Economics of Transition and Institutional Change

WILEY

ECONOMICS OF TRANSITION AND INSTITUTIONAL CHANGE

ORIGINAL ARTICLE

Supply-Induced Litigation and the Role of Informal Institutions

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Received: 9 April 2025 | **Revised:** 18 November 2025 | **Accepted:** 28 December 2025

Keywords: informal institution | legal profession | litigation | supplier-induced demand

ABSTRACT

Access to legal services is argued to be an integral part of inclusive growth. This paper examines how litigation demand responds to an increased supply of legal professionals, that is, supply-induced litigation, in a developing economy using a newly constructed city-level panel dataset of litigation rate, law firms and socioeconomic variables from China throughout 2013–23. Our empirical analysis reaches several conclusions. We find that an increase in the number of law firms has a positive and significant effect on the litigation rate, which supports supply-induced litigation. This result is robust to the instrument variable (IV) estimation and several robustness checks. Further, we find that the supply-induced litigation potentially attributes to a better matching between lawyers and clients. Finally, we find that supply-induced litigation is more pronounced for cities with higher social trust. In other words, formal and informal institutions, such as social trust, are complementary in driving the use of the judicial system.

JEL Classification: J41, P37

1 | Introduction

Access to legal services has long been an issue in many economies worldwide. Four billion people around the world still live without adequate legal protection, mostly due to social marginalisation and the lack of available, affordable legal services (OECD 2016). Thus, it is imperative to expand the supply of legal services to people in developing economies. However, the poor population may lack the understanding of the judicial process, lack the awareness of using lawyers for representation and lack the direct and indirect resources to use legal services. The existing evidence on how the use of judicial institutions responds to an increased supply of legal services from developed economies may not carry over to the setting of developing economies.

To fill the void of our understanding, we examine how litigation demand responds to an increased supply of legal services in a large developing economy, China. We use China as our research setting because, such as other developing economies, it has a weak institutional quality according to the Worldwide Governance Indicator developed by the World Bank. Informal institutions play an active role in shaping human behaviours in developing economies in which formal institutions are weak (North 1990). In our context, the weak institutional quality in China may impose friction for lawyers and clients entering into a transaction. The informal institution is expected to provide a means to mitigate such friction. Thus, China provides a unique setting for exploring how informal institution shape the relationship between litigation demand and the supply of legal services.

We begin our analysis by developing the hypotheses of supply-induced litigation, that is, how litigation demand responds to an increased supply of legal services. We propose a theoretical framework centred on two mechanisms through which legal

supply may induce litigation demand. First, a competition effect: an increased supply of legal services intensifies market competition, leading to lower prices and more active outreach and legal education. This reduces costs and informs potential clients about the feasibility of legal action. Second, a matching effect: a thicker market increases the probability that a client can find a suitable and trustworthy legal representative. However, this matching effect is not automatic; it is contingent on the presence of mechanisms that reduce information asymmetry.

This is where institutions, both formal and informal, become critical. We argue that the strength of market-intermediating mechanisms (e.g., licencing, online review, regulatory oversight) and informal institutions (e.g., social trust) determines the matching effect. When these institutions are strong, an increase in supply of legal services translates into more litigation as clients are confident in legal services. When these institutions are weak, market noise and persistent distrust may dampen the positive relationship.

We then test this framework with a newly constructed dataset across Chinese cities from 2013 to 2023. We employ the litigation rate of civil cases to measure litigation demand and the number of law firms to measure the supply of legal services. In our empirical analysis, we estimate a panel data model and find that more law firms in a city lead to a higher litigation rate. Specifically, a 10% increase in law firms brings about almost 6% increase in litigation rate, supporting the supply-induced litigation hypothesis. We also find the supply-induced litigation potentially attributed to a better matching between lawyers and clients.

However, there is an empirical challenge that cities experiencing higher and lower rates of litigation are different from each other in various dimensions and such differences in city characteristics (potentially unobserved) may affect the number of law firms. Thus, the supply of legal services in the empirical model of litigation is endogenous. We employ the spatial distribution of law schools in a historical context to explore exogenous variation in the number of law firms across cities in current time. Specifically, we constructed an instrumental variable (IV) using the distance of each city from the three closest law schools back in 1992. The idea of our IV is that the proximity to law school promotes the establishment of law firms back in 1992. Then, the spatial distribution of law firms in 1992 partially persists into the current time. Encouragingly, our results are robust to the use of IV estimation.

