} S^* + \frac{p^* - \underline{p}}{\bar{p} - \underline{p}} \left[\rho^*(D - C_p + R_p) - (1 - \rho^*)(C_p + R_d) \right] - c_p,$$

where $\rho^* = \frac{1}{2}(p^* + \bar{p})$ is the average probability that the plaintiff prevails in court if the equilibrium settlement offer is turned down by the defendant. A potential plaintiff decides to file a case if and only if $\Pi^*(D, R_p, R_d) > 0$. The following lemma shows that the set of potential plaintiffs filing a case has a very natural structure.

Lemma 2. *There exists a unique threshold $D^*(R_p, R_d) \geq \underline{D}$, decreasing in R_p and increasing in R_d, such that a potential plaintiff of type D files a case if and only if:*

$$D > D^*(R_p, R_d).$$

Proof. See Online Appendix C. □

Let us emphasize here a key difference between our setting and models of pre-trial settlement. In the latter a potential plaintiff files a case *after* settlement fails whenever the

credibility condition (1) is satisfied. In our setting, condition (1) ensures that the plaintiff proceeds to trial if *post-filing* settlement fails but is not sufficient to ensure that a case is filed *ex ante*. The reason is that a potential plaintiff must pay a positive cost c to file a case, which is sunk by the time he needs to decide whether to proceed to trial (if the settlement offer is turned down).

2.3 Effects of a costs cap

In this section we study the effects of a (binding) costs cap, i.e., $\bar{R} < \min(c_p + C_p, C_d)$, on the equilibrium number of case filings, the equilibrium settlement rate, and plaintiffs' win rate (conditional on not having settled). We also examine the impact of a costs cap on plaintiffs' litigation expenditures in an extended version of the model.

2.3.1 Number of case filings

Let us first investigate the impact of a costs cap, i.e., a switch from $(R_p, R_d) = (c_p + C_p, C_d)$ to $(R_p, R_d) = (\bar{R}, \bar{R})$, on the number of case filings. To sign this effect, we need to sign the difference between the post-reform plaintiff's gain from filing a case and its pre-reform counterpart, $\Pi^*(D, \bar{R}, \bar{R}) - \Pi^*(D, c_p + C_p, C_d)$, which can be written as

$$\underbrace{\Pi^*(D, \bar{R}, \bar{R}) - \Pi^*(D, c_p + C_p, \bar{R})}_{\text{negative effect of a decrease in } R_p} + \underbrace{\Pi^*(D, c_p + C_p, \bar{R}) - \Pi^*(D, c_p + C_p, C_d)}_{\text{positive effect of a decrease in } R_d}. \tag{4}$$

The first term captures the effect of a decrease in plaintiffs' recoverable costs (resulting from the costs cap) on a plaintiff's gain from litigation while the second one captures the effect of a decrease in defendants' recoverable costs on that gain. The next lemma shows that the former is negative while the latter is positive.

Lemma 3. *A plaintiff's expected gain from litigation* $\Pi^*(D, R_p, R_d)$ *is increasing in* R_p *and decreasing in* R_d.

Proof. See Online Appendix C. □

The inevitable conclusion is that a costs cap has a generally ambiguous effect on plaintiffs' gain from litigation, which leads us to the following proposition.

Proposition 1. *The impact of a costs cap on equilibrium case filings is ambiguous in general.*

Proof. See Online Appendix C. □

Thus, the (sign of the) impact of a cap on case filings depends on the specific characteristics of the environment in which the cap is implemented. In Online Appendix C, we consider two such characteristics and provide sufficient conditions under which the impact of a cap is positive (resp. negative). First, we use decomposition (4) to show that a cap has a positive (resp. negative) effect on case filings if the reduction in plaintiffs' recoverable costs resulting from the costs cap is sufficiently small (resp. large) relative to the reduction in defendants' recoverable costs. Second, we establish that the impact of a costs cap on case filings is positive if total litigation costs $c_p + C_p + C_d$ are sufficiently large relative to damages.

The next sections show that the way a costs cap affects case filings plays a crucial role in determining the impact of the cap on the settlement rate, plaintiffs' win rate, and plaintiffs' average litigation expenditures.

2.3.2 Settlement rate

Let us now turn to the effect of a costs cap on the equilibrium settlement rate, i.e.,

$$\theta^* \left(R_p, R_d \right) \equiv \frac{\int_{D^*(R_p,R_d)}^{\bar{D}} q^* \left(D, R_p, R_d \right) dD}{\bar{D} - D^* \left(R_p, R_d \right)},$$

where $q^* \left(D, R_p, R_d \right) = 1 - p^*(D, R_p, R_d)$ is the (individual) settlement probability of a plaintiff of type D. The difference between the post-reform equilibrium settlement rate and its pre-reform counterpart, $\theta^* \left(\bar{R}, \bar{R} \right) - \theta^* \left(c_p + C_p, C_d \right)$, is the sum of a direct effect and an

indirect one:

$$\underbrace{\frac{\int_{D^*(c_p+C_p,C_d)}^{\bar{D}} q^*\left(D,\bar{R},\bar{R}\right)dD}{\bar{D}-D^*\left(c_p+C_p,C_d\right)} - \frac{\int_{D^*(c_p+C_p,C_d)}^{\bar{D}} q^*\left(D,c_p+C_p,C_d\right)dD}{\bar{D}-D^*\left(c_p+C_p,C_d\right)}}_{\text{direct effect}}$$

$$\underbrace{+\frac{\int_{D^*(\bar{R},\bar{R})}^{\bar{D}} q^*\left(D,\bar{R},\bar{R}\right)dD}{\bar{D}-D^*\left(\bar{R},\bar{R}\right)} - \frac{\int_{D^*(c_p+C_p,C_d)}^{\bar{D}} q^*\left(D,\bar{R},\bar{R}\right)dD}{\bar{D}-D^*\left(c_p+C_p,C_d\right)}}_{\text{indirect effect}}$$

The direct effect captures the impact of the costs cap on the settlement rate holding the set of
plaintiffs fixed, while the indirect effect captures the change in the settlement rate resulting
from a change in the set of plaintiffs. It is straightforward that the equilibrium probability
of settlement for a given plaintiff is decreasing in both the plaintiff's and the defendant's
recoverable costs.[20] This implies that the direct effect of a costs cap on the settlement rate
is always positive. The sign of the indirect effect is determined by the impact of the costs
cap on the critical threshold D^* or, equivalently, its impact on the number of case filings.
To see why, note first that the equilibrium probability of settlement for a given plaintiff is
decreasing in its type D.[21] This in turn implies that, holding the individual probabilities
of settlement fixed, the settlement rate increases (resp. decreases) if the set of potential
plaintiffs filing a case expands (resp. shrinks).[22] In other words, the sign of the indirect
effect is the same as the sign of the impact of the costs cap on case filings. If the latter is
positive then the overall impact of the costs cap on the settlement rate is the sum of two
positive effects and is, therefore, positive. If, however, the costs cap has a negative impact
on case filings, then the direct effect and the indirect effect do not have the same sign and,

---

[20]This is a straightforward generalization of the result in Bebchuk (1984) about the impact of a switch from
the English Rule to the American Rule on the probability of settlement. The intuition behind this is that a
decrease in recoverable costs does not affect the joint surplus from settlement but makes the adverse selection
problem faced by a plaintiff less severe, i.e., he finds it less costly to separate defendant types.

[21]The intuition behind this is similar to the intuition behind the result that the settlement probability decreases with recoverable costs: a decrease in damages does not affect the joint surplus from settlement but
makes the adverse selection problem faced by a plaintiff less severe.

[22]The formal proof follows directly from rewritting the indirect effect as:

$$\frac{D^*\left(c_p+C_p,C_d\right)-D^*\left(\bar{R},\bar{R}\right)}{\bar{D}-D^*\left(\bar{R},\bar{R}\right)}\left[\frac{\int_{D^*(\bar{R},\bar{R})}^{\bar{D}} q^*\left(D,\bar{R},\bar{R}\right)dD}{D^*\left(c_p+C_p,C_d\right)-D^*\left(\bar{R},\bar{R}\right)} - \frac{\int_{D^*(c_p+C_p,C_d)}^{\bar{D}} q^*\left(D,\bar{R},\bar{R}\right)dD}{\bar{D}-D^*\left(c_p+C_p,C_d\right)}\right].$$

consequently, the sign of the overall impact depends on their relative magnitudes. Thus, we get the following theoretical prediction.

Proposition 2. *If a costs cap yields an increase in case filings then it leads to an increase in the equilibrium settlement rate. However, if a costs cap yields a decrease in case filings then it has a generally ambiguous effect on the settlement rate.*

Note that the costs cap also leads to an increase in the equilibrium settlement rate if it does not affect case filings or if it leads to a sufficiently small decrease in case filings. In the former case, there is no indirect effect stemming from a change in case filings while in the latter the indirect effect is negative but is outweighed by the positive direct effect.

2.3.3 Plaintiffs' win rate

We now examine the impact of the costs cap on plaintiffs' win rate conditional on not having settled, i.e.,

$$\gamma^* \left(R_p, R_d \right) \equiv \frac{\int_{D^* \left(R_p, R_d \right)}^{\bar{D}} \rho^* \left(D, R_p, R_d \right) dD}{\bar{D} - D^* \left(R_p, R_d \right)},$$

where $\rho^* \left(D, R_p, R_d \right) = \frac{1}{2} \left(\underline{p} + p^* \left(D, R_p, R_d \right) \right)$ is the probability that an individual plaintiff of type $D \in \left[\underline{D}, \bar{D} \right]$ wins if her settlement offer is turned down by the defendant.

We have already shown that $p^* \left(D, R_p, R_d \right)$ is increasing in R_p and R_d. This implies that $\rho^* \left(D, R_p, R_d \right)$ is increasing in R_p and R_d. Therefore, the impact of the costs cap on the probability that a *given* plaintiff (who would file a case both in the absence of and under the cap) prevails in court is negative. Considering the impact of the costs cap on plaintiff win rate, it is again useful to write the overall effect $\gamma^* \left(\bar{R}, \bar{R} \right) - \gamma^* \left(c_p + C_p, C_d \right)$ as the sum of a direct effect and an indirect one:

$$\underbrace{\frac{\int_{D^* \left(c_p + C_p, C_d \right)}^{\bar{D}} \rho^* \left(D, \bar{R}, \bar{R} \right) dD}{\bar{D} - D^* \left(c_p + C_p, C_d \right)} - \frac{\int_{D^* \left(c_p + C_p, C_d \right)}^{\bar{D}} \rho^* \left(D, c_p + C_p, C_d \right) dD}{\bar{D} - D^* \left(c_p + C_p, C_d \right)}}_{\text{direct effect}}$$

$$+ \underbrace{\frac{\int_{D^* \left(\bar{R}, \bar{R} \right)}^{\bar{D}} \rho^* \left(D, \bar{R}, \bar{R} \right) dD}{\bar{D} - D^* \left(\bar{R}, \bar{R} \right)} - \frac{\int_{D^* \left(c_p + C_p, C_d \right)}^{\bar{D}} \rho^* \left(D, \bar{R}, \bar{R} \right) dD}{\bar{D} - D^* \left(c_p + C_p, C_d \right)}}_{\text{indirect effect}}$$

14

The direct effect of the costs cap is always negative because $\rho^*\left(D, R_p, R_d\right)$ is increasing in R_p and R_d. The sign of the indirect effect, however, depends on the impact of the costs cap on the number of case filings. An argument similar to the one used to relate the sign of the indirect effect of the costs cap on the settlement rate to its effect on case filings, allows us to state that the indirect effect on plaintiffs' win rate is negative (resp. positive) if the costs cap leads to an increase (resp. decrease) in case filings. Thus, we get the following result.

Proposition 3. *If a costs cap yields an increase in case filings then it leads to a decrease in plaintiffs' win rate conditional on not settling. However, if the costs cap yields a decrease in case filings then it has a generally ambiguous effect on plaintiffs' win rate.*

2.3.4 Plaintiffs' litigation spending

In this section we extend our model to study the effect of a costs cap on plaintiffs' average litigation expenditures. More specifically, let us now assume that each plaintiff can make an investment before he makes a settlement offer in order to increase the damages he gets in case settlement fails and he wins at trial. Importantly, we suppose that such investment is observable to the defendant. Furthermore, we assume that plaintiffs are heterogeneous regarding the amount they need to invest to achieve a certain increase in damages. Specifically, suppose that an investment x by a plaintiff of type $\beta \in \left[\underline{\beta}, \bar{\beta}\right]$ allows the plaintiff to obain $D\left(x, \beta\right)$ where $D(., \beta)$ is increasing, $D\left(0, \beta\right) = D_0$ for any $\beta \in \left[\underline{\beta}, \bar{\beta}\right]$, and $\frac{\partial D}{\partial x}\left(x, \beta\right)$ is increasing in β. The parameter β can be interpreted as an idiosyncratic efficiency parameter. Assuming that $\Pi^*(D\left(x, \beta\right), R_p, R_d)$ is concave in x, we get the following preliminary result.

Lemma 4. *The optimal investment level $x^*(\beta, R_p, R_d)$ of a given plaintiff is increasing in β, R_p, and R_d.*

Proof. See Online Appendix C. □

An immediate implication of this lemma is that a costs cap leads to a decrease in a given plaintiff's investment level. This means that the direct effect of a costs cap on plaintiff's average investment in litigation is negative. However, there is again an indirect effect that

15

depends on whether the costs cap leads to more or less case filings. It can be easily shown that, in the current setting, there exists $\beta^*\left(R_p, R_d\right) \in \left[\underline{\beta}, \bar{\beta}\right]$, increasing in R_p and decreasing in R_d, such that a plaintiff files a claim if and only if $\beta > \beta^*\left(R_p, R_d\right)$. As in the baseline model, the costs cap has an ambiguous effect, in general, on the number of case filings. However, decomposing again the overall effect of the costs cap into a direct one and an indirect one and using a reasoning similar to the one behind Propositions 2 and 3 leads to the following result.

Proposition 4. *If a costs cap leads to an increase in case filings then it also leads to a decrease in plaintiffs' average investment in litigation. However, if the cap leads to a decrease in case filings then its impact on plaintiffs' average investment in litigation is generally ambiguous.*

Proof. See Online Appendix C. □

3   Data

For our empirical analysis, we rely on data on IP cases litigated in England and Wales. In England and Wales, all IP lawsuits are adjudicated in one of two courts: the IPEC and the PHC. This section describes our methods for collecting data from both courts.

3.1   IPEC

We collected information for all cases filed at the IPEC between 2007 and 2013. To do so, we examined by hand all physical (i.e., paper) case files stored with the court in London.[23]

For each IPEC case, we identified its filing date, all parties to the case, all claims and counterclaims raised by the parties, the specific IP right(s) involved (including patent and trademark numbers), and the date and manner in which the case was terminated (either by settlement or due to a procedural or substantive ruling). We additionally noted when cases were transferred to or from the IPEC. Data collection was completed between September 2013 and July 2014, and all case data are current as of July 2014.

---

[23]For more details on the data collection see Online Appendix D.

3.2   PHC

We also collected as much data as possible for IP cases brought in the PHC during the same 2007-2013 period, and again we examined physical court records to do so. Our PHC data collection efforts were limited by two challenges. First, some 2007 Chancery Division case files were destroyed in a fire in 2008. Accordingly, it is likely that our data excludes some small number of patent cases filed in 2007. Second, another group of case files – one that contained files for all non-patent IP cases initiated prior to 2009 – had been moved to off-site storage and could not be retrieved for examination.

Subject to these two caveats, we examined by hand all available PHC case files (roughly 5,000 per year) to identify the subset of cases concerning IP rights and to collect data on their parties and claims. For patent cases, our PHC data spans 2007-2013 and include the same information that we collected from IPEC case files. For all other types of IP cases (i.e., cases concerning copyrights, designs, database rights, and trademarks), our PHC data are limited to the period 2009-2013 and are further limited with respect to some case-level details.[24]

3.3   Firm-level data

To obtain additional data on all parties to the IP cases that we identified, we cleaned and standardized the raw text collected from court records and, where relevant, consolidated company litigants into business groups so as not to double-count related subsidiaries appearing in the same case. Using this data, we identified the location of each company's (or group's) headquarters, obtained basic information for each UK company (e.g., SIC code and incorporation date) from Companies House's online WebCheck, and obtained detailed financial information for all companies (e.g., assets, turnover, and employee count) from Bureau van Dijk's FAME database. Finally, combining information from Companies House and FAME, we classified all companies (or groups) by size as either a micro/SME or large entity.[25]

---

[24]For more details on our data collection methodology and its limitations, see Online Appendix D.

[25]We follow the standard EU definition, which relies on information on a firm's number of employees, turnover, and total assets.

4 Empirical analysis

4.1 IPEC reforms and costs cap

Our empirical analysis focuses on an important change in the cost allocation rules applied by the IPEC. Since October 2010, cases assigned to the IPEC have been subject to a recoverable costs cap, which limits fee awards to £50,000 for trials on substantive liability (plus an additional cap of £25,000 relating to subsequent hearings concerning damages).[26]

This costs cap was one of a series of procedural reforms that went into effect on a staggered basis from 2010 to 2013.[27] Among those was the introduction of a £500,000 cap on damages awards. This limitation on damages was applied to cases asserting patent and design rights in June 2011, and it was subsequently extended to all IP cases four months later. While in theory a damages cap can affect litigation behavior, all available evidence suggests that this particular cap has in actual practice not done so. For one, the damages cap was set so high that it is very rarely binding. The average value that plaintiffs assigned to their own IPEC cases during the period of our study was less than £75,000 total.[28] Even among patent cases, which tend to have the largest damages awards, the average case value provided was less than £230,000 – i.e., less than half the maximum possible recovery. In addition, many plaintiffs report that the primary reason they file IP suits is to seek injunctions, not damages.[29] Both facts are further confirmed by extensive qualitative interviews that we conducted with legal practitioners (i.e., judges, solicitors, barristers, and patent and trademark attorneys) and companies that litigated at the IPEC or PHC during the period of our study (Helmers et al., 2015).

Second, beginning in late 2012, the IPEC introduced a set of "Small Claims Track" (SCT) procedures for use in especially low value non-patent cases – i.e., cases enforcing copyrights, trademarks, database rights, or unregistered designs. This change is also very unlikely to

---

[26]Separate hearings on damages occur in the courts of England and Wales after the conclusion of the trial on substantive matters.

[27]We provide more details on the legal background and reforms in Online Appendices A and B. See also Fox (2014) and Helmers et al. (2015).

[28]This average excludes cases filed in the IPEC "Small Claims Track."

