

Judicial Institution, Local Protection and Market Segmentation: Evidence from the Establishment of Interprovincial Circuit Tribunals in China

Abstract

A central challenge in economic development is market segmentation (MS) within countries, which largely arises from judicial local protection(JLP). By taking advantage of China's establishment of interprovincial circuit tribunals (ICTs) that separate the judicial system from local governments, we find that: (1) ICTs significantly rectify the JLP provided by lower-level courts. (2)A micro-mechanism analysis shows that ICTs decrease transportation costs of cases involving small and private enterprises as plaintiffs and increase their probability applying for retrials in the Supreme People's Court (SPC). In combination with the fact that these enterprises are more likely to be discriminated against by lower-level courts, the rectification effect of ICTs becomes significant after the reform. (3)Consistently, although ICTs significantly decrease the MS between provinces within the same circuit area, the MS between provinces of different circuit areas barely changes. Our paper provides timely implications and potentially actionable insights for countries facing similar concerns.

Keywords: Judicial institutions; Local protection; Market segmentation; Interprovincial circuit tribunal.

JEL Classification Codes: K40, O17, P37, P48

1. Introduction

Domestic market segmentation (MS) is deeply rooted in most countries and is responsible for insufficiently specialized regional economies and overcapacity (Robinson,2016; Donaldson,2018). In addition, extensive studies have documented that

MS mainly arises from local protection (LP) (Bai et al., 2019; Head and Mayer, 2019; Li and Zhou, 2005).¹

Prior scholarship has arrived at theoretically conflicting conclusions about the effects of judicial institutions on LP and MS. Advocates in developed countries primarily argue that judicial institutions could outlaw LP in various forms² (e.g., the commerce clause in the U.S.) (Barwick et al., 2021). Detractors concern that local governments in developing countries are endowed with the power to make personnel and budgetary decisions for courts; and thus, the branch courts soon become local-interest-oriented (Gratton et al., 2021; Mehmood, 2021; Li and Ponticelli, 2020).³

China provides an ideal laboratory to empirically study this decades-old problem. Dating back at least to 1979, China has allowed decentralization and sufficient competition among local governments so as to stimulate economic growth. Unsurprisingly, this policy leads to severe LP and MS.⁴ According to one recent survey conducted by the Supreme People's Court (SPC), over 68% of judges identified LP as a major cause of unfairness in judicial decisions and a major reason for the difficulties in law enforcement (Firth et al., 2020). However, with increasing trade uncertainty, China is seeking to rebalance its economy toward a unified domestic market (i.e., great domestic circulation). The discriminatory local policies in mass forms thus are frequently banned. This great structural transformation provides rich exogenous variations in judicial institution that can be used to address the endogeneity issue.

Specifically, China has gradually introduced a system of interprovincial circuit tribunals (ICTs). They seated outside of Beijing, but act in the same capacity as

¹ For example, even in the developed world such as the U.S., Eyer and Kahn (2017) document that coal states provide large financial incentives to encourage power plants to purchase locally mined coal. In contrast, Geography is less likely to be a key factor that influences MS since many countries have constructed impressive transportation systems (Faber, 2014).

² These forms include discriminatory subsidies, entry requirements and inspection standards that disfavor nonlocal products vis-à-vis local products (Fajgelbaum et al., 2016). For example, in a quality control test on electronic bikes conducted by the Liuzhou city government in 2015, all local brands passed the test and all nonlocal brands failed the test (Han, 2021).

³ Internationally, Bhattacharya et al. (2007) find that U.S. firms have a home court advantage in their own country's courts.

⁴ For example, Barwick et al. (2021) show that the LP in China's automobile market results in 18.7 billion yuan of consumer welfare loss and amounts to 40% of local governments' subsidies.

headquarters of the SPC (HSPC) (see Figure1).⁵ Since ICTs were introduced in different provinces at different times, there is variation in the date when cases in different provinces were exposed to them. This allows a difference-in-differences (DID) approach to evaluate whether ICTs increase the rectification effect of judicial LP (JLP) (compared with the HSPC in Beijing) and alleviate MS.

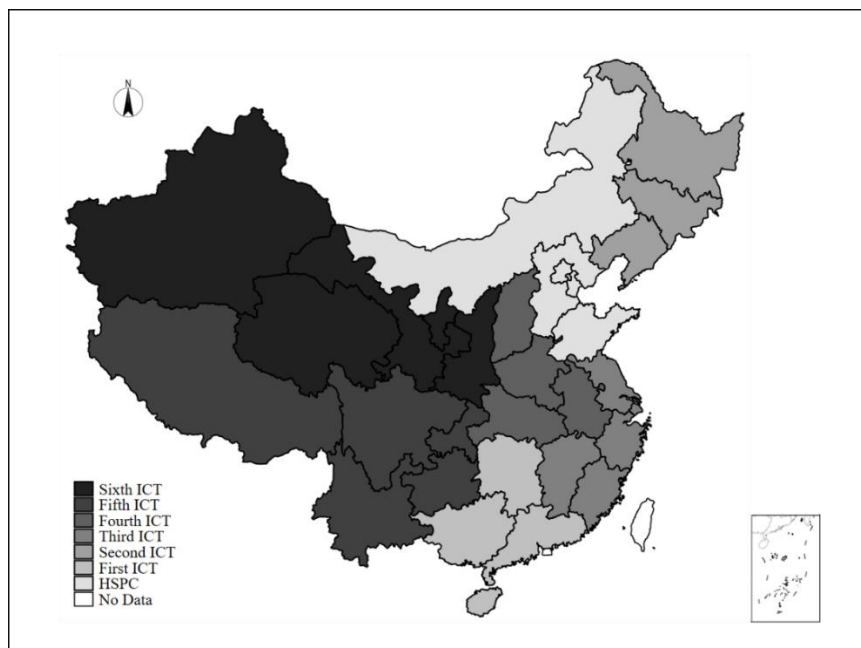


Figure 1 The geographical distribution of the circuit areas

Theoretically, the establishment of ICTs is expected to affect judicial local protection through two ways. First, ICTs might *directly* rectify the wrongful conviction judged by lower-level courts (i.e., the rectification effect). For example, small enterprises who are more likely to suffer judicial local protection have to appeal for retrial in the HSPC in Beijing before the reform. Due to the high transportation cost, they might choose to stop appeal even though they have a large winning probability. In contrast, the establishment of ICTs lowers transportation cost. Then small enterprises might turn to appeal and these cases will be more likely to be rectified (see section 5.2 for more details). Second, according to the promotion rules, judges of the lower-level courts are responsible for the cases rectified by ICTs.⁶ Therefore, the rectification behavior of

⁵ For micro case studies that ICT can remove local protection, see Ip and Kwok (2017).

⁶ See “The Guiding Opinions on Strengthening and Improving the Assessment of Judges” (*Guanyu Jiaqiang He Wanshan Faguan Kaohegongzuo De Zhidaoyijian*), Web: <https://www.court.gov.cn/fabu-xiangqing-330041.html>.

ICTs will exert negative effect on the assessment of province-or-below court and force them to alleviate JLP in advance (i.e., *the deterrent effect*) (see Table 12 for more details).

We need to bear in mind that rectification of JLP(which is typically opaque and implicit) is difficult to measure directly. In this paper, we primarily follow the conventional literature that uses *changes* in the winning probability of plaintiffs to trace the rectification of JLP (Mehmood, 2021;Long and Wang, 2015; Zhang et al., 2020).

⁷Although imperfect, the proxy has its rationales:(1) According to the law, plaintiffs in China need to file a case of first instance in the location where the defendant usually resides (i.e., *yuan gao jiu bei gao*). (2) Under this arrangement, defendants are more likely to be locally protected, which indicates a lower winning probability of plaintiffs in the local court (i.e.,home court bias).⁸ (3) Since ICTs play the correctional role in rectifying the mistakes made by lower courts, the *increase* in the winning probability of plaintiffs (compared with previous trials) is thus evidence of an *increase* in the rectification effect.⁹

Our main finding is that the reform rectifies the JLP of lower-level courts and alleviates MS. (1) Compared with the situation without ICT coverage (i.e., retrials are still handled exclusively by the HSPC), the reform increases the rectification effect significantly by 16.6%. (2) ICTs significantly decrease the index of MS by 0.014 or 45.2%, thus providing additional evidence that the increase in winning probability of plaintiff reflects more ‘correct’ and higher quality judicial decisions. (3) Interestingly, although the MS between provinces of the same circuit area indeed decreases, the MS between provinces of different circuit areas and the MS between cities within the same province barely changes.

Next we turn to mechanisms explaining the rectification effect of ICTs. Several prior

⁷ Alternatively, Bhattacharya et al. (2007) identify JLP by comparing shareholders’ reaction when a U.S. firm or a foreign firm is sued in the U.S..

⁸ For the ease of exposition, we continue to use the titles of plaintiff and defendant in the appeal instead of using the titles of appellant and appellee.

⁹ Nonetheless, the final ruling may support only parts of the claims made by either party. We further determine the plaintiff to be the winner if the court supports at least some of his or her damage demands in the first ruling.

studies have suggested the transportation cost conjecture (Huang et al., 2017). Before the reform, all litigants around the country had to appeal for retrial in the HSPC in Beijing. While after the reform, litigants only needed to appeal for a retrial in ICTs, which significantly lowered their transportation costs (e.g. “the SPC in front of peoples’ door”). Given that transportation costs are comparatively larger for the set of small (typically private) enterprises, the establishment of ICTs will provide them with stronger incentives to apply for retrials. Since these enterprises are also more likely to suffer from JLP, the rectification effect will thus increase. We find pieces of evidence that support the above conjecture.

In addition to bolstering the case for our empirical strategy by using a number of specification checks, we also demonstrate its robustness in the following ways. (1) We replace the binary measure of the rectification effect with alternative continuous measures of JLP.¹⁰ (2) We rigorously test the assumption of home court bias. (3) We use broader province-level economic factors to test the exogeneity of the timing of the reform. (4), Finally, we change the treatment year to implement the placebo test.

Our paper complements and extends the fast-growing research on how China’s judiciary applies national laws against local actors. Zhang et al. (2019) show that the effect of environmental courts on corporate environmental investment is more pronounced in subsamples with severe LP (e.g., state-owned enterprises (SOEs) or non-SOEs with political connections). Long and Wang (2015) provide evidence that whether the plaintiff’s residence coincides with the court’s location has a significant impact on obtaining a favorable ruling; however, the appellate courts redress the JLP found in the first instance rulings. Li and Ponticelli (2020) find that the cities that introduced courts specializing in bankruptcy experienced a 1.7 percentage points larger decline in the share of labor employed in zombie-intensive industries (mostly SOEs). Utilizing China’s “Trans-Regional Jurisdiction” Reform¹¹ in administrative litigation, Cao et al.