To validate our IV, we conduct several robustness checks. First, we include city-specific time trends to capture any unobserved city-level characteristics that cause litigation to trend linearly over time. The result is consistent with the positive baseline effect. We then conduct two placebo tests to: we examine whether our IV predicts litigation levels in the pre-treatment year 2012 and construct a placebo sample of cities that are mainly agricultural with little demand for specialised legal services. We find that the IV is uncorrelated with pre-treatment litigation levels and is not effective in agricultural cities. This test thus rejects alternative explanations in which the instrument influences litigation through unobserved pathways.

Finally, we explore the heterogeneous effects of supply-induced litigation driven by local informal institutions. We focus on three aspects of the informal institutions at the city level: social trust, language diversity and religion. We find that the supply-induced litigation is more pronounced in cities with higher levels of social trust and lower levels of ethnic diversity whereas religiosity does not significantly impact this positive relationship. Law firms serve as formal institutions to provide legal services. Interestingly, our result highlights the complementarity between formal and informal institutions in promoting the use of the judicial system. Informal institutions reduce the friction between lawyers and clients engaging in a transaction.

Our work contributes to the literature on supply-induced litigation. Earlier studies show mixed evidence. On one hand, some studies find a positive relationship, including Hanssen (1999) and Do et al. (2023) in the United States of America and Ginsburg and Hoetker (2006) in Japan[1]. On the other hand, some find no relationship, such as Posner (1997) in the United States of America and England and Clemenz and Gugler (2000) in Austria. Recent studies focus on the endogeneity issue of the supply of legal services in the empirical model of litigation and employ instrumental variable (IV) methodology. This group of studies includes Carmignani and Giacomelli (2010), D'Agostino et al. (2012), Buonanno and Galizzi (2014), Mora-Sanguinetti and Garoupa (2015) and Bielen and Marneffe (2018). They all find support for the supply-induced litigation.

Our work contributes to the literature in three aspects. First, our work extends the existing literature by exploring the mediating roles of informal institutions in supply-induced litigation. Informal institutions are shown to be crucial to determine economic and firm performance (see Williamson [2009] as an example). We add to the literature by showing that better informal institutions can reduce friction for transacting parties engaging with each other in the context of legal services. Second, given that the previous studies focus on developed economies, such as Europe, Italy, Japan, Spain and the U.S., we extend the empirical evidence of supply-induced litigation to a large developing economy, China. Such extension is important because, as we argued before, the evidence from developed economies may not carry over to developing economies because of their weak institutional quality.

This paper is structured as follows. Section 2 develops several testable hypotheses. Section 3 presents descriptive analysis and empirical methodology. Section 4 reports the main empirical results and robustness checks. Section 5 provides additional analyses. Section 6 concludes.

2 | Hypothesis Development

In this section, we discuss the relationship between the supply of legal services and litigation rates. We then propose two hypotheses.

2.1 | Legal Services Supply and Litigation Rates

Information asymmetry is a cause of the inadequate use of lawyers. Lawyers' interests are not perfectly aligned with those of their clients; consequently, they may increase income by encouraging clients to pursue litigation even when a favourable outcome is unlikely (Cooter and Rubinfeld 1989; Dana and Spier 1993). As a result, litigation demands may not be met because clients do not find the lawyers they encounter to be trustworthy.

An increased supply of lawyers generates two effects on litigation rate: the competition effect and matching effect. First, more lawyers lead to stronger competition in the legal services market. It lowers the lawyer fees and hence encourages more clients to have lawyers for representation (Carmignani and Giacomelli 2010)[2]. Second, with more lawyers available, it is more likely that clients can find a suitable lawyer to represent them. Nonetheless, whether the matching effect can be realised or not depends on the strength of market intermediating mechanisms, M. These mechanisms include institutional factors (e.g., licencing, ethics enforcement, regulatory oversight) and market signals (e.g., online reviews, professional referral networks)[3]. M functions to reduce information asymmetry between lawyers and their clients.

Figure 1 plots the relationship between the litigation demand (D, y-axis) and lawyer supply (S, x-axis), conditional on M. The steeper line (M_{Strong}) represents a regime with low information asymmetry, where M is strong. Clients can observe lawyer quality and can more easily find their lawyers when the supply of lawyers increases. The positive relationship between litigation demand and lawyer supply is a result of both competition effect and matching effect. The flatter line (M_{Weak}) represents a regime with high information asymmetry, where M is weak. Clients do not have good information to assess an increased supply of lawyers; thus the matching effect plays a weaker role in this case. Although M likely alters the strength of how legal services affect litigation, it does not affect the direction of impact. Based on the above discussion, we propose the following hypothesis:

H1. *An increased supply of legal services leads to a higher rate of litigation.*

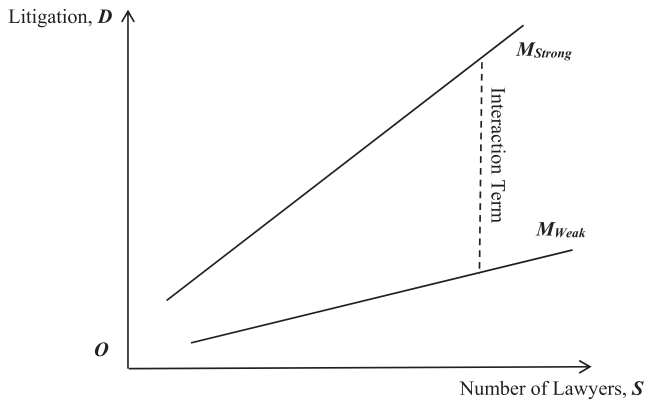

FIGURE 1 | Supply-litigation relationship. The figure is made by the authors. The x-axis denotes the supply of lawyers, and the y-axis represents the litigation demand.

2.2 | The Role of Informal Institutions

Given that information asymmetry between lawyers and clients is a cause for inadequate use of litigation, an increased supply of lawyers is expected to have a more pronounced increase in the use of lawyers when there is less information asymmetry between lawyers and clients. Existing literature suggests that informal institutions are the foundation of social order (North 1990). The stronger informal institution provides guidelines and norms to human behaviours, which in turn increases trust and hence reduces information asymmetry among people. In our context, informal institutions facilitate more transactions between lawyers and clients when there is an increase in the supply of lawyers.

The informal institution that we examine is social trust. Social trust promotes community norms, which help limit opportunistic behaviour (Coleman 1988), constrain self-interest (Knack and Keefer 1997) and overcome the free rider problem (Guiso et al. 2011). Previous studies find that social trust promotes financial activity (Guiso et al. 2004), government performance and economic growth (Putnam 1993; La Porta et al. 1997), international trade and development (Guiso et al. 2009), and corporate M&A activity (Ahern et al. 2015).

Although most literature connects social trust to macroeconomic outcomes, we apply it to the lawyer-client context, where clients are often less informed about the quality, effort and integrity of a lawyer, leading to adverse selection and moral hazard problems. Specifically, clients struggle to identify high-quality lawyers, which discourage transactions and fear that lawyers will shirk effort or engage in opportunistic billing and case-prolonging behaviours. Although social trust is the generalised trust in society, it also affects lawyers as they are accountable to society's ethical standard (Xia et al. 2021). A society with a higher level of social trust creates an atmosphere of honesty and adherence to social norms.

In a society with higher social trust, this informal institution acts as a substitute for formal institutions (Chan and Du 2022). On the client side, they are more likely to assume lawyers will hold integrity to their professional practices and ethical standards, reducing their perceived risk of opportunism and thereby increasing their willingness to transact. It mitigates adverse selection. On the lawyer side, they are more incentivised to adhere to their professional practices and ethical standards because violating the social norm carries a higher reputational cost (Coleman 1988). It mitigates moral hazard. Lawyers and their clients are more likely to be matched into a transaction in a society with a higher level of social trust because the problem of information asymmetry is less severe.

However, social trust may encourage informal dispute resolution before a formal lawsuit is filed, as people are more cooperative and willing to compromise informally, thus reducing the need for litigation. It is the direct effect of social trust on litigation, but it is different from our focus. Our focus is on the successful match between lawyers and their clients once the clients decide to pursue legal services. In other words, we focus on the interaction between social trust and supply of legal services.

Overall, when institutional quality is low, formal institutions, such as licencing and market signals, play a limited role in facilitating transactions between lawyers and their clients. High social trust substitutes formal institutions to facilitate the matching between lawyers and their clients. In this case, it resembles the case of M_{Strong} as illustrated in Figure 1. In contrast, a society with low social trust does not have an alternative market intermediation mechanism to substitute formal institutions. In this case, it resembles the case of M_{Weak} as illustrated in Figure 1. Therefore, we propose the following hypothesis:

H2. *The positive relationship between litigation demand and supply of legal services is stronger in cities with stronger social trust.*

3 | Empirical Strategy

This section presents the data and empirical method used to test our hypotheses. Our empirical analysis is based on prefecture city-level panel data over the period 2013–2023. The dataset is compiled with information from various sources. Our final data includes 284 cities, resulting in 3112 observations. Table 1 reports the variable definitions and descriptive statistics.

3.1 | Variable Definitions

Dependent Variable: Following the literature, we use the litigation rate to measure the demand for legal services. We manually collect the number of closed litigations on civil cases from China Judgements Online at the city-year level. We measure the litigation rate with the number of closed cases[4]. On average, a city has about 10,827 litigation cases in a year.

Key Explanatory Variable: The key explanatory variable in the supply of legal services is measured by the number of law firms[5]. The number of law firms for each city-year is manually collected from www.Qcc.com (or Qichacha as a mobile application), which shares the same database as the State Administration for Industry and Commerce (SAIC). For each year, SAIC lists all registered law firms (as well as other commercial organisations) and their location information. The mean value of the logarithm of the number of law firms (*Law Firms*) is 3.94, which corresponds to about 103 law firms on average for a city in a year.

Informal Institutions: We mainly employ social trust to represent informal institutions. We use the China City Commercial Environment Credit Index (*CEI*) to measure social trust in different cities. The *CEI* index is obtained from the '2013 China City Business Credit Environment Index Blue Book,' which is edited by the China Business Credit Environment Index Research Group. It is calculated based on the data from the previous year (March 2012–March 2013) through multidimensional comparative data analysis[6,7]. The index, ranging from 0 to 100, measures the credit environment with seven dimensions, such as credit release, credit investigation market and government credit supervision. The higher the value, the better the credit environment of the city. We consider that a better credit environment can foster greater social trust in the local community. Table 1 presents the summary statistics for the *CEI* index, with a mean value of 72.25. This suggests that cities with a *CEI* score above 72.25 are characterised by a good credit environment.

Control Variables: We follow the previous studies to include a set of control variables that may drive the litigation rate. The first set of variables relates to demographics, such as population. The second set of variables relates to the economy, including GDP growth rates, the secondary industry as a percentage of GDP and the tertiary industry as a percentage of GDP. All

TABLE 1 | Variable definition and descriptive statistics.

Variable	Definition	Observation	Mean	SD	Min	Max
Outcome variable						
Litigation	Log of the number of litigation cases	3112	8.599	1.331	1.792	12.14
Key explanatory variable						
Law firm	Log of the number of law firms	3112	4.034	0.981	1.792	8.325
Informal institutions						
CEI	Commercial environment credit index	3112	72.25	3.321	62.32	86.06
ELF	Dialect diversity	2749	0.289	0.230	0.001	0.778
Buddhist	Number of buddhist temple	3112	98.09	161.2	0	1434
Taoist	Number of taoist temple	3112	27.35	77.05	0	1031
Control variables						
Population	Log of the number of inhabitants per 10,000	3112	5.892	0.704	2.996	8.136
GDP growth	GDP growth rates	3112	0.066	0.040	−0.506	1.090
Secondary sector	Log of secondary sectors as percentage of GDP	3112	0.357	0.077	0.101	0.584
Tertiary sector	Log of tertiary sectors as percentage of GDP	3112	0.371	0.068	0.152	0.614

Note: Table 1 reports the mean, standard deviation, minimum and maximum values of the variables used in the regressions. Specifically, we take the log of the percentage of the secondary sector and tertiary sector (each plus 1) because these two variables range from 0 to 1.

control variables are time-varying at the city level. We collect this set of variables from the China City Statistic Yearbook[8].

Turning first to the demographic variables. The inclusion of population is because there is a market size effect of litigation. A larger size of the population may induce more conflict and increase litigation rates (Bielen and Marneffe 2018).

Turning to the economic variables. We follow previous work to include the GDP growth rate, as a proxy of the economic cycle, as a determinant of litigation rate (Bielen and Marneffe 2018). Since the industrial structure varies across Chinese cities, the demand for litigation is different across cities because of the sophistication of their local industries. Thus, we include the industrial structure as the control variable.

3.2 | Descriptive Analysis

Based on the construction of the dependent variable, the log of the number of closed cases and the independent variable, the log of the number of law firms, we plot the relationship between these two variables at the city level. Figure 2 illustrates this relationship, revealing two key findings. Firstly, a positive linear relationship exists between the number of closed cases and the number of law firms. Secondly, cities such as Beijing, Shanghai, Shenzhen and Chongqing have a higher number of law firms and greater litigation demand, whereas cities such as Jinchang, Lincang, Lijiang and Hebi have fewer law firms and lower litigation demand.

Figure 3 presents the four-dimensional bubble plot of the informal institutions. *Y*-axis shows the distribution of *CEI* scores, with cities such as Beijing, Shanghai and Shenzhen having higher *CEI* scores, indicating stronger social trust environments. In comparison, cities such as Hebi have lower *CEI* scores, suggesting weaker social trust environments.

Overall, we can see that there is significant heterogeneity in informal institutions across Chinese cities, which suggests that the impact of law firms on litigation may vary depending on the level of informal institutions.

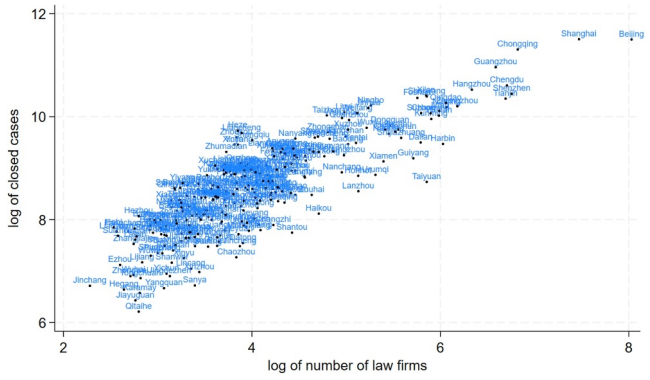

FIGURE 2 | Relationship between law firms and litigation. This figure shows the relationship between law firms and litigation. The *x*-axis denotes the average of the log of the number of law firms by city and the *y*-axis represents the average of the log of the number of closed cases by city.

3.3 | Empirical Model

We examine the supply-induced litigation hypothesis with the following model:

$$\ln(Litigation_{it}) = \beta_1 \ln(Law\ Firms_{it}) + X_{it}\gamma + \gamma_P + \gamma_t + u_{it} \quad (1)$$

The outcome variable is the logarithm of *Litigation* in city *i* during year *t*. The key explanatory variable is the logarithm of *Law Firms* in city *i* during year *t*. The variable X_{it} is the set of city-level control variables. We include provincial-level FEs, γ_P, to control unobserved heterogeneities on litigation across provinces, such as the efficiency of the local judicial system. We include year-level FEs, γ_t, to control the aggregate non-linear trend of litigation over time. The variable u_{it} is the error term. The standard error is clustered at the city level.

In order to test the moderating effect of informal institutions on the above relationship, we employ the following model:

$$\begin{aligned}\ln(Litigation_{it}) = {} & \beta_1 \ln(Law\ Firms_{it}) \\ & + \beta_2 \ln(Law\ Firms_{it})\chi\ Informal_i \\ & + \beta_3\ Informal_i + X_{it}\gamma + \gamma_P + \gamma_t + u_{it}\end{aligned} \quad (2)$$

The variable *Informal* denotes *CEI*[9]. Other variables are defined as the same as above for Equation (1).

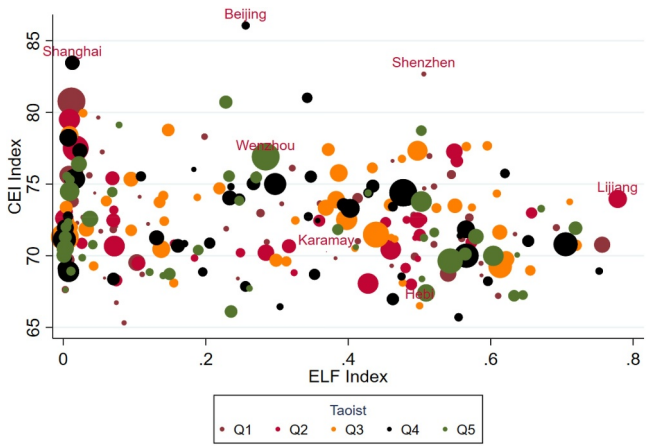

FIGURE 3 | Four-dimensional bubble plots of informal institutions. The *y*-axis displays the CEI scores, whereas the *x*-axis shows the ELF index. The size of each bubble represents the number of Buddhists and the colour indicates the number of Taoists. Specifically, Taoist counts are divided into five quantile-based groups: maroon bubbles denote the first quantile (Q1) for cities with 0–1 Taoists; cranberry bubbles denote the second quantile (Q2) for cities with 2–3 Taoists; orange bubbles denote the third quantile (Q3) for cities with 4–10 Taoists; yellow-green bubbles denote the fourth quantile (Q4) for cities with 11–32 Taoists; and forest-green bubbles denote the fifth quantile (Q5) for cities with more than 32 Taoists.

The parameter of interest in Equation (2) is β_2, which represents the heterogeneous effects of *Law Firms* on *Litigation* due to informal institutions. Here, we provide anecdotal evidence to support the identification of such heterogeneous effects. For example, the number of law firms in Tai'an in 2013 was 62, which is the same as that in Huizhou in 2014. However, the number of litigations in Tai'an was 2257 whereas that in Huizhou was 8380. We also find that the values of *CEI* differ substantially. The value of *CEI* in Tai'an is 71.28 and in Huizhou it is 73.29. A part of the variation of *Litigation* cannot be explained by city-level control variables and FFs, but can identify the interactive effect between ln (*Law Firms*) and *Informal*.

Equation (2) also includes the variable *Informal*. This term allows informal institutions, such as social trust, to have a direct effect on litigation, for example through encouraging informal dispute resolution before a formal lawsuit is filed. Technically, this term controls some confounding issues of ln (*Law Firms*) and *Informal* related to the direct effect of *Informal*.

3.4 | Instrumental Variable Strategy

Although we include a set of control variables, province FEs and year FEs, there is still a potential correlation between *Law Firms* and the error term. For example, unobserved city-level factors may influence both the demand of litigation and provision of legal services. To address this concern, we employ the instrumental variable (IV) strategy. Following Carmignani and Giacomelli (2010), Buonanno and Galizzi (2014) and Mora-Sanguinetti and Garoupa (2015), we explore the historical information on the spatial distribution of law schools[10]. Specifically, we construct our IV as the distance of each city from the three closest law schools in 1992 as follows:

$$\text{Distance}_i = \ln\left(\frac{1}{3}\sum_j d_{ij} + 1\right)$$

where d_{ij} denotes the distance between city i and the law school $j = 1, 2$ and 3.[11] The IV uses historically predetermined variation in the placement of law schools as an exogenous shifter of legal services supply, thereby helping to address endogeneity arising from unobserved demand shocks.

We argue that the proposed IV meets the relevance and validity conditions (Newhouse and McClellan 1998). First, historical law school density is strongly correlated with long-run development of the legal profession (Carmignani and Giacomelli 2010), ensuring relevance. Second, the availability of law schools in nearby locations is orthogonal to the shock to litigation demand during our sample period, which spans more than two decades from 1992. In other words, the initial placement of law schools in 1992 was based on historical factors rather than expectations of future litigation demand. And province fixed effects absorb general historical correlation between the place where a law school was established and places with high future litigation. The remaining identifying variation thus comes from city-specific time-varying shocks that are unlikely to be related to a school placement decision made two decades earlier. Therefore, the historical law school presence created a supply shock of legal professionals, which persists and translates into a larger number of law firms in the city and in turn facilitates and potentially increases the total volume of litigation (supply-side driven demand).

4 | Empirical Results

We report the main results of Equation (1) in Table 2 and then discuss the heterogeneities in our results.

4.1 | Main Results

Column 1 of Table 2 reports that the coefficient of *Law Firms* is positive and significant at a 1% level, which suggests that a higher number of law firms is associated with an increased litigation rate. Specifically, a city with a 1% increase in the number of *Law Firms* brings about a 0.63% increase in *Litigation*. For example, the number of law firms in Chongqing was 686 in 2014 and that in Guangzhou was 762 in 2018. If the number of law firms in Chongqing had increased to 762 (i.e., a 11% increase), the litigation in Chongqing would have increased by 6.93% (= 11 × 0.63) from 56,050 to 59,989 litigation cases.

Further, the control variables exhibit reasonable signs. The demographic variables, namely *Population*, show positive and significant effects. There is a positive market size effect, which is consistent with Bielen and Marneffe (2018). The GDP growth rate shows an insignificant effect and the secondary industry as a percentage of GDP and the tertiary industry as a percentage of GDP display negative and significant coefficients.

To address the potential endogeneity issues, we employ IV strategy and report the first and second stages results in columns 2 and 3, respectively. Column 2 reports that the F-statistics is 33.99 in the first stage, which is well above the lower bounds indicated by the literature on weak instruments (Stock and Yogo 2005), suggesting that weak instruments are not a significant issue in our model. The coefficient of *Distance*, the IV, is negative and significant at the 1% level, implying that a 1% increase in distance of each city from the three closest law schools in 1992 yields a 0.20% decrease in the number of law firms.

Column 3 reports that the IV estimate of ln (*Law Firms*) remains positive and significant at the 1% level. The IV estimate is larger in magnitude than the OLS estimate, which may relate to the difference in the identifying variation used in IV and OLS estimations. The IV exploits cross-city variation in historical proximity to law schools, comparing cities with several historical law schools nearby (low-distance group) to those without (high-distance group). This pattern is consistent with IV identification of a local average treatment effect on cities whose law-firm supply responds to historical law school placement.

TABLE 2 | Empirical results.

Dependent variable =	(1) OLS ln (Litigation)	(2) First-stage ln (Law firm)	(3) 2SLS ln (Litigation)
Distance		−0.1984***	
		(0.0340)	
ln (Law firm)	0.6329***		0.9156***
	(0.0452)		(0.1710)
Population	0.3806***	0.7777***	0.1480
	(0.0507)	(0.0440)	(0.1426)
GDP growth	0.0170	0.2974	−0.0791
	(0.4983)	(0.3190)	(0.4687)
Secondary sector	−0.9654*	6.1061***	−2.9356**
	(0.5039)	(0.6572)	(1.2618)
Tertiary sector	−1.5118**	9.2081***	−4.4753**
	(0.6207)	(0.8708)	(1.8134)
Province FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	3112	3112	3112
R-squared	0.8026		0.4983
F-statistics		33.985	

Note: This table presents the results of Model 1. All variables are defined above. Column 1 is the results of OLS regression. Column 2 is the results of first-stage regression and column 3 is the results of second-stage regression. Standard errors are listed in parentheses below the coefficients. ***, ** and* denote statistical significance levels of 1%, 5% and 10%, respectively.

4.2 | Robustness Checks

4.2.1 | City-Specific Time Trends

To further address concerns that the time-invariant instrument might correlate with unobserved long-run differences in litigation paths, we include city-specific linear time trends. These trends capture any unobserved city-level characteristics (e.g., legal culture, long-run economic development or persistent political factors) that cause litigation to trend linearly over time. If cities closer to historical law schools were already on faster litigation growth paths for reasons independent of legal-service supply, these trends would absorb that variation.

The result, including city-specific time trends, is presented in column 1 of Table 3. We still find a significant positive effect for β_1, which suggests that our baseline result is not driven by pre-existing differential trends.

4.2.2 | Placebo Tests

To further assess the exclusion restriction, we conduct two placebo tests. First, we examine whether our IV predicts litigation levels in the pre-treatment year 2012. A valid IV should be unrelated to pre-treatment litigation after controlling for observables and province fixed effects. Therefore, we estimate the following model using the logarithm of litigation cases in 2012 as the dependent variable:

$$\ln\left(Litigation_{i2012}\right) = \alpha_0 + \alpha_1 \text{Distance}_i + X_{i2012}\delta + \mu_p + \epsilon_i \quad (3)$$

The set of control variables X_{i2012} and province fixed effects μ_p are included. Standard errors are clustered at the city level. The coefficient of interest is α_1. If α_1 is not significant, it would support the assumption that our instrument is not associated with pre-existing demand for litigation.

The result is presented in column 2 of Table 3. As shown, the coefficient on our instrument is statistically insignificant, which suggests that proximity to historical law schools is not associated with pre-treatment litigation levels. Thus, our instrument operates primarily through its effect on legal service supply.

Second, we provide further support for the exclusion restriction of our IV. The logic is that if the IV affects litigation only by expanding the supply of legal services (i.e., the number of law firms), then in settings where this channel is plausibly absent, we should detect no effect.

We therefore construct a placebo sample of cities that are mainly agricultural with little commercial activity. In these cities, civil disputes, such as land boundaries and small debts, are typically resolved through village mediation rather than formal court filings, so there is little demand for specialised legal services. Consequently, even if the IV still predicts the number of law firms, the marginal increase in law firms should have a negligible impact on overall litigation.

We restrict the sample to cities whose primary-sector GDP share exceeded 30% in 2012, including Heihe, Suihua, Yichun, Shuangyashan, Pu'er, Lincang, Dingxi and Jiamusi and re-estimate the IV model. The result is presented in column 3 of Table 3. Consistent with our expectation, the IV estimate is statistically insignificant in this placebo sample. In contrast, column 4 reports the estimate for the non-agricultural sub-sample: the coefficient is positive, significant and larger than that in the full-sample baseline (Table 2, Column 3).

This finding indicates that our IV does not raise litigation by broadly increasing legal awareness—channels that should also operate in agricultural cities. Instead, the effect of the IV is related to the specific economic structure, exactly consistent with a mechanism in which greater supply of legal services induces more litigation. The placebo test thus rejects alternative explanations in which the instrument influences litigation through unobserved pathways.

4.3 | Potential Mechanisms

Section 2 hypothesises that an increased supply of legal services could impact litigation demand through the competition effect and the matching effect. To test these potential mechanisms, we conduct two sub-sample analyses.[12]

First, we explore the competition effects by examining whether the relationship varies with clients' price sensitivity. We split our sample into high-income and low-income cities based on the median GDP per capita in 2012. The underlying assumption is that lower-income clients are more sensitive to price reductions driven by competition. The results, presented in columns 1–2 of Table 4, show statistically insignificant coefficients for *Law Firms* in both subsamples, indicating that there is no supportive evidence for the competition effect. However, we interpret this null result with caution, as it may reflect limitations of the proxy variable rather than the absence of the mechanism.

TABLE 3 | Robustness checks.

Dependent variable =	(1) ln (Litigation)	(2) ln (Litigation)	(3) Agriculture	(4) Non-agriculture
Distance		−0.2069		
		(0. 1352)		
ln (Law firm)	0.4627***		−0.9580	0.9509***
	(0.1429)		(1.0366)	(0.1958)
City-specific control	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
City*Time trend	Yes			
Observations	3112	284	88	3024
R-squared	0.2431	0.7191	0.3706	0.5022

Note: Column 1 reports the results by adding city-specific time trends. Column 2 reports the results of Equation (3). Columns 3–4 reports the results using different sub-samples. Standard errors are listed in parentheses below the coefficients. ***, ** and * denote statistical significance levels of 1%, 5% and 10%, respectively.

TABLE 4 | Potential mechanisms.

Dependent variable =	(1) Low GDP per capita ln (Litigation)	(2) High GDP per capita ln (Litigation)	(3) Low Internet usage ln (Litigation)	(4) High Internet usage ln (Litigation)
ln (Law firm)	1.6497	−0.3808	−1.8862	0.5290**
	(2.1685)	(0.6751)	(12.9120)	(0.2103)
City-specific control	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	1560	1552	1490	1622
R-squared	0.0955	0.3417	−0.4055	0.3059

Note: Columns 1–4 reports the results using different sub-samples. Standard errors are listed in parentheses below the coefficients. ***, ** and * denote statistical significance levels of 1%, 5% and 10%, respectively.

Second, we test the matching effect by exploiting variation in the information costs. We posit that internet access reduces information asymmetry between clients and lawyers, thereby strengthening the matching process. We divide our sample based on the median number of internet users in 2012. The results, in columns 3–4 of Table 4, show a positive and significant relationship between the number of law firms and litigation demand in cities with high internet usage, but an insignificant relationship in cities with low usage. This pattern is consistent with the matching effect: where information costs are lower (proxied by internet access), an increase in legal service supply is more effectively translated into successful lawyer-client matches and, consequently, higher litigation.

In summary, these results support the matching effect as a potential channel through which legal supply increases demand.

4.4 | The Role of Informal Institutions

Table 5 reports the results of Equation (2), which illustrates the heterogeneous effect of ln (*Law Firms*) on ln (*Litigation*).

Column 1 reports that the coefficient of ln (*Law Firms*) × *CEI* is positive and significant, indicating that a rise in law firms yields a greater promotion of litigation in cities with higher *CEI* scores. In terms of economic significance, compared to cities with a lower *CEI* score, the litigation rate in cities with a higher *CEI* score increased by 0.49% when the number of law firms increased by 10%. To put this into perspective, consider two cities, A (low CEI) and B (high CEI), that experience the same exogenous 10% increase in the number of law firms. Although both cities see an increase in litigation, City B's legal services market is 0.49% more sensitive to this supply shock. This magnitude suggests that policies or shocks affecting the supply side of legal services will disproportionately impact the litigation rates in cities with higher social capital.

In summary, our result supports Hypothesis 2. In cities where social trust—proxied by *CEI* score—is higher, the relationship between legal service supply and litigation demand is stronger. This result suggests that social trust does not replace the need for the legal system; rather, it enhances the efficiency and utilisation rate of the formal legal market. Higher social trust allows the legal supply side to translate more efficiently into effective litigation demand.

5 | Further Analyses

In this section, we examine two additional informal institutions, ethnic diversity and religiosity, to supplement our results on social trust as an informal institution to facilitate supply-induced litigