Home Country Bias in the Legal System: Empirical Evidence from the Intellectual Property Rights Protection in Canada

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Abstract

Are judges concerned with the effect of their decisions on national welfare in the same way as policy-makers do? In this paper we analyze this question by examining the outcomes of intellectual property rights (IPR) litigations between domestic and foreign firms. We develop a simple model of oligopoly where foreign firms have access to more efficient production technology and show that weak protection of foreign-owned IPR always leads to welfare gains at home. We also show that the positive welfare effect increases with the size of the foreign innovator, as well as in the size of the domestic imitator. We test predictions of the model using the data on all Canadian IPR cases over a four-year period. We find that domestic firms are substantially more likely, by 17 percentage points, to succeed in litigations with foreign firms than with other Canadian firms. We also find evidence supporting the hypothesis of the home bias in the legal system. Specifically, we establish that courts' decisions are aligned with welfare maximization principles so that foreign firms are less likely to win in those cases when the implied welfare gains from not protecting foreign IPR are greater.

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1 Introduction

With the continuing rise in the number of intellectual property right (IPR) suits and associated damage awards worldwide, there is a pronounced trend for firms involved in cross-border litigations to file complaints to, and often receive favour from, a home country jurisdiction. In the recent intellectual property battles between the U.S. based Apple Inc. (Apple) and the South Korea based Samsung Electronics Co. (Samsung), Apple sued Samsung for patent infringements over the design and technology of its mobile devices in several countries, and the outcomes vary substantially across different jurisdictions. The U.S. jury took the side of the U.S. firm and on August 24, 2012 concluded that Samsung had violated several of Apple's design and utility patents, awarding Apple with over a billion dollars in damages.[1] However, when the same case was filed to the Seoul Central District Court in South Korea, the decision was in favor of Samsung. Moreover, the claim by South Korean firm that Apple had violated some of its own patents resulted in several Apple's devices being banned from sales in Korea. Yet, the same claim filed to the U.S. court was dismissed by the jury. Another patent infringement case between the Canadian Research in Motion (RIM) and the U.S. Visto share many similarities. Visto brought RIM to the U.S. court, and although Visto's patents were broadly considered invalid, the lawsuit was settled with RIM paying 267.5 million dollars to Visto in 2009. In contrast, when RIM brought Visto to the Canadian Federal Court for patent violation, the decision was in favour of RIM.

The above prominent cases clearly suggest that firms involved in cross-country IPR litigations may have significant advantage over foreign firms in their home country jurisdiction. In this study, we set out to investigate whether foreign firms are systematically disadvantaged in IPR litigations with domestic firms. We test this hypothesis using the data on all IPR litigation cases in Canada that took place between 2007 and 2010. With 1,079 cases in our data, we identify a country of residence for 2,502 firms involved in those cases, and relate it to the probability of winning the case. We find that nationality of a firm is a statistically and economically large determinant of the success rate in a courtroom. Foreign firms litigating in Canada have much smaller likelihood of winning the case: while a Canadian firm has a 50% probability of winning in IPR litigation against another Canadian company, the probability of winning against a foreign firm is 56%. This result is very persistent and is remarkably robust to the definition of a foreign firm, inclusion of a variety of case-related fixed effects, and firm size controls.

We next attempt to identify whether foreign firms' disadvantage in IPR disputes can be driven

[1] The damage amount was later revised to half a billion dollar.

by welfare consideration concerns. Extensive literature analyzes welfare gains from discrimination of foreign IPR owners. A success of a foreign firm in an IPR litigation with a domestic firm would imply a transfer of intellectual property along with its associated market value to a foreign jurisdiction. This in turn may have negative impact on both domestic profits and consumer surplus. Therefore, a welfare-maximizing policy maker may want to protect domestic innovators more rigorously than foreign ones. In practice, the room for discrimination of foreign IPR owners is substantially reduces by several international treaties on IPR protection reduce. The most important one, the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) to which all World Trade Organization member countries must adhere, determines minimum standards for IPR protection and empowers legal authorities to grant relief by way of injunction or damages. However, implementation of these agreements by the legal system may not be completely unbiased towards foreign IPR owners. In particular, being concerned about the impact of their orders on national well-being, the judges may factor in welfare considerations in their decisions. If domestic firms are more likely to win in those IPR cases which result in larger welfare gains, it would imply that, despite international treaties, countries can achieve better social outcomes by violating national treatment in patent protection. Whether the legal system fosters discrimination of foreign innovators or is independent of national welfare considerations is an empirical question, which we try to answer in this study.

To test whether home bias is present in the legal system, we develop a simple partial equilibrium model where domestic and foreign firms compete in an oligopolistic market with a homogeneous good. A foreign firm is assumed to have access to a more efficient production technology, associated with lower marginal costs, which domestic firms try to imitate. Using this model, we identify several economic factors which make welfare gains from not protecting foreign IPR greater. First, the model predicts that the social planner would choose not to protect foreign IPR when domestic imitator is larger, in which case the effect of imitation on domestic prices and consumer surplus is stronger. Second, the welfare gains from not protecting foreign IPR is increasing in the size of the foreign firm due to stronger profit reallocation effect from foreign to domestic firms. Therefore, the model predicts that if welfare considerations lead to home country bias in the legal system, we would expect the size of the firm to be positively related to the likelihood of success in IPR litigation for domestic firms and negative for foreign firms.

Testing these two predictions of the model empirically, we find support for the home country bias hypothesis in the data. The analysis reveals that the size of a firm, measured either with revenue or

employment, has positive (negative) association with the probability of winning a case for domestic (foreign) firms. This relationship is statistically significant and economically sizable: one standard deviation increase in log revenue is linked to 13.3 percentage points increase in success probability for domestic firms and 16.1 percentage points decrease for foreign firms. This result implies that court's decisions are aligned with welfare maximization principles. Although it is consistent with the home country bias hypothesis, we want to point out up front that the effect we estimate admits alternative explanations. Yet, we believe that the provocative relationship between courts' decisions and the implied welfare effects will promote the research agenda and stimulate more research on identification of the factors of foreign firms' disadvantage in IPR litigations.

Nevertheless, our empirical methodology does allow us to rule out some alternative interpretations for the home bias hypothesis. First, the negative coefficient on foreign firms' revenue suggests that the effect of our interest is not driven by differences in effort levels and resources that domestic and foreign firms put into litigation process. For both types of firms there is a positive relationship between the firm size and private gains from IPR protection. Therefore, large foreign firms would spend more resources on protecting their IPR, and we would expect to find a positive coefficient on foreign firms' revenue. However, the negative coefficient that we estimate is consistent with the home bias hypothesis because private gains of foreign firms is not part of national welfare, so that the welfare gain from imitating foreign firm's technology are increasing in its size. Second, we find that our results are not driven by differences in familiarity with the legal system between domestic and foreign firms. In one of the robustness test we control for firms' prior litigation experience and find that our main results remain qualitatively unchanged. Furthermore, the results are robust to the inclusion of a wide range of fixed effects such as industry, location and type of jurisdiction, subject of litigation, and time period.

Our study provides several contributions to the literature on IPR protection. While the evidence on the presence of home bias in national policies is abound, whereby governments vary the intensity of IPR protection in order to raise national welfare at expense of foreign agents, most of the previous literature assumes national treatment of foreign IPR owners. Our study is the first one to show that discrimination of foreign firms can take place not only at the policy level but also at the implementation level because foreign innovators are not able to protect their intellectual property as effectively as domestic ones. It implies that stringent IPR laws at the country level do not guarantee that interests of foreign innovators are well protected.

This paper is also the first study that analyses the role of the legal system in differential treatment

of foreign and domestic IPR owners. We show that even if the country's policies comply with the national treatment principle and do not discriminate firms based on their country of origin, the legal system can serve as a channel for violation of the national treatment if courts implement policies differently for domestic and foreign firms. Although courts are supposed to prevent any discrimination of foreign IPR holders, it may not be the cases if judged take into account the effect of their decisions on national well being. Given the evidence we find in the Canadian data, the home bias in the judicial system can be even a more serious issue in developing countries, where legal systems not completely independent from governments' influences and instirutions are weaker.

The paper proceeds as follows. Section 2 surveys the literature on discrimination of foreign nationals in general and in IPR in particular. Section 3 presents the theoretical model on the effect of discrimination of foreign IPR owners on national welfare. Section 4 outlines the empirical strategy, which is followed by the data description in Section 5. The baseline results are reported in Section 6. Section 7 presents several extensions, and Section 8 concludes.

2 Literature Review

It is commonly agreed that government's incentives to protect intellectual property rights vary across countries. In the theoretical literature, a number of studies show that countries actively involved into innovation activities are keener on protecting IPR than countries with low levels of innovation. Grossman and Chin (1990) and Grossman and Lai (2004) show that the interests of the developed and developing countries conflict in the matter of IPR protection due to the opposite outcomes resulting from implementing stricter IPR rules. The innovative countries benefit from extension of stronger IPR rules to developing ones because stronger IPR protection increases the rent transferred from the latter to the former and the ability of recouping investments in R&D by innovating firms. In contrast, tightening of the IPR rules in the developing countries increases the monopolistic power of foreign firms and restricts the opportunity of domestic firms for producing inexpensive imitations using foreign technologies (also see Helpman, 1993; Diwan and Rodrik, 1991; Hunt, 2006).[2]

Since policymakers tend to support domestic firms in competition with foreign ones, they are typically less interested in protecting IPR owned by foreign firms. It is thus not surprising that

[2] Deardorff (1992) adds to the above literature that the global welfare as a whole decreases if stricter IRP rules extend globally because increased market power of firms in developed countries could eventually exhaust the market share of resource-constrained firms from developing countries. Due to the downside of extensive IPR protection, Lanjouw (1998) and McCalman (2001) alert to the danger of the global spread of stronger IPR rules and advocate weaker IPR rules for developing countries.

incentives for adoption and enforcement of IPR protection rules vary between countries depending on relative innovation intensity of foreign and domestic firms.[3] Prior to the Uruguay Round of the WTO negotiations, the standards for IPR protection had varied a lot across the WTO members and this variation was closely related to the level of economic development. A vast majority of developing countries had weak IPR rules, and some of them did not even have any adequate mechanisms to protect intellectual property. Developed countries, on the other hand, were characterized by higher IPR standards designed to stimulate local innovation. However, with increased globalization, the growth in IPR violation in countries with weak IPR standards started to threaten revenue from overseas markets earned by innovative firms from developed countries. Thus, lack of adequate protection of the intellectual property of innovative firms in foreign markets puts the profitability of these firms and their incentive for R&D investments at risk. The implied welfare costs to the countries where innovative firms reside led a group of developed countries to form a campaign for a global standardization of IPR protection (Deere, 2008), which resulted in Trade Related Aspects of Intellectual Property Rights (TRIPS) agreement.

The TRIPS agreement, which came into force in 1996, is a system of rules that governs the practices on IPR protection among all WTO member countries. TRIPS outlines the minimum protection standards for the length and the width on each type of intellectual property (e.g. trademarks, patent, industrial designs, and etc.), and details the enforcement procedures. Each WTO member country is required to meet the minimum standards of the TRIPS within a specified deadline and most of the developing countries have undertaken substantial reforms to their legal systems in order to meet the standards of the TRIPS. In contrast, the majority of the developed WTO member countries already had IPR protection laws that met or exceeded the TRIPS standards before the agreement became effective (Deere, 2008). Overall, the TRIPS has only mitigated the variation in international IPR protection but hardly eliminated the incentives of countries to deviate from the TRIPS standards. Large variation in TRIPS implementation still persisted even ten years after the TRIPS had been in force. For example, developing countries often miss the deadline on domestic law reforms for TRIPS implementation or exploit the TRIPS flexibility which offers some degree of freedom in adjusting their policies to domestic needs (Maskus, 2000). Furthermore, developed and developing countries often interpret the TRIPS provisions differently (Musungu and Oh, 2006).

[3] Geng and Saggi (2013) point out that even countries at the same level of economic development may be better off from weaker global IRP protection in the presence of trade frictions. In this case domestic become more important than foreign markets and firms gain more from discriminatory treatment of foreign firms at home.

The above studies highlight the incentives of policymakers to adopt different levels of IPR protection depending on the relative stock of domestic and foreign-owned intellectual property. Developed countries stick to stricter IPR protection standards in order to prevent leakage of productive knowledge to other countries, while developing countries tend to encourage domestic firms to imitate foreign intellectual property by adopting weaker standards. Thus far, the majority of empirical studies on IPR in international context have focused on this relationship between the level of IPR protection standard and its associated impact on national welfare (Maskus, 1995; Yang & Kuo, 2008). However, as the TRIPS agreement has narrowed the room for differences in IPR protection standards between countries, policymakers may have switched to alternative means of favouring domestic firms in order to either increase the transfer of foreign technologies or decrease the outflow of technologies to other countries. For example, there can be varying degrees of rigor in which policymakers enforce IPR protection rules, depending on the nationality of the IPR owner.

Discrimination of foreign firms in various aspects of governments' policies is well documented in the literature. McAfee and McMillan (1989) discuss how the 1933 Buy American Act has impacted the international trade pattern in the US and raised national welfare by favouring local businesses with government procurement contracts. Branco (1994) shows that a government's home bias against foreign firms, whereby foreign firms are required to cut prices of domestic firms by a certain margin, is necessary in order to induce lower market price and to boost consumer surplus.[4] In trade policy literature a large number of papers demonstrate how trade policies are used to discriminate against foreign firms and to shift consumer's expenditure away from foreign to domestic products. These studies show how the bias against foreign firms can arise in various policies set by welfare-maximizing policymakers.

In the IPR context, several papers have demonstrated the presence of home bias. For example, several studies have shown that commercial and civil laws in some countries are designed to discriminate foreign patentees in favour of domestic ones. Lerner (2002) shows that in a large number of countries discriminations of foreign patentees takes the form of higher registration costs, shorter granted durations, more limitations on extensions, and premature patent expirations. Liegsalz and Wagner (2012) argue that discrimination against foreign patentees can exist even after the implementation of the TRIPS by empirically showing that the Chinese State Intellectual Property Office favours domestic

[4] Countries such as the US, Canada, Australia, and New Zealand have explicit laws that give domestic firms price advantages in auctions for government procurement contracts, e.g. the Buy American Act; while European and Japanese governments have rather implicit rules and requirements that reduces the chance for foreign firms to win government procurement contracts (McAfee and McMillan, 1988).

patentees by granting patents to foreign firms for a significantly shorter period of time.

3 Theoretical analysis

In this section we develop a simple model to study factors which determine the effect of foreign IPR protection on welfare. Predictions of this model will be used to test whether the bias that foreign firms may face at courts can be explain by national welfare maximization concerns. Let us consider an oligopolistically competitive market with firms producing a homogeneous good traded at price p. On the demand side, preferences of a representative consumer are characterized by a quadratic utility function:

$$U = \alpha Q - \beta Q^2, \tag{1}$$

where $Q = \sum_i q_i$ is the total consumption of the homogeneous good and q_i is the quantity purchased from firm i. Maximizing utility function subject to the standard budget constraint we obtain inverse demand function

$$p = \alpha - \beta Q. \tag{2}$$

Suppose there are $N + 2$ firms in the market. Firm 1 (F1) is a home country firm which may attempt to imitate the production technology of a foreign firm. Firm 2 (F2) is the foreign firm exporting to the home country market and utilizing a potentially more advanced production technology. The remaining N firms are symmetric in terms of costs and represent the rest of the industry. We assume they are all domestic firms. Denote a representative firm from the rest of the industry by F3. We further assume that each firm i has a constant marginal costs c_i. Profit function of firm i is then given by

$$\pi_i = (p - c_i)q_i. \tag{3}$$

Using first-order conditions for profit maximization and the market demand function we obtain the industry total output, price, consumer surplus (CS), and welfare (W):

$$\begin{aligned} Q &= \frac{\alpha(N+2) - c_1 - c_2 - Nc_3}{\beta(N+3)} \quad (4) \\ p &= \frac{\alpha + c_1 + c_2 + Nc_3}{(N+3)} \\ CS &= \frac{\beta}{2} Q \\ W &= CS + \pi_1 + N\pi_3 \quad (5) \end{aligned}$$

Suppose foreign firm possesses a more advanced production technology which lowers marginal costs by $\epsilon > 0$.[5] Let W_0 be the value of welfare function when domestic legal system protects IPR of the foreign firm and does not allow F1 to imitate its technology. In this case, the marginal costs of the three firms are $(c_1, c_2 - \epsilon, c_3)$. Also, let W_1 be the value of welfare function when the legal system favours domestic firm and allows it to imitate technology of F2, so that the marginal costs of the three firms become $(c_1 - \epsilon, c_2 - \epsilon, c_3)$. Then $\Delta W = (W_1 - W_0)$ reflects the welfare gain from not protecting the IPR of the foreign firm, and in our model ΔW is always positive. This result is very intuitive. Since π_1 enters national welfare function while π_2 does not, an increase in relative productivity of F1 will increase its market share at expense of other firms, including F2, and decrease the market price, thus rising both consumer surplus and aggregate profit of domestic producers. Therefore, in the partial equilibrium framework, when the effect of IPR protection on incentives to innovate is not taken into account, allowing domestic firms to imitate advanced foreign technologies is always in a country's best interest.

In what follows we perform some comparative-static exercises to derive the implications of the relative size of domestic and foreign firms for the gain from not protecting foreign firm's IPR. Since firm's relative size is determined by relative marginal costs, we first differentiate ΔW with respect to c_2:

$$\frac{\partial \Delta W}{\partial c_2} = -\frac{(2N+3)\,\epsilon}{\beta\,(N+3)^2} < 0. \quad (6)$$

Equation (6) implies that for small c_2 (when foreign firm is large and efficient) allowing F1 to imitate technology of F2 will have a stronger positive impact on home country welfare. This effect stems from reallocation of market shares from foreign to domestic firm, which is increasing in the size of the foreign

[5] The case when domestic firm possesses a superior technology and F2 tries to imitate is symmetric and all predictions of the model continue to hold.

firm. Similarly, the relationship between ΔW and the size of F1 is

$$\frac{\partial \Delta W}{\partial c_1} = -\frac{2\left(N+2\right)}{\beta\left(N+3\right)}\epsilon + \frac{3}{\beta\left(N+3\right)^2}\epsilon < 0. \tag{7}$$

Therefore, when domestic firm is originally larger and more efficient (c_1 is small), the positive effect of allowing it to imitate foreign technology on welfare is stronger. This result is due to reallocation of market shares from F2 to F1, which is increasing in relative productivity of F1, and the effect on prices which is stronger when domestic imitator is larger.

The above results lead us to the following proposition, whose empirical validity we test in this paper:

Proposition 1 *If discrimination of foreign IPR owners by the judicial system is driven by national welfare considerations, then in IPR litigations between foreign and domestic firms the following must hold:*

(a) Domestic firms have higher likelihood of success

(b) The probability of winning against a domestic firm must decrease in the size of a foreign firm

(c) The probability of winning against a foreign firm must increase in the size of a domestic firm

Proposition 1 allows as to test the hypothesis that welfare considerations are present in the legal system and can thus explain the bias against foreign IPR holders. Part (a) relates to the fact that ΔW is always positive and the welfare-motivated courts would always tend to protect domestic IPR more stringently than foreign. Parts (b) and (c) relate to equations (6) and (7), state that the bias of a welfare-motivated court against foreign IPR owners is increasing in the size of domestic and foreign firms.

4 Econometric Specifications

In this section we discuss the empirical strategy that we use to identify home bias in IPR enforcement in the legal system. The simplest structure to study the relationship between the country of origin of a firm and the likelihood of winning a court case is the following probit model:

$$\Pr(Y_{ij} = 1) = \Phi(\beta_1 Nat_{ij}) \tag{8}$$

where Y_{ij} is an indicator variable for success in the court which is equal to one if firm j succeeded in winning the case i, and Nat_{ij} is an indicator variable which takes the value of one when firm j involved in case i is foreign. The coefficient β_1 in equation (8) measures the relationship between nationality and the likelihood of winning the case. If foreign and domestic firms are treated on the equal footing in Canadian courts, β_1 would be statistically indistinguishable from zero. Negative β_1 would support the hypothesis, formulated in Proposition 1a, that foreign firms are in general more likely to lose in IPR litigations with domestic firms. Yet, $\beta_1 < 0$ could also signal the presence of some other factors, not necessarily related to bias, which could disadvantage foreign firms in litigation processes, such as information asymmetry.

In order to test parts (b) and (c) of Proposition 1, we include the size of domestic and foreign firms in equation (8):

$$Pr(Y_{ij} = 1) = \Phi(\beta_1 Nat_{ij} + \beta_2 Rs_{ij} + \beta_3 Nat_{ij} \times Rs_{ij}). \tag{9}$$

where Rs_{ij} is the log of revenue of firm j. If Canadian courts are more likely to favour domestic firms when the implied welfare gains are larger, as predicted by the model, we would expect the likelihood of winning the case to increase in revenue for domestic firms ($\beta_2 > 0$) and to decrease in revenue for foreign firms ($\beta_3 < 0$).

Previous literature has demonstrated that the outcome of the court's hearing can be affected by the relative size of litigating firms for reasons unrelated to national welfare. Lanjouw and Schankerman (2004) argue that legal costs imply greater financial burden for smaller firms relative to larger ones, thus lowering the probability of successful outcome. In addition, larger firms can afford lawyers with better legal expertise and experience which may influence court's decisions (Szmer et al., 2007; McGuire, 1995 and 1998; Haire et al., 1999). Therefore, positive β_2 estimate may reflect both the bias in the legal system and the the negative impact on firms which lack financial resources. However, the same two channels have opposite effect on β_3 and its estimate can thus be used to gauge the relative importance of these two factors.

To account for factors which may affect court's decisions, we add a number of fixed effects as controls to equation (9). Specifically, we include fixed effects for the type of the jurisdiction interacted

with location,[6] the subject of litigation,[7] and 6-digit NAICS industry in which firm j operates.[8] The jurisdiction fixed effect, Jur, picks up the variations in IP expertise across Canadian jurisdictions. The subject fixed effect, $Subj$, controls for the difference in success rates of domestic and foreign firms across subjects in IP litigations. Including industry fixed effects, $Indust$, is also important since the same 2012 Patent Litigation Study shows that the success rate in IPR litigations varies a lot across industries. For example, patent holders in medical devices and electronics have the highest success rate while those in service business have the lowest success rate in litigation among industries. We also include time fixed effects to control for changes in policies on intellectual property protection, the variation in court's willingness to enforce IPR over time (North, 1990), and other external factors. This rich array of fixed effects allows us to control for many unobservables and resolve omitted variable bias stemming from any possible variation in courts' decisions over jurisdictions, industries, and time.

Finally, we also include a plaintiff indicator variable ($Plaintiff_{ij}$) as a control which is equal to one if firm j involved in case i is a plaintiff and zero if it is a defendant. It controls for the selection effect in litigation arising from asymmetric information between the parties. Litigation is supposed to be a costly process for firms. A plaintiff has a choice to litigate or not to litigate while defendant must respond. A plaintiff will not litigate unless the expected success rate is high enough for positive economic return. Under this assumption, plaintiffs are presumably better informed than defendants prior to litigation. Thus, with all control variables equation (9) becomes:

$$\begin{aligned} Pr(Y_{ij} &= 1) = \Phi(\beta_1 Nat_{ij} + \beta_2 Rs_{ij} + \beta_3 Nat_{ij} \times Rs_{ij} + \beta_4 Plaintiff_{ij} \\ &\quad + Jur + Subj + Indust + Year). \end{aligned} \tag{10}$$

5 Data

Estimation of equation (10) requires information on the outcomes of a large number of IPR litigations and on firms involved in those litigations. We construct the database of all IPR-related cases which

[6] The types of the jurisdictions are municipal court, provincial court, federal court, court of appeal, supreme court, superior court, Canadian International Trade Tribunal, Trade-marks Opposition Board. Provincial courts and courts of appeal are interacted with provincial dummy variables. More than 80% of all cases come from federal court and Trade-marks Opposition Board.

[7] This includes copyright infringement, intellectual property violation, patent application opposition, patent infringement, trademark infringement, trademark opposition.

[8] The 2012 Patent litigation study by PricewaterhouseCoopers shows that the success rates and the median damage awards varies widely by the above factors. This study is available on-line at http://www.pwc.com/en_US/us/forensic-services/publications/assets/2012-patent-litigation-study.pdf.

took place in Canada in four consecutive years between 2007 and 2010. The data is retrieved from the Canadian Legal Information Institute (CanLII), which records all litigations across all Canadian jurisdictions.[9] For this study we select only those cases which relate to IPR and involve disputes on patents, copyrights, trade marks, and industrial designs.[10] The final data include 2502 firms involved in 1079 cases, where each case may comprise multiple claims. For every case and firm, we record information on the name of the firm, jurisdiction and location of the court, and the litigation subject. We also record information on the court's decision for every claim of a case and keep track of all cases in which the Canadian government is involved.

The data on IPR cases we complement with the information on firms that are involved in litigations using three different sources: firms' annual reports, the Canadian Company Capabilities (CCC) database, and Manta. The data for publicly traded companies come from their annual reports, and include: the firm's country of ownership, annual revenue, number of employees, and industrial affiliation which we record at 6-digit NAICS industry classification. For firms that are not publicly traded our primary source of information is the CCC database maintained by the Industry Canada. It provides information the same information as above, although the data on revenue is not as detailed.[11] Our secondary source of information for non-publicly traded firms is Manta, which is an on-line business service directory and collects data directly from the companies. The objective of this on-line business listing service is to build a network of companies and connect possible partners, vendors and suppliers. Manta provides the same information as the CCC database and covers a large number of smaller firms which are often missing in the CCC database.[12] Using these three sources of information, we were able to obtain data for 74% of firms in our sample.

To construct the nationality indicator variable, we employ two methods. Our first measure, Nat_{ij}, is based on the CCC's classification of firms into domestic and foreign, which defines nationality based on the location of a firm. Therefore, a subsidiary of a foreign firm located in Canada is recorded as a Canadian company according to CCC. As the second measure, Nat_HQ_{ij}, we define nationality of a firm based on the country of residence of its headquarter, which information we obtained either from the firm's annual report or from the company's websites.[13] For example, AstraZeneca Canada Inc., a

[9] Appeals are recorded as different cases in the CanLII databases and we treated them accordingly.

[10] We exclude all cases which involve individuals.

[11] The CCC database records firms' revenues in ten size brackets. When CCC information on firm's revenue is used in our data, we take the average of the lower and upper value of the bracket. For example the revenue of National Forming Systems Inc. is reported in CCC as "between $10 and $25 million", we record 17.5 million for its annual revenue.

[12] The information provided by Manta is self-reported and is thus not as accurate as annual reports or Industry Canada's administrative records. However, for firms which are present in both Manta and CCC we did not find considerable discrepancies in reported revenue and employment.

[13] It should be noted that not in all cases it is possible to identify the presence of a headquarter abroad. Out of 1458

subsidiary entity of a multinational pharmaceutical company AstraZeneca plc. with a headquarter in the United Kingdom, is classified as a Canadian firm in the CCC database because it has manufacturing facilities in Canada. Alternatively, AstraZeneca Canada Inc. will be classified as a foreign firm in the second measure because its global headquarter is located outside of Canada. If the bias against foreign firms in present in the Canadian legal system, these two measures will allow us to say whether it is driven by the foreign ownership or by the location of a firm. Figure 1 compares the kernel density for the log of employment and revenue between domestic and foreign firms based on Nat_HQ definition. The figure shows that foreign firms are considerably larger, employing four times more workers and earning seven times greater revenue than an average domestic firm.

Construction of the dependent variable, which is an indicator for success in a case, is straightforward for cases which include a single claim. For multi-claim cases, which are relatively scarce in our data,[14] the task is more challenging since only some of the claims may be granted to a plaintiff. Ideally, for such cases we would like to have information on the relative importance of different claims for the case, which would allow us to evaluate whether the main objective of the claim was achieved by the plaintiff. Unfortunately, this information is unavailable to us and we rely on several approaches to classify cases in order to make sure that our results are not driven by the way the dependent variable is constructed. First, we consider a plaintiff firm to win and the defendant to lose the case if at least one of the claims is successful. Second, a plaintiff firm is considered to win and the defendant to lose the case if at least half of the claims in a case are successful. The summary statistics for the two success indicators, Y_{ij}^1 and Y_{ij}^2, is presented in Table 1. The two definitions produce very similar measures of Y_{ij} with the means around 0.5 the correlation coefficient of 0.99. This similarity suggests that our results will not vary much with the definition of Y_{ij}. Yet, in the robustness section we use several alternative ways of constructing the dependent variable and demonstrate that our main findings are not sensitive to the definition of success in a case.

6 Baseline results

Table 2 reports the probit regression of the baseline econometric specifications (8)-(10). Columns (1)-(4) show regression results when the case is assumed to be successful for the plaintiff if at least one claim

firms in our sample which are registered in Canada, we managed to identified 117 with a headquarter in another country.

[14] We have 165 firms involved in multiple claims, of which 124 involved in 2 claims, 36 involves in 3 claims, only 5 involved more than 3 claims. Most of these multi claims cases are multiple IPR violations, or one violation with improper use in multi areas.

is granted. The results for specification (8) show negative and statistically significant coefficients on the foreign firm dummy variable for both measures of nationality, based on the presence of productivon facilities in Canada (Nat, column 1), and on the headquarter location (nat_HQ, column 2). This result implies that foreign firms have lower probability of winning an IPR-related case in Canadian courts. The average foreign firm in our sample is by 12 percentage point less likely to succeed in IPR litigation in Canada relative to the average Canadian firm. In other words, two firms have equal chance for success if they are both domestic. On the other hand, in litigations involving domestic and foreign firms the odds are 0.56 and 0.44 in favour of the domestic firm.

The finding that foreign firms are less likely to successfully protect their IPR in Canada than local firms provides first support for the hypothesis of the legal system's bias against foreign firms. While this result may have other interpretations, columns (3) and (4) provide further evidence to the bias hypothesis. Regression results reveal a significant and positive link between revenue of domestic firms and their likelihood of winning against foreign IPR owners. This is consistent with the prediction of our theoretical model, summarized in Proposition 1(b), that welfare gains from imitating foreign IPR are greater when the domestic imitator is larger. Yet, this result can also be explained by correlation between firm's revenue and some unobserved firm-level characteristics. Most importantly, larger firms may have more to gain from a case and thus be more inclined to put more effort and resources in litigation.[15] However, negative and significant coefficient on foreign firms' revenue is at odds with this explanation. Indeed, if positive coefficient on domestic revenue were due to the stronger effort by larger firms, driven by positive correlation between size and private gains from IPR protection, then the coefficient on foreign firms' revenue would also be positive, since larger foreign firms are losing more from imitation of their technologies. At the same time, negative coefficient on the size of foreign firm is consistent with the bias hypothesis because private gains of foreign firms is not part of national welfare, while the negative effect of imitation of foreign IPS by domestic firms on prices is increasing with size of foreign firms.[16]

Turning to the quantitative assessment of the effect of revenue on courts' outcomes, evaluated at sample means, the coefficients $\beta_2 = 0.034$ and $\beta_3 = -0.028$ in column (4) suggest that a 10 percent increase in revenue is associated with 0.14 percentage points increase in the probability of success in

[15] For example, Lanjouw and Schankerman (2004) and Szmer, Johnson, and Sarver (2007) show that larger firms have more advantage than smaller firms in litigation.

[16] By the same argument, we can rule out the possible correlation between revenue and the amount of available resources as the alternative interpretation for $\beta_2 > 0$ because the effect of resources on the likelihood of winning should be the same for domestic and foreign firms.

litigation for domestic firms but only with 0.03 percentage points increase for foreign firms.[17] It is important to note that foreign firms' disadvantage in Canadian courts operates entirely through the revenue term as the coefficient on the foreign status dummy variable becomes insignificant in column (4). Nevertheless, the estimates in column (4) imply that a foreign firm with the average revenue is 9.24 percentage points less likely to win against a domestic firm, which is comparable to 12.5 percentage points disadvantage identified in column (2).

In columns (5)-(8) of Table 2 we report estimates of specification with Y_{ij}^2 as the dependent variable. The results are very similar to those in columns (1)-(4), indicating that classification of multi-claim cases into successful or not does not play a major role in our analysis. Because of the high degree of similarity, in the analysis that follows we only report the results with Y_{ij}^2 as the dependent variable. Columns (9)-(11) present results for the benchmark specification with a full set of time, location of jurisdiction, industry, and subject of litigation fixed effects. The results do not suggest that industrial affiliation, jurisdiction and location of a court, or subject of litigation affect foreign firms' disadvantage in Canadian courts. That said, these additional fixed effects do help explain the variation in success rates among firms, since many of the binary variables are statistically significant and including them into the model increases pseudo R-sqared from 0.017 to 0.03. Adding a plaintiff indicator variable in column (11) reveals that plaintiffs are less likely to win a case, with the average success rate being 6.5 percentage points below of that for defendants. At the same time, the main coefficients of our interest are unaffected by inclusion of this variable in the regression.

7 Extensions

7.1 Prior litigation experience

Previous studies argue that process expertise, which is accumulated through past litigation experience, could play important role in courts' outcomes because knowledge of institutional rules and practices may place a litigant in a better position (McGuire, 1995 and 1998; France, 1998; Mauro, 2000; Szmer et al., 2007). If domestic firms, being more exposed to the local judicial system, have on average more experience with the Canadian courts than foreign firms, difference in experience levels could explain our previous results that foreign firms have lower likelihood of success in litigations. Indeed, in our data, over 60% of the foreign firms have no prior litigation experience in Canada comparing to only

[17] One standard deviation increase in log revenue is linked to 13.3 percentage points increase in success probability for domestic firms and 16.1 percentage points decrease for foreign firms.

45% for the domestic firms. To control for firms' prior litigation experience, we expand equation (10):

$$\begin{aligned} Pr(Y_{ij} &= 1) = \Phi(\beta_1 Nat_{ij} + \beta_2 Rs_{ij} + \beta_3 Nat_{ij} \times Rs_{ij} + \beta_4 Plaintiff_{ij} \\ &\quad \beta_5 Exp_{ij} + Jur + Subj + Indust + Year). \end{aligned} \tag{11}$$

where Exp_{ij} is a legal experience indicator for firm j. To construct this indicator, we searched CanLII database for the number of cases in which firm j had been involved in ten years prior to case i. Summary statistics for prior experience is provided in Table 1. An average firm in our sample had been involved in 24 cases with the median being equal to one. We classify firms into experienced and not using different thresholds on the number of prior cases in order to investigate the robustness of our results to the definition of Exp_{ij}. In columns (1)-(5) of Table 3 we use the thresholds of 1, 5, 10, and 30 on the number of previous cases, and for each definition we report the number of firms classified as experienced at the bottom of the table.

The results show that when firms' prior experience is controlled for, the coefficients on the key variables, such as domestic and foreign revenue, remain close to the benchmark values. However, the coefficients on prior experience variables are statistically insignificant for all definitions of Exp_{ij}, although they are always positive. Contrary to previous studies, we failed to find a specification where the previous court experience would have a statistically significant effect on the dependent variable. In column (6) we differentiate firms in terms of the intensity of prior legal experience. In particular, we use four quartiles of the prior experience distribution to categorize all firms into four groups, using the firms without prior experience as a control group. More experienced firms are found to have higher likelihood of success in a court but this pattern is also not statistically significant.

In columns (3)-(6) we also use the log of a firm's age as a proxy for its outside-of-court experience. The intuition for using this variable is that it captures the effect of a firm's relative experience in business operation and knowledge in the industry. Again, this measure of experience is positive but not statistically significant, and adding it to the benchmark specification does not affect our main results. Overall, we failed to find any evidence for the hypothesis that prior legal experience has positive impact on success in a courtroom, and that reject the hypothesis that the difference in success rates between domestic and foreign firms is driven by difference in legal experience.

7.2 The role of political connections

In Section 3 we hypothesized that the legal system may factor in welfare considerations, as a government would do, in IPR disputes between domestic and foreign firms. The objective of this section is to test whether the government plays any role in the mechanism that leads to disadvantage of foreign firms in Canadian courts. If both the courts and the government share welfare-maximization concerns, can firms rely on the latter to increase their chances in a courtroom? If they can, then we would expect politically connected firms to be more likely to succeed in litigations, and since domestic firms have stronger ties to the government it could explain the findings of the previous section.[18]

To construct a measure of a firm's political influence we use information on lobbying activity obtained from the Office of the Commissioner of Lobbying of Canada. Lobbying expenditure has long been used in the political economy literature to assess the degree of industrial political activity. However, since the data on lobbying expenditure by firms is unavailable in Canada, we approximate it by the number of officially registered lobbyists representing each firm. In Canada every person seeking for a conversation with a public office holder regarding any modifications to current legislation or policies is required to register with the Lobbyist Registrar and fill out a registration form. The form includes information on the beneficiaries of the lobbying activity (firms) and on the subjects of communication with the office holders, selected from the list of 46 descriptors. We use the subject of communication to categorize all lobbyists into three groups according to their relevance to IPR. We define a lobbyist as "highly relevant" for IPR when the subject of communication is related to "intellectual property", "law and justice enforcement", or "research and development"; lobbyists with subjects related to "industry", "international relations", and "science and technology", are classified as "relevant"; the remaining lobbyists are treated as "irrelevant". If political connections matter for IPR litigations, we would expect lobbyists proposing changes to the existing IPR regulations to have stronger impact on the outcomes of litigations.

We measure the degree of political connectivity with a binary variable which takes the value of one if a firm is connected and zero otherwise. Since firms differ in the number and the degree of relevance of lobbyists which represent them, we classify a firm as connected using different thresholds on the number of lobbyists. In column (1) of Table 4 a firm is considered to be politically connected if it is represented by at least one lobbyist of any relevance. With this definition, 15% of all firms are classified

[18] While we do not expect politicians in Canada to be able to put direct pressure on judiciary, indirect influence may be possible. For example, judges can be responsive to media's reporting of legal proceedings which may also represent the government's political agenda. Alternatively, if politically connected firms are also more likely to win in a court, it may simply reflect similarity in values of political and judicial powers rather than a formal relationship between the two.

as connected, however, the coefficient on the indicator variable is negative and insignificant. This results is preserved for alternative definitions on political connectivity in columns (2)-(5). Only when firms with at least ten highly relevant lobbyists are classified as connected in column (6) the coefficient on political connectivity variable becomes positive and significant. However, with this definition only 11 firms are defined as connected, and the coefficient of interest may not be well identified.

Results in Table 4 provide no evidence that the intensity of communication between litigating firms and policymakers is associated with higher likelihood of winning a case. Therefore, we find no support for the hypothesis that firms can use the legislative branch to influence decision in a courtroom.

8 Conclusions

The objective of this study is to investigate whether foreign firms have any disadvantage in protecting their IPR relative to domestic firms and the role of the legal system in enforcing national treatment in IPR disputes. Using Canadian litigation data on all IPR-related cases between 2007 and 2010, we find several notable results. First, domestic firms are more likely to win in IPR litigations than foreign firms. The difference in litigation success rate between domestic and foreign nationals is statistically significant and economically large: domestic firm has about 7 percentage points higher probability of winning against a foreign firm than against another Canadian firm. Second, we find that disadvantage of foreign firms in protecting their IPR is systematically related to the Canadian welfare gains, associated with success of domestic firms in litigations with foreign nationals. This result is consistent with the hypothesis that the legal system is concerned about national welfare and that judges, to some extent, discriminate foreign firms in order to increase national well being. However, our results admit other explanations too. For example, it is possible that foreign firms have disadvantage in protecting their IPR due to lack of familiarity with the local legal system or by a lower quality representation in a courtroom.

Yet, even with these alternative explanations, our results have several important implications. First, they reveal a potential flaw in the IPR protection mechanism which has been largely overlooked in previous literature. In most cases, laws and regulations regarding IPR protection receive the most attention in international negotiations. However, results of our study suggest that even stringent regulations may not provide strong enough protection to foreign IPR holders due to weak, and potentially discretionary, law enforcement by the legal system. Second, international treaties on IPR protection, such as TRIPS, do not guarantee national treatment as foreign firms are unable to protect their IPR as

effectively as domestic firms. This, in turn, will affect industrial development through firms' decision on exporting, FDI, and technology transfer to overseas subsidiaries.

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9 Appendix

Partial equilibrium model with one industry producing homogeneous product traded at price p.

Assume that preferences of a representative consumer are characterized by a quadratic utility function:

$$U = \alpha Q - \beta Q^2$$

where $Q = \sum_i q_i$ is the total consumption of the homogeneous good and q_i is quantity purchased from firm i. Maximizing utility function subject to the standard budget constraint we obtain inverse demand function

$$p = \alpha - \beta Q$$

Suppose there are $(N + 2)$ firms in the market. Firm 1 (F1) is a home country firm which will attempt to imitate production technology of a foreign firm, firm 2 (F2) is the foreign firm exporting to the home country market utilizing a potentially more advanced production technology, and the remaining N firms are symmetric in terms of costs and represent the rest of the industry. We assume they are all domestic firms although this assumption is not critical. A representative firm from the rest of the industry we call firm 3 (F3). We further assume that each firm i has a constant marginal costs c_i. Profit function of firm i is then given by

$$\pi_i = (p - c_i)\, q_i$$

If all equilibrium quantities are positive, then the first-order conditions for profit maximization give the following best response functions

$$\begin{aligned} q_1 &= \tfrac{\alpha - c_1}{2\beta} - \tfrac{q_2 + N q_3}{2} \\ q_2 &= \tfrac{\alpha - c_2}{2\beta} - \tfrac{q_1 + N q_3}{2} \\ q_3 &= \tfrac{\alpha - c_3}{(N+1)\beta} - \tfrac{q_1 + q_2}{(N+1)\beta} \end{aligned}$$

Solving this system of equations we obtain equilibrium output of each firm:

$$\begin{aligned} q_1 &= \tfrac{\alpha - (N+2)c_1 + c_2 + N c_3}{\beta(N+3)} \\ q_2 &= \tfrac{\alpha + c_1 - (N+2)c_2 + N c_3}{\beta(N+3)} \\ q_3 &= \tfrac{\alpha + c_1 + c_2 - 3c_3}{\beta(N+3)} \end{aligned}$$

Total output, price and consumer surplus:

$$Q = \frac{\alpha(N+2)-c_1-c_2-Nc_3}{\beta(N+3)}$$
$$p = \frac{\alpha+c_1+c_2+Nc_3}{\beta(N+3)}$$
$$CS = \frac{\beta}{2}Q$$

Suppose foreign firm possesses a more advanced production technology characterized by lower marginal costs. We want to compare two cases: when domestic legal system protects IPR of the foreign firm and does not allow F1 to imitate its technology; when the legal system favours domestic firm and allows it to imitate technology of F2. We want to analyze the relationship between size of F1 and F2 and the change in welfare from technology transfer. Since in our model a firm's relative size depends on relative marginal costs, we want to know how welfare change varies with c_1 and c_2.

Some partial derivatives:

$$\begin{aligned}
\frac{\partial Q}{\partial c_1} &= \frac{\partial Q}{\partial c_2} = -\frac{1}{\beta(N+3)} \\
\frac{\partial p}{\partial c_1} &= \frac{\partial p}{\partial c_2} = \frac{1}{(N+3)} \\
\frac{\partial CS}{\partial c_1} &= \frac{\partial CS}{\partial c_2} = -\frac{Q}{(N+3)} \\
\frac{\partial q_1}{\partial c_1} &= \frac{\partial q_2}{\partial c_2} = -\frac{N+2}{\beta(N+3)} \\
\frac{\partial q_1}{\partial c_2} &= \frac{\partial q_2}{\partial c_1} = \frac{\partial q_3}{\partial c_2} = \frac{\partial q_3}{\partial c_1} = \frac{1}{\beta(N+3)} \\
\frac{\partial \pi_1}{\partial c_1} &= \frac{q_1}{(N+3)} - q_1 - (p-c_1)\frac{(N+2)}{\beta(N+3)} \\
\frac{\partial \pi_1}{\partial c_2} &= \frac{q_1}{(N+3)} + (p-c_1)\frac{1}{\beta(N+3)} \\
\frac{\partial \pi_3}{\partial c_1} &= \frac{\partial \pi_3}{\partial c_2} = \frac{q_3}{(N+3)} - (p-c_3)\frac{1}{\beta(N+3)}
\end{aligned}$$

Welfare:

$$W = CS + \pi_1 + N\pi_3$$

$$\begin{aligned}
\frac{\partial W}{\partial c_2} &= -\frac{Q}{(N+3)} + \frac{q_1}{(N+3)} + (p-c_1)\frac{1}{\beta(N+3)} + \frac{q_3}{(N+3)} - (p-c_3)\frac{1}{\beta(N+3)} \\
&= -\frac{q_2}{(N+3)} + \frac{N+1}{\beta(N+3)}p - \frac{1}{\beta(N+3)}c_1 - \frac{1}{\beta(N+3)}c_3
\end{aligned}$$

Consider the case when F2 has access to production technology which reduces marginal costs by $\varepsilon > 0$. Denote by Δx the change in variable x when we move from the equilibrium in which F1 is not allowed to imitate this technology to the one where it is allowed. Then

$$\frac{\partial \Delta W}{\partial c_2} = -\frac{\Delta q_2}{(N+3)} + \frac{N+1}{\beta (N+3)} \Delta p - \frac{1}{\beta (N+3)} \Delta c_1$$

shows the extent to which the size of the foreign firm affects the benefit of not protecting its IPR. Using the following conditions:

$$\begin{aligned} \Delta q_2 &= -\frac{\varepsilon}{\beta (N+3)} \\ \Delta q_1 &= \frac{(N+2)\varepsilon}{\beta (N+3)} \\ \Delta p &= -\frac{\varepsilon}{(N+3)} \\ \Delta c_1 &= -\varepsilon \end{aligned}$$

we obtain the result:

$$\frac{\partial \Delta W}{\partial c_2} = -\frac{(2N+3)\varepsilon}{\beta (N+3)^2} < 0$$

This result implies that for small c_2 (when foreign firm is large and efficient) allowing F1 to imitate IPR of F2 will have a stronger positive impact on home country welfare.

Similarly,

$$\begin{aligned} \frac{\partial \Delta W}{\partial c_1} &= -\Delta q_1 - \frac{\Delta q_2}{(N+3)} - \frac{2}{\beta (N+3)} \Delta p + \frac{(N+2)}{\beta (N+3)} \Delta c_1 \\ &= -\frac{2(N+2)}{\beta (N+3)} \varepsilon + \frac{3}{\beta (N+3)^2} \varepsilon < 0 \end{aligned}$$

Therefore, when domestic firm is originally larger and more efficient (c_1 is small), the positive effect of allowing it to imitate foreign IPR is stronger.

As a result, if a court has welfare-maximizing objectives, it would tend to favour domestic firms in their litigations against foreign when both domestic and foreign firm tend to be larger.

TABLE 1 - SUMMARY STATISTICS

Variable	Mean	Standard deviation	Min	Max	Observations
Decision (Y)	0.508	0.500	0	1	2502
Decision (Y*)	0.524	0.500	0	1	2502
Nat	0.377	0.485	0	1	2340
Nat_HQ	0.428	0.495	0	1	2335
L_emp	5.053	3.100	0	13.21	1985
L_revenue	17.881	4.017	9.99	26.637	1855
Plaintiff	0.482	0.500	0	1	2502
Dom_gov	0.031	0.173	0	1	2335
Foreign_gov	0.039	0.194	0	1	2335
Experience	24.190	87.906	0	705	2337
Lobbyists	0.452	1.882	0	40	2502

Source: CanLII, Industry Canada, Office of the Commissioner of Lobbying of Canada, Manta, and firms' annual reports. Decision(Y) is the court decision which equals 1 if any of claim succeed. Decision(Y*) equals 1 if at least half of the claims succeed. Nat is a foreign indicator if no research or manufacturing facilities, and subsidiary entities present in Canada. Nat_HQ is a foreign indicator if headquarter is outside of Canada. Plaintif equals 1 indicating for firms being as plaintif in litigation. Dom_gov indicates for cases that government is on the side of domestic firms while foreign_gov indicates for government on the side of foreign firms in the litigation. High_lobb, Low_lobb, and Irre_lobb indicate the number of lobbyists hired for high relevent, low relevent, and irrelevent lobbying activities respectively. Lob_H equals 1 if at least 1 high relevent lobbyists hired.

Table 2 - The probit regression estimation of court outcomes on firms' country of origin

	Y				Y*						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Nat	-0.296***				-0.271***						
	(0.054)				(0.054)						
	[-0.118]				[-0.108]						
Nat_HQ		-0.314***	-0.430***	0.082		-0.295***	-0.416***	0.120	-0.440***	0.200	0.196
		(0.053)	(0.066)	(0.296)		(0.053)	(0.065)	(0.295)	(0.069)	(0.310)	(0.311)
		[-0.125]	[-0.172]	[0.033]		[-0.118]	[-0.166]	[0.048]	[-0.176]	[0.080]	[0.078]
Log(Rs)			0.019**	0.034***			0.019***	0.036***	0.025**	0.045***	0.047***
			(0.008)	(0.012)			(0.008)	(0.012)	(0.010)	(0.014)	(0.014)
			[0.008]	[0.014]			[0.008]	[0.014]	[0.010]	[0.018]	[0 .018]
Log(Rs) x Nat_HQ				-0.028*				-0.030*		-0.035**	-0.035**
				(0.016)				(0.016)		(0.017)	(0.017)
				[-0.011]				[-0.012]		[-0.014]	[-0.014]
Plaintiff											-0.162***
											(0.062)
											[-0.065]
Jurisdiction FE	No	No	No	No	No	No	No	No	Yes	Yes	Yes
Subject FE	No	No	No	No	No	No	No	No	Yes	Yes	Yes
Industry FE	No	No	No	No	No	No	No	No	Yes	Yes	Yes
Year FE	No	No	No	No	No	No	No	No	Yes	Yes	Yes
Wald chi2	30.233	35.540	43.092	46.645	25.462	31.366	40.563	44.281	73.128	78.735	85.250
Log likelihood	-1607	-1600	-1264	-1262	-1609	-1602	-1265	-1263	-1229	-1227	-1224
N	2340	2335	1855	1855	2340	2335	1855	1855	1829	1829	1829

Notes: Marginal effects are calculated at the sample means of the variables. Partial effect of the dummy variables is calculated as the increase in the probability of litigation success rate with a change in the dummy variable from zero to one. Standard errors and marginal effects are reported in round brackets and square brackets respectively. Y is the court decision which equals 1 if any of the claims succeeds. Y* equals 1 if at least half of the claims succeed. Nat is a foreign indicator if no research or manufacturing facilities, and subsidiary entities present in Canada. Nat_HQ is a foreign indicator if headquarter is outside of Canada. Plaintif equals 1 indicating for firms being as plaintif in litigation. ***, **, and * indicate p<0.01, p<0.05, and p<0.1 respectively.

Table 3 - probit regression estimation of court outcome on firms' nationalities taken into account effects from prior experience.

	(1)	(2)	(3)	(4)	(5)	(6)
	1X	5X	5X	10x	30x	
Nat_HQ	0.191	0.177	0.322	0.305	0.339	0.313
	(0.311)	(0.311)	(0.343)	(0.344)	(0.348)	(0.347)
	[0.076]	[0.071]	[0.128]	[0.122]	[0.135]	[0.125]
Log(Rs)	0.046***	0.040***	0.044***	0.044***	0.050***	0.045***
	(0.014)	(0.015)	(0.016)	(0.016)	(0.016)	(0.016)
	[0.018]	[0.016]	[0.018]	[0.018]	[0.020]	[0.018]
Log(Rs) x Nat_HQ	-0.034**	-0.032*	-0.039**	-0.038**	-0.041**	-0.039**
	(0.017)	(0.017)	(0.018)	(0.018)	(0.019)	(0.019)
	[-0.014]	[-0.013]	[-0.016]	[-0.015]	[-0.016]	[-0.015]
Plaintiff	-0.164***	-0.169***	-0.161**	-0.160**	-0.155**	-0.160**
	(0.062)	(0.062)	(0.066)	(0.066)	(0.066)	(0.067)
	[-0.065]	[-0.067]	[-0.064]	[-0.064]	[-0.062]	[-0.064]
Log(Age)			0.011	0.011	0.014	0.011
			(0.036)	(0.036)	(0.036)	(0.036)
			[0.004]	[0.005]	[0.006]	[0.005]
Experience	0.019	0.098	0.086	0.099	0.001	
	(0.070)	(0.080)	(0.083)	(0.090)	(0.116)	
	[0.007]	[0.039]	[0.034]	[0.034]	[0.000]	
Exp_25						-0.025
						(0.096)
						[-0.010]
Exp_25_50						0.027
						(0.109)
						[0.011]
Exp_50_75						0.054
						(0.108)
						[0.021]
Exp_75up						0.074
						(0.123)
						[0.029]
Share of firms	1354	828	828	646	410	[373,241,282,458]
Wald chi2	85.374	85.961	77.457	77.774	77.174	77.329
Log likelihood	-1224	-1223	-1105	-1104	-1105	-1105
N	1829	1829	1654	1654	1654	1654

Notes: Marginal effects are calculated at the sample means of the variables. Partial effect of the dummy variables is calculated as the increase in the probability of litigation success rate with a change in the dummy variable from zero to one. Standard errors and marginal effects are reported in round brackets and square brackets respectively. Exp_5x indicates for firms that have at least 5 litigation involvements last 10 year prior to litigation. All regressions are controlled for subject, jurisdiction location, industry, and time trend fixed effects. The experience indicator is specified by each column for the number of involvements. The number of firms satisfying the specification is summarized in "Number of fims". ***, **, and * indicate p<0.01, p<0.05, and p<0.1 respectively.

Table 4 -Robustness checks for probit regression estimation of court outcome on firms' nationalitie taken into account effects from prior experience and lobbying.

	(1)	(2)	(3)	(4)	(5)	(6)
	Any	High_Low	High	High X 2	High X 5	High X 10
Nat_HQ	0.185	0.179	0.181	0.176	0.219	0.215
	(0.311)	(0.311)	(0.311)	(0.311)	(0.314)	(0.312)
	[0.074]	[0.072]	[0.072]	[0.070]	[0.087]	[0.086]
Log(Rs)	0.042***	0.041***	0.041***	0.040***	0.041***	0.041***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
	[0.017]	[0.016]	[0.016]	[0.016]	[0.016]	[0.016]
Log(Rs) x Nat_HQ	-0.033*	-0.032*	-0.033*	-0.032**	-0.035**	-0.035**
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
	[-0.013]	[-0.013]	[-0.013]	[-0.013]	[-0.014]	[-0.014]
Plaintiff	-0.169***	-0.169***	-0.170***	-0.168***	-0.171***	-0.175***
	(0.062)	(0.062)	(0.062)	(0.062)	(0.062)	(0.062)
	[-0.067]	[-0.067]	[-0.068]	[0.067]	[-0.068]	[-0.070]
Exp_5x	0.121	0.117	0.111	0.110	0.086	0.086
	(0.083)	(0.083)	(0.082)	(0.082)	(0.081)	(0.080)
	[0.048]	[0.046]	[0.044]	[0.044]	[0.034]	[0.034]
Lobboyists	-0.101	-0.089	-0.078	-0.080	0.178	0.784*
	(0.105)	(0.107)	(0.114)	(0.119)	(0.183)	(0.435)
	[-0.040]	[-0.035]	[-0.031]	[-0.032]	[0.071]	[0.313]
Share of firms	278	261	217	188	60	11
Wald chi2	86.706	86.361	86.134	86.099	87.106	88.828
Log likelihood	-1222	-1223	-1223	-1223	-1222	-1221
N	1829	1829	1829	1829	1829	1829

Notes: Marginal effects are calculated at the sample means of the variables. Partial effect of the dummy variables is calculated as the increase in the probability of litigation success rate with a change in the dummy variable from zero to one. Standard errors and marginal effects are reported in round brackets and square brackets respectively. Exp_10x and Exp_30x indicate litigation involvements of 10 and 30 times respectively in the past prior to litigation. Lob is 1 if the firm hires any lobbyists (regardless relevent or not). Lob_HL and Lob_H2 indicate the firm hires any lobbyists of high or low relevence, and at least 2 high relevent lobbyists respectively. All regressions are controlled for subject, jurisdiction location, industry, and time trend fixed effects. The specification of the lobbyist indicator is defined by each column and the number of firms satisfying the specification is summarized in "Number of fims". ***, **, and * indicate p<0.01, p<0.05, and p<0.1 respectively.

Table 5 - probit regression estimation of court outcome on nationality ration of government involvement

	(1)	(2)	(3)	(4)
Nat_HQ	-0.359***	0.241	0.183	0.151
	(0.097)	(0.315)	(0.312)	(0.313)
	[-0.143]	[0.096]	[0.073]	[0.06]
Log(Rs)	0.027***	0.046***	0.046***	0.046***
	(0.010)	(0.014)	(0.014)	(0.014)
	[0.011]	[0.018]	[0.018]	[0.018]
Log(Rs) x Nat_HQ		-0.034**	-0.034**	-0.031*
		(0.017)	(0.017)	(0.017)
		[-0.013]	[-0.013]	[-0.012]
Plaintiff	-0.111	-0.115	-0.161***	-0.157**
	(0.080)	(0.080)	(0.062)	(0.062)
	[-0.044]	[-0.046]	[-0.064]	[-0.063]
NatxPlaintiff	-0.134	-0.118		
	(0.127)	(0.127)		
	[-0.053]	[-0.047]		
gov_dom			0.097	
			(0.168)	
			[0.039]	
gov_foreign				-0.199
				(0.167)
				[-0.079]
N	1829	1829	1829	1829
Log likelihood	-1225	-1223	-1223	-1223
Wald chi2	81.023	86.195	85.912	86.956

Notes: Marginal effects are calculated at the sample means of the variables. Partial effect of the dummy variables is calculated as the increase in the probability of litigation success rate with a change in the dummy variable from zero to one. Standard errors and marginal effects are reported in round brackets and square brackets respectively. Dom_gov indicates for cases that government is on the side of domestic firms while foreign_gov indicates for government on the side of foreign firms in the litigation. All regressions are controlled for subject, jurisdiction location, industry, and time trend fixed effects. ***, **, and * indicate p<0.01, p<0.05, and p<0.1 respectively.

Table 6 - Robustness checks for different thresholds of win-ratio for probit estimation of court outcome on nationality

	Y_01	Y_25	Y_50	Y_75	Y_90
	(1)	(2)	(3)	(4)	(5)
Nat_HQ	0.073	0.080	0.181	0.373	0.315
	(0.311)	(0.311)	(0.311)	(0.314)	(0.314)
Log(Rs)	0.035**	0.036**	0.041***	0.044***	0.045***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Log(Rs) x Nat_HQ	-0.027	-0.027	-0.033*	-0.043**	-0.041**
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
Plaintiff	-0.168***	-0.178***	-0.170***	-0.165***	-0.178***
	(0.062)	(0.062)	(0.062)	(0.062)	(0.062)
Exp_5x	0.118	0.113	0.111	0.139*	0.136
	(0.082)	(0.082)	(0.082)	(0.083)	(0.083)
Lob_H	-0.104	-0.102	-0.078	-0.011	-0.010
	(0.114)	(0.114)	(0.114)	(0.114)	(0.115)
N	1834	1834	1829	1829	1829
Log likelihood	-1223	-1225	-1223	-1213	-1211
Wald chi2	89.185	87.406	86.134	97.048	100.862

Notes: Marginal effects are calculated at the sample means of the variables. Partial effect of the dummy variables is calculated as the increase in the probability of litigation success rate with a change in the dummy variable from zero to one. Standard errors are reported in round brackets. Y_01, Y_25, Y_50, Y_75 and Y_90 are success indicators which equal 1 if win ratios are at least 0.01, 0.25, 0.50, 0.75 and 0.90 respectively. All regressions are controlled for subject, jurisdiction location, industry, and time trend fixed effects. ***, **, and * indicate $p<0.01$, $p<0.05$, and $p<0.1$ respectively.

Figure 1 Distribution of revenue and prior court experience for domestic and foreign frims.