¹⁰ For example, we compute the ratio between the amount of damage demanded by the plaintiff and the amount of damage granted in the ruling, and use the ratio as the win rate of the plaintiff.

¹¹ That is, for administrative litigation cases registered in a given county court, the superior prefectural court could adjudicate the case by itself, or assign it to another subordinate county court within the same prefecture.

(2021) find that the reform improve judicial independence on protecting the rights of the private sector against potential abuses of government. Huang et al. (2021) point out that when provinces are covered by the circuit court, investment of the publicly listed companies of those provinces increase significantly. The primary ways that our paper differs from these papers are the type of data used and the nature of the reform. And it is difficult to know whether their conclusions can be generalized to other types of judicial institutions.

Our paper is also widely related to other organizations selected for addressing MS. Han (2021) finds that the reform of incorporating counties into prefectures (ICIP) significantly reduces the LP and MS between incorporated counties and their corresponding prefectures. However, we argue that the generalization of ICIP is limited because we cannot incorporate all provinces into a single province. Bai et al. (2019) point out that nonlocal private enterprises have to choose to enter joint ventures with local SOEs to avoid discrimination by the local government, which constitutes an important source of misallocation. Kostka and Nahm(2017) state that although China's environmental vertical management reform insulates intervention by local governments, it does not improve environmental outcomes because of a lack of local information. Although lowering the weight of GDP when evaluating local officials could alleviate LP, its GDP growth rate drops significantly(Bai et al.,2019).

This paper makes three main contributions. (1) How the second-largest economy in the world addresses domestic MS has important policy implications for economies facing similar questions. Although a fast-growing empirical literature has examined the effect of infrastructure on reducing MS, very few have investigated the the role judiciary plays, especially in a weakly institutionalized setting (Donaldson and Hornbeck, 2016; Acemoglu et al., 2020). (2) To the best of our knowledge, we present the first empirical evidence on the fundamental importance of the ICT reform (arguably the most important Chinese legal reform of the last two decades) in LP resolution and market integration, which is an area thus far unexplored by academic research due to the lack of valuable data. (3)Although many studies admit that non-SOE discrimination is widespread, finding a resolution is challenging in China, we identify one particular

instrument—the efficiency of judicial institutions.

The remainder of the paper is organized as follows. section 2 describes the institutional background, section 3 explains the data and variables, and sections 4 and 5 analyze the effects of ICTs on LP and MS, respectively. Section 6 conducts robustness examinations and section 7 concludes.

2. Institutional background

2.1 The judicial system and environment in China

It is difficult to understand the ICT reform without taking a closer look at the hierarchy of Chinese people's courts. Specifically, their locations follow the same administrative divisions as regional governments(see Figure 2).¹² In reality, the judiciary is subject to the control of the government in terms of judges' salaries and bonuses, office supplies, vehicles, and court buildings (Wang, 2013).

Since China's economic success is widely believed to arise from its arrangements of fiscal decentralization and GDP-based promotion tournaments (Xu, 2011), the local government has strong incentives to protect local firms (Li and Zhou, 2005), which results in JLP.

The workflow of a trial is as follows. Each level of court could be the first instance court, which depends on the monetary value at stake in the dispute.¹³ Should the litigant not agree with the judgment or ruling of the first instance, he may appeal to a higher court. For example, if the first instance of a case is in the provincial higher court, then the second instance court would be the SPC. Typically, the judgment is final and cannot be appealed after the second instance. However, it is still possible to apply for a retrial in the SPC if major errors are found during previous trials.

¹²That includes basic courts at the county or district level, intermediate courts at the prefectural city level, higher courts at the provincial level, and the supreme court in Beijing.

¹³ Because of the heterogeneity in economic development, each province has its own threshold of commercial claims to be heard by the basic, intermediate, or higher courts.

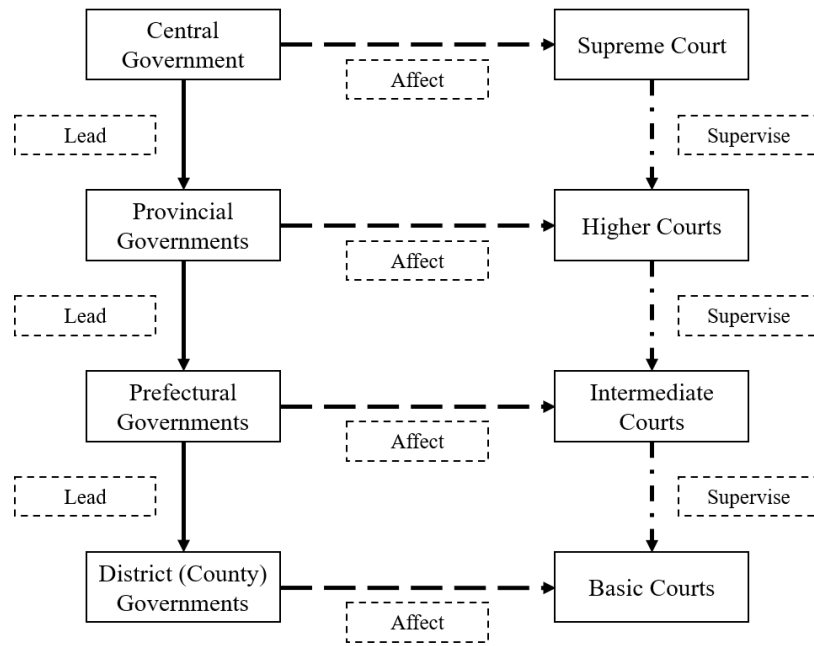


Figure 2 Hierarchy of Chinese people's courts

Importantly, the plaintiff needs to file a case of first instance in the location where the defendant usually resides, which makes plaintiffs more likely to suffer JLP (Long and Wang, 2015). Technically, however, how does JLP work in reality? Some researchers state that China's law leaves judges a fair amount of discretion that enables lower-level courts to select facts or interpret laws in their best interest (Liu and Liu, 2008).¹⁴

2.2 ICT as a solution to China's governance problems and potential mechanisms

On January 28, 2015, the first ICT was officially established in Shenzhen, which was soon followed by the establishment of the second ICT on January 31, 2015 in Shenyang, an old industrial city in northeastern China. Around two years later, on December 28 and 29, 2016, the Third, Fourth, Fifth, and Sixth Circuit Courts officially inaugurated their operations in Nanjing, Zhengzhou, Chongqing and Xi'an respectively, leaving only Beijing, Tianjin, Hebei, Shandong, and Inner Mongolia as the final five provincial units whose cases will continue to be handled by the HSPC in Beijing. Their jurisdiction areas are displayed in Figure 1.

¹⁴ Judges can adopt the facts that are beneficial to local parties as much as possible, while judges can ignore for the facts that are harmful to local parties. (Gennaioli and Shleifer, 2008; Wang, 2021).

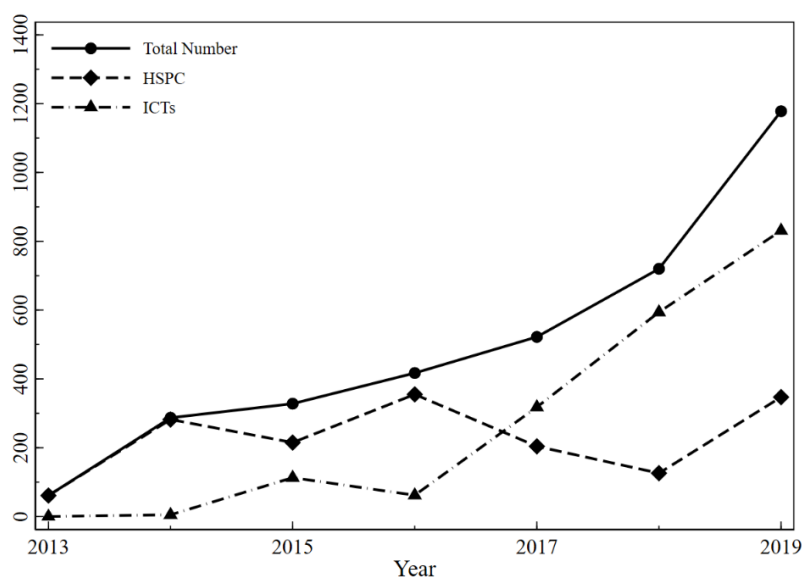


Figure 3 The number of cases increases significantly after the establishment of ICTs

Institutionally, the new tribunals are an integral part of the SPC, are established outside its headquarters and are subject to the direct leadership of the SPC instead of the local party committee, which effectively insulates the tribunals from all local authorities.¹⁵ However, there are also unstated or implied objectives (Wang and Chen, 2020). Having cases handled locally – especially cases relating to petitions contributes to the maintenance of the social stability (*weiwen*) of the national capital, and also allows the HSPC to focus its core functions on formulating judicial policy and judicial interpretations. As Figure 3 presents, compared with the HSPC in Beijing, the establishment of ICTs induced a significantly increased number of cases,¹⁶ which indicates that ICTs exert a nonnegligible effect.

Compared with the HSPC in Beijing, the establishment of ICTs could improve the rectification effect of JLP through transportation costs. Clearly, it would be convenient for the litigants (especially for private and small enterprises) of petitions if the SPC has outlets in different parts of the country.

2.3 A glimpse of the rectification effect of the SPC

Before moving to the empirical analysis, we shed some light on whether the SPC rectifies the mistakes made by the lower-level courts. Note that to avoid sample

¹⁵ Mehmood(2021) finds that a 10% rise in judges selected by the judicial commission(rather than Presidential appointment) reduces winning probability of states by about 2 percentage points.

¹⁶ In 2019, approximately 60% of the SPC's cases were heard in these six circuit tribunals.

selection, we restrict the sample to cases that experience all stages(i.e., from first instance to retrial). ¹⁷In other words, we only keep cases judged by SPC and collect history information of these cases(see Section 3 for more details).As shown in Figure 4, the winning probability of plaintiffs changes little from 30% to 26% when plaintiffs appeal for second instances. In contrast, this number increases significantly from 26% to 72% when plaintiffs further apply for retrials in ICTs.