[29]This is particularly true in patent cases where the plaintiff seeks only the revocation of a patent owned by the defendant.

have affected cases employing ordinary IPEC procedures. Our data indicate that the SCT has only attracted cases that, before, likely would not have been litigated at all due to their low claim value. The vast majority of SCT cases filed during the period of our study allege infringement of a copyright (mostly digital photos) and were brought by an individual seeking an average of just £3,300 in damages.[30]

4.2 Empirical approach

For our empirical analysis, we rely on heterogeneity among IP cases and the availability of the PHC as a control group to isolate the effect of the adoption of a costs cap at the IPEC in October 2010 – i.e., an intermediate fee shifting rule – on case filings, litigation expenses, and case outcomes.

First, we rely on heterogeneity among IP cases. Patent cases tend to be more complex than cases involving other forms of IP and therefore are more expensive to litigate.[31] We have some data on costs awards among decided cases at the IPEC (see Figure G-1 in the Online Appendix). It is important to keep in mind that these data come from a small share of cases that were decided by the court and, moreover, that within the set of decided cases only a small subset proceeds to a cost hearing because parties more often than not settle the payment of costs once the case is decided. In addition, the costs awards do not reflect the total costs incurred by each party, only the costs actually shifted by the court. This explains why we have this information for only 17 patent cases and 84 cases involving other forms of IP. That said, the data show that parties incur larger expenses in patent cases (average costs awards are £37,000) than in cases that involve any other type of IP (average costs awards are £18,000). This means that the costs cap is more likely to be binding for patent cases; indeed, we see in Figure G-1 that costs were capped in two patent cases post-reform. We therefore distinguish in our empirical analysis between patent cases and other non-patent IP cases.

Second, we rely on the PHC as a control group. No changes were made to the PHC's cost

---

[30]For more discussion and analysis of the SCT see Helmers et al. (2018).

[31]A recent survey of U.S. IP lawyers reports that the median total cost of litigating a low value patent case exceeds the cost of litigating a copyright case of the same value by 27 percent and the cost of litigating a similarly valued trademark case by 154 percent (AIPLA, 2019: I-141, I-192, I-208).

allocation rule during the same time period. Therefore we compare case filings, litigation expenses, and case outcomes at the IPEC and the PHC before and after the reforms. Using the PHC as a control group allows us to control for any broader trends that could have affected litigation behavior at the IPEC even in the absence of the introduction of the costs cap. There are, however, potential concerns with this approach. Litigation at the PHC could have been affected by the reforms (i) directly or (ii) through forum shopping (i.e., plaintiffs' choice to file suit in the IPEC or the PHC), either of which would invalidate the use of the PHC as a control group.

Regarding (i), in principle, IP cases can be heard and determined by either the IPEC or PHC (Fox, 2014: 15-16). In practice, however, there has been a clear separation between the different venues regarding the types of cases they hear. The PHC hears more complex cases which often involve large companies litigating factually and legally complex issues. Crucially, this has remained unaffected by the reforms. Indeed, the qualitative data that we collected from judges and lawyers involved in IP litigation at both the PHC and IPEC demonstrate that the PHC was largely unaffected by the IPEC reforms (Helmers et al., 2015). This in turn raises the concern that litigation at the PHC may not be an appropriate control group if litigation of complex issues between large companies follows a different trend and is possibly subject to different unobservable shocks. To address this issue, we include a large set of case- and litigant-level controls to account for observable differences between the IPEC and PHC (for a summary see Online Appendix F).

With respect to (ii), forum shopping could be a concern because parties cannot contract out of the IPEC fee regime while staying within the IPEC. While plaintiffs generally choose the venue they deem appropriate, defendants can affect venue choice by applying for a transfer to another venue. That is, a case that is initiated at the IPEC may be transferred to the PHC and vice versa. In addition, both courts have the power to transfer cases to the other venue without consent from either litigating party while imposing the costs of the transfer on the litigating parties (Fox, 2014: 173-174).[32] The case law on transfers shows that the relevant factors to be considered by judges include the size and financial resources of

---

[32]Note that IP claims (except for patents and registered designs) can also be filed with a select number of county courts. These courts usually transfer these cases to the IPEC.

either of the litigating parties, factual and legal complexity, the expected length of trial, the value of the claim and any non-pecuniary relief sought, and whether a case raises important issues of law that are in the public interest.[33] The case law also shows that judges take into account any potential abuse of the IPEC or PHC procedures by either party.[34] Hence, the combination of a clear separation between the two venues and a high likelihood that the court will transfer cases to the most appropriate venue act as strong safeguards against attempted forum shopping.

When we look at actual case transfers between the two venues before and after the reforms as shown in Figure G-2 in the Online Appendix, we see that the share of cases transferred from the IPEC to the PHC is extremely low and does not change substantially following the reforms. Similarly, the share of cases transferred from the PHC to the IPEC does not change in any significant way following the reforms. Although data on transfers does not rule out the possibility that venue choice was affected by the introduction of the costs cap, the combination of quantitative evidence and clear legal guidelines discussed in this section mitigate concern that litigation at the PHC could have been affected by the costs cap directly or as a result of forum shopping.

4.3   Case counts

We start by analyzing whether the costs cap has changed the number of case filings at the IPEC. Table 1 shows the total case counts by IP right for the IPEC and the PHC during the period 2007-2013.[35]

---

[33]See Fox (2014:48-57) for a detailed review of the different factors and the corresponding extensive case law.

[34]For a detailed analysis of the factors and safeguards taken into account, see the judgments in *Comic Enters., Ltd. v. Twentieth Century Fox Film Corp.*, [2012] EWPCC 13, and *77M, Ltd. v. Ordnance Survey, Ltd.*, [2017] EWCH 1501 (IPEC).

[35]We exclude SCT cases throughout our analysis as they differ substantially in observable and presumably unobservable characteristics from the main IPEC multi-track cases. For the same reason we also exclude all copyright cases filed by the music licensing company PPL (Phonographic Performance Limited) at both the IPEC and PHC (see Table H-1 in the Online Appendix for case counts including cases brought by PPL). These cases account for the large majority of copyright cases at the PHC. Note also that as explained in Section 3, for the PHC we only have data for the entire 2007-2013 period for patent cases. For all other IP rights, our PHC data are limited to 2009-2013. Note also that in Table 1, we drop all cases at the IPEC and PHC that were dropped by the plaintiff or for which only the claim form but no response by the defendant was filed – which are also the data used in our analysis of case outcomes in Section 4.4. For counts of all cases see Table H-2 in the Online Appendix.

At the IPEC, the largest subset of cases concerns trademark claims (331 cases) followed by copyright (246), design (145), and patent (89) claims. Across all types of IP cases, there is a notable jump in case filings between 2010 and 2011, which coincides with the introduction of the costs cap in October 2010. It is tempting to conclude from these figures that case numbers for all IP rights have substantially increased at the IPEC as a result of the costs cap. However, the corresponding figures for the PHC caution against hasty conclusions. At the PHC, we see an increase in IP case counts between 2010 and 2011, too, especially patent case counts. Patent case counts increased between 2010 and 2011 by 97%. While total case counts for other IP rights increased only moderately (or in some instances dropped), total IPEC case counts increased by nearly 50% and total PHC case counts by 11% between 2010 and 2011. This suggests on the one hand that the costs cap may have led to a large increase in case filings at the IPEC. But, on the other hand, it suggests that additional factors may have affected case filings (especially patent case filings) during the same time period.

Table 1: IPEC an PHC case counts, 2007-2013

Year	Patent		Trademark		Design		Copyright		Database		Total	
	IPEC	PHC	IPEC	PHC	IPEC	PHC	IPEC	PHC	IPEC	PHC	IPEC	PHC
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2007	5	29	3		3		8		0		19	29
2008	4	64	14		3		29		0		50	64
2009	8	43	61	63	15	14	28	54	2	4	114	178
2010	8	43	44	106	17	42	33	66	2	16	104	273
2011	25	84	50	103	26	21	48	74	3	21	152	303
2012	22	68	75	95	37	13	41	48	1	7	176	231
2013	17	47	84	58	44	19	59	55	4	6	208	185
Total	89	378	331	425	145	109	246	297	12	54	823	1,263

Notes: For PHC no data available for trademarks, design, copyright, and database rights prior to 2009; trademark case count includes passing-off claims; design cases includes registered and unregistered design rights. Case counts exclude cases brought by performance rights organisation PPL (Phonographic Performance Limited). Only cases counted for which filing date available.

Figure 1 investigates this issue further. It plots the log number of cases related to (a) patents and (b) all other types of IP by filing date of the claim (in quarterly intervals). Since we only possess data on patent cases at the PHC before 2009, the right-hand-side plot only shows PHC case counts from 2009 onward. The vertical line represents the introduction of the costs cap in October 2010. When we look at patent cases, we see a clear jump in filings

at the IPEC during the quarter following the introduction of the costs cap. This finding is in-line with the evidence we gathered from qualitative interviews and surveys where respondents indicated that they regarded the costs cap as the key reform that has led to an increase in case filings. That said, Figure 1 also shows an increase in case filings at the PHC during the second quarter of 2011. From looking at individual cases, we know that the increase in patent cases at the PHC during that time window was at least partly driven by an increase in patent litigation between companies in the information and communication technologies industry (for example Nokia filed four cases in the first half of 2011 compared to just one case in the first half of 2010). This type of patent case would not be suitable for litigation at the IPEC, which means the increase in case filings at the IPEC cannot be explained by an increase in this type of case.[36] We also note that on average, case filings at the PHC and IPEC move in parallel before the costs cap suggesting similar pre-reform trends. The right-hand-side plot also shows a steep increase in case filings at the IPEC; however, that increase starts long before the introduction of the costs cap and there does not appear to be be any additional bump following the introduction of the intermediate fee shifting rule.[37] The PHC data for all other IP cases are more difficult to interpret pre-reform due to the relatively short time window available. However, post-reform we observe a decline in court cases while we see a sustained increase at the IPEC.

Figure 2, shows the β_t coefficients of the following regression $case_t = \beta_0 + \beta_1 IPEC + \beta_t[IPEC \times D_t] + \varepsilon_t$ where $case_t$ denotes the log total number of cases by quarter t, $IPEC$ is a dummy (0/1) variable that is equal to one for all cases heard at the IPEC, and D_t are quarter dummies. If we focus on patent cases shown in the left-hand-side plot, we see that before the introduction of the costs cap, the IPEC-specific time trend hovers around zero, which supports the common trends assumption required for the PHC to be a valid control group in our difference-in-differences approach. Following the introduction of the costs cap, the coefficients turn immediately positive and are statistically significantly different

---

[36]If the factors that have led to the large increase in patent case filings at the PHC did not affect the IPEC to the same extent, we would *under*estimate the increase in case filings at the IPEC due to the introduction of the costs cap when we use the PHC as a control group.

[37]Note that the spike in case filings at the IPEC at the end of 2009 is due to Nike's and Nintendo's idiosyncratic litigation behavior, filing 26 trademark and 9 trademark and copyright claims in December 2009, respectively.

Figure 1: Comparison IPEC-PHC: patent cases and all other IP

(a) Patents
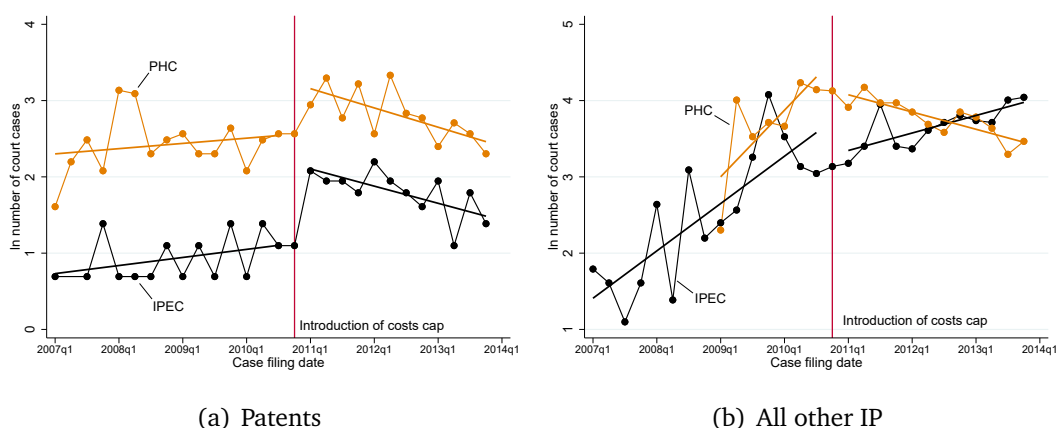
(b) All other IP

Notes: Copyright case counts exclude cases brought by performance rights organization PPL (Phonographic Performance Limited).

from zero. The right-hand-plot in contrast shows the estimates for all other IP cases. We see that the trend remains relatively flat throughout the entire period observed, i.e., there is no clear increase in case filings following the introduction of the costs cap.

Figure 2: Estimated effect of costs cap: patent cases and all other IP
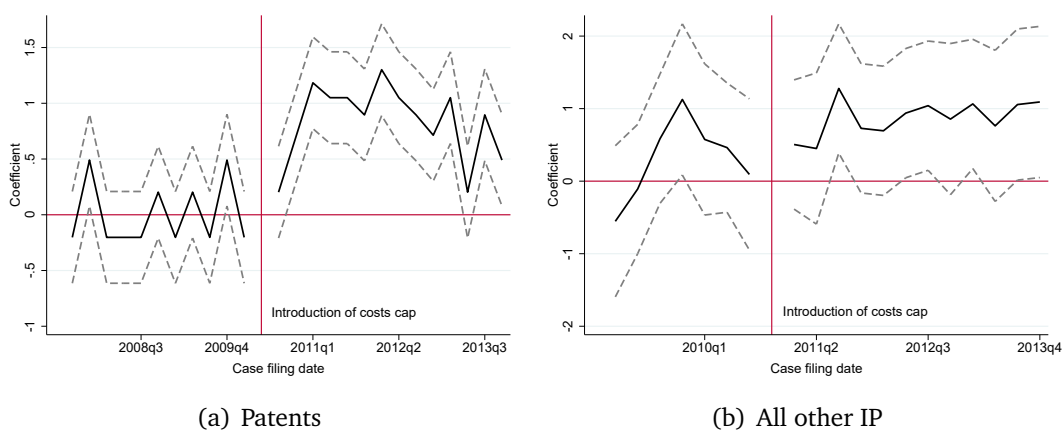
(a) Patents

(b) All other IP

Notes: The figure shows the β_t coefficients of the following regression $case_t = \beta_0 + \beta_1 IPEC + \beta_t[IPEC \times D_t] + \varepsilon_t$ where $case_t$ denotes the log total number of cases by quarter t, $IPEC$ is a dummy (0/1) variable that is equal to one for all cases heard at the IPEC, and D_t are quarter dummies. The specification for (b) includes IP type dummy variables. 95% confidence intervals reported.

As discussed in Section 4.2 above, we start off by analyzing changes in case counts within the IPEC where we compare patent cases with all other types of IP cases (see Figure G-3 in the Online Appendix). We estimate the effect of the introduction of the costs cap on case filings using OLS where we regress the log of the total number of cases by quarter ($case_t$) on a dummy (0/1) variable that is equal to one for all patent cases heard at the

IPEC (Pat), and a dummy variable that indicates when the costs cap was introduced at the IPEC ($Postreform_t$) which is equal to one from October 2010 onward and their interaction ($Pat \times Postreform_t$):

$$case_t = \beta_0 + \beta_1 Pat + \beta_2 Postreform_t + \beta_3 Pat \times Postreform_t + \delta_t + \varepsilon_t \qquad (5)$$

The coefficient on the interaction term β_3 captures the differential effect of the costs cap on patent case filings relative to all other types of IP at the IPEC. In our regressions, we also distinguish between cases where the plaintiff is a SME or a large company. The results in Table 2 show that the coefficients on the interaction term $Pat \times Postreform$ are positive, large, and statistically significant in columns (1) and (3). This suggests that the number of patent cases that were brought before the IPEC increased significantly relative to the PHC following the reforms. A comparison of the results in columns (2) and (3) suggests that this effect is driven by large plaintiffs.[38]

Next, we use the PHC cases as a control group. We first run separate regressions comparing case counts at the IPEC and PHC before and after the introduction of the costs cap for both the set of patent cases and the set of all non-patent IP cases. That is, we use a specification similar to Equation (5) except that we use a dummy (0/1) variable that is equal to one for all cases heard at the IPEC ($IPEC$) instead of the patent case dummy variable Pat:

$$case_t = \beta_0 + \beta_1 IPEC + \beta_2 Postreform_t + \beta_3 IPEC \times Postreform_t + \delta_t + \varepsilon_t \qquad (6)$$

Table 3 columns (1)-(3) show results for the set of patent cases, while columns (4)-(6) show results for all other IP cases (in the regressions shown in columns (4)-(6) we also include dummy variables for each type of IP right). In columns (1) and (2), the coefficients on the interaction term $IPEC \times Postreform$ are positive, large, and statistically significant. This suggests that the number of patent cases that were brought before the IPEC increased significantly following the reforms relative to the PHC; for example the coefficient in column

---

[38]As shown in Table H-3 in the Online Appendix, our results are qualitatively unchanged when we rely on monthly instead of quarterly data.

Table 2: IPEC: total number of patent vs all other IP court cases by quarter, 2007-2013

	Patents vs All other IP		
	All	P SME	P Large
	(1)	(2)	(3)
Patent	18.014***	12.170**	24.868***
	(5.415)	(6.018)	(6.506)
Postreform	-0.523	-0.118	-0.786
	(0.332)	(0.381)	(0.485)
Patent×Postreform	1.152**	0.480	1.340**
	(0.439)	(0.461)	(0.573)
Time trend (quarterly)	YES	YES	YES
Time trend × Patent	YES	YES	YES
R2	0.877	0.786	0.758
Number obs.	56	56	56

Notes: OLS regression. Dependent variable log(number of cases by quarter +1). P SME: plaintiff is SME; P Large: plaintiff is large firm. All regressions include a constant. Time period 2007-2013; trademark case count includes passing-off claims; design cases includes registered and unregistered design rights. Case counts exclude cases brought by performance rights organisation PPL (Phonographic Performance Limited). Robust standard errors. * significant at 10%, ** at 5%, *** at 1%.

(1) implies an increase of around 65% relative to the PHC. The results in columns (2) and (3) suggest that this effect is driven by SME plaintiffs. This contrasts with our findings from Table 2. While within the set of IPEC cases, the increase in patent cases was driven by large plaintiffs, the increase was driven by SME plaintiffs when IPEC cases are compared to the PHC. The results for all other types of IP cases also show an increase in case filings for SME plaintiffs, but there is no statistically significant effect for all types of plaintiffs, nor for the subset of large plaintiffs.[39]

Table 3: IPEC and PHC: total number court cases by quarter, 2007-2013

	Patents			**All other IP**		
	All	P SME	P Large	All	P SME	P Large
	(1)	(2)	(3)	(4)	(5)	(6)
IPEC	-1.555***	-0.383**	-1.921***	-0.468*	-0.358	-0.757*
	(0.133)	(0.161)	(0.145)	(0.247)	(0.326)	(0.379)
Postreform	0.442	0.883**	0.105	1.070**	0.407	2.168**
	(0.350)	(0.396)	(0.217)	(0.470)	(0.394)	(0.747)
IPEC×Postreform	0.503***	0.719***	0.126	0.485	0.840**	0.364
	(0.172)	(0.223)	(0.245)	(0.292)	(0.367)	(0.427)
IP type FE				YES	YES	YES
Quarter FE	YES	YES	YES	YES	YES	YES
R2	0.926	0.731	0.915	0.931	0.896	0.927
Number obs.	56	56	56	48	48	48

Notes: OLS regression. Dependent variable log(number of cases by quarter +1). P SME: plaintiff is SME; P Large: plaintiff is large firm. All regressions include a constant. Time period for all IP is 2009-2013 because no data are available for trademarks, design, copyright and database rights at the PHC prior to 2009; data for patent cases for 2007-2013; trademark case count includes passing-off claims; design cases includes registered and unregistered design rights. Case counts exclude cases brought by performance rights organisation PPL (Phonographic Performance Limited). IP type FE: dummy variable for each type of IP right (patent, trademark, copyright, registered design, database). Robust standard errors. * significant at 10%, ** at 5%, *** at 1%.

In order to evaluate the validity of our results, Figure 3 shows the results from a simple counterfactual exercise. We estimate Equation (5) using the observed data on patent cases and compute the corresponding predicted values. Next, we set the *Postreform* dummy variable equal to zero to obtain a counterfactual set of predicted values. Figure 3 shows

---

[39]Table H-6 in the Online Appendix shows the same results generated using monthly instead of quarterly data. Again, the results are largely unchanged, though we also find a marginally statistically significant increase in case filings for all plaintiff types in all non-patent IP cases.

that the observed data display a clear jump in case filings following the introduction of the costs cap, whereas our results when we set $Postreform = 0$ suggest that case counts would have largely remained unchanged in the absence of the costs cap.

Figure 3: Comparison IPEC-PHC: patent cases with/out costs cap
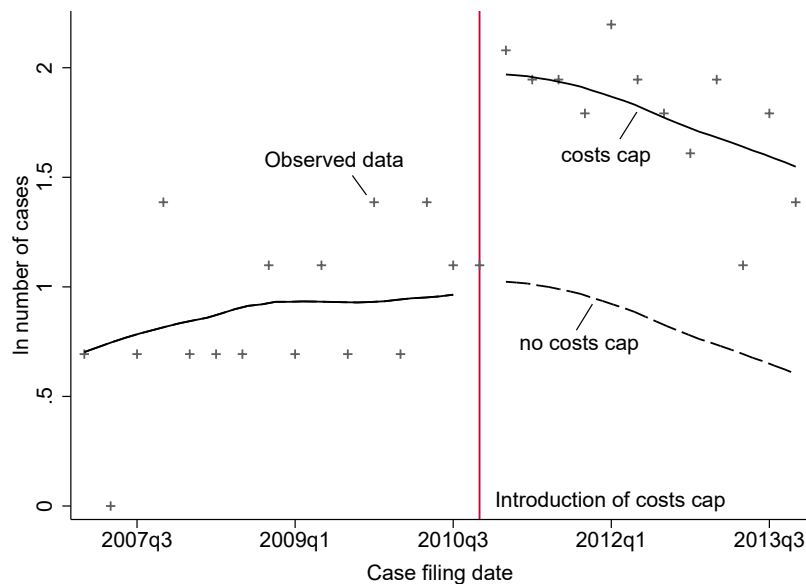
Notes: Solid lines ("costs cap") show predicted values obtained from the following specification $case_t = \beta_0 + \beta_1 IPEC + \beta_2 Postreform_t + \beta_3 IPEC \times Postreform_t + \delta_t + \varepsilon_t$, dashed lines ("no costs cap") obtained from setting $Postreform = 0$.

Next we implement a difference-in-difference-in-differences approach by combining the two approaches of Equations (5) and (6):

$$
\begin{aligned}
case_t = \; & \beta_0 + \beta_1 IPEC + \beta_2 Postreform_t + \beta_3 Pat + \\
& + \beta_4 IPEC \times Postreform_t + \beta_5 IPEC \times Pat + \beta_6 Pat \times Postreform_t + \\
& + \beta_7 IPEC \times Pat \times Postreform_t + \delta_t + \varepsilon_t
\end{aligned} \tag{7}
$$

The coefficient on the triple interaction term β_7 captures the differential effect of the costs cap on patent case filings at the IPEC following the introduction of the intermediate fee shifting rule. The results are shown in Table 4.[40] We see that the triple interaction term is again positive for all three samples in columns (1)-(3). The triple interaction term in column (1) indicates that patent cases at the IPEC increased significantly relative to all

---

[40]Results using monthly data are shown in Table H-5 in the Online Appendix

other IP cases and relative to cases at the PHC following the introduction of the costs cap. The coefficient β_7 in column (2) for the set of SME plaintiffs is also positive but marginally not statistically significant. Instead, similar to the results shown in Table 2, case filings by large plaintiffs increased significantly following the change in fee shifting rules.

Table 4: IPEC and PHC: total number of patent vs all other IP court cases by quarter, 2007-2013

	IPEC vs PHC: Patents vs All other IP		
	All	P SME	P Large
	(1)	(2)	(3)
IPEC	0.442	0.340	-0.264
	(0.457)	(0.316)	(0.434)
Patent	0.481	-0.200	0.369
	(0.501)	(0.331)	(0.477)
Postreform	3.256***	1.862***	3.361***
	(0.576)	(0.385)	(0.619)
IPEC×Postreform	-1.472***	-0.041	-1.514
	(0.472)	(0.350)	(0.461)
IPEC×Patent	-1.997***	-0.723*	-1.658***
	(0.553)	(0.404)	(0.536)
Patent×Postreform	-2.211***	-1.221***	-2.107***
	(0.512)	(0.372)	(0.496)
IPEC×Patent×Postreform	1.975***	0.761	1.640***
	(0.576)	(0.460)	(0.588)
Quarter FE	YES	YES	YES
R2	0.751	0.698	0.777
Number obs.	112	112	112

Notes: OLS regression. Dependent variable log(number of cases by quarter +1). P SME: plaintiff is SME; P Large: plaintiff is large firm. All regressions include a constant. Time period for all IP is 2009-2013 because no data are available for trademarks, design, copyright and database rights at the PHC prior to 2009; data for patent cases for 2007-2013; trademark case count includes passing-off claims; design cases includes registered and unregistered design rights. Case counts exclude cases brought by performance rights organisation PPL (Phonographic Performance Limited). Robust standard errors. * significant at 10%, ** at 5%, *** at 1%.

Finally, as a robustness test, we also use a parametric regression discontinuity approach relying on the potential discontinuity induced by the introduction of the costs cap. Since the introduction of the costs cap occurred on a specific date and only applied to cases filed after this date (it was not retroactively applied to cases filed earlier that were still

pending in October 2010), we can look for any discontinuous changes around the cut-off date. Figure G-4 in the Online Appendix shows again case filings by quarter for patent cases and cases associated with all other types of IP at the IPEC and the PHC. Despite the relatively sparse data, the figure suggests that there was a discrete jump in case filings only among patent cases at the IPEC around the introduction of the costs cap. There is little evidence for any discontinuity among all other IP cases at the IPEC or the PHC. Table H-6 in the Online Appendix contains the corresponding regression results. As suggested by Gelman and Imbens (2019), we include a quadratic polynomial of our forcing variable in all specifications. Yet again, we see a large positive coefficient on the post-cap dummy for patent cases at the IPEC, but not for other non-patent IP cases. The table also conducts a placebo test by moving the date of the introduction of the costs cap by one year in both directions, i.e., instead of October 2010, we set it to October 2009 and October 2011. In neither scenario do we find evidence for a statistically significant increase in case filings among patent cases, and in both, results are largely unchanged for all other types of IP cases.

Overall, these results provide robust evidence that case counts increased following the IPEC's adoption of a costs cap and that the increase was driven by both SME and large plaintiffs, depending on the comparison group used in the analysis.

4.4   Litigation expenses and outcomes

Next, we analyze whether the costs cap affected litigation spending and case-level outcomes.

In this part of our analysis, we utilize a large number of case- and litigant-level characteristics. While this allows us to account for observable heterogeneity among cases,[41] it also restricts our analysis to PHC cases involving patent rights (since we were unable to collect detailed information on case outcomes for all other types of PHC cases, see Section 3). We further limit the analysis to IPEC and PHC cases in which the defendant appeared and affirmatively defended the case to a settlement or court decision. Accordingly, we remove all

---

[41]For details on these case- and litigant-level characteristics see Online Appendix E.

cases that were dropped by the plaintiff,[42] as well as all cases that were still pending in the first instance at the time of our data collection. Unfortunately, imposing these restrictions comes at a significant cost: it reduces the number of patent cases at the IPEC to just 15 cases before the introduction of the costs cap and just 52 cases afterwards (9 and 34 of which, respectively, were filed by SMEs). We therefore cannot rely on case heterogeneity and instead must focus exclusively on differences between litigation at the IPEC and the PHC (and, as a result, we are less likely to find an effect).

Table 5 shows the mean of all included variables before and after the introduction of the costs cap. We see a number of statistically significant changes in observable case- and litigant-level characteristics at the IPEC, but much less so at the PHC. Table H-7 in the Online Appendix compares average litigant- and case-level characteristics between the IPEC and the PHC, and distinguishes as well between the set of cases brought by SME and large plaintiffs. The table underscores the importance of controlling for differences in the observable characteristics between the IPEC and PHC because cases at the PHC differ significantly in many ways from cases heard at the IPEC. IPEC cases are more likely to have been transferred to the IPEC (from local courts and the PHC), infringement claims are brought more often (and invalidity claims less often) at the IPEC, and litigants are more often UK companies. These differences are to be expected given the different mandates of the two courts.

We first analyze changes in litigation expenses by plaintiffs and defendants. We do not observe actual litigation expenses by the parties. As discussed in Section 4.2 above, information on costs awards (Figure G-1) is only available for a small, selected subset of cases, and even then, only actual costs awards are observed, not total costs incurred by the parties. Thus, following survey data, which reports a strong correlation between law firm size and billing rates,[43] we use law firm size as a proxy measure for litigation expenses. Specifically, we classify all firms representing parties in our case data into six size categories: (1) 1-5 attorneys, (2) 6-10 attorneys, (3) 11-50 attorneys, (4) 51-200 attorneys, (5) 201-

---

[42]In addition to cases that were clearly dropped – e.g., because the defendant entered into bankruptcy – we also assume that a case was dropped if the case file contained the claim form but lacked any response from the defendant.

[43]AIPLA (2019: I-29, I-42), for example, reports that lawyers who practice IP law at U.S. law firms employing more than 150 lawyers charge a median hourly fee that is twice as large as the median fee charged by lawyers at firms employing 5 or fewer attorneys.

Table 5: IPEC and PHC: case and litigant characteristics before and after introduction of costs cap, 2007-2013

	IPEC			PHC		
	Mean		Diff.	Mean		Diff.
	Before	After		Before	After	
	(1)	(2)	(3)	(4)	(5)	(6)
Case characteristics						
Infringement claim	0.956	0.918	-0.037*	0.512	0.519	0.006
Invalidity claim	0.030	0.063	0.032*	0.427	0.404	-0.023
Infringement counterclaim	0.013	0.018	0.005	0.144	0.181	0.037
Invalidity counterclaim	0.087	0.191	0.104***	0.367	0.311	-0.056
Case value	24,836	101,447	76,610***	174,166	845,185	671,018
Litigant characteristics						
Plaintiff individual	0.152	0.169	0.016	0.048	0.047	-0.0007
Plaintiff SME	0.401	0.477	0.075*	0.198	0.132	-0.066*
Plaintiff large	0.462	0.389	-0.073*	0.777	0.829	0.052
Plaintiff UK	0.672	0.706	0.033	0.493	0.478	-0.015
Plaintiff Europe	0.061	0.069	0.008	0.307	0.341	0.034
Plaintiff world	0.139	0.122	-0.017	0.307	0.327	0.019
Defendant individual	0.598	0.467	-0.130**	0.072	0.066	-0.005
Defendant SME	0.519	0.571	0.051	0.289	0.213	-0.075*
Defendant large	0.100	0.232	0.132***	0.680	0.734	0.053
Defendant UK	0.606	0.761	0.154***	0.548	0.540	-0.008
Defendant Europe	0.013	0.040	0.027**	0.325	0.303	-0.021
Defendant world	0.008	0.034	0.025**	0.246	0.303	0.056
NPE	0.013	0.010	-0.003	0.138	0.113	-0.024
Number of obs.	229	490		166	211	

Notes: Notes: For PHC data contain only patent cases; trademark case count includes passing-off claims; design cases includes registered and unregistered design rights. Cases brought by performance rights organisation PPL (Phonographic Performance Limited) excluded.

500 attorneys, and (6) above 500 attorneys.[44] Figure G-5 in the Online Appendix shows the distribution of (plaintiff and defendant) legal counsel size before and after the introduction of the costs cap for the IPEC and PHC. The graph shows that litigants at the PHC tend to employ significantly larger law firms than litigants at the IPEC, which is explained by the fact that the PHC handles more complex patent cases with significantly higher stakes. As a result, the distribution across size categories is far less skewed at the IPEC. The graphs suggests that some changes in the size distribution occurred following the introduction of the costs cap, but it is difficult to gauge the net effect from the graph.

Table 6 shows regression results where the dependant variable is the law firm size variable for the plaintiff in columns (1)-(3) and the defendant in columns (4)-(6). If we focus on the $IPEC$ interaction term, we find little evidence for a significant change in litigation expenses. Yet, we find a statistically significant effect for large plaintiffs suggesting that large plaintiffs reduce their litigation expenses, i.e., employ smaller law firms post-reform. These results are in line with the theoretical prediction in Proposition 4, as well as with Fenn et al. (2017), who find that plaintiffs' litigation expenses increased following a cost allocation transition (in the opposite direction of the one which we study) from a weaker to a stronger form of the English Rule. However, in contrast to Snyder and Hughes (1990) and Hughes and Snyder (1995), we do not find any significant effects on defense expenditures.

Next, we investigate potential changes to the settlement rate and plaintiffs' win rate following introduction of the costs cap. The theoretical literature suggests that there is selection into settlement (Priest and Klein, 1984; Bebchuck, 1984; Reinganum and Wilde, 1986; Spier, 2007; Klerman et al., 2018). However, recent empirical evidence suggests that selection may not necessarily occur (Helland et al., 2018). We have detailed information on the content of settlement agreements for a subset of all settled cases that allows us to gauge the importance of selection into settlement in our data to inform our empirical approach of analyzing plaintiffs' win rate. We obtained this information directly from the court records. When the outcome of a settlement was clear, i.e., when we were able to unambiguously

---

[44]Since the data are at the case-level, when there are multiple plaintiffs or defendants we pick the largest size category of the legal counsel associated with plaintiffs or defendants. However, our results are not sensitive to this decision.

Table 6: IPEC and PHC: litigation expenses measured as size of legal counsel employed (by quarter, 2009-2013)

	Plaintiff legal counsel			Defendant legal counsel		
	All	P SME	P Large	All	P SME	P Large
	(1)	(2)	(3)	(4)	(5)	(6)
Costs cap						
IPEC	-0.390	0.146	0.689*	-0.751**	-0.277	-1.356***
	(0.291)	(0.489)	(0.410)	(0.323)	(0.621)	(0.456)
Postreform	0.829	0.424	0.745	0.009	0.507	-1.006**
	(0.715)	(0.963)	(1.134)	(0.660)	(1.194)	(0.393)
IPEC×Postreform	-0.144	-0.726	-0.925**	0.288	-0.342	0.363
	(0.264)	(0.526)	(0.387)	(0.271)	(0.680)	(0.410)
Case characteristics						
Case transferred	-0.031	-0.234	0.172	0.096	-0.157	0.073
	(0.198)	(0.307)	(0.314)	(0.204)	(0.317)	(0.384)
ln case value	0.152**	0.165**	0.401***	0.004	-0.042	0.160
	(0.061)	(0.064)	(0.127)	(0.058)	(0.073)	(0.130)
Infringement claim	0.393	-0.094	0.261	-0.064	-0.297	-0.399
	(0.310)	(0.502)	(0.385)	(0.263)	(0.564)	(0.391)
Invalidity claim	0.548*	0.250	0.313	-0.138	-0.518	-0.537
	(0.315)	(0.574)	(0.380)	(0.263)	(0.569)	(0.388)
Litigant characteristics						
Plaintiff individual	-0.282	0.152	0.036	-0.326	-0.602**	0.251
	(0.212)	(0.511)	(0.796)	(0.212)	(0.304)	(0.517)
Defendant individual	-0.321**	-0.384	-0.167	-0.371**	-0.255	-0.428
	(0.161)	(0.254)	(0.246)	(0.162)	(0.246)	(0.271)
Plaintiff Europe	0.441**	-0.036	0.055	-0.135	1.186	-0.352*
	(0.175)	(0.587)	(0.225)	(0.161)	(0.809)	(0.182)
Plaintiff world	0.132	0.265	-0.131	-0.076	-0.428	-0.231
	(0.174)	(0.675)	(0.203)	(0.153)	(0.660)	(0.167)
Defendant Europe	0.481**	0.392	0.438*	0.371*	0.576	-0.011
	(0.203)	(0.436)	(0.247)	(0.191)	(0.538)	(0.215)
Defendant world	0.073	-0.374	0.014	0.343*	0.549	-0.036
	(0.203)	(0.472)	(0.246)	(0.175)	(0.342)	(0.201)
NPE	0.350	-0.091	0.258	-0.447*	1.538***	-0.633***
	(0.222)	(0.740)	(0.234)	(0.234)	(0.559)	(0.203)
IP type FE	YES	YES	YES	YES	YES	YES
Quarter FE	YES	YES	YES	YES	YES	YES
R2	0.329	0.311	0.361	0.264	0.361	0.326
Number obs.	563	207	320	571	201	324

Notes: OLS regression. Dependent variable is the size category of the legal counsel of the plaintiff or defendant. There are the following size categories: (1) 1-5 attorneys, (2) 6-10 attorneys, (3) 11-50 attorneys, (4) 51-200 attorneys, (5) 201-500 attorneys, and (6) above 500 attorneys. P SME: plaintiff is SME; P Large: plaintiff is large firm. All regressions include a constant. Time period is 2007-2013; PHC data contain only patent cases; IPEC trademark cases include passing-off claims; IPEC design cases include registered and unregistered design rights. Sample excludes cases brought by performance rights organisation PPL (Phonographic Performance Limited). IP type FE: dummy variable for each type of IP right (patent, trademark, copyright, registered design, database). Regressions include a dummy variable equal to one if the case value is missing and a dummy variable equal to one if no patent information is available for a patent case. Time FE by quarter. Robust standard errors. * significant at 10%, ** at 5%, *** at 1%.

tell whether the plaintiff or defendant prevailed in the settlement agreement, we coded the outcome of the settlement agreement as a win or loss for the plaintiff.[45] Figure G-6 in the Online Appendix shows a comparison of the share of cases in which the plaintiff prevailed in settlement and the share in which the plaintiff prevailed in a court decision. The graph provides strong evidence of selection into settlement: plaintiffs are much more likely to prevail in settled than decided cases.[46] This means that in order to estimate the effect of the costs cap on plaintiffs' win rate, we take into account selection into settlement by estimating a Heckman (1979) two-step selection model where we estimate in a first step the likelihood of settlement and then include the inverse Mills ratio in the second step to estimate the likelihood that a plaintiff wins in a case decided by the court. There is no obvious exclusion restriction that we can impose in the estimation. However, we include a dummy variable in the settlement equation that is equal to one if the defendant raised a counterclaim because raising a counterclaim is likely to be an important determinant of selection into settlement.[47]

Table 7 shows the OLS estimates for both the settlement decision and the likelihood that the plaintiff wins the case. In columns (1)-(2) of Table 7, we use data on all IP cases at the IPEC and patent cases at the PHC. We see that there is no effect of the costs cap on the likelihood of a settlement or the likelihood that the plaintiff prevails at trial. When we restrict the sample to cases brought by SME plaintiffs, we again see no statistically significant change in settlement behavior; however, we see a negative and statistically significant drop in the likelihood that the plaintiff prevails at trial after the costs cap was introduced. When

---

[45]To provide specific examples of the information available that allowed us to code settlement outcomes: (a) plaintiff win – in a trademark case where the plaintiff alleged infringement the settlement was summarized by "The defendant shall not infringe the claimant's trademark; the defendant shall deliver up all offending goods within 14 days; the defendant shall provide names and addresses of all persons from whom they have received products that would infringe the claimant's trademark; the defendant agreed to pay £[redacted] in damages calculated as account of net profits and the defendant pays £[redacted] in costs." (b) plaintiff loss – in a patent case where the plaintiff alleged infringement the settlement was summarized by "Agreed upon by parties to revoke the patent; claimant therefore discontinued claim for infringement and claimant agreed to pay court costs in the sum of £[redacted]."

[46]The large difference between the IPEC and PHC is due to the fact that the PHC data only contain patent cases, which have a relatively low plaintiff win rate due to greater case complexity and the fact that an asserted patent can be held invalid (in addition to not infringed).

[47]Consider, for example, the difference in win rates between patent cases at the PHC (in which counterclaims are commonly raised) and IPEC cases involving all other types of IP (in which counterclaims are uncommon), as shown in Figure G-6.

we use the sample of cases brought by large plaintiffs instead, we again see no statistically significant effect on settlements or plaintiffs' win rate. A comparison with OLS results (see Table H-8 in the Online Appendix), shows that if we ignore the potential selection into settlement, the magnitude of the drop in column (4) is much smaller. These results suggest that the introduction of a costs cap, and hence the shift away from the English and towards the American Rule, has led to a decrease in SME plaintiffs' win rate. This result is consistent with the theoretical prediction in Proposition 3. It also agrees with Hughes and Snyder (1995), who found an increase in plaintiffs' win rate following a transition from the American to the English Rule. Note also that, while the effect of the costs cap on the settlement rate is not statistically significant, it is positive as predicted by Proposition 2.

There is a concern that the settlement rate might be upward biased during the last few quarters of the sample period due to pending cases. That is, if pending cases are less likely to settle, removing pending cases from the sample will inflate the settlement rate observed late in the sample period. To investigate this concern, Table H-9 in the Online Appendix shows results when we drop all cases filed in 2013, as they are the ones most likely to be subject to this selection problem.[48] Dropping the last year of the sample also addresses potential concerns that the introduction of the SCT might have affected litigation in the IPEC multi-track. The results for all types of plaintiffs and the result of the subset of large plaintiffs are very similar to those shown in Table 7. However, there is an important difference with respect to the results for SME plaintiffs. We now also find a statistically significant increase in settlements following the introduction of the costs cap while still finding a decrease of the likelihood that the plaintiff prevails at trial. This positive effect on settlements is in agreement with Snyder and Hughes (1990), who found a negative effect on settlements due to a shift in cost allocation in the opposite direction, i.e., from the American to the English Rule.

---

[48]An alternative approach would be to limit the analysis to settlements that occurred within some number of months post-filing. However, because parties commonly fail to notify the court of the date of their settlement agreement, we lack information on the precise settlement date for slightly more than 20% of settled cases. Accordingly, this approach would lead to a significant loss of data (before we even apply a date restriction).

Table 7: IPEC and PHC: settlement decision and judgment (plaintiff win), 2007-2013

	All		**P SME**		**P Large**	
	Settle	P Win	Settle	P Win	Settle	P Win
	(1)	(2)	(3)	(4)	(5)	(6)
Costs cap						
IPEC	-0.038	0.176	-0.309	0.323	0.308	0.053
	(0.245)	(0.253)	(0.405)	(0.214)	(0.397)	(0.386)
Postreform	-0.024	0.022	-0.902	1.081**	0.102	-0.207
	(0.241)	(0.253)	(0.656)	(0.477)	(0.310)	(0.269)
IPEC×Postreform	0.148	-0.214	0.961	-1.162***	0.404	-0.173
	(0.213)	(0.269)	(0.614)	(0.444)	(0.326)	(0.422)
Case characteristics						
Case transferred	-0.061	-0.236	-0.055	-0.219**	0.080	-0.204
	(0.146)	(0.172)	(0.214)	(0.108)	(0.281)	(0.278)
ln case value	0.0004	0.008	-0.045	0.042	-0.004	-0.124
	(0.046)	(0.048)	(0.070)	(0.036)	(0.111)	(0.116)
Infringement claim	0.112	0.074	-0.180	0.233	0.213	0.108
	(0.230)	(0.255)	(0.426)	(0.231)	(0.400)	(0.448)
Invalidity claim	0.328	0.068	-0.383	0.070	0.568	0.102
	(0.223)	(0.414)	(0.445)	(0.240)	(0.363)	(0.657)
Counterclaim	-0.077		-0.370**		0.129	
	(0.102)		(0.173)		(0.151)	
Litigant characteristics						
Plaintiff individual	0.191	-0.188	0.336	-0.066	0.176	-0.228
	(0.150)	(0.257)	(0.292)	(0.156)	(0.482)	(0.443)
Defendant individual	0.426***	-0.205	0.580***	-0.060	0.451**	-0.105
	(0.115)	(0.524)	(0.172)	(0.158)	(0.201)	(0.437)
Plaintiff Europe	-0.124	0.057	-0.031	-0.617	-0.041	-0.048
	(0.150)	(0.206)	(0.618)	(0.474)	(0.176)	(0.144)
Plaintiff World	0.045	-0.188	-0.399	0.418	0.191	-0.310
	(0.133)	(0.152)	(0.636)	(0.606)	(0.161)	(0.206)
Defendant Europe	0.380**	-0.232	0.310	0.587**	0.422*	-0.136
	(0.177)	(0.478)	(0.447)	(0.295)	(0.218)	(0.369)
Defendant World	0.440***	-0.505	-0.056	-0.608***	0.515**	-0.389
	(0.167)	(0.528)	(0.402)	(0.209)	(0.208)	(0.456)
NPE	-0.146	0.002	1.001	-0.918*	-0.424	0.148
	(0.227)	(0.283)	(0.895)	(0.484)	(0.261)	(0.409)
Mills ratio	-1.004		-0.427		-0.777	
	(1.638)		(0.337)		(1.220)	
IP type FE	YES	YES	YES	YES	YES	YES
Time trend (by quarter)	YES	YES	YES	YES	YES	YES
Number obs.	812		303		427	
Number obs. settled	558		202		301	

Notes: Heckman 2-step selection correction OLS regression. Dependent variable in 1st stage equal to one if case settled and in 2nd stage if plaintiff wins. P SME: plaintiff is SME; P Large: plaintiff is large firm. All regressions include a constant. Time period is 2007-2013; PHC data contain only patent cases; IPEC trademark cases include passing-off claims; IPEC design cases include registered and unregistered design rights. Sample excludes cases brought by performance rights organisation PPL (Phonographic Performance Limited). IP type FE: dummy variable for each type of IP right (patent, trademark, copyright, registered design, database). Regressions include a dummy variable equal to one if the case value is missing. * significant at 10%, ** at 5%, *** at 1%.

5 Conclusion

This paper contributes to the theoretical and empirical literature on the effect of fee shifting in civil litigation. We first develop a theoretical model to analyze the effect that fee shifting rules have on plaintiffs' decisions to file suit. Our analysis expands on the seminal litigation model by Bebchuk (1984) in three respects. First, rather than modeling the decisionmaking process of a single plaintiff, we model the effect of fee shifting rules on a set of heterogeneous potential plaintiffs. Second, our model generates predictions regarding the observable post-filing settlement rate rather than the (typically) unobservable pre-trial settlement rate. Third, rather than studying just the American and English Rules, we study a series of cost recovery rules, including a regime that places a cap on the amount of costs that a party may recover. Importantly, our analysis reveals a new indirect effect not included in prior models: the effect that a change in cost recovery rules has, not just on individual plaintiffs, but also indirectly on the set of plaintiffs. Taking these novel considerations into account, our model suggests that a costs cap has an ambiguous net effect on incentives to file a case but clear-cut effects on the settlement rate, plaintiffs' win rate, and plaintiffs' average litigation expenditures whenever the costs cap yields an increase in case filings.

Next, relying on a recent reform to the rules for awarding fees in IP suits brought in the UK, we present an empirical analysis of the effect of fee shifting. Our analysis takes advantage of the introduction of a cap on the amount of costs recoverable in suits litigated in the IPEC. To identify the effect of the costs cap on litigation, we rely on variation among case types, distinguishing between patent cases and cases that involve any of the other types of IP, as well as data on IP cases filed at the PHC, which does not employ a costs cap. Our findings, which use data for the period 2007-2013, suggest that patent case filings increased following the IPEC's shift from a pure English Rule to a rule that caps costs awards. Further, consistent with our theoretical predictions (in a scenario where a costs cap increases case filings), we find evidence that smaller plaintiffs both won less often and settled more often post-reform, as well as evidence that larger plaintiffs spent less on litigation post-reform.

In addition to underscoring the need for further theoretical and empirical research in this area, our findings are directly relevant to a number of legal developments unfolding

across the globe. In the U.S. policymakers have on several occasions in recent years considered legislation that would make two-way fee awards routine in patent suits. In addition, U.S. policymakers recently established a venue modeled after the IPEC for litigating relatively small copyright claims and have considered doing the same for small patent claims. Finally, despite being home to the American Rule, the U.S. legal system has already adopted a variety of fee shifting rules applicable in certain jurisdictions or in cases enforcing certain statutory or constitutional rights. Important civil litigation reforms are underway in Europe as well, particularly in the arena of IP enforcement. Europe continues long-standing efforts to establish a Unified Patent Court that would drastically decrease the cost of enforcing patent rights across the continent and, moreover, place caps on the recovery of litigation expenses much like current practice in the IPEC. Our findings suggest that the use of costs caps in a European Unified Patent Court may well increase the overall rate of patent litigation.

References

[1] American Intellectual Property Law Association. 2019. *Report of the Economic Survey*.

[2] Anderson, David A., and Thomas D. Rowe, Jr. 1995. "Empirical Evidence on Settlement Devices: Does Rule 68 Encourage Settlement?," 71 *Chicago-Kent Law Review* 519-45.

[3] Bebchuk, Lucian A. 1984. "Litigation and Settlement under Imperfect Information," 15 *RAND Journal of Economics* 404-15.

[4] Cohen, Henry. 2008. "Awards of Attorneys' Fees by Federal Courts and Federal Agencies," *Report of the Congressional Research Service*. Available at: https://fas.org/sgp/crs/misc/94-970.pdf.

[5] Cremers, Katrin, Max Ernicke, Fabian Gaessler, Dietmar Harhoff, Christian Helmers, Luke McDonagh, Paula Schliessler, and Nicholas van Zeebroeck. 2017. "Patent Litigation in Europe," 44 *European Journal of Law and Economics* 1-44.

[6] Di Pietro, Susanne, Teresa W. Carns, and Pamela Kelley. 1995. "Alaska's English Rule: Attorney's Fee Shifting in Civil Cases," *Report to the Alaska Judicial Council*. Available at: http://www.ajc.state.ak.us/publications/docs/research/AtyFEE10-95.pdf.

[7] Fenn, Paul, Veronica Grembi, and Neil Rickman. 2017. "'No Win, No Fee', Cost-shifting and the Costs of Civil Litigation: A Natural Experiment," 127 *Economic Journal* F142-63.

[8] Flanz, Scott M. 2016. "*Octane Fitness*: The Shifting of Patent Attorneys' Fees Moves Into High Gear," 19 *Stanford Technology Law Review* 329-63.

[9] Forsyth, Chris, and Justin Watts. 2011. "A Guide to Patent Litigation in England and Wales," *Freshfields Bruckhaus Deringer LLP*. Available at: http://www.lexology.com/library/detail.aspx?g=6bd0f5bc-df2c-4578-8102-02c6d3c9946f.

[10] Fournier, Gary M., and Thomas W. Zuehlke. 1989. "Litigation and Settlement: An Empirical Approach," 71 *Review of Economics and Statistics* 189-95.

[11] Fox, Angela. 2014. *Intellectual Property Enterprise Court: Practice and Procedure*. London: Sweet and Maxwell.

[12] Gelman, Andrew, and Guido Imbens. 2019. "Why High-Order Polynomials Should Not Be Used in Regression Discontinuity Designs," 37 *Journal of Business and Economic Statistics* 447-56.

[13] Genn, Hazel G. 1987. *Hard Bargaining: Out of Court Settlement in Personal Injury Actions*. Gloucestershire: Clarendon Press.

[14] Heckman, James J. 1979. "Sample Selection Bias as a Specification Error," 47 *Econometrica* 153-61.

[15] Helland, Eric, and Jungmo Yoon. 2017. "Estimating the Effects of the English Rule on Litigation Outcomes," 99 *Review of Economics and Statistics* 678-82.

[16] Helland, Eric, Daniel Marc Klerman, and Yoon-Ho Alex Lee. 2018. "Maybe There Is No Bias in the Selection of Disputes for Litigation," 174 *Journal of Institutional and Theoretical Economics* 143-70.

[17] Helmers Christian, Yassine Lefouili, and Luke McDonagh. 2015. "Evaluation of the Reforms of the Intellectual Property Enterprise Court 2010-2013," *Report to the UK Intellectual Property Office*.

[18] Helmers, Christian, Yassine Lefouili, Brian J. Love, and Luke McDonagh. 2018. "Who Needs a Copyright Small Claims Court? Evidence from the UK's IP Enterprise Court," *Berkeley Technology Law Journal Commentaries*.

[19] Hoynes, Hilary W., Nicole Maestas, and Alexander Strand. 2016. "The Effect of Attorney and Non-Attorney Representation on the Initial Disability Determination Process." Available at: https://www.nber.org/programs-projects/projects-and-centers/retirement-and-disability-research-center/center-papers/drc-nb16-15.

[20] Hughes, James W., and Edward. A. Snyder (1995): "Litigation and Settlement under the English and American Rules: Theory and Evidence," 38 *Journal of Law and Economics* 225-50.

[21] Inglis, Laura, Kevin McCabe, Steve Rassenti, Daniel Simmons, and Erik Tallroth. 2005. "Experiments on the Effects of Cost Shifting, Court Costs, and Discovery on The Efficient Settlement of Tort Claims," 33 *Florida State University Law Review* 89-117.

[22] Klerman, Daniel, Yoon-Ho Alex Lee, and Lawrence Liu. 2018. "Litigation and Selection with Correlated Two-sided Incomplete Information." 20 *American Law and Economics Review* 382-459.

[23] Kritzer, Herbert M. 1984. "Fee Arrangements and Fee Shifting: Lessons from the Experience in Ontario," 47 *Law and Contemporary Problems* 125-38.

[24] Kritzer, Herbert M. 2002. "Lawyer Fees and Lawyer Behavior in Litigation: What Does the Empirical Literature Really Say?," 80 *Texas Law Review* 1943-83.

[25] Massenot, Baptiste, Maria Maraki, and Christian Thoni. 2021. "Litigation Spending and Care under the English and American Rules: Experimental Evidence," *American Law and Economics Review* 10.1093/aler/ahab005.

[26] McDonagh, Luke, and Christian Helmers. 2013. "Patent Litigation in England and Wales and the Issue-Based Approach to Costs," 32 *Civil Justice Quarterly* 369-84.

[27] McDonagh, Luke. 2016. *European Patent Litigation in the Shadow of the Unified Patent Court*. Cheltenham: Edward Elgar.

[28] Nalebuff, Barry. 1987. "Credible Pretrial Negotiation," 18 *RAND Journal of Economics* 198-210.

[29] Patent Progress's Guide to Federal Patent Reform Legislation. 2019. Available at: http://www.patentprogress.org/patent-progress-legislation-guides/patent-progresss-guide-patent-reform-legislation/.

[30] Pfennigstorf, Werner. 1984. "The European Experience with Attorney Fee Shifting," 47 *Law and Contemporary Problems* 37-124.

[31] Polinsky, A. Mitchell, and Daniel L. Rubenfeld. 1998. "Does the English Rule Discourage Low-Probability-of-Prevailing Plaintiffs?," 27 *Journal of Legal Studies* 519-35.

[32] Preparatory Committee for the Unified Patent Court. 2016. "Rules on Court fees and Recoverable Costs." Available at: https://www.unified-patent-court.org/news/upc-court-fees-and-recoverable-costs.

[33] Prescott, J. J., and Kathryn E. Spier. 2016. "A Comprehensive Theory of Civil Settlement," 91 *NYU Law Review* 59-143.

[34] Priest, George L., and Benjamin Klein. 1984. "The Selection of Disputes for Litigation," 13 *Journal of Legal Studies* 1-55.

[35] Reinganum, Jennifer F., and Louis L. Wilde. 1986. "Settlement, Litigation, and the Allocation of Litigation Costs," 17 *RAND Journal of Economics* 557-66.

[36] Rennie, Douglas C. 2012. "Rule 82 and Tort Reform: An Empirical Study of the Impact of Alaska's English Rule on Federal Civil Case Filings," 29 *Alaska Law Review* 1-50.

[37] Rowe, Jr., Thomas D., and David A. Anderson. 1996. "One Way Fee Shifting Statutes and Offer of Judgment Rules: An Experiment," 36 *Jurimetrics* 255-73.

[38] Schwab, Stewart J., and Theodore Eisenberg. 1988. "Explaining Constitutional Tort Litigation: The Influence of the Attorney Fees Statute and the Government as Defendant," 73 *Cornell Law Review* 719-84.

[39] Shapard, John E. 1995. "Likely Consequences of Amendments to Rule 68, Federal Rules of Civil Procedure," *Report of the Federal Judicial Center*. Available at: http://www.uscourts.gov/file/document/likely-consequences-amendments-rule-68-federal-rules-civil-procedure-1995.

[40] Snyder, Edward A., and James W. Hughes. 1990. "The English Rule for Allocating Legal Costs: Evidence Confronts Theory," 6 *Journal of Law, Economics, & Organization* 345-80.

[41] Spier, Kathryn E. 2007. "Litigation," in A. Mitchell Polinsky and Steven Shavell, eds., *Handbook of Law and Economics*. Amsterdam: North-Holland.

[42] Spier, Kathryn E., and J. J. Prescott. 2019. "Contracting on Litigation," 50 *RAND Journal of Economics* 391-417.

[43] Williams, Jackson. 2001. "Effects of Attorney Fee Shifting Laws on Claiming Behavior," 34 *Policy Sciences* 347-56.

[44] Yoon, Albert, and Tom Baker. 2006. "Offer-of-Judgment Rules and Civil Litigation: An Empirical Study of Automobile Insurance Litigation in the East," 59 *Vanderbilt Law Review* 155-96.

The Effect of Fee Shifting on Litigation: Evidence from a Policy Innovation in Intermediate Cost Shifting

Christian Helmers, Yassine Lefouili, Brian J. Love, Luke McDonagh

A   Appendix: Legal background

A number of key aspects of the procedures of the IPEC and the PHC are described here in order to give more information about the legal background of the reforms:

Appellate Structure: Where permission is granted, appeals from the PHC are heard at the Court of Appeal, where the costs of litigation can easily reach the same level as the PHC. Meanwhile, depending on the nature of the order being appealed, the destination of an appeal from the multi-track of the IPEC is either the Court of Appeal or the PHC - final orders are appealed to the Court of Appeal whereas interim orders are appealed to the PHC (HMCTS, The Intellectual Property Enterprise Court Guide). IP case appeals from the IPEC to the Court of Appeal are rare due to the cost involved (if parties have chosen the IPEC due to its limited costs structure, they are rarely willing to spend hundreds of thousands of pounds appealing the initial ruling at the Court of Appeal). Moreover, appeals are much more likely in complex cases, i.e., cases suited to the PHC, not the IPEC. Finally, the destination of an appeal from a decision on the IPEC small claims track is to the IPEC multi-track judge.

Disclosure: Within the PHC there is a wide-ranging disclosure requirement under the Civil Procedure Rules parts 31-35, which is on-going throughout the duration of the case, and gives parties the ability to inspect documents belonging to the other side, perform experiments, call expert witnesses and to engage in extensive cross-examination. These requirements were present at the pre-reform IPEC as well - however, post-reforms, in line with the active case management (ACM) that now takes place at the IPEC – which includes the limiting of claims/submissions – both the re-

quirement of disclosure and the use of expert evidence are now much more limited at the IPEC level than at the PHC level. Interestingly, in October 2015 the PHC began a two-year trial run of a 'Shorter Trial Scheme' which allows for disclosure and submissions to be limited along the lines of IPEC trials (Practice Direction 51N – Shorter and Flexible Trials Pilot Schemes). In any case, this trial falls outside of the period of our study.

Remedies: All the remedies available in the PHC are available in the IPEC multi-track including preliminary and final injunctions, damages, accounts of profits, delivery up, disclosure, search and seizure and asset freezing. In other words, there are no differences in the remedies each court can award (apart from the damages cap, which restricts the level of damages available at the IPEC). However, the remedies available in the IPEC small claims track are more limited - it has the power to order final injunctions, and final damage awards, but it does not have the power to issue preliminary injunctions, search and seizure orders or asset freezing orders.

Cost allocation: In England and Wales the substantive legal issues and the issues of costs and damages are dealt with separately, and the losing party will typically bear the brunt of the costs of the case on an issue-cost basis – the so-called 'loser-pays rule' (McDonagh and Helmers, 2013). This issue-based approach works such that each party will have to pay the costs of the issues they lost at trial. For instance, if a patent infringement trial concludes with a two-part ruling that (i) the claimant's patent was invalid and (ii) the defendant's activities would have infringed the claimant's patent if it had been valid, the claimant would have to pay the costs of the part of the trial dedicated to the validity issue, and the defendant would have to pay the costs of the part of the trial dedicated to the infringement issue.

Legal representation: At the IPEC and the PHC litigants may be represented before courts by appropriately qualified and certified barristers, solicitors, patent attorneys and trademark attorneys (Right to Conduct Litigation and Rights of Audience 2012). Legal representation is not required at the IPEC small claims track level, though par-

ties are free to obtain it if they wish.

B   Appendix: Summary of legal changes

The IPEC reforms consisted of several stages, and were staggered over a number of years
between 2010 and 2013:

1. **October 2010 – Procedures and Costs cap:**

   - Procedural changes at the PCC come into force – the most crucial of these are
     the introduction of active case management (ACM), early identification of the
     issues by the judge, and a limit on the time to be taken at trial;

   - Introduction of a recoverable costs scale with a total cap of £50,000 (with an
     additional cap of £25,000 relating to hearings concerning damages).

2. **June-October 2011 – Damages cap:**

   - June 2011: £500,000 damages (and accounts of profits) cap is applied to patents
     and designs;

   - October 2011: £500,000 damages cap is extended to all IP claims.

3. **October 2012–April 2013 – Introduction of Small Claims Track and implemen-
   tation of Jackson Review costs changes:**

   - October 2012-April 2013: Introduction of the small claims track (SCT) in Octo-
     ber 2012. Under CPR part 63.27 the SCT can hear copyright, trademarks and
     passing off, databases, breach of confidence, and unregistered designs matters
     – but not cases concerning patents, registered designs and plant variety rights.
     The SCT consists of informal hearings heard by a District Court judge without
     the need for legal representation. Although final injunctions and damages can
     be awarded, interim injunctions are not available on the SCT. Decisions of the
     SCT may be appealed to the judge at the IPEC multi-track (MT). SCT claims are
     limited to a value of £5,000; SCT Costs recovery – as with all small claims track

matters – is set at a level of £260. In April 2013, the SCT Claims limit was raised to a value of £10,000.

- April 2013: General civil litigation reforms (in most cases applicable to both IPEC and PHC) arising from the Jackson Review come into force. Under the new rules judges are to apply stricter case management rules – with a focus on litigant compliance with court directions and orders, such as under CPR 3.1(8) – and a new proportionality test in the assessment of costs and in the PHC new costs management and budgeting procedures for cases with claims valued at less than £2million (CPR 3.12-3.18, PD 3E and CPR 31.5). There are also changes to costs arrangements between clients and legal representatives – successful parties who have 'Conditional Fee Agreements' (CFAs) or 'after-the-event' (ATE) litigation insurance in place can no longer claim the CFA 'success fee' and ATE premium as part of costs recovery from the other side; instead damages-based agreements (DBAs) are permitted in contentious litigation. In addition, CPR Part 36 (offers to settle) is reformed to include new sanctions aimed at encouraging early settlement of disputes.

4. **October 2013: IPEC**

- The Intellectual Property Enterprise court (IPEC) takes over the jurisdiction of the PCC. The IPEC's jurisdiction as a specialist court operating within the Chancery Division of the High Court of England and Wales means that it is now equal to that of the PHC in virtually all IP matters (Fox, 2014: 10). Thus, in accordance with CPR part 63 and Practice Direction (PD) 63 the IPEC can hear cases concerning patents, designs (registered/unregistered, UK/Community), trademarks (UK/Community), passing off, copyright, database right, other rights conferred by the Copyright Designs and Patents Act 1988 and actions for breach of confidence (HMCTS, The Intellectual Property Enterprise Court Guide).

C Appendix: Model

Proof of Lemma 1

Let us first consider Stage 3. The defendant knows that if he rejects the settlement offer, there will be a trial that will cost him in expectation:

$$p(D + C_d + R_p) + (1 - p)(C_d - R_d).$$

Thus, he accepts to pay an amount S to the plaintiff if and only if

$$S \leq p(D + C_d + R_p) + (1 - p)(C_d - R_d).$$

Denoting $\underline{S} = \underline{p}(D + C_d + R_p) + (1 - \underline{p})(C_d - R_d)$ and $\bar{S} = \bar{p}(D + C_d + R_p) + (1 - \bar{p})(C_d - R_d)$, we can distinguish three cases: (i) If $S < \underline{S}$: the settlement offer is always accepted; (ii) if $S > \bar{S}$: the settlement offer is never accepted, and (iii) if $\underline{S} \leq S \leq \bar{S}$: the settlement offer is accepted by a defendant of type p if and only if

$$p \geq \frac{S - C_d + R_d}{D + R_p + R_d} \equiv \hat{p}(D, R_p, R_d, S).$$

Intuitively, the probability that a settlement offer involving a given payment $S \in \left[\underline{S}, \bar{S}\right]$ is accepted by the defendant, i.e., $\frac{\bar{p} - \hat{p}}{\bar{p} - \underline{p}}$, increases with the damages D and the plaintiff's recoverable cost R_p. Also, it decreases with the defendant's recoverable cost R_d since $\frac{\partial \hat{p}}{\partial R_d} = \frac{D + R_p + C_d - S}{\left(D + R_p + R_d\right)^2} \geq 0$ for any $S \leq \bar{S}$.

Consider now the plaintiff's choice of the amount S requested from the defendant at Stage 2. Note first that the plaintiff will never find it strictly optimal to make a settlement offer involving a payment $S < \underline{S}$ or $S > \bar{S}$. A settlement offer such that $S < \underline{S}$ leads to strictly lower profit for the plaintiff than a settlement offer such that $S = \bar{S}$. Moreover, all settlement offers involving payments $S > \bar{S}$ lead to the same payoff for the plaintiff as the settlement offer involving the payment $S = \bar{S}$. Therefore, we can focus on the range $\left[\underline{S}, \bar{S}\right]$ when solving the plaintiff's maximization program. Moreover, the plaintiff knows that if his settlement offer involves a payment $S \in \left[\underline{S}, \bar{S}\right]$, there is a probability $\frac{\bar{p} - \hat{p}}{\bar{p} - \underline{p}}$ that it will be

accepted and a probability $\frac{\hat{p}-\underline{p}}{\bar{p}-\underline{p}}$ that it will be turned down. If the offer is accepted then the plaintiff's payoff is $S-c_p$. If the offer is turned down there will be a trial and the plaintiff's expected payoff will be

$$\hat{\rho}\left(D-C_p+R_p\right)-(1-\hat{\rho})\left(C_p+R_d\right)-c_p$$

where

$$\hat{\rho}=\frac{\hat{p}+\bar{p}}{2}$$

is the average probability that the plaintiff prevails in court conditionally on the settlement offer being turned down by the defendant. Therefore, the plaintiff's expected payoff if he makes a settlement offer involving a payment $S \leq \bar{S}\left(D,R_p,R_d\right)$ is given by

$$\hat{\Pi}(D,R_p,R_d,S) = \frac{\bar{p}-\hat{p}}{\bar{p}-\underline{p}}S + \frac{\hat{p}-\underline{p}}{\bar{p}-\underline{p}}\left[\hat{\rho}\left(D-C_p+R_p\right)-(1-\hat{\rho})\left(C_p+R_d\right)\right]-c_p.$$

The assumption $\bar{p}-\underline{p} \geq \frac{C_p+C_d}{\underline{D}}$ ensures that $\left.\frac{\partial \hat{\Pi}}{\partial S}\right|_{S=\underline{S}} > 0$ for any $D \in (\underline{D},\bar{D}], R_p \in \left[0,c_p+C_p\right]$ and $R_d \in [0,C_d]$, which implies that $\hat{\Pi}(D,R_p,R_d,S)$ is not maximized at $S = \underline{S}$. Solving the first-order condition $\frac{\partial \hat{\Pi}}{\partial S} = 0$ yields the optimal settlement amount

$$S^*\left(D,R_p,R_d\right)=\bar{p}\left(D+R_p+R_d\right)-C_p-R_d.$$

The corresponding threshold type is

$$p^*(D,R_p,R_d)=\hat{p}(D,R_p,R_d,S^*\left(D,R_p,R_d\right))=\bar{p}-\frac{C_p+C_d}{D+R_p+R_d}.$$

Proof of Lemma 2

   Straightforward computations lead to

$$\Pi^*(D,R_p,R_d)=\bar{p}\left(D+R_p+R_d\right)+\frac{1}{2(\bar{p}-\underline{p})}\frac{\left(C_p+C_d\right)^2}{D+R_p+R_d}-\frac{1}{2}\left(C_p+C_d\right)-C_p-R_d-c_p.$$

Differentiating this with respect to D leads to

$$\frac{\partial \Pi^*}{\partial D}(D,R_p,R_d) = \bar{p} - \frac{1}{2(\bar{p}-\underline{p})}\frac{(C_p+C_d)^2}{(D+R_p+R_d)^2} > \bar{p} - \frac{1}{2(\bar{p}-\underline{p})}\frac{(C_p+C_d)^2}{\underline{D}^2} > \bar{p} - \frac{\bar{p}-\underline{p}}{2} = \frac{\bar{p}+\underline{p}}{2} > 0.$$

This shows that there exists a unique threshold $D^*(R_p,R_d) \geq \underline{D}$ such that a potential plaintiff files a case if and only if $D > D^*(R_p,R_d)$. Moreover,

$$\frac{\partial \Pi^*}{\partial R_p}(D,R_p,R_d) = \frac{\partial \Pi^*}{\partial D}(D,R_p,R_d) > 0$$

and

$$\frac{\partial \Pi^*}{\partial R_d}(D,R_p,R_d) = \bar{p} - \frac{1}{2(\bar{p}-\underline{p})}\frac{(C_p+C_d)^2}{(D+R_p+R_d)^2} - 1 < 0,$$

which implies that $D^*(R_p,R_d)$ is decreasing in R_p and increasing in R_d.

Proof of Lemma 3

We have shown in the proof of Lemma 2 that $\partial \Pi^*/\partial R_p > 0$ and $\partial \Pi^*/\partial R_d < 0$.

Proof of Proposition 1

It is straightforward that if $\Pi^*(D,\bar{R},\bar{R}) - \Pi^*(D,C_p,C_d)$ is positive (resp. negative) for any D then $D^*(\bar{R},\bar{R})$ is less (resp. greater) than $D^*(C_p,C_d)$ or, equivalently, the number of case filings under the costs cap is larger (resp. smaller) than in the absence of the costs cap. This shows that if $\Pi^*(D,\bar{R},\bar{R}) - \Pi^*(D,C_p,C_d)$ is ambiguous then $D^*(\bar{R},\bar{R}) - D^*(C_p,C_d)$ is ambiguous too, which means that the impact of the costs cap on case filings is ambiguous.

Sufficient conditions for the impact of the costs cap on case filings to be positive or negative

We have

$$-\left[(c_p+C_p)-\bar{R}\right]\max\frac{\partial \Pi^*}{\partial R_p} \leq \Pi^*(D,\bar{R},\bar{R}) - \Pi^*(D,c_p+C_p,\bar{R}) \leq -\left[(c_p+C_p)-\bar{R}\right]\min\frac{\partial \Pi^*}{\partial R_p}$$

and

$$\left(C_d - \bar{R}\right)\min\left|\frac{\partial \Pi^*}{\partial R_d}\right| \leq \Pi^*(D, c_p + C_p, \bar{R}) - \Pi^*(D, c_p + C_p, C_d) \leq \left(C_d - \bar{R}\right)\max\left|\frac{\partial \Pi^*}{\partial R_d}\right|.$$

Summing these two double inequalities leads to

$$\Pi^*(D, \bar{R}, \bar{R}) - \Pi^*(D, c_p + C_p, C_d) \geq -\left[\left(c_p + C_p\right) - \bar{R}\right]\max\frac{\partial \Pi^*}{\partial R_p} + \left(C_d - \bar{R}\right)\min\left|\frac{\partial \Pi^*}{\partial R_d}\right|$$

and

$$\Pi^*(D, \bar{R}, \bar{R}) - \Pi^*(D, c_p + C_p, C_d) \leq -\left[\left(c_p + C_p\right) - \bar{R}\right]\min\frac{\partial \Pi^*}{\partial R_p} + \left(C_d - \bar{R}\right)\max\left|\frac{\partial \Pi^*}{\partial R_d}\right|.$$

Thus, a sufficient condition for $\Pi^*(D, \bar{R}, \bar{R}) - \Pi^*(D, c_p + C_p, C_d) > 0$ or, equivalently, for the costs cap to generate an increase in case filings, is that

$$-\left[\left(c_p + C_p\right) - \bar{R}\right]\max\frac{\partial \Pi^*}{\partial R_p} + \left(C_d - \bar{R}\right)\min\left|\frac{\partial \Pi^*}{\partial R_d}\right| > 0,$$

which can be rewritten as

$$\left(c_p + C_p\right) - \bar{R} < \left(C_d - \bar{R}\right)\frac{\min\left|\frac{\partial \Pi^*}{\partial R_d}\right|}{\max\frac{\partial \Pi^*}{\partial R_p}}.$$

This inequality can be interpreted as meaning that the reduction in plaintiffs' recoverable costs resulting from the costs cap is sufficiently small relative to the reduction in defendants' recoverable costs.

Similarly, a sufficient condition for $\Pi^*(D, \bar{R}, \bar{R}) - \Pi^*(D, c_p + C_p, C_d) < 0$ or, equivalently, for the costs cap to generate a decrease in case filings, is that

$$-\left[\left(c_p + C_p\right) - \bar{R}\right]\min\frac{\partial \Pi^*}{\partial R_p} + \left(C_d - \bar{R}\right)\max\left|\frac{\partial \Pi^*}{\partial R_d}\right| < 0,$$

which we can rewrite as

$$\left(c_p + C_p\right) - \bar{R} > \left(C_d - \bar{R}\right) \frac{\max\left|\frac{\partial \Pi^*}{\partial R_d}\right|}{\min \frac{\partial \Pi^*}{\partial R_p}}.$$

We can interpret this inequality as meaning that the reduction in plaintiffs' recoverable costs resulting from the costs cap is sufficiently large relative to the reduction in defendants' recoverable costs.

Let us now use an alternative decomposition of $\Pi^*(D, \bar{R}, \bar{R}) - \Pi^*(D, c_p + C_p, C_d)$ to show that the impact of the costs cap on case filings is positive if total litigation costs is large enough. We can write $\Pi^*(D, \bar{R}, \bar{R}) - \Pi^*(D, c_p + C_p, C_d)$ as

$$\underbrace{\left(c_p + C_p + C_d - 2\bar{R}\right) \left[\frac{\left(c_p + C_p + C_d\right)^2}{2(\bar{p} - \underline{p})\left(D + 2\bar{R}\right)\left(D + c_p + C_p + C_d\right)} - \bar{p} \right]}_{\text{can be either} >0 \text{ or} <0} + \underbrace{C_d - \bar{R}}_{>0}.$$

Thus, the impact of the costs cap on the plaintiff's expected gain from filing a case is the sum of a term that can be either positive or negative, depending on the size of litigation costs, and a term that is always positive. However, the ratio $\frac{\left(c_p + C_p + C_d\right)^2}{2(\bar{p} - \underline{p})\left(D + 2\bar{R}\right)\left(D + c_p + C_p + C_d\right)}$ goes to infinity when $c_p + C_p + C_d$ goes to infinity (holding fixed D), which implies that the first term in the decomposition is positive whenever $c_p + C_p + C_d$ is sufficiently large (relative to the upper bound of damages $\bar{D}$). In this case, $\Pi^*(D, \bar{R}, \bar{R}) - \Pi^*(D, c_p + C_p, C_d)$ is positive for any $D \in (\underline{D}, \bar{D}]$, which implies that the costs cap generates an increase in case filings.

Proof of Lemma 4

The optimal investment level $x^*(\beta, R_p, R_d)$ for a plaintiff of type β is such that

$$\frac{\partial D}{\partial x}\left(x^*(\beta, R_p, R_d), \beta\right) \frac{\partial \Pi^*}{\partial D}\left(D\left(x^*(\beta, R_p, R_d), \beta\right), R_p, R_d\right) = 1 \qquad (8)$$

Differentiating this with respect to β leads to

$$\frac{\partial^2 D}{\partial x^2} \cdot \frac{\partial x^*}{\partial \beta} \frac{\partial \Pi^*}{\partial D} + \frac{\partial^2 D}{\partial x \partial \beta} + \left(\frac{\partial D}{\partial x}\right)^2 \frac{\partial^2 \Pi^*}{\partial D^2} \frac{\partial x^*}{\partial \beta} = 0$$

that is,

$$\frac{\partial x^*}{\partial \beta} = \frac{-\frac{\partial^2 D}{\partial x \partial \beta}}{\frac{\partial^2 D}{\partial x^2}\frac{\partial \Pi^*}{\partial D} + \left(\frac{\partial D}{\partial x}\right)^2 \frac{\partial^2 \Pi^*}{\partial D^2}}$$

The denominator is negative because $\Pi^*(D(x,\beta), R_p, R_d)$ is concave. This, combined with our assumption that $\frac{\partial D}{\partial x}(x,\beta)$ is increasing in β, implies that $\frac{\partial x^*}{\partial \beta} > 0$.

Let us now differentiate (8) with respect to R_p:

$$\frac{\partial^2 D}{\partial x^2}\frac{\partial x^*}{\partial R_p}\frac{\partial \Pi^*}{\partial D} + \frac{\partial^2 \Pi^*}{\partial D^2}\left(\frac{\partial D}{\partial x}\right)^2 \frac{\partial x^*}{\partial R_p} + \frac{\partial D}{\partial x}\frac{\partial^2 \Pi^*}{\partial D \partial R_p} = 0$$

which yields

$$\frac{\partial x^*}{\partial R_p} = \frac{-\frac{\partial^2 \Pi^*}{\partial D \partial R_p}}{\frac{\partial^2 D}{\partial x^2}\frac{\partial \Pi^*}{\partial D} + \left(\frac{\partial D}{\partial x}\right)^2 \frac{\partial^2 \Pi^*}{\partial D^2}}$$

Therefore, $\frac{\partial x^*}{\partial R_p}$ has the same sign as

$$\frac{\partial^2 \Pi^*}{\partial D \partial R_p} = \frac{\left(C_p + C_d\right)^2}{\bar{p} - \underline{p}}\frac{1}{\left(D + R_p + R_d\right)^3} > 0.$$

Likewise, we can show that $\frac{\partial x^*}{\partial R_d} > 0$. Thus, the costs cap leads to a decrease in the investment of any *given* plaintiff.

Proof of Proposition 4

Assume that the costs cap leads to an increase in case filings, i.e., $\beta^*\left(\bar{R},\bar{R}\right) < \beta^*\left(c_p + C_p, C_d\right)$. The difference between the average investment under the cap and its counterpart in the absence of a cap is given by

$$\Delta \equiv \frac{\int_{\beta^*\left(\bar{R},\bar{R}\right)}^{\bar{\beta}} x^*(\beta,\bar{R},\bar{R})d\beta}{\bar{\beta} - \beta^*\left(\bar{R},\bar{R}\right)} - \frac{\int_{\beta^*\left(c_p + C_p, C_d\right)}^{\bar{\beta}} x^*(\beta,c_p + C_p, C_d)d\beta}{\bar{\beta} - \beta^*\left(c_p + C_p, C_d\right)}.$$

Since $x^*(\beta, R_p, R_d)$ is increasing in R_p and R_d, we have that $x^*(\beta,\bar{R},\bar{R}) < x^*(\beta, c_p + C_p, C_d)$ and, therefore,

$$\Delta \leq \frac{\int_{\beta^*\left(\bar{R},\bar{R}\right)}^{\bar{\beta}} x^*(\beta,\bar{R},\bar{R})d\beta}{\bar{\beta} - \beta^*\left(\bar{R},\bar{R}\right)} - \frac{\int_{\beta^*\left(c_p + C_p, C_d\right)}^{\bar{\beta}} x^*(\beta,\bar{R},\bar{R})d\beta}{\bar{\beta} - \beta^*\left(c_p + C_p, C_d\right)}. \tag{9}$$

Notice that

$$
\frac{1}{\bar{\beta} - \beta^*(\bar{R},\bar{R})} \int_{\beta^*(\bar{R},\bar{R})}^{\bar{\beta}} x^*(\beta,\bar{R},\bar{R}) d\beta
$$

$$
= \frac{\beta^*(c_p + C_p, C_d) - \beta^*(\bar{R},\bar{R})}{\bar{\beta} - \beta^*(\bar{R},\bar{R})} \frac{\int_{\beta^*(\bar{R},\bar{R})}^{\beta^*(c_p+C_p,C_d)} x^*(\beta,\bar{R},\bar{R}) d\beta}{\beta^*(c_p + C_p, C_d) - \beta^*(\bar{R},\bar{R})}
$$

$$
+ \frac{\bar{\beta} - \beta^*(c_p + C_p, C_d)}{\bar{\beta} - \beta^*(\bar{R},\bar{R})} \frac{\int_{\beta^*(c_p+C_p,C_d)}^{\bar{\beta}} x^*(\beta,\bar{R},\bar{R}) d\beta}{\bar{\beta} - \beta^*(c_p + C_p, C_d)}.
$$

From the fact that $x^*(\beta, R_p, R_d)$ is increasing in β and that $\beta^*(\bar{R},\bar{R}) < \beta^*(c_p + C_p, C_d)$, it follows that

$$
\frac{\int_{\beta^*(\bar{R},\bar{R})}^{\bar{\beta}} x^*(\beta,\bar{R},\bar{R}) d\beta}{\beta^*(c_p + C_p, C_d) - \beta^*(\bar{R},\bar{R})} < \frac{\int_{\beta^*(c_p+C_p,C_d)}^{\bar{\beta}} x^*(\beta,\bar{R},\bar{R}) d\beta}{\bar{\beta} - \beta^*(c_p + C_p, C_d)}.
$$

Therefore,

$$
\frac{\int_{\beta^*(\bar{R},\bar{R})}^{\bar{\beta}} x^*(\beta,\bar{R},\bar{R}) d\beta}{\bar{\beta} - \beta^*(\bar{R},\bar{R})} < \frac{\beta^*(c_p + C_p, C_d) - \beta^*(\bar{R},\bar{R})}{\bar{\beta} - \beta^*(\bar{R},\bar{R})} \frac{\int_{\beta^*(c_p+C_p,C_d)}^{\bar{\beta}} x^*(\beta,\bar{R},\bar{R}) d\beta}{\bar{\beta} - \beta^*(c_p + C_p, C_d)}
$$

$$
+ \frac{\bar{\beta} - \beta^*(c_p + C_p, C_d)}{\bar{\beta} - \beta^*(\bar{R},\bar{R})} \frac{\int_{\beta^*(c_p+C_p,C_d)}^{\bar{\beta}} x^*(\beta,\bar{R},\bar{R}) d\beta}{\bar{\beta} - \beta^*(c_p + C_p, C_d)}
$$

$$
= \frac{\int_{\beta^*(c_p+C_p,C_d)}^{\bar{\beta}} x^*(\beta,\bar{R},\bar{R}) d\beta}{\bar{\beta} - \beta^*(c_p + C_p, C_d)}.
$$

This, combined with (9), implies that $\Delta \leq 0$, i.e., the costs cap leads to a decrease in the average investment of a plaintiff that files a claim.

Extension to asymmetric stakes

We assumed in our baseline model that a plaintiff who prevails in court receives a payment D from the defendant or, equivalently, that the benefit derived by a plaintiff who prevails in court is equal to the loss of the defendant he is facing. In this extension we assume that a judgment in favor of the plaintiff leads to a gain for the plaintiff $B_p \in \left[\underline{B_p}, \overline{B_p}\right]$ that is potentially different from the loss $L_d \in \left[\underline{L_d}, \overline{L_d}\right]$ incurred by the defendant. Such asymmetric stakes are relevant for instance if the court awards an injunction to the plain-

tiff. We assume that the values of B_p and L_p associated to a given dispute are known to both the plaintiff and the defendant.

We now show below that our analysis can be extended to the scenario described above. Let us first consider the defendant's decision to accept or turn down a given settlement offer. The defendant knows that if he rejects the settlement offer, there will be a trial that will cost him in expectation:

$$p(L_d + C_d + R_p) + (1-p)(C_d - R_d).$$

Thus, he accepts to pay an amount S to the plaintiff if and only if

$$S \leq p(L_d + C_d + R_p) + (1-p)(C_d - R_d).$$

Denoting $\underline{S} = \underline{p}(L_d + C_d + R_p) + (1-\underline{p})(C_d - R_d)$ and $\bar{S} = \bar{p}(D + C_d + R_p) + (1-\bar{p})(C_d - R_d)$, we can distinguish three cases: (i) if $S < \underline{S}$: the settlement offer is always accepted, (ii) if $S > \bar{S}$, the settlement offer is never accepted, and (iii) if $\underline{S} \leq S \leq \bar{S}$: the settlement offer is accepted by a defendant of type p if and only if

$$p \geq \frac{S - C_d + R_d}{L_d + R_p + R_d} \equiv \hat{p}(L_d, R_p, R_d, S).$$

Consider now the plaintiff's choice of the amount S requested from the defendant at Stage 2. The plaintiff's expected payoff if he makes a settlement offer $S \in [\underline{S}, \bar{S}]$ involving a payment $S \leq \bar{S}(D, R_p, R_d)$ is given by

$$\hat{\Pi}(B_p, L_d, R_p, R_d, S) = \frac{\bar{p} - \hat{p}}{\bar{p} - \underline{p}} S + \frac{\hat{p} - \underline{p}}{\bar{p} - \underline{p}} \left[\hat{\rho}\left(B_p - C_p + R_p\right) - (1-\hat{\rho})\left(C_p + R_d\right) \right] - c_p.$$

where $\hat{\rho} = \frac{1}{2}(\hat{p} + \bar{p})$ is the probability that the plaintiff prevails in court conditional on the settlement offer being turned down. To avoid a corner solution $S = \underline{S}$ (which would lead

to all cases being settled), we assume that

$$\frac{1}{\bar{p} - \underline{p}} \leq \frac{B_p}{C_p + C_d}.$$

Solving the plaintiff's maximization program leads to an equilibrium threshold:

$$p^*\left(B_p, L_d, R_p, R_d\right) = \frac{\bar{p} - \frac{C_p + C_d}{L_d + R_p + R_d}}{1 + \frac{L_d - B_p}{L_d + R_p + R_d}} = \frac{\bar{p}\left(L_d + R_p + R_d\right) - \left(C_p + C_d\right)}{2L_d + R_p + R_d - B_p}.$$

and an equilibrium settlement amount

$$S^*(B_p, L_d, R_p, R_d) = p^*\left(B_p, L_d, R_p, R_d\right)\left(L_d + R_p + R_d\right) + C_d - R_d.$$

Considering now the first stage of the game, a potential plaintiff files the case if and only if

$$\Pi^*(B_p, L_d, R_p, R_d) \equiv \hat{\Pi}(B_p, L_d, R_p, R_d, S^*\left(B_p, L_d, R_p, R_d\right)) > 0.$$

Similar to the baseline model, one can show that there exists a unique threshold $B_p^*\left(L_d, R_p, R_d\right)$ such that a potential plaintiff files a case if and only if

$$B_p > B_p^*\left(L_d, R_p, R_d\right).$$

Importantly, this threshold is decreasing in R_p and increasing in R_d as is the threshold $D^*(R_p, R_d)$ in the baseline model.

We now investigate the way the equilibrium threshold p^* depends on B_p, L_d, R_p and R_d, which determines the way the equilibrium probability of settlement for a given plaintiff depends on B_p, L_d, R_p and R_d. First, it is clear that p^* is increasing in B_p. Moreover, straightforward calculations also show that p^* is increasing in L_d. These two results generalize the finding in the baseline model that p^* increases with D. Second, simple calculations show that p^* increases in R_p and R_d, as is the case in the baseline model, if

$$B_p < L_d + \frac{C_p + C_d}{\bar{p}}. \tag{10}$$

Thus, we have established that the key qualitative properties of the baseline model, i.e., the way the equilibrium number of case filings depends on recoverable costs, and the way the equilibrium (individual) probability of settlement depends on stakes and recoverable costs are preserved as long as Condition (10) is satisfied. This condition always holds when the plaintiff's gain from a favorable judgment is less than, or equal to, the defendant's loss, and is satisfied in the scenario in which the plaintiff's gain is larger than the defendant's loss as long as the difference between them is not too large. In the latter scenario, an alternative interpretation of Condition (10) is that litigation costs are large enough.

D   Appendix: Data

D.1   IPEC 2007-2013

We collected information on all IP cases filed at the IPEC for the entire period 2007-13. In order to do this, we first compiled the physical IPEC court records/files and associated information for all cases filed 2007-13; secondly, we used a set of specially devised IP right-specific spreadsheets to extract and organize the relevant information gathered from these often extremely detailed and complex records; thirdly, we compiled the different files into a single database. Nonetheless, because the record keeping at the IPEC is largely paper-based, it is not uncommon for case files to be misfiled, or to go missing altogether. For this reason there are a very small number of cases for which we were unable to obtain any information except for the case number. Nonetheless, we are confident that we have examined every possible physical IPEC case file for 2007-13. To double check, in September 2014 we examined the available IPEC judgments for 2007-13 online (via BAILII); we did not find any cases that we did not already have a record of from our search of the physical files.

For IPEC cases, the information that we collected on IP cases filed 2007-13 contains detailed information on the start date of the case, the initial and counter claims (infringement, revocation etc.), the names of the litigating parties, information on the relevant IP

right (including patent numbers, trademark numbers etc.), and the outcomes of the cases. We also gathered information on whether cases were transferred from the IPEC to the PHC or vice versa. These data were collected during the period September 2013-July 2014 and these spreadsheets are up to date in terms of outcomes (decided cases, settlements etc.) up to July 2014.

D.2 PHC

We collected the same set of information on patent cases at the PHC as for the IPEC for the entire 2007-2013 period. For all other IP rights (trademark, design, copyright, and database related disputes), we collected only the following streamlined data for all PHC cases filed 2009-2013:

- Case numbers;

- Parties to the claim;

- Initial claim(s);

- Type of IP right(s) litigated – noting differences within IP rights where relevant – for instance, whether the right was a Community trademark, or a UK trademark (registered or unregistered), or a UK or Community unregistered/registered design right.

Similar to the IPEC data collection, we undertook a number of checks to ensure the completeness of the patent data:

- For the years 2011 and 2012, we were able to cross-reference patent cases via a list that the law firm Powell-Gilbert had provided us of case file numbers drawn from a physical search of files they had undertaken during early 2013.

- We used the Patents Court Diary in order to cross-reference the listed cases with what we found in the physical records to ensure no cases were missed.

- We liaised with HMCTS regarding their published records for the amount of PHC cases filed per year. However, on completion of the search what we found was that

the published HMCTS statistics are not an accurate reflection of the amount of cases actually filed per year.

- As with the IPEC, from September-October 2014 we examined the available PHC patent judgments for 2007-13 online (via BAILII). Thus, as with the IPEC, while there are a very small number of patent PHC cases for which we are missing data, we are confident that our PHC dataset comprehensively includes all available physical and online records.

D.3   Case Data Consolidation

We additionally examined IPEC and PHC cases to identify relationships among cases. For purposes of data collection, we merged all pairs (or groups) of cases that were litigated (1) contemporaneously, (2) between the same two parties, and (3) to address alleged infringement of the same patent rights. In all, we identified 23 groups (comprised of 62 total cases) that met all three criteria.

The 23 groups of cases that we merged fall into three categories. First, 17 groups consist of related cases in which the same patent or patents were asserted against *and challenged by* the same alleged infringer in separate, parallel law suits. Consider, for example, HC08C02525 and HC08C03143. In HC08C02525, Nokia sued IPCom to challenge the validity of two patents. In HC08C03143, IPCom sued Nokia for infringing the same two patents. Such cases are substantively indistinguishable from a set of claim(s) and counterclaim(s) litigated in a single case, and frequently such cases are consolidated together shortly after filing.

Second, we merged three sets of coordinated cases filed by generic pharmaceutical companies to challenge IP rights to branded pharmaceuticals. Two were pairs of cases in which a generic pharmaceutical company filed one suit to challenge a branded pharmaceutical company's patent rights, and later filed an additional suit to challenge "supplementary protection certificates" (SPCs) obtained by the branded pharmaceutical company to extend the previously challenged patents. In the third set, one generic pharmaceutical company filed six separate cases against six nation-specific subsidiaries of the same branded pharmaceu-

tical company parent.

Finally, we merged three additional sets of duplicate cases. Each group consists of cases filed by the same claimant, alleging the same claims, against the same defendant. To provide one example, consider HC11C01030 and HC11C01423. Both cases were filed by the UK government to challenge a patent owned by Servier Labs, but the first claim was never served on Servier and was later dropped in favor of the second.

E   Appendix: Variable Description

This appendix describes the construction of the variables used in our analysis.

- **Dependent variables**

  - *Size of legal counsel:* we collected information on the number of attorneys employed by the law firms that represent the plaintiffs and defendants in a given case and then coded six size categories: (1) 1-5 attorneys, (2) 6-10 attorneys, (3) 11-50 attorneys, (4) 51-200 attorneys, (5) 201-500 attorneys, and (6) above 500 attorneys.

  - *Plaintiff win:* the outcome of a case is coded as equal to one if the court hands down a decision and the plaintiffs prevails on the core issue of the dispute.

  - *Settlement:* the outcome of a case is coded as settlement if the court does not hand down a decision. Settlements include court settlements as well as out-of-court settlements.

- **Case characteristics**

  - *Case transferred:* the variable is equal to one if a case was transferred to the IPEC from another court or cases were transferred between the IPEC and the PHC.

  - *Case value:* the litigating parties specify the value of the case on the claim form.

  - *Infringement claim:* the variable is equal to one if the plaintiff alleges infringement of the IP right.

– *Invalidity claim:* the variable is equal to one if the plaintiff alleges that the IP right is invalid.

– *Counterclaim:* the variable is equal to one if the defendant files a counterclaim; for example in a patent case, if the plaintiff alleges infringement, the defendant may file a counterclaim alleging the invalidity of the asserted patent.

- **Litigant characteristics**

  – *Size:* we categorized companies according to the EU definition into four size categories using a combination of the number of employees, turnover, and total assets. If several companies from the same business group appeared as co-plaintiffs or co-defendants, we allocated the entire business group into the size category of its largest member.

  – *Individual:* the variable is equal to one of at least one of the plaintiffs or defendants in a case is a private individual.

  – *Residence:* we identified a company's origin using information available in the court records, Bureau van Dijk's FAME and Amadeus databases, as well as web searches. We then allocated companies into three categories: domestic (UK), Europe, and rest of the world.

  – *Non-practicing entity (NPE):* we identified NPEs by identifying the patent holder in each case and we then determined manually, using web searches, news reports, court filings, and the existing academic literature on NPEs and PAEs whether a patent holder was an NPE at the time of the court case. For more details see Love et al. (2016).

F Appendix: Factors Affecting Forum Selection and Litigation Time Trends

This appendix identifies a number of general factors that could lead to time trends in case filings and/or affect claimants' choice of forum. For each, we provide relevant qualitative

information and point to related controls used in our empirical analysis.

Table F-1: Differences between IPEC and PHC (2007-2013)

Factors	IPEC vs PHC	Changes 2007-2013	Relevant Variables
Substantive Law/ Statutes	Both IPEC and PHC cases are governed by the same UK statutes, e.g., Copyright, Designs & Patents Act of 1988; Trade Marks Acts of 1994.	No substantive IP reform legislation was enacted during this period.	IP type FE
Precedent	IPEC interim rulings are appealable to PHC, and both IPEC and PHC final rulings are appealable to the Court of Appeals followed by the House of Lords/Supreme Court.	Rulings by the PHC, COA, or House of Lords/ Supreme Court are equally binding on both courts.	IP type FE, Quarter/Month FE
Procedural Rules	Subject to the procedural changes listed in Appendix A, both IPEC and PHC litigants may: - pursue a counterclaim - provide/inspect disclosure - perform/inspect experiments - prepare witness statements and expert reports - hold a trial - recover costs, etc.	For a detailed overview of procedural changes, see Appendix A.	Litigant size, Litigant individual, Litigant residence, NPE status, IP type FE, Quarter/Month FE
Decision-makers	Neither court conducts jury trials. All cases filed in the IPEC are assigned to the same judge. The Chancery Division of the HC consists of more than a dozen judges, the majority of which are eligible to sit on the PHC. Technical complexity is also taken into account when assigning PHC cases.	Judges of the IPEC: - Fysh, 2001-2010 - Birss, 2010-2013 - Hacon, 2013-present For a list of judges on the HC Chancery Division, see https://www.judiciary.uk/ you-and-the-judiciary/going-to-court/high-court/the-chancery-division/judges/.	Within-IPEC analysis, IPEC dummy variable, IP type FE, Quarter/Month FE
Location	IPEC and PHC are both located in London, and cover the same geographic jurisdiction (England and Wales).	Both courts were located in London and covered the same jurisdiction during the entire period of our study.	Litigant residence
Legal Representation	Litigants in both courts may be represented by barristers, solicitors, patent attorneys, and trademark attorneys.	No changes to legal representation rules were made during this period.	Litigant size, Litigant individual, IP type FE
IP Business Models	IP licensing specialists may file suit in both courts.	During this period, NPE patent litigation remained stable in both absolute and relative terms. (Helmers, et al., 2014). As discussed above, we exclude cases filed by the copyright licensing entity PPL.	NPE status, IP type FE, Quarter/Month FE
Industry, Technology, Business Cycle	Neither court's jurisdiction is restricted by industry or technology.	Both courts have retained the same jurisdiction (both geographic and subject matter) during the entire period of our study.	Litigant size, Litigant individual, Litigant residence, NPE status, IP type FE, Quarter/Month FE

G   Appendix: Figures

Figure G-1: Costs awarded at IPEC

(a) All IP

(b) Patents vs all other IP
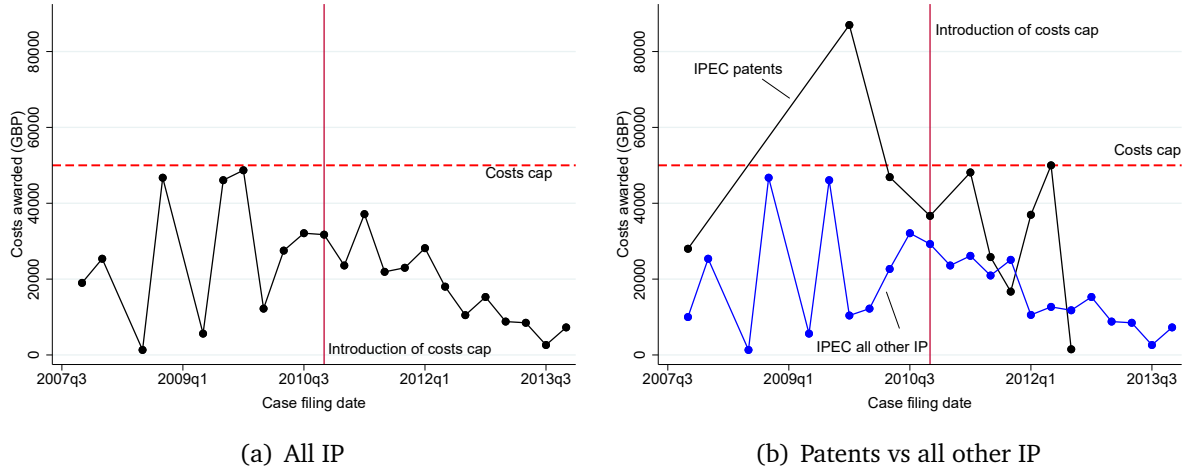
Notes: Data only available in cases with costs award following a costs hearing (17 patent cases and 84 cases involving any other type of IP). Excludes settled cases. Costs awards in British Pound.

Figure G-2: Case transfers between IPEC-PHC

(a) Patents
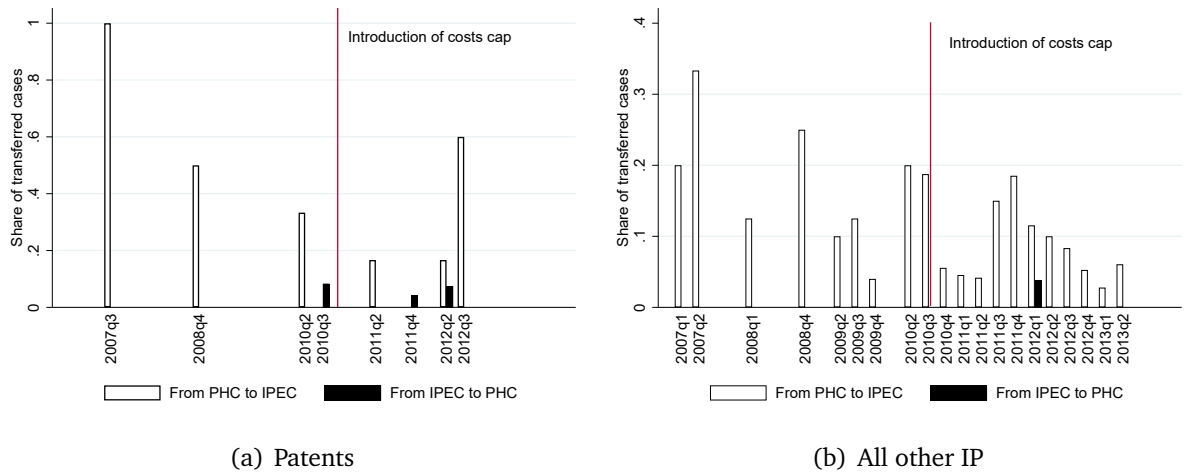
(b) All other IP

Notes: Excludes cases brought by performance rights organization PPL (Phonographic Performance Limited).

Figure G-3: Comparison within IPEC: patent cases vs all other IP
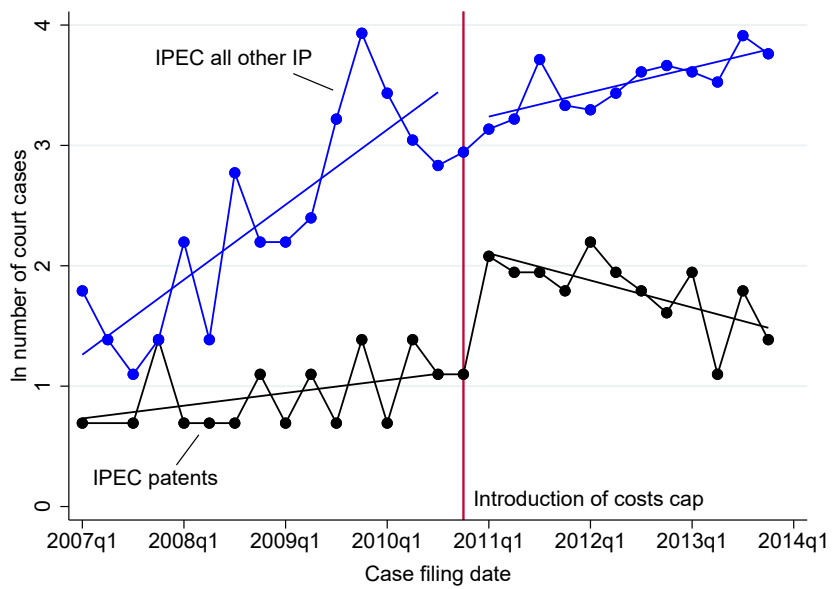
Notes: Case counts exclude cases brought by performance rights organization PPL (Phonographic Performance Limited).

Figure G-4: Comparison IPEC-PHC: discontinuity in patent case filings and all other IP case filings
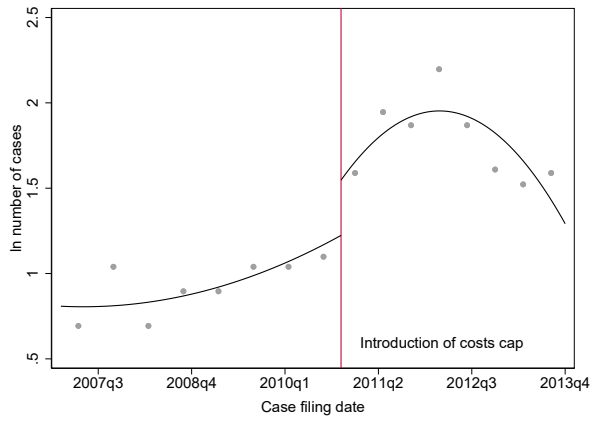
(a) Patents: IPEC

(b) Patents: PHC
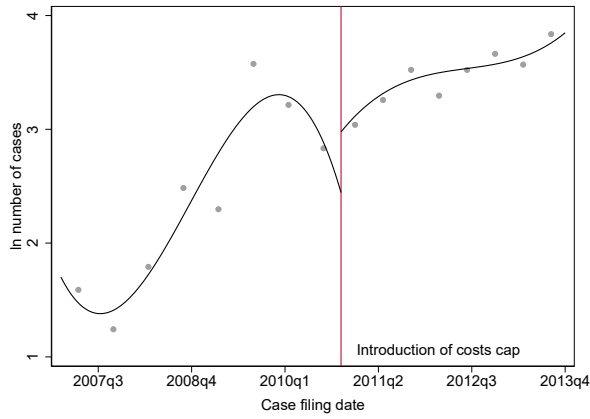
(c) All other IP: IPEC
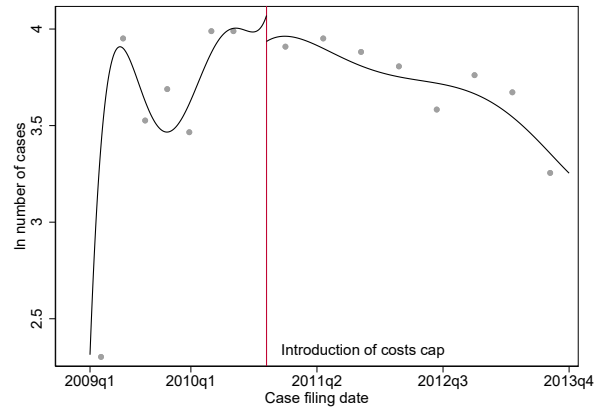
(d) All other IP: PHC

Notes: For PHC no data available for trademarks, design, copyright, and database rights prior to 2009; case counts exclude cases brought by performance rights organization PPL (Phonographic Performance Limited).

Figure G-5: Litigation expenses measured as size of legal counsel

(a) Plaintiff

(b) Defendant
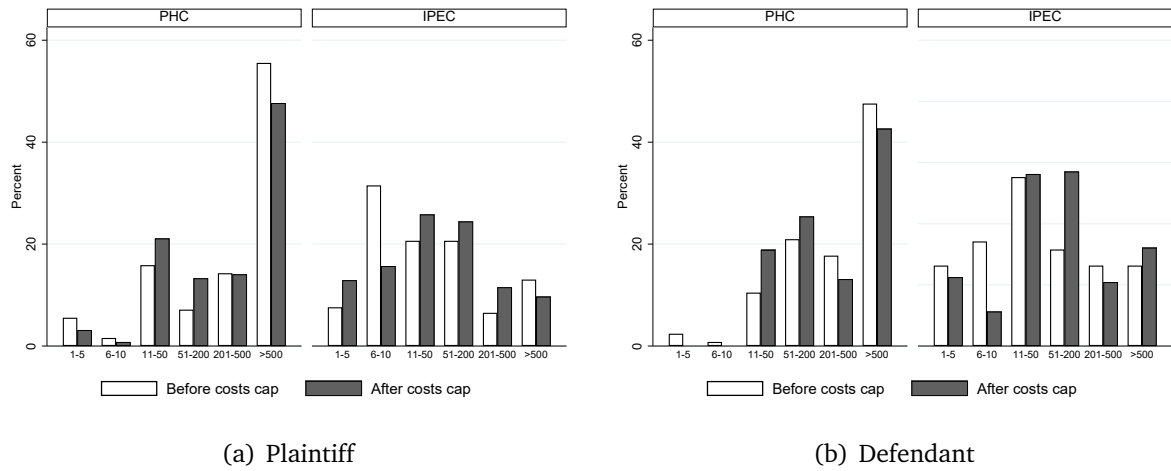
Notes: The figure shows the distribution of court cases where parties have employed legal counsel that was allocated in one of six size categories depending on the number of attorneys employed by the law firm representing plaintiffs or defendants: (1) 1-5 attorneys, (2) 6-10 attorneys, (3) 11-50 attorneys, (4) 51-200 attorneys, (5) 201-500 attorneys, and (6) above 500 attorneys.

Figure G-6: Comparison of plaintiff win rate in decided vs settled cases at IPEC and PHC
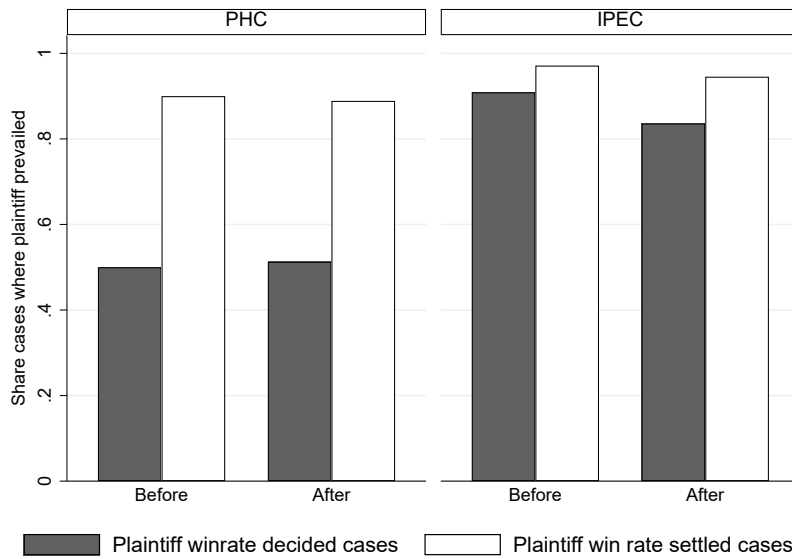
Notes: Data on whether plaintiff prevailed in settlement available at PHC for 20 cases (23.5% of all settled cases) before the introduction of the costs cap and 9 cases (8.5%) afterwards, at the IPEC for 35 cases (30.7%) before the introduction of the costs cap and 165 cases (52.2%) afterwards.

H Appendix: Tables

Table H-1: IPEC an PHC case counts, 2007-2013: all cases incl. PPL cases

Year	Patent		Trademark		Design		Copyright		Database		Total	
	IPEC	PHC	IPEC	PHC	IPEC	PHC	IPEC	PHC	IPEC	PHC	IPEC	PHC
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2007	6	32	7		7		11		0		31	32
2008	4	70	17		3		31		0		55	70
2009	8	49	61	66	16	14	30	265	2	4	117	398
2010	8	48	45	107	18	42	37	156	2	16	110	369
2011	27	87	56	107	27	21	56	324	3	22	169	561
2012	26	73	81	97	39	13	52	271	1	7	199	461
2013	17	51	87	60	47	19	66	241	4	6	221	377
Total	96	410	354	437	157	109	283	1,257	12	55	902	2,268

Notes: For PHC no data available for trademarks, design, copyright, and database rights prior to 2009; trademark case count includes passing-off claims; design cases includes registered and unregistered design rights. Only cases counted for which filing date available.

Table H-2: IPEC an PHC case counts, 2007-2013: all cases (including cases dropped by plaintiffs, cases where service not acknowledged by defendant etc.) excl. PPL cases

Year	Patent		Trademark		Design		Copyright		Database		Total	
	IPEC	PHC	IPEC	PHC	IPEC	PHC	IPEC	PHC	IPEC	PHC	IPEC	PHC
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
2007	6	32	7		7		10		0		30	32
2008	4	70	17		3		30		0		54	70
2009	8	49	61	66	16	14	29	57	2	4	116	190
2010	8	48	45	107	18	42	36	66	2	16	109	279
2011	27	87	56	107	27	21	55	76	3	22	168	313
2012	26	73	81	97	39	13	48	49	1	7	195	239
2013	17	51	87	59	47	19	63	63	4	6	218	198
Total	96	410	354	436	157	109	271	311	12	55	890	1,321

Notes: For PHC no data available for trademarks, design, copyright, and database rights prior to 2009; trademark case count includes passing-off claims; design cases includes registered and unregistered design righ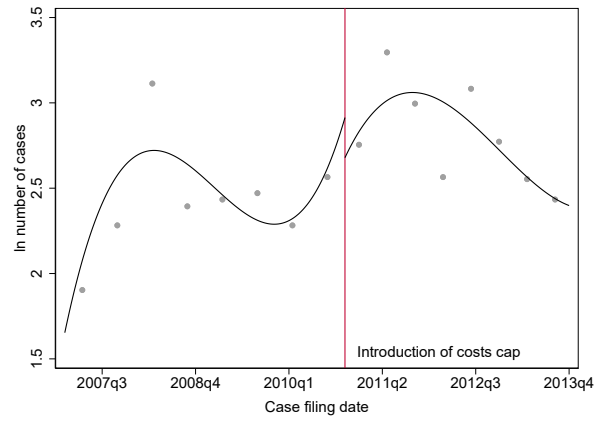ts. Case counts exclude cases brought by performance rights organisation PPL (Phonographic Performance Limited). Only cases counted for which filing date available.

Table H-3: IPEC: total number of patent vs all other IP court cases by month, 2007-2013

	Patents vs All other IP		
	All	P SME	P Large
	(1)	(2)	(3)
Patent	16.681***	10.632***	15.920***
	(3.399)	(3.216)	(3.131)
Postreform	-0.352*	-0.019	-0.394
	(0.205)	(0.204)	(0.264)
Patent×Postreform	0.849***	0.312	0.598**
	(0 .274)	(0.263)	(0.301)
Time trend (quarterly)	YES	YES	YES
Time trend × Patent	YES	YES	YES
R2	0.766	0.615	0.631
Number obs.	162	162	162

Notes: OLS regression. Dependent variable log(number of cases by month +1). P SME: plaintiff is SME; P Large: plaintiff is large firm. All regressions include a constant. Time period 2007-2013; trademark case count includes passing-off claims; design cases includes registered and unregistered design rights. Case counts exclude cases brought by performance rights organisation PPL (Phonographic Performance Limited). Robust standard errors. * significant at 10%, ** at 5%, *** at 1%.

Table H-4: IPEC and PHC: total number court cases by month, 2007-2013

	Patents			All other IP		
	All	P SME	P Large	All	P SME	P Large
	(1)	(2)	(3)	(4)	(5)	(6)
IPEC	-1.139***	-0.228**	-1.160***	-0.380**	-0.092	-0.747***
	(0.103)	(0.090)	(0.092)	(0.167)	(0.178)	(0.259)
Postreform	0.404	0.140	0.586	-0.118	-1.333**	1.222
	(0.957)	(0.290)	(0.595)	(0.329)	(0.507)	(0.825)
IPEC×Postreform	0.290**	0.414***	-0.074	0.350*	0.505**	0.318
	(0.140)	(0.136)	(0.142)	(0.193)	(0.226)	(0.293)
IP type FE				YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES
R2	0.805	0.564	0.831	0.824	0.728	0.796
Number obs.	164	164	164	138	138	138

Notes: OLS regression. Dependent variable log(number of cases by month +1). P SME: plaintiff is SME; P Large: plaintiff is large firm. All regressions include a constant. Time period for all IP is 2009-2013 because no data are available for trademarks, design, copyright and database rights at the PHC prior to 2009; data for patent cases for 2007-2013; trademark case count includes passing-off claims; design cases includes registered and unregistered design rights. Case counts exclude cases brought by performance rights organisation PPL (Phonographic Performance Limited). IP type FE: dummy variable for each type of IP right (patent, trademark, copyright, registered design, database). Robust standard errors. * significant at 10%, ** at 5%, *** at 1%.

Table H-5: IPEC and PHC: total number of patent vs all other IP court cases by month, 2007-2013

	IPEC vs PHC: Patents vs All other IP		
	All	P SME	P Large
	(1)	(2)	(3)
IPEC	-0.011	0.084	-0.511**
	(0.210)	(0.130)	(0.206)
Patent	0.016	-0.278**	-0.056
	(0.227)	(0.132)	(0.219)
Postreform	2.906***	1.088***	2.908***
	(0.520)	(0.209)	(0.459)
IPEC×Postreform	-0.992***	0.186	-1.158***
	(0.227)	(0.175)	(0.229)
IPEC×Patent	-1.077***	-0.303*	-0.597**
	(0.265)	(0.171)	(0.254)
Patent×Postreform	-1.709***	-0.739***	-1.641***
	(0.244)	(0.171)	(0.241)
IPEC×Patent×Postreform	1.231***	0.218	1.032***
	(0.294)	(0.230)	(0.293)
Quarter FE	YES	YES	YES
R2	0.727	0.618	0.732
Number obs.	336	336	336

Notes: OLS regression. Dependent variable log(number of cases by month +1). P SME: plaintiff is SME; P Large: plaintiff is large firm. All regressions include a constant. Time period for all IP is 2009-2013 because no data are available for trademarks, design, copyright and database rights at the PHC prior to 2009; data for patent cases for 2007-2013; trademark case count includes passing-off claims; design cases includes registered and unregistered design rights. Case counts exclude cases brought by performance rights organisation PPL (Phonographic Performance Limited). Robust standard errors. * significant at 10%, ** at 5%, *** at 1%.

Table H-6: Regression discontinuity: IPEC total number court cases by month, 2007-2013

Patents

	October 2010			Placebo: October 2009			Placebo: October 2011		
	All	P SME	P Large	All	P SME	P Large	All	P SME	P Large
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Postreform	0.520***	0.315*	0.217	0.299	0.160	0.143	0.134	0.158	0.141
	(0.188)	(0.173)	(0.158)	(0.183)	(0.167)	(0.124)	(0.235)	(0.230)	(0.220)
Month quadratic trend	YES	YES	YES	YES	YES	YES	YES	YES	YES
R2	0.334	0.213	0.115	0.287	0.189	0.100	0.271	0.188	0.099
Number obs.	82	82	82	82	82	82	82	82	82

All other IP

	October 2010			Placebo: October 2009			Placebo: October 2011		
	All	P SME	P Large	All	P SME	P Large	All	P SME	P Large
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Postreform	-0.276	-0.062	-0.275	0.208	0.126	0.137	-0.215	-0.193	-0.030
	(0.199)	(0.236)	(0.307)	(0.269)	(0.239)	(0.465)	(0.164)	(0.271)	(0.234)
IP type FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Month quadratic trend	YES	YES	YES	YES	YES	YES	YES	YES	YES
R2	0.739	0.592	0.488	0.734	0.593	0.482	0.734	0.594	0.481
Number obs.	78	78	78	78	78	78	78	78	78

Notes: OLS regression. Dependent variable log(number of cases by month +1). P SME: plaintiff is SME; P Large: plaintiff is large firm. All regressions include a constant. Time period for all IP is 2009-2013 because no data are available for trademarks, design, copyright and database rights at the PHC prior to 2009; data for patent cases for 2007-2013; trademark case count includes passing-off claims; design cases includes registered and unregistered design rights. Case counts exclude cases brought by performance rights organisation PPL (Phonographic Performance Limited). IP type FE: dummy variable for each type of IP right (patent, trademark, copyright, registered design, database). Robust standard errors. * significant at 10%, ** at 5%, *** at 1%.

Table H-7: IPEC and PHC: differences in means, 2007-2013

	All			P SME			P Large		
	Mean		Diff.	Mean		Diff.	Mean		Diff.
	PHC	IPEC		PHC	IPEC		PHC	IPEC	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Case characteristics									
Case transferred	0.017	0.250	-0.232***	0.024	0.225	-0.200***	0.017	0.195	-0.178***
ln case value	1.360	6.050	-4.689***	4.104	5.811	-1.706*	0.840	6.317	-5.477***
Infringement claim	0.478	0.936	-0.457***	0.585	0.938	-0.353***	0.459	0.948	-0.489***
Invalidity claim	0.471	0.061	0.409***	0.243	0.053	0.190***	0.519	0.082	0.436***
Counterclaim	0.708	0.498	0.210***	0.707	0.496	0.211**	0.721	0.505	0.215***
Litigant characteristics									
Plaintiff individual	0.032	0.183	-0.151***	0.048	0.080	-0.031	0.012	0.025	-0.012
Defendant individual	0.046	0.496	-0.449***	0.097	0.519	-0.421***	0.038	0.479	-0.440***
Plaintiff Europe	0.316	0.063	0.252***	0.048	0.015	0.033	0.364	0.154	0.210***
Plaintiff World	0.327	0.112	0.214***	0.073	0.019	0.054**	0.377	0.283	0.094**
Defendant Europe	0.320	0.024	0.295***	0.170	0.030	0.140***	0.351	0.020	0.331***
Defendant World	0.334	0.033	0.300***	0.170	0.049	0.121***	0.369	0.015	0.353***
NPE	0.129	0.011	0.118***	0.048	0.003	0.044***	0.141	0.010	0.131***
Number of obs.	278	534		41	262		233	194	

Notes: Notes: P SME: plaintiff is SME; P Large: plaintiff is large firm. PHC data contain only patent cases; trademark case count includes passing-off claims; design cases includes registered and unregistered design rights. Excludes cases brought by performance rights organisation PPL (Phonographic Performance Limited). Cases at the IPEC and PHC (patents) excluded if the plaintiff dropped the case unilaterally (no settlement) or only a claim form was filed and there is no response by the defendant or other actions by the plaintiff.

Table H-8: IPEC and PHC: settlement decision and judgment (plaintiff win) OLS, 2007-2013

	All		P SME		P Large	
	Settle	P Win	Settle	P Win	Settle	P Win
	(1)	(2)	(3)	(4)	(5)	(6)
Costs cap						
IPEC	0.008	0.164	0.076	0.275	-0.111	0.200
	(0.082)	(0.156)	(0.125)	(0.256)	(0.133)	(0.274)
Postreform	0.004	0.012	0.217	0.720**	-0.042	-0.154
	(0.080)	(0.147)	(0.164)	(0.289)	(0.103)	(0.195)
IPEC×Postreform	-0.043	-0.122	-0.225	-0.816***	-0.134	0.017
	(0.073)	(0.122)	(0.152)	(0.203)	(0.103)	(0.214)
Case characteristics						
Case transferred	0.019	-0.289***	0.020	-0.250**	-0.030	-0.149
	(0.048)	(0.083)	(0.071)	(0.120)	(0.078)	(0.194)
ln case value	0.00003	0.005	0.018	0.021	0.002	-0.124
	(0.017)	(0.028)	(0.035)	(0.033)	(0.026)	(0.076)
Infringement claim	-0.040	0.119	0.062	0.136	-0.065	0.301
	(0.077)	(0.140)	(0.131)	(0.286)	(0.119)	(0.185)
Invalidity claim	0.113	0.269**	0.132	-0.039	-0.186*	0.480***
	(0.078)	(0.118)	(0.140)	(0.216)	(0.110)	(0.138)
Counterclaim	0.026		0.127**		-0.040	
	(0.034)		(0.056)		(0.047)	
Litigant characteristics						
Plaintiff individual	-0.061	-0.064	-0.110	0.020	-0.050	-0.079
	(0.052)	(0.081)	(0.113)	(0.151)	(0.180)	(0.286)
Defendant individual	-0.138***	0.105	-0.190***	0.105	0.127**	0.147
	(0.038)	(0.064)	(0.057)	(0.089)	(0.059)	(0.145)
Plaintiff Europe	0.039	-0.026	0.041	-0.586*	0.015	-0.061
	(0.048)	(0.099)	(0.211)	(0.323)	(0.055)	(0.114)
Plaintiff World	-0.013	-0.149*	0.089	0.233	-0.060	-0.212**
	(0.044)	(0.080)	(0.120)	(0.425)	(0.051)	(0.105)
Defendant Europe	-0.127*	0.039	-0.130	0.656**	-0.137*	0.068
	(0.065)	(0.102)	(0.140)	(0.299)	(0.081)	(0.123)
Defendant World	-0.150**	-0.200	-0.011	-0.614***	-0.168**	-0.119
	(0.058)	(0.110)	(0.089)	(0.199)	(0.075)	(0.124)
NPE	0.045	-0.092	-0.297	-0.631	0.139*	-0.077
	(0.076)	(0.146)	(0.256)	(0.395)	(0.083)	(0.171)
IP type FE	YES	YES	YES	YES	YES	YES
Time trend (by quarter)	YES	YES	YES	YES	YES	YES
R2	0.071	0.254	0.181	0.464	0.105	0.282
Number obs.	812	254	303	101	427	126

Notes: OLS regression. Dependent variable in columns (1), (3), and (5) equal to one if case settled and in columns (2), (4), (6) if plaintiff wins. P SME: plaintiff is SME; P Large: plaintiff is large firm. All regressions include a constant. Time period is 2007-2013; PHC data contain only patent cases; IPEC trademark cases include passing-off claims; IPEC design cases include registered and unregistered design rights. Sample excludes cases brought by performance rights organisation PPL (Phonographic Performance Limited). IP type FE: dummy variable for each type of IP right (patent, trademark, copyright, registered design, database). Regressions include a dummy variable equal to one if the case value is missing. * significant at 10%, ** at 5%, *** at 1%.

Table H-9: IPEC and PHC: settlement decision and judgment (plaintiff win), 2007-2012

	All		P SME		P Large	
	Settle	P Win	Settle	P Win	Settle	P Win
	(1)	(2)	(3)	(4)	(5)	(6)
Costs cap						
IPEC	0.097	0.040	-0.320	0.430	0.500	-0.007
	(0.253)	(0.891)	(0.414)	(0.315)	(0.412)	(0.497)
Postreform	-0.007	0.116	-1.362*	1.715*	0.274	-0.299
	(0.266)	(0.781)	(0.703)	(0.936)	(0.345)	(0.370)
IPEC×Postreform	0.130	-0.453	1.126*	-1.567**	0.306	-0.258
	(0.225)	(0.955)	(0.631)	(0.796)	(0.346)	(0.382)
Case characteristics						
Case transferred	-0.088	-0.122	-0.137	-0.171	0.020	-0.244
	(0.152)	(0.655)	(0.220)	(0.168)	(0.303)	(0.315)
ln case value	0.021	-0.032	-0.022	0.039	0.093	-0.150
	(0.050)	(0.189)	(0.074)	(0.050)	(0.128)	(0.152)
Infringement claim	0.127	-0.138	-0.277	0.333	0.255	0.084
	(0.255)	(0.982)	(0.434)	(0.354)	(0.458)	(0.500)
Invalidity claim	0.309	-0.294	-0.521	0.267	0.583	0.131
	(0.241)	(1.841)	(0.453)	(0.392)	(0.413)	(0.646)
Counterclaim	0.006		-0.253		0.194	
	(0.114)		(0.192)		(0.172)	
Litigant characteristics						
Plaintiff individual	0.152	-0.315	0.195	-0.064	0.228	-0.270
	(0.162)	(0.947)	(0.311)	(0.220)	(0.505)	(0.491)
Defendant individual	0.455***	-0.787	0.541***	-0.105	0.379*	-0.027
	(0.128)	(2.618)	(0.188)	(0.287)	(0.228)	(0.340)
Plaintiff Europe	-0.059	0.074	-0.088	-0.566	0.025	-0.090
	(0.157)	(0.531)	(0.649)	(0.655)	(0.186)	(0.160)
Plaintiff World	0.038	-0.281	-0.314	0.524	0.163	-0.364*
	(0.150)	(0.501)	(0.696)	(0.824)	(0.178)	(0.193)
Defendant Europe	0.468**	-0.842	0.358	0.559	0.508**	-0.203
	(0.187)	(2.647)	(0.471)	(0.418)	(0.233)	(0.386)
Defendant World	0.484***	-1.111	-0.007	-0.592**	0.543**	-0.404
	(0.178)	(2.730)	(0.423)	(0.293)	(0.221)	(0.430)
NPE	-0.108	0.089	1.071	-1.153	-0.368	0.098
	(0.235)	(0.876)	(0.912)	(0.772)	(0.269)	(0.346)
Mills ratio	-2.773		-0.660		-0.834	
	(8.048)		(0.721)		(1.067)	
IP type FE	YES	YES	YES	YES	YES	YES
Time trend (by quarter)	YES	YES	YES	YES	YES	YES
Number obs.	674		253		355	
Number obs. settled	454		163		244	

Notes: Heckman 2-step selection correction OLS regression. Dependent variable in 1st stage equal to one if case settled and in 2nd stage if plaintiff wins. P SME: plaintiff is SME; P Large: plaintiff is large firm. All regressions include a constant. Time period is 2007-2013; PHC data contain only patent cases; IPEC trademark cases include passing-off claims; IPEC design cases include registered and unregistered design rights. Sample excludes cases brought by performance rights organisation PPL (Phonographic Performance Limited). IP type FE: dummy variable for each type of IP right (patent, trademark, copyright, registered design, database). Regressions include a dummy variable equal to one if the case value is missing. * significant at 10%, ** at 5%, *** at 1%.

References

[1] Fox, Angela. 2014. *Intellectual Property Enterprise Court: Practice and Procedure*. London: Sweet and Maxwell.

[2] Helmers Christian, Brian J. Love, and Luke McDonagh. 2014. "Is There a Patent Troll Problem in the UK?," 24 *Fordham Intellectual Property, Media & Entertainment Law Journal* 509-553.

[3] Love, Brian J., Fabian Gaessler, Christian Helmers, and Max Ernicke. 2016. "Patent Assertion Entities in Europe," in Daniel Sokol, ed., *Patent Assertion Entities and Competition Policy*. Cambridge: Cambridge University Press.

[4] McDonagh, Luke, and Christian Helmers. 2013. "Patent Litigation in England and Wales and the Issue-Based Approach to Costs," 32 *Civil Justice Quarterly* 369-84.