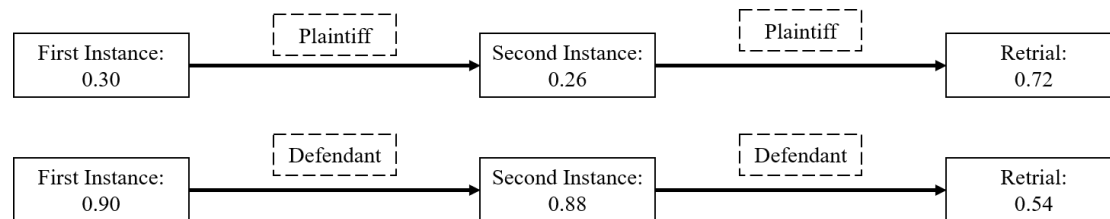


Figure 4 A glimpse of the SPC's rectification effect

Note: The numbers represent the winning probability of plaintiffs across stages

Similarly, the winning probability of plaintiffs decreases slightly from 90% to 88% when defendants appeal for second instances but the number decreases significantly from 88% to 54% when defendants further apply for retrials in ICTs. All of these preliminary facts indicate that JLP does exist and that HSPC/ICTs has first-order implications for rectifying the misbehaviors of lower courts.

3. Data and construction of the key variables

The lack of causal evidence is largely due to stringent data requirements. In this section, we present an overview of these data sources and the construction of the variables that we use for the analysis.

3.1 Case information

Our main data source is the text of the rulings from China Judgments Online administered by China's SPC. It offers the largest collection of judgments and decisions from almost all Chinese courts and is mostly up-to-date.¹⁸ The case records contain

¹⁷ If not, the winning probability of plaintiffs may reflect sample selection bias resulting from the impact of last stage sentence on the composition of trial applicants in the next stage.

¹⁸ Judicial documents involving national security, juvenile delinquency and divorce proceedings are not reported in the online platform.

full case histories, including the dates on which the court accepted the cases, the dates of the main judicial decisions, the dates of the official closure of the cases, case types, judge assignments (the names of the main judge and the secondary judges), and sentencing. They also include litigants' characteristics such as names and addresses.

We manually extract the above information from the documents and restrict the sample as follows: (1) To identify the rectification effect, we focus on cases judged by the SPC¹⁹. To shed some light on the deterrent effect, we focus on cases judged by province-or-below courts. (2) We keep only commercial cases, which are most closely related to local GDP and therefore JLP. (3) We keep the judgments between 2013 and 2019.

The reason why we select this time period is twofold. First, our preliminary draft was written in the January of 2021 and the data was manually collected (cases judged by SPC are typically complex and therefore less likely to be collected by Python) at the end of 2020. Since the time between the date of initial filing and that of disclosing could be more than one hundred days (Liu et al., 2022), it might be more reasonable to focus on cases judged before 2019. Second, lower-level judgment documents are publicly available on the Internet since 2014, however, judgments of the SPC are required to be published since July 2013.²⁰ Therefore, it allows us to make full use of these cases for the second half year of 2013 and enable us conduct a longer pre-trend test before the reform (see Figure 8). In total, our final sample consists of 3513 observations.

Figure 5 visualizes the descriptive statistics of the cases. Panel (a) shows that 76% of the plaintiffs and 84% of the defendants are enterprises. Among the enterprises as plaintiffs, 17% (13%) are SOEs and 79% (84%) are private, foreign enterprises account for less than 5% of the sample (see Panel (b) of Figure 5).

Note that more than 90% of cases have only one plaintiff but the number of defendants varies. Following Bhattacharya et al. (2007), we only focus on the first-named litigant.

¹⁹ The cases that reach ICTs are a selective sample of highly valuable cases in which the potential welfare costs induced by JLP are likely to be larger.

²⁰ see 《Interim Measures for the Online Publication of Judgments of the Supreme People's Court, 《最高人民法院裁判文书上网公布暂行办法》, Website: <https://www.court.gov.cn/zixun-xiangqing-5515.html>.

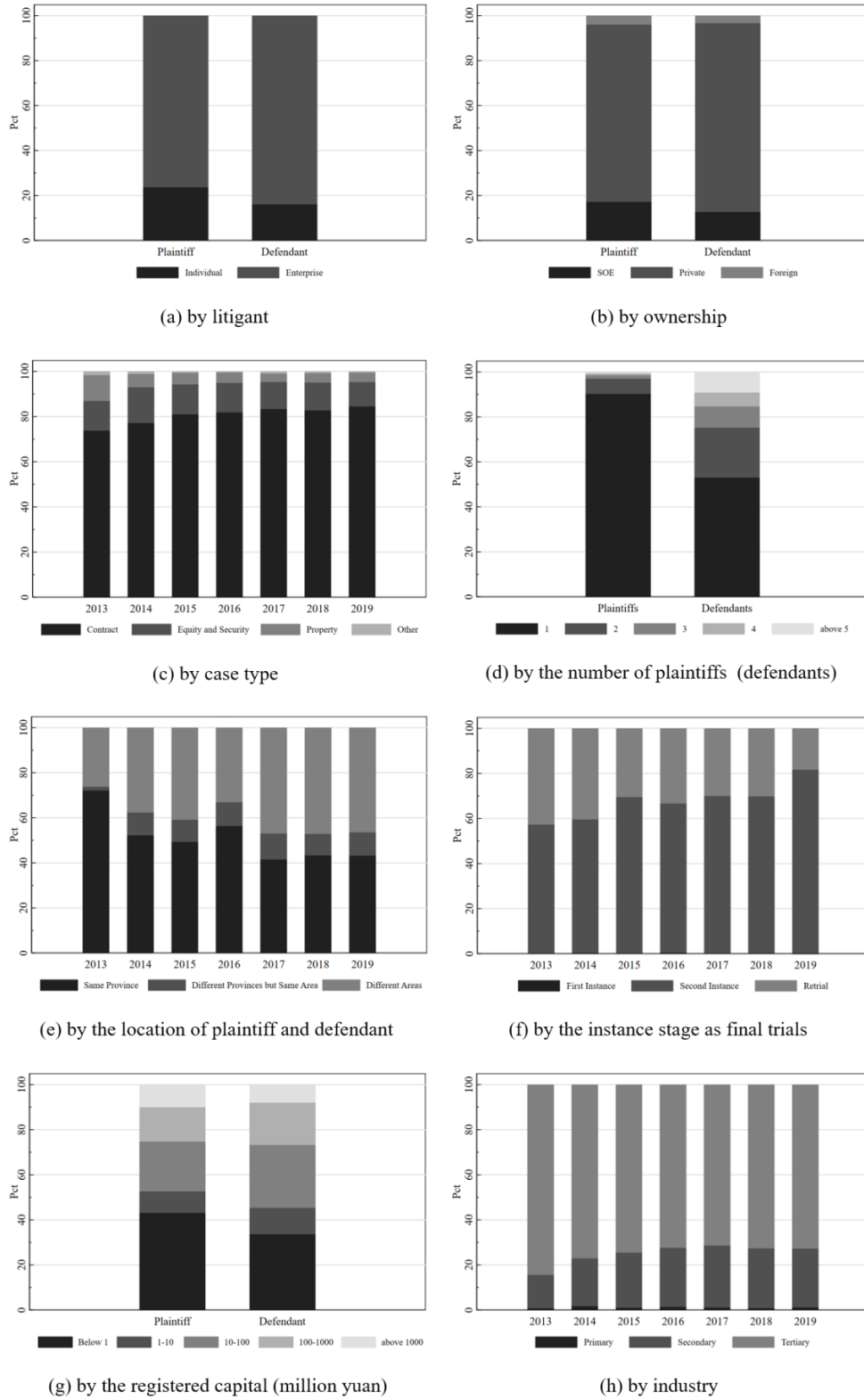


Figure 5 Cases and firm characteristics

Interestingly, for 1629 out of 3513 cases, both litigants are in the same province. For 357 cases, the plaintiffs and defendants are in different provinces but within the same circuit area. For 1527 cases, each litigant is located in different circuit areas. The spread

of the sample allows us to analyze to what scope (e.g., nationwide, circuit-level, or province-level) will ICTs make an impact.

Although cases by type is relatively stable throughout the period(see Panel (c)), some clear trends emerge in the composition of cases in terms of litigants' location(see Panel (e))instance stage. Moreover, the share of cases that end in the second instance has increased over time from less than 60% in 2013 to more than 80% in 2019(see Panel (f)).

3.2 Enterprise information

When one of the litigants is an enterprise, we also obtain their characteristics from QICHACHA, which is a data source organized by the State Administration for Market Regulation (SAMR). The records contain information on every enterprise registered in China, including its industry, ownership, registered capital, operating status, year of establishment and social credit code.

According to SAMR, the registered capital for universal enterprises is only approximately 10 million yuan. However, since cases that reach the SPC are a selective sample of highly valuable cases, the registered capital for plaintiffs(defendants) is 502(423) million yuan.

In terms of industry, Panel (h) of Figure 5 shows that secondary industry accounts for 20% while the share of tertiary industry is at a range from at least 70% to at most 85%.

3.3 Measure of rectification of the JLP

We provide three variables to reflect the rectification of the JLP. (1) The key outcome variable is *Plaintiff Win*, a dummy variable that equals one if the plaintiff wins and is zero otherwise. Following classical literature (Djankov et al., 2003; La Porta et al., 2008; Mehmood, 2021), we ask law students to code this variable based on whether plaintiff's claim is satisfied. When plaintiffs make more than one claim, students need to identify the *key* claim according to the case type and then check whether it has been satisfied. For example, the key claim of a property case is typically the ownership of the relevant property. And for a debt contract case, the key claim is the enforcement of most relevant terms.

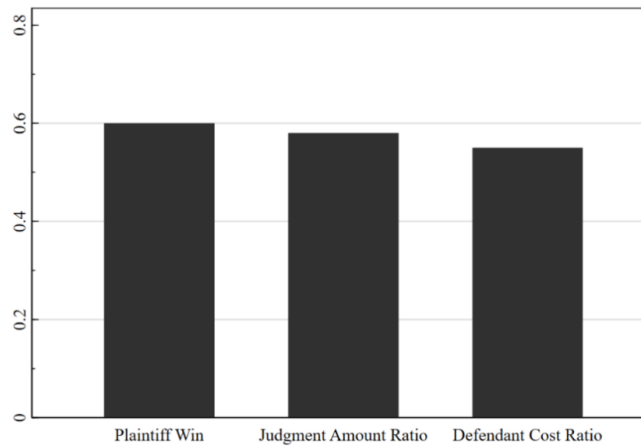


Figure 6 Variables used to reflect the rectification of JLP

Figure 6 shows that the average value of *Plaintiff Win* is 0.60, which indicates that plaintiffs have a higher probability of winning their cases in ICTs.²¹ Unavoidably, there exist some *subjectivity* in identifying the key claim in actual judicial trials. For ease of robustness, we provide the following two *objective* variables as dependent variables. (2) The *Judgement Amount Ratio*, defined as the ratio of the awards granted by the court to the amount claimed by the plaintiffs (Lu et al., 2015). (3) The *Defendant Cost Ratio*, defined as the ratio of the litigant costs that defendant burdens to the total litigant costs. Consistent with *Plaintiff Win*, the average values of both the *Judgment Amount Ratio* and the *Defendant Cost Ratio* are larger than 0.50 at 0.58 and 0.55, respectively.

3.4 Measure of market segmentation

To construct an index of MS, we follow Chen et al. (2007) and use the retail price index of commodities from the China Statistical Yearbook.²² Since the method has been well established and widely used, we only describe the construction process in short in the Appendix.

As shown in Figure 7, MS and the growth of GDP have a negative relationship after

²¹ The number of cases and *PlaintiffWin* (in parentheses) for the HSPC are 684 (0.63). The other ICTs from first to sixth place are 447 (0.60), 352 (0.62), 484 (0.58), 442 (0.63), 500 (0.59), and 604 (0.55).

²² The commodities are as follows: food (including grain; oil or fat; livestock meat, poultry meat and processed products; eggs; aquatic products; vegetables; and dried and fresh melons and fruits); beverages, tobacco and liquor; garments, shoes and hats; textiles; household appliances, music and video equipment; cultural and office appliances; articles for daily use; sports and recreation articles; transportation and communication appliances; furniture; cosmetics; gold and silver ornaments; traditional Chinese and Western medicines and health care articles; books, newspapers, magazines and electronic publications; fuels; and building materials and hardware.

2014. One potential explanation is that when China's economy is in a recession, local governments might have a stronger incentive to implement LP.

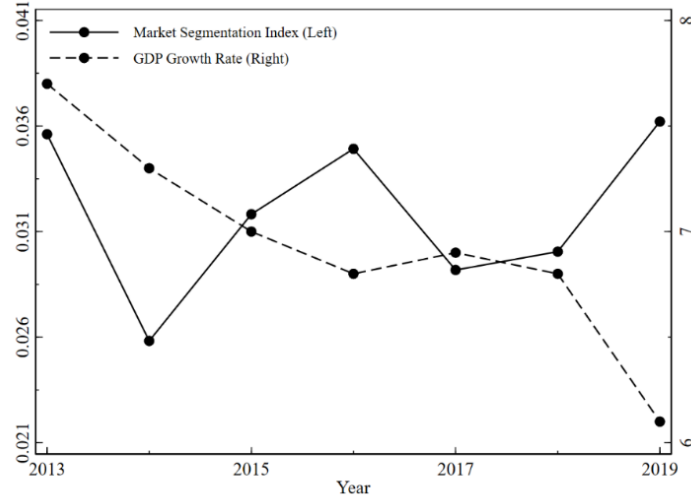


Figure 7 Growth rate of GDP and the evolution of market segmentation in China

4. Model specification

To estimate the impacts of ICT on LP, we use the following time-varying DID specification (Mehmood, 2021; Behrer et al., 2021; Li and Ponticelli, 2020):

$$PlaintiffWin_{c,i,t} = \beta_{-1}ICT_{i,t+1} + \beta_{post}ICT_{i,t-\tau} + \mu X_{e,t} + \pi X_{c,t} + \gamma_i + \gamma_t + \varepsilon_{c,i,t} \quad (1)$$

where $PlaintiffWin_{c,i,t}$ is an indicator that equals one when the plaintiff in province i wins their case c in year t . $ICT_{i,t+1}$ is another indicator that is one for cases when province i is covered by the circuit area one year later. Similarly, $ICT_{i,t-\tau}$ is an indicator that is one for province i if it was covered by ICTs τ years ago. That is, for provinces covered by the first and second ICT(both established in January 2015), $ICT_{i,t-\tau}$ equals to 1 for years ranging from 2015 to 2019(i.e., $1 \leq \tau \leq 5$). For provinces covered by other ICTs(all established in December 2016), $ICT_{i,t-\tau}$ equals to 1 for years ranging from 2017 to 2019(i.e., $1 \leq \tau \leq 3$). According to Martinez-Bravo et al. (2017) and Mehmood (2021), winning probability of plaintiffs pre- and post-reform are compared in provinces with ICT covering versus provinces without ICT covering. We normalize the period two years before the reform as the benchmark period. Therefore, β_{-1} and β_{post} can be interpreted as the treatment effects before and after the reform respectively.

The DID specification relies on the assumption that, in the absence of the reform, the change in outcomes before the reform should have parallel trends. We test the validity of this assumption by reporting an estimate of β_{-1} and the corresponding 95 percent confidence intervals.²³ If ICTs provide rectification mechanisms at a higher level to remedy the wrongs perpetrated at the lower level judiciary, then our parameter of interest (i.e., β_{post}) will be positive.

Following Li and Ponticelli (2020), $X_{e,t}$ is a set of enterprise-level variables (e.g., whether the plaintiff is enterprise, whether the defendant is enterprise, industry of enterprise, ownership of enterprise etc.) and $X_{c,t}$ is a set of case-level variables (e.g., number of plaintiffs, number of defendants, length of judgement text, number of law articles cited, case type, chief judge fixed effect etc.) to address potential variable omission issues.²⁴ γ_i and γ_t represent province and year fixed effects respectively. Standard errors are clustered by province to allow for arbitrary autocorrelation in the error term $\varepsilon_{c,i,t}$ and arbitrary correlation across cases in the same province.

Next we turn to ICTs' effects on MS:

$$Seg_{i,j,t} = \theta_{-1}ICT_{i,t+1} + \theta_{post}ICT_{i,t-\tau} + \delta X_{i,j,t} + \varphi distance_{i,j} + \gamma_i + \gamma_t + \varepsilon_{i,j,t} \quad (2)$$

As discussed above, $Seg_{i,j,t}$ is the MS between province i and province j in year t . Correspondingly, $X_{i,j,t}$ includes the trade-to-GDP ratio, government expenditures-to-GDP ratio of two provinces. $distance_{i,j}$ represents the road distance between the capitals of province i and province j .²⁵ Other terms are defined the same as those in equation (1). Again, if ICTs alleviate MS, θ_{post} will be negative.

5. Empirical analysis

In this section, we present the results on the effect of ICTs on rectifying JLP and alleviating MS.

5.1 Baseline results

²³ Since the trial function of the SPC (Beijing) is equivalent to that of SPC circuit courts, provinces in the judgment area of the SPC (Beijing) are also included in the treatment group after 2017.

²⁴ We sequentially control these variables in Table A2. It shows that the estimates remain relatively stable.

²⁵ This is calculated using the geographical information system (GIS) from Google Map.

We begin the regression analysis by estimating the DID model in equation (1). Column (1) of Table 1 describes the estimates that use a parsimonious specification without additional information. It shows that the parameter in period -1 is statistically insignificant, with a marginal effect of -2.9 percentage points, which thus validates the parallel trend hypothesis. That is, changes in the winning probability of cases in the treated provinces do not significantly differ from those in the uncovered provinces prior to the reform.

In addition, the establishment of ICTs increases the probability of plaintiffs winning by 9.9 percentage points. We further add enterprise-level information and case-level information in column (2) and column (3) respectively. These results are quantitatively similar with the baseline findings, albeit less precise.

Table 1 The impact of ICTs on rectifying JLP: Baseline results

Dep. Var.	<i>Plaintiff Win</i>					
	(1)	(2)	(3)	(4)	(5)	(6)
β_{-1}	-0.029 (0.058)	-0.027 (0.058)	-0.023 (0.060)			
β_{post}	0.099** (0.045)	0.100** (0.044)	0.096** (0.047)	0.104** (0.045)	0.104** (0.044)	0.100** (0.047)
$X_{e,t}$	No	Yes	Yes	No	Yes	Yes
$X_{c,t}$	No	No	Yes	No	No	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs	3513	3513	3513	3513	3513	3513
Adjusted R^2	0.006	0.008	0.024	0.006	0.008	0.025

Note: (1) Standard errors are in parentheses and clustered at the province level; (2) *** p<0.01, ** p<0.05, * p<0.1.

Given the absence of pre-existing trends, we normalize all periods before the establishment of ICTs as the benchmark period and replicate columns (1)-(3). The results are given in columns (4)-(6). It presents that estimate of β_{post} remains positive and statistically significant, and the differences in the coefficients are modest.

In our most preferred specification of column (6), the establishment of ICTs causes the winning probability of plaintiffs to be 10.0 percentage points higher. Compared with a baseline mean of 60 percentage points before the reform (see Table 1), this estimate indicates that ICTs substantially increase the winning probability of plaintiffs by 16.6%.

When interpreting these empirical results through the lens of the previous literature

on MS, several points are relevant to emphasize. (1) Local governments or courts under the pressure of ICTs may choose to alleviate LP in advance. Although we lack comprehensive data on lower-level cases, we argue that if this were the case, then our results above provide a lower bound in terms of estimating ICTs' real function. (2) Many researchers have stated that there is neither clear formal legal protection for private property in China, nor an independent judiciary that enforces contracts and adjudicates disputes (Bai et al.,2019). However, the above evidence implies that ICTs make a progress.

5.2 *Where does the effect of ICT arise?*

The results in the previous section do not mean that ICTs have beneficial effects for all subsamples. Next, we examine the different potential mechanisms through which ICTs may affect the rectification of JLP.

One of the most important potential channels is the decrease in the transportation cost of litigants. For example, Wang and Chen (2019) argue that the HSPC already has the power to exercise jurisdiction over these cases, and using ICTs to handle cross-administrative-division cases does not by itself make much sense. The *only* difference is that ICTs would make it more convenient for litigants to apply for a retrial.

To explore the importance of transportation costs, we study the rectification effect across the two dimensions: spatial distance and enterprise size. First, we split the cases based on the distance between litigants and the HSPC in Beijing and replicate column (6) in Table 1.²⁶ Table 2 reports that the effect increases as the distance to the HSPC increases: plaintiffs located with the farthest location are associated with 18.3 percentage points increase in the winning probability.²⁷ In contrast, ICTs located nearest to the HSPC are associated with only 6.8 percentage points increase in the winning probability and this result is statistically insignificant.

Table 2 Transportation cost

Dep. Var.	<i>Plaintiff Win</i>	<i>Registered capital</i>	<i>Distance</i>
-----------	----------------------	---------------------------	-----------------

²⁶ We collect road distance directly from Google Maps.

²⁷ We extensively check the sensitivity of our results to alternative classifications of physical distance.

	By distance			By size		By ownership		Full sample	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	<500 km	<1000 km	<1500 km	>10 mil.	<10 mil.	SOE	Private		
ICT	0.068 (0.063)	0.168*** (0.046)	0.183*** (0.040)	0.038 (0.106)	0.124** (0.055)	0.132 (0.144)	0.120** (0.050)	-0.511** (0.212)	-2.051*** (0.721)
$X_{e,t}$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$X_{c,t}$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prov FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	798	1128	2256	1664	1849	463	2111	3513	2660
Adjusted R^2	0.011	0.021	0.031	0.019	0.025	0.085	0.023	0.776	0.290

Note: (1) Standard errors are in parentheses and clustered at the province level. (2) *** p<0.01, ** p<0.05, * p<0.1.

Second, theoretically, small enterprises are more sensitive to transportation cost and will be more likely to apply for retrials after the establishment of ICTs. Combine with the fact that small (typically private) enterprises have a higher intensity of being discriminated against during previous trials, it is reasonable to expect that the rectification effect of final trials will be larger for these enterprises(Firth et al., 2011).²⁸ Consistently, we find the much smaller and statistically insignificant rectification effects for enterprises with larger registered capital or when plaintiff is SOE(see columns (4)-(7) of Table 2).²⁹

Along these lines, we replace the dependent variable in equation (1) with the registered capital. Column (8) of Table 2 provide additional evidence on the impact of ICTs. Specifically, the registered capital decreased by 51.1% (with a standard error of 21.2%) after the reform, suggesting that ICTs induce more smaller enterprises apply for retrials.

Moreover, our previous grouping in Table 2 is based on the distance between ICT and the Supreme Court. The logic behind is that, establishment of ICTs lowers transportation cost of litigants. However, there is another possibility. For example, if one plaintiff is located in Liaoning province which is near Beijing, and the defendant is

²⁸ This occurs since their small potential gains from litigation will be more likely to dominate the significant decrease in the litigation costs.

²⁹ Compared with the HSPC in Beijing, it will be more convenient for ICTs to access information on litigants, which is beneficial for trial quality (Huang et al., 2017; Wang and Chen, 2019).This local information channel could potentially explain why larger enterprises also benefit from the reform(see columns (4) of Table 2) even when larger enterprises are insensitive to transportation costs.

Sichuan Province, then the establishment of ICTs will *increase* transportation cost of litigants since the plaintiff has to file a lawsuit in Chongqing. To consolidate our results, we replace the dependent variable in equation (1) with the logarithm of the distance (meter) between *plaintiffs* and the *location of the courts* (instead of the distance between ICT and the Supreme Court). Column (9) of Table 2 shows that the distance drops by 205.1%, highlighting the role of transportation cost.

The above result is reasonable. Note that the economic divide between China's prospering southern regions and lagging northern areas has continued to widen during our sample period, with huge implications for inter-province investment. It indicates that business is more likely to take place between two provinces in southern China. Therefore, the probability of the south invest in north is much larger than that the north invests in the south, indicating that the above Liaoning-Sichuan investment pattern is less prevalent in reality.

5.3 The effect of ICT on market segmentation

According to the existing literature (Chen et al., 2007; Chen and Li, 2013; Yin and Cai, 2001), in the past, the market segmentation in China arises from two major sources: underdeveloped infrastructure and local-interest-oriented political institution.³⁰ While the infrastructure has been well improved over the past two decades, the institution has not been efficiently organized to deal with the market segmentation. However, from the very beginning, the ICT is designed to prevent the local government from interfering the market through local judiciary, and further to contribute to the formation of a unified domestic market. Hence, the establishment of ICTs is expected to have impacts on market segmentation.

Therefore, after examining LP, we further study the impacts of ICTs on MS. Consistent with the result in Table 1, column(1) of Table 3 shows that ICTs decrease index of MS by 0.014. Compared with a baseline mean of 0.031 before the reform, this estimate indicates that MS decreases by 45.2% after the reform.

Interestingly, the index of the MS between provinces in the same area decreases

³⁰ In sharp contrast, major sources of market segmentation in Europe are language and currency (Bartz and Fuchs-Schundeln, 2012).

significantly by 0.022. These results are consistent with the breakdown of JLP within the same circuit area (column (4) of Table 4).³¹ Perhaps in reflection of this improvement, China's ranking in the World Bank's Doing Business indicators has improved dramatically since 2013 from approximately the 80th percentile to approximately the 20th percentile in the world distribution of "ease of starting a business."

In contrast, we find that the index of MS among different circuit areas only decreases by 0.005 and is not statistically significant. This may arise from the fact that these cases are out of the jurisdiction of a single ICT. These additional findings lend support to our results that ICTs cannot rectify JLP beyond their circuit area (see column (5) of Table 4).

Table 3 The impact of ICTs on MS: by circuit area

	Market segmentation			Rectification of JLP		
	(1) Baseline	(2) Same area	(3) Different areas	(4) Same area	(5) Different areas	(6) Same province
ICT	-0.014*** (0.004)	-0.022*** (0.005)	-0.005 (0.004)	0.090** (0.035)	0.157 (0.096)	0.077 (0.047)
$X_{i,j,t}$	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs	966	476	490	1815	1465	1458
Adjusted R^2	0.218	0.165	0.327	0.027	0.024	0.031

Note: (1) Standard errors are in parentheses and clustered at the province level. (2) *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

As a robustness check, we extend the previous analysis from the province level to the city level. Specifically, we argue that when both plaintiffs and defendants are within the same province, provincial high courts (PHCs) are sufficiently able to rectify the JLP of lower courts in different cities. We thus could expect that the establishment of ICTs will no longer exert a further effect on these types of cases, which is verified in column (6) of Table 4.

Table 4 The impact of ICTs on MS: By distance

(1)	(2)	(3)	(4)
-----	-----	-----	-----

³¹ We split the sample into three subgroups according to whether plaintiffs and defendants are located in the same province or circuit areas. Specifically, in cases involving multiple plaintiffs or defendants, we define plaintiffs or defendants according to the orders in the judgment, which is believed to undertake the main responsibility of the case.

	Baseline	Distance<500 km	Distance<1000 km	Distance<1500 km
ICT	-0.014*** (0.004)	-0.007 (0.011)	-0.008 (0.006)	-0.012*** (0.005)
$X_{i,j,t}$	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes
Obs	966	182	266	644
Adjusted R^2	0.218	0.232	0.170	0.150

Note: (1) Standard errors are in parentheses and clustered at the province level. (2)*** p<0.01, ** p<0.05, * p<0.1.

Consistent with the results presented in Table 2, Table 4 reports that the effect of ICT on MS appear to be concentrated among provinces whose capitals are located far from the HSPC in Beijing. Specifically, the estimate is statistically insignificant when the distance is less than 500km. As the distance is less than 1000km, the absolute value is slightly larger but is still insignificant. However, when the distance is less than 1500km, the estimate is -0.012 and is significant the 1% level, which supports our JLP results.

6. Robustness test

6.1 Measures of the rectification of JLP

Although the previous literature used the winning probability of plaintiffs as a proxy for the rectification of JLP, authors admit its imperfection. For example, some may view the zero-one measure in the baseline model as inadequate, that is, its value of one may reflect a different extent of winning. It may thus be more accurate to measure JLP as a continuous variable.

Table 5 Alternative measures of the rectification of JLP

	(1)	(2)	(3)
Dep. Var.	Baseline	<i>Judgment Amount Ratio</i>	<i>Defendant Cost Ratio</i>
ICT	0.100** (0.047)	0.118*** (0.042)	0.093* (0.049)
$X_{e,t}$	Yes	Yes	Yes
$X_{c,t}$	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
Province FE	Yes	Yes	Yes
Obs	3513	3022	3411
Adjusted R^2	0.025	0.080	0.053

Note: (1)Standard errors are in parentheses and clustered at the province level. (2)*** p<0.01, ** p<0.05, * p<0.1.

We thus repeat equation (1) using alternative measures of the rectification of JLP and compare these results with the initial estimates in Table 1. Note that the litigation request might does not involve compensation, which will make it impossible to calculate *Judgement Amount Ratio*. To be specific, 491 out of 3513 cases (including 303 contract cases, 89 equity and security cases, 37 property cases, and 62 other cases) are dropped. However, as Table 5 presents, estimates for the *Judgement Amount Ratio* and *Defendant Cost Ratio* are still positive, indicating that plaintiffs receive more support from ICTs. Specifically, compared with a baseline mean of 58(55) percentage points before the reform, the estimates imply that the rectification effect increases by 20.3% (16.9%) , which is similar to our baseline result.

6.2 Data quality

Previously, we include cases published in 2013. However, cases at the early stage may suffer quality bias. To alleviate this concern, we drop all the observations in 2013 and rerun equation (1). Table 6 shows that our results remain significant as those in Table 1, suggesting that the sample in 2013 would not bias our main conclusions.

Table 6 Potential case disclosure problem in 2013

Dep. Var.	Plaintiff Win		
	(1)	(2)	(3)
ICT	0.101** (0.045)	0.101** (0.044)	0.097** (0.048)
$X_{e,t}$	No	Yes	Yes
$X_{c,t}$	No	No	Yes
Time FE	Yes	Yes	Yes
Province FE	Yes	Yes	Yes
Obs	3452	3452	3452
Adjusted R^2	0.006	0.008	0.025

Note: (1) Standard errors are in parentheses and clustered at the province level; (2) *** p<0.01, ** p<0.05, * p<0.1.

6.3 Test of home court bias

Another primary potential threat to our empirical design is the assumption behind those measures. Specifically, we ever interpret the *increase* (rather than the *decrease*) of winning probability as strong evidence of rectification of JLP. The logic behind this interpretation is that plaintiffs must file a case of first instance in the location where the defendants usually reside. Therefore, defendants are more likely to be protected by local

courts than plaintiffs.

It is reasonable to argue that if the logic is true, the rectification effect of ICTs should be smaller when defendants apply for retrials. Consistently, Table 7 shows that the winning probability increases significantly by 21.4 percentage points when plaintiffs apply for retrials, which is more than twice as much as the baseline results. In contrast, the estimate is only 0.014 and statistically insignificant when defendants apply for retrials. These estimates provide us with an additional validation of our research design: defendants suffer less from JLP.

Table 7 The impact of ICTs on the rectification of JLP: By appellant

	(1) Baseline	(2) Plaintiff	(3) Defendant
ICT	0.100** (0.047)	0.214*** (0.075)	0.014 (0.066)
$X_{e,t}$	Yes	Yes	Yes
$X_{c,t}$	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
Province FE	Yes	Yes	Yes
Obs	3513	1281	1732
Adjusted R^2	0.025	0.044	0.018

Note: (1) Standard errors are in parentheses and clustered at the province level. (2)*** p<0.01, ** p<0.05, * p<0.1.

6.4 Potential endogeneity of timing of ICT reform

One major identification challenge with comparing cases initiated in provinces that introduced ICTs with cases initiated in ICTs that did not is the potential endogeneity in the timing of the introduction.³² That is, unobservable regional characteristics related to both ICTs and LP/MS are left in the residual term of the regression, which makes it difficult to draw the correct statistical inferences. For example, ICTs might be introduced earlier in provinces that are experiencing negative economic shocks and therefore need such courts to improve the business environment. Alternatively, ICTs might be introduced first in provinces where local politicians can “afford” to be stricter

³² We would like to argue that this paper is less likely to suffer reverse causality issues. The key reason is that our variable of interest is measured at *national* level while the dependent variable is case outcome at the *micro* level. Therefore, it might be hard to imagine that the outcome of a single case would have effect on macro policies. Likewise, when we analyze the effect of monetary policy on income at the household-level, it is reasonable to assume that monetary policy is exogenous, though it might be endogenous to gross output at the macro-level or household income as a whole. Besides, according to the official documents, JLP is not explicitly viewed as a potential factor for the determination of timing or location of ICTs in official documents.

with local enterprises because the local economy is rapidly growing and can absorb layoffs (e.g., the First Circuit Court inaugurated in Shenzhen city).

Table 8 Determinants of provincial reform timing

	(1)	(2)
<i>ln (GDP Per Capita)</i>	0.120 (0.072)	0.479 (0.730)
<i>GOV-to-GDP Ratio</i>	0.123 (0.083)	-1.353 (2.316)
<i>NE-to-GDP Ratio</i>	0.079 (0.229)	-0.038 (0.265)
<i>Private Employment-to-Total Employment Ratio</i>	0.517 (0.312)	-0.106 (0.855)
Time and Province FEs	No	Yes
Obs	135	135

Note: Standard errors are in parentheses and clustered at the province level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

To test this possibility, we employ a linear probability model and check whether the factors that affect LP/MS (e.g., the GDP per capita, ratio of government expenditures to GDP, ratio of net exports to GDP, and private employment ratio) predict the timing of the establishment of ICTs (Han, 2021). Table 8 shows that the estimates of these variables are insignificant with or without controlling the time and province fixed effects, which indicates that the timing of ICT establishment is arguably exogenous (Dittmar and Meisenzahl, 2020).

6.5 Randomness of location of ICT

Some researchers might challenge that the location of ICT is non-random, which could bias our results. For example, He et al. (2015) point out that the choice of the location of the ICTs might be related to the number, type and distribution of various cases as well as the geographical location, regional area, population, economic and social development level of provinces. If this were true, we would like to argue that our estimate provides a *lower* bound for the rectification effect.

To be specific, we find that economic development level (closely correlated with case number) might be the key driving factor. For example, Xi'an, Shenyang, Shenzhen, is the most developed city in northwest, northeast, south China, respectively. As two exceptions, GDP per capita of Chongqing and Nanjing are much higher than that of most other cities in corresponding areas, they are lower than that of Chengdu or

Shanghai. However, given that an important goal of ICT is to lower plaintiffs' litigation cost and case number of Chongqing or Jiangsu province are much larger than that of Chengdu or Shanghai. The location choice seems to be reasonable.³³

Combine with the common belief that JLP is less severe in developed areas and therefore the rectification effect is lower, we belief that our estimate provides a lower bound.

Table 9 Determinants of location of ICT

Dep. Var.	<i>Whether the prefecture is the resident of ICT</i>					
	Factors of current year		Factors of one year before		Factors of two years before	
	(1)	(2)	(3)	(4)	(5)	(6)
ln(GDP per capita)	0.036** (0.014)	0.014 (0.015)	0.037** (0.016)	0.008 (0.017)	0.042*** (0.016)	0.016 (0.017)
ln(Total number of cases)		0.037*** (0.010)		0.047*** (0.011)		0.042*** (0.010)
ln(Employment)	0.001 (0.003)	-0.001 (0.003)	0.001 (0.003)	-0.002 (0.003)	0.000 (0.003)	-0.002 (0.003)
ln(Government expenditure)	-0.004 (0.004)	-0.002 (0.004)	-0.002 (0.004)	-0.000 (0.004)	-0.002 (0.004)	-0.000 (0.004)
Share of secondary industry employment	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Government expenditure to GDP ratio	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Market segmentation index	-0.277 (1.076)	-0.140 (1.053)	0.129 (0.901)	0.495 (0.874)	0.608 (1.118)	1.383 (1.101)
Obs	271	271	273	273	275	275
Adjusted R ²	0.009	0.052	0.005	0.071	0.010	0.067

Note: (1) *** p<0.01, ** p<0.05, * p<0.1.

6.6 Parallel trend test

A semi-annually frequented event study is conducted to further test the parallel trend hypothesis. To be specific, we set 6 months before the reform as the base period and re-estimate equation (1) as those in Table 1. Moreover, we set the year before the reform as the base period and conduct an event study for market segmentation as those in Table 3. Figure 8 shows that, all the estimates before the reform are not significantly different

³³ To explore the determinants formally, we regress the dummy variable (equals one if a prefecture is the resident of ICT) on the above potential factors (e.g., GDP per capita, employment, government expenditure, employment share of secondary industry, ratio of government expenditure to GDP and MS). Consistent with our hypothesis, Table 9 suggests that economic development and case burden (instead of MS) are indeed the two key driving factors.

from zero, suggesting that the experimental group and the control group share similar trend before the reform.

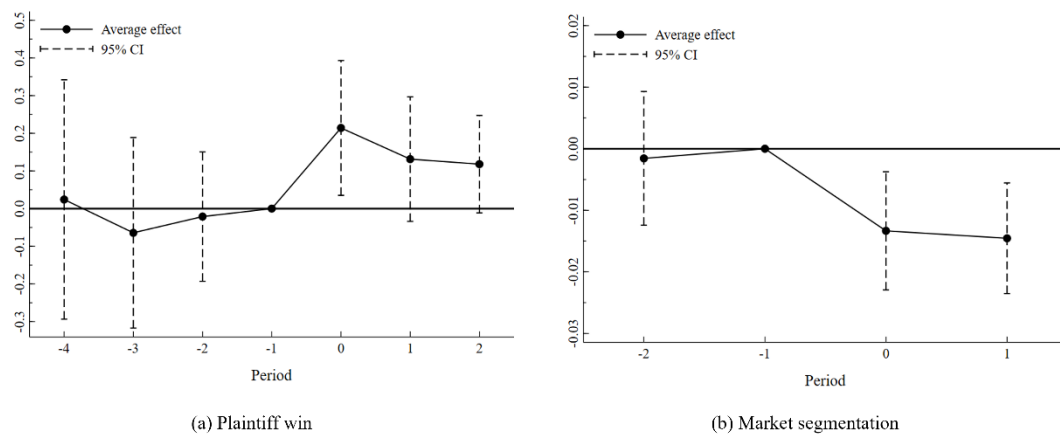


Figure 8 Parallel trend test

6.7 Placebo test of ICTs

If the effect that we measure in Table 1 is truly due to ICTs becoming enforceable, then assigning treatment in other timings should result in estimated effects that are smaller and less precise. The results in Table 9 fit this pattern and give us confidence that the effect that we measure in Section 5 is due to the establishment of ICTs and not to other contemporaneous trends.

Table 10 Placebo test

	(1)	(2)	(3)	(4)
	Two quarters earlier	One quarter earlier	One quarter later	Two quarters later
ICT	0.062 (0.041)	0.044 (0.041)	0.053 (0.039)	0.004 (0.038)
$X_{e,t}$	Yes	Yes	Yes	Yes
$X_{c,t}$	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes
Obs	3513	3513	3513	3513
Adjusted R^2	0.024	0.024	0.024	0.024

Note: (1) Standard errors are in parentheses and clustered at the province level. (2) *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

6.8 The limited role of local information

In Section 5, we argue that the baseline result mainly arises from differential selection into retrial application after the establishment of ICTs. If this were true, we could expect that the baseline estimate would be insignificant when the sample before and after the reform are balanced. We repeat equation (1) using propensity score matching and find that the estimate indeed appears insignificant (see Table 10), indicating that rectification

effect can be wholly explained by changes of sample composition(i.e., an increase of smaller enterprises as plaintiffs) (Basker and Simcoe, 2021).

Table 11 The limited role of local information

	(1)	(2)	(3)	(4)
	One-to-one matching	K-nearest matching	Kernel matching	Radius matching
ICT	0.074 (0.060)	0.066 (0.051)	0.081 (0.050)	0.082 (0.049)
$X_{e,t}$	Yes	Yes	Yes	Yes
$X_{c,t}$	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes
Obs	1326	2630	2679	2679
Adjusted R^2	0.027	0.044	0.036	0.036

Note: (1)Standard errors are in parentheses and clustered at the province level. (2)*** p<0.01, ** p<0.05, * p<0.1.

Moreover, if local information conjecture were the key driver of our baseline results, the enterprises with similar characteristics before and after the reform should also benefit from the improvement of trial quality. However, the above evidence provides suggestive evidence against local information conjecture.

6.9 Deterrent effect

In China, the appeal rate is a key index for promotion of judges (Kinkel and Hurst, 2019). If ICTs do have a rectification effect, we should expect that the lower-level courts may rectify JLP in advance, namely the deterrent effect.

Table 12 Deterrent effect

Dep. Var.	<i>Appeal</i>			
	(1)	(2)	(3)	(4)
β_{post}	-0.021*** (0.008)	-0.018** (0.007)	-0.018** (0.007)	-0.012* (0.009)
$X_{e,t}$	No	Yes	Yes	Yes
$X_{c,t}$	No	No	Yes	Yes
$X_{i,t}$	No	No	No	Yes
Time FE	Yes	Yes	Yes	Yes
Prefecture FE	Yes	Yes	Yes	Yes
Obs	948247	948247	948247	948247
Adjusted R^2	0.012	0.029	0.030	0.030

Note: (1) Standard errors are in parentheses and clustered at the prefecture level; (2) *** p<0.01, ** p<0.05, * p<0.1.

To shed some light on this effect, we replace dependent variable in equation (1) with

Appeal, which equals one if the case is appealed after the first instance.³⁴ Column (1) of Table 11 shows that the appeal rate decreases by 2.1 percentage points. The effects are quantitatively similar in column (2) and column (3) after adding enterprise-level and case-level information, but smaller and less significant (1.2 percentage points) after adding prefecture-level factors (the logarithm of case number). Compared with a baseline mean of 4.2 percentage points before the reform, the estimate indicates that ICTs decrease the appeal probability by 28.57% in basic courts, suggesting that the deterrent effect may exist and our baseline results provide a lower bound in terms of estimating ICTs' real function.

6.10 The impact of ICT on infrastructure improvement

Previously, we study the impacts of ICT on JLP and MS. However, whether ICT reform alleviates MS by weakening JLP, remains unknown. That is, some researchers may concern that ICT could exert its impact through other channels. For example, a thorough investigation of existing literature reveals that China's MS might arise from underdeveloped infrastructure such as dead-end roads (*duantou lu*) among provinces. (Chen et al., 2007; Chen and Li, 2013; Yin and Cai, 2001).

To directly test this possibility, we evaluate whether the establishment of ICTs improves infrastructure. Specifically, we manually collect the prefecture-level high-speed rail opening data and estimate the model shown in equation (3):

$$Connect_{m,i,t} = \theta_{-1}ICT_{i,t+1} + \theta_{post}ICT_{i,t-\tau} + \omega X_{m,t} + \gamma_m + \gamma_t + \varepsilon_{m,i,t} \quad (3)$$

where $Connect_{m,i,t}$ is a dummy variable that equals one if the prefecture m in province i connects to the high-speed railway in year t . $X_{m,t}$ is the prefecture-level control variables including the logarithms of GDP, government expenditure, trade, and population. γ_m and γ_t are prefecture and time fixed effects, and $\varepsilon_{m,i,t}$ is the random error term. If the establishment of ICTs facilitated the high-speed rail connection, θ_{post} would be positive and significant.

Moreover, in the spirit of Wan and Long (2020), we manually identify dead-end roads completed and open to traffic between provinces from 2013 to 2019. We then estimate the model in equation (4):

$$DEroad_{i,t} = \theta_{-1}ICT_{i,t+1} + \theta_{post}ICT_{i,t-\tau} + \rho X_{i,t} + \gamma_i + \gamma_t + \varepsilon_{i,t} \quad (4)$$

³⁴ Due to data availability, we focus on cases in Guangdong and Zhejiang.

where $DE_{road_{i,t}}$ represents either the number of opened dead-end road or the length of opened dead-end road. $X_{i,t}$ is the province-level control variables including the logarithms of GDP, government expenditure, trade, and population. γ_i and γ_t are province and time fixed effects, and $\varepsilon_{i,t}$ is the random error term. Similarly, if the establishment of ICTs facilitated the opening of dead-end road, θ_{post} would be positive and significant.

We also replace the dependent variable in equation (4) with logarithms of the length of railway, road, and waterway in each province. As shown in Table 13, all these estimates are not significantly different from zero, consolidating our results that ICT exerts its impact on MS through LP.

Table 13 The impact of ICTs on infrastructure between and within provinces

Dep. Var.	(1) <i>Connect to high-speed rail</i>	(2) <i>The number of opened dead-end road</i>	(3) <i>The distance of opened dead-end road (km)</i>	(4) <i>ln(railway)</i>	(5) <i>ln(road)</i>	(6) <i>ln(waterway)</i>
ICT	-0.014 (0.027)	0.045 (1.383)	-34.032 (27.301)	0.020 (0.034)	-0.018 (0.019)	-0.006 (0.005)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	No	Yes	Yes	Yes	Yes	Yes
Prefecture FE	Yes	No	No	No	No	No
Obs	2037	217	217	217	217	189
Adjusted R^2	0.757	0.127	0.151	0.992	0.998	1.000

Note: (1) Standard errors are in parentheses. Column (1) is clustered at the prefecture level, and column (2)- (6) are clustered at the province level.
(2) *** p<0.01, ** p<0.05, * p<0.1.

7. Concluding remarks

Along with the unprecedented development in infrastructure in China, institutional barriers such as JLP have become increasingly more important obstacles to building a unified market. This paper first examines the impact of a judicial reform that separates jurisdiction areas from local administrative authorities, which is hotly debated to have the potential to break through market barriers among provinces.

Specifically, we exploit disaggregated and detailed administrative data on trial records of the SPC and report three main findings. First, the establishment of ICTs significantly rectifies the JLP of lower-level courts. Second, since small and private enterprises are more sensitive to transportation costs, the establishment of ICTs

increases their probability of applying for retrials after local trials. Combined with the fact that small and private enterprises are more likely to suffer from JLPs, the rectification impact of ICTs (compared with the HSPC) increases. Third, ICTs have shortcomings in terms of coordinating cases among different circuit areas. That is, MS only decreases between provinces within the same circuit, and MS between provinces of different circuit areas barely changes. Research studying China's political economy has, up to now, largely focused on governors or mayors. Our work shifts the focus to the role of judiciaries and contributes to the burgeoning literature on understanding relationship between China's governance system and its economy.

Our paper sets a rich research agenda to examine the additional impacts of ICTs. Typically, a more efficient and independent judicial system can promote local economic development in other ways (including firm entry, an increase in the average firm productivity or market shares of more productive sector at city level). In addition, a glimpse of newspapers reveals that with the establishment of ICTs, the probability of nonlocal enterprises winning in local governments also increases. However, exploiting all consequences of ICTs as thoroughly as possible is beyond the scope of this paper, and we leave such examination for further study.

Reference

Acemoglu, Daron, et al. 2020. "Trust in state and nonstate actors: Evidence from dispute resolution in Pakistan." *Journal of Political Economy*, 128(8): 3090-3147.

Bai, Chong-en, Chang-Tai Hsieh, and Zheng Song. 2019. "Special Deals with Chinese Characteristics." *NBER Macroeconomics Annual*, 34: 341-79.

Barwick, Panle Jia, Shengmao Cao, and Shanjun Li. 2021. "Local Protection, Market Structure, and Social Welfare: China's Automobile Market." *American Economic Journal: Economic Policy*, forthcoming.

Basker, Emek and Timothy Simcoe. 2021. "Upstream, Downstream: Diffusion and Impacts of the Universal Product Code." *Journal of Political Economy*, 129(4): 1252-86.

Behrer, Patrick, Edward Glaeser, Giacomo Ponzetto, and Andrei Shleifer. 2021. "Securing

Property Rights.” *Journal of Political Economy*, forthcoming.

Bhattacharya, Utpal, Neal Galpin, and Bruce Haslem. 2007. “The home court advantage in international corporate litigation.” *The Journal of Law and Economics*, 50(4): 625-660.

Bartz, Kevin, and Nicola Fuchs-Schundeln. 2012. “The role of borders, languages, and currencies as obstacles to labor market integration.” *European Economic Review*, 56: 1148-1163.

Chen, Min, Qihan Gui, Ming Lu, and Zhao Chen. 2007. “How to Maintain China’s High Growth Rate via Scale Economy. An Empirical Study of Economic Opening and Domestic Market Segmentation.” *China Economic Quarterly*, 7(1): 125-50.

Cao, Guangyu and Chenran Liu and Li-An Zhou. 2021. “Suing the Government Under Independent Jurisdiction: Evidence from Administrative Litigation Reform in China.” Available at SSRN: <https://ssrn.com/abstract=3986268>.

Chen, Min, Qihan Gui, Ming Lu, and Zhao Chen. 2007. “How to Maintain China’s High Growth Rate via Scale Economy-An empirical study of economic opening and domestic market segmentation.” *China Economic Quarterly*, 7(1): 125-150.

Chen, Gang, and Shu Li. 2013. “Judicial Independence and Market Fragmentation—Evidence from the Geographical Rotation of Judges in China.” *Economic Research Journal*, 9: 30-42.

Dittmar, Jeremiah E., and Ralf R. Meisenzahl. 2020. “Public goods institutions, human capital, and growth: Evidence from German history.” *The Review of Economic Studies* 87(2): 959-996.

Donaldson, Dave. 2018. “Railroads of the Raj: Estimating the Impact of Transportation Infrastructure.” *American Economic Review*, 108(4-5): 899–934.

Donaldson, Dave, and Richard Hornbeck. 2016. “Railroads and American Economic Growth: A “Market Access” Approach.” *The Quarterly Journal of Economics*, 131(2): 799–858.

Djankov, Simeon, Edward Glaeser, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer. 2003. “The New Comparative Economics.” *Journal of Comparative Economics*, 31(4): 595-619.

Eyer, Jonathan, and Matthew Kahn. 2017. “Prolonging Coal’s Sunset: The Causes and Consequences of Local Protection for a Declining Polluting Industry,” National Bureau of Economic Research (NBER) Working Paper 23190.

Fajgelbaum, Pablo, Eduardo Morales, Juan Carlos Suárez Serrato, and Owen Zidar. 2019. “State Taxes and Spatial Misallocation.” *The Review of Economic Studies*, 86(1): 333-76.

Faber, Benjamin. 2014. "Trade Integration, Market Size, and Industrialization: Evidence from China's National Trunk Highway System." *The Review of Economic Studies*, 81(3): 1046-70.

Firth, Michael, and W. U. Wenfeng. "Judicial Local Protection and Home Court Bias in Corporate Litigation." *Corruption and Fraud in Financial Markets: Malpractice, Misconduct and Manipulation*. Wiley, 2020. 541-582.

Firth, Michael, Oliver M. Rui, and Wenfeng Wu. 2011. "The effects of political connections and state ownership on corporate litigation in China." *The Journal of Law and Economics*, 54(3): 573-607.

Gennaioli, Nicola and Andrei Shleifer. "Judicial Fact Discretion." *The Journal of Legal Studies*, 37(1): 1-35.

Gratton, Gabriele, et al. "From Weber to Kafka: Political instability and the overproduction of laws." *American Economic Review* 111.9 (2021): 2964-3003.

Han, Yi. 2021. "Administrative Barriers, Market Integration and Economic Growth: Evidence from China." Working Paper.

Head, Keith, and Thierry Mayer. 2019. "Brands in Motion: How Frictions Shape Multinational Production." *American Economic Review*, 109 (9): 3073-124.

Huang, Zhangkai, Lixing Li, Guangrong Ma, and Lixin Colin Xu. 2017. "Hayek, Local Information, and Commanding Heights: Decentralizing State-Owned Enterprises in China." *American Economic Review*, 107 (8): 2455-78.

Huang, Jun, Yu Zhao, Danqi Hu, and Xinyuan Chen. 2021. "Judicial Improvement and Corporate Investment—Empirical Analysis on the Establishment of Circuit Court." *China Economic Quarterly*, 21(5):1521-1544.

He, Xiaorong, Fan He, and Yuanjie Ma. 2015. "Understanding and Application of the Provisions of the Supreme People's Court on Several Issues concerning the Trial of Cases by Circuit Courts." *People Court Newspaper* (in Chinese), Jan.29, section 5.

Ip Eric, and Kelvin Kwok. 2017. "Judicial Control of Local Protection in China: Antitrust Enforcement Against Administrative Monopoly on the Supreme People's Court." *Journal of Competition Law & Economics*, 13(3): 549-75.

Kinkel, Jonathan and William Hurst. 2015. "The Judicial Cadre Evaluation System in China: From Quantification to Intra-state Legibility." *The China Quarterly* 224: 933-954.

Kostka, Genia, and Jonas Nahm. 2017. "Central-local Relations: Recentralization and Environmental Governance in China." *The China Quarterly* 231: 567-582.

Li, Bo, and Jacopo Ponticelli. 2020. "Going Bankrupt in China." National Bureau of Economic Research (NBER) Working Paper 27501.

Long, Xiaoning, and Jun Wang. 2015. "Judicial Local Protection in China: An Empirical Study of IP Cases." *International Review of Law and Economics*, 42: 48-59.

Li, Hongbin, and Li-An Zhou. 2005. "Political Turnover and Economic Performance: The Incentive Role of Personnel Control in China." *Journal of Public Economics*, 89(9-10): 1743-62.

Liu, Nanping, and Michelle Liu. 2008. "Trick or Treat: Legal Reasoning in the Shadow of Corruption in the People's Republic of China." *North Carolina Journal of International Law and Commerical Regulation*, 34: 179-261.

Lu, Haitian, Hongbo Pan, and Chenying Zhang. 2015. "Political Connectedness and Court Outcomes: Evidence from Chinese Corporate Lawsuits." *Journal of Law and Economics*, 58(4): 829-61.

Liu, Zhuang, T.J. Wong, Yang Yi, and Tianyu Zhang. 2022. "Authoritarian Transparency: China's Missing Cases in Court Disclosure." *Journal of Comparative Economics*, 50(1): 221-239.

La Porta, Rafael, Florencio Lopez-de-Silanes, and Andrei Shleifer. 2008. "The Economic Consequences of Legal Origins." *Journal of Economic Literature*, 46 (2): 285-332.

Mehmood, Sultan. 2021. "Judicial Independence and Development: Evidence from Pakistan." *Review of Economic Studies*, forthcoming.

Robinson, Amanda Lea. 2016. "Internal Borders: Ethnic-based market segmentation in Malawi." *World Development* 87: 371-384.

Storeygard, Adam. 2016. "Farther on down the Road: Transport Costs, Trade and Urban Growth in Sub-Saharan Africa." *The Review of Economic Studies*, 83(3): 1263-95.

Wang, Yuhua. 2013. "Court Funding and Judicial Corruption in China." *The China Journal*, 69: 43-63.

Wang, Yueduan. 2021. "Detaching Courts from Local Politics? Assessing the Judicial Centralization Reforms in China." *China Quarterly*, forthcoming.

Wang, Zhiqiong, and Jianfu Chen. 2020. "Will the Establishment of Circuit Tribunals Break Up the Circular Reforms in the Chinese Judiciary?" *Asian Journal of Comparative Law*, 14: 91-112.

Wan, Wei and Xiaoning Long. 2020. “Detour Effect on Economic Growth? – An empirical Investigation of Secondary Road Charge Cancellation”. *China Economic Quarterly* (in Chinese) 19(03): 897-912.

Xu, Chenggang. 2011. “The Fundamental Institutions of China's Reforms and Development.” *Journal of Economic Literature*, 49 (4): 1076-151.

Young, Alwyn. 2000. “The Razor’s Edge: Distortions and Incremental Reform in the People's Republic of China.” *The Quarterly Journal of Economics*, 115(4): 1091-1135.

Yin, Wenquan, and Wanru Cai. 2001. “The Genesis of Regional Barriers in China’s Local Market and Countermeasures.” *Economic Research Journal*, 6: 1-12.

Zhang, Yafeng, Antonio Crupi and Alberto Di Minin. 2020. “Pursuing Justices or Protecting Local Firms? Shenzhen Courts Move beyond Judicial Local Protection.” *R&D Management*, 50(5): 614-30.

Zhang, Qi, Zhi Yu, and Dongmin Kong. 2019. “The Real Effect of Judicial institutions: Environmental Courts and Firm Environmental Protection Expenditure.” *Journal of Environmental Economics and Management*, 98: 102254.

Appendix

A Construction of the index of MS.

First, for province i and neighboring province j , we define $\Delta Q_{i,j,t}^k$ as the relative inflation of good k across the two provinces in year t (see equation (A1)). It is noteworthy that if transportation costs are believed to be constant in the short run, then this type of trade barrier is cancelled out and no longer exists in $\Delta Q_{i,j,t}^k$.

$$\Delta Q_{i,j,t}^k = \ln(P_{i,t}^k/P_{j,t}^k) - \ln(P_{i,t-1}^k/P_{j,t-1}^k) = \ln(P_{i,t}^k/P_{i,t-1}^k) - \ln(P_{j,t}^k/P_{j,t-1}^k) \quad (A1)$$

Second, we condition $|\Delta Q_{i,j,t}^k|$ on the nationwide good-specific prices to isolate the variation of MS.³⁵ Specifically, the variance of $q_{i,j,t}^k$ (see equation (A2)) across different goods reflects the degree of market segmentation(i.e., $Seg_{i,j,t}$).

³⁵To avoid reversing the sign as induced by the order of province i and province j , we employ its absolute value hereafter(i.e., $|\Delta Q_{i,j,t}^k|$).

$$|\Delta Q_{i,j,t}^k| = \beta |\overline{Q_t^k}| + q_{i,j,t}^k \quad (\text{A2})$$

B Sequential controls

Table A1 The impact of ICTs on rectifying JLP with sequential controls

Dep. Var. <i>Plaintiff Win</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ICT	0.104** (0.045)	0.104** (0.044)	0.104** (0.044)	0.103** (0.043)	0.100** (0.047)	0.101** (0.047)	0.103** (0.048)
Enterprise as plaintiff		-0.017 (0.025)	-0.027 (0.025)	-0.030 (0.025)	-0.030 (0.025)	-0.035 (0.028)	-0.036 (0.028)
Enterprise as defendant			0.057** (0.021)	0.057** (0.021)	0.053** (0.021)	0.053** (0.021)	0.080*** (0.023)
Number of plaintiffs				-0.010** (0.004)	-0.010** (0.004)	-0.010** (0.004)	-0.011** (0.004)
Number of defendants					0.030*** (0.005)	0.031*** (0.005)	0.030*** (0.005)
Whether the case is revised							
ln(The length of judgement text)							
ln(The number of law articles cited)							
SOE as plaintiff							
SOE as defendant							
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Plaintiff industry FE	No	No	No	No	No	Yes	Yes
Defendant industry FE	No	No	No	No	No	No	Yes
Judge FE	No	No	No	No	No	No	No
Type FE	No	No	No	No	No	No	No
Obs	3513	3513	3513	3513	3513	3513	3513
Adjusted R^2	0.006	0.006	0.008	0.009	0.025	0.024	0.028

Note: (1) Standard errors are in parentheses and clustered at the province level; (2) *** p<0.01, ** p<0.05, * p<0.1.

Table A1 The impact of ICTs on rectifying JLP with sequential controls (continued)

Dep. Var. <i>Plaintiff Win</i>	(8)	(9)	(10)	(11)	(12)	(13)	(14)
ICT	0.109** (0.048)	0.093** (0.045)	0.112** (0.041)	0.112** (0.041)	0.108** (0.042)	0.122** (0.049)	0.130** (0.049)
Enterprise as plaintiff	-0.042 (0.028)	-0.057* (0.029)	-0.064** (0.028)	-0.063** (0.028)	-0.062** (0.028)		
Enterprise as defendant	0.077*** (0.026)	0.059** (0.026)	0.055** (0.026)	0.056** (0.026)	0.055** (0.026)	0.045 (0.034)	

Number of plaintiffs	-0.013*** (0.004)	-0.011*** (0.003)	-0.010*** (0.003)	-0.009*** (0.003)	-0.010*** (0.003)	-0.027** (0.010)	-0.033*** (0.010)
Number of defendants	0.028*** (0.006)	0.028*** (0.006)	0.025*** (0.005)	0.026*** (0.005)	0.024*** (0.005)	0.023*** (0.006)	0.020*** (0.006)
Whether the case is revised			-0.197*** (0.023)	-0.198*** (0.023)	-0.195*** (0.023)	-0.219*** (0.025)	-0.233*** (0.027)
ln(The length of judgement text)				-0.023 (0.025)	-0.036 (0.025)	-0.035 (0.027)	-0.048 (0.029)
ln(The number of law articles cited)					0.052*** (0.013)	0.054*** (0.015)	0.063*** (0.015)
SOE as plaintiff						0.096*** (0.028)	0.112*** (0.027)
SOE as defendant							-0.086** (0.036)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Plaintiff industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Defendant industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Judge FE	No	Yes	Yes	Yes	Yes	Yes	Yes
Type FE	No	No	Yes	Yes	Yes	Yes	Yes
Obs	3509	3509	3506	3506	3506	2677	2360
Adjusted R^2	0.040	0.053	0.080	0.081	0.085	0.094	0.109

Note: (1) Standard errors are in parentheses and clustered at the province level; (2) *** p<0.01, ** p<0.05, * p<0.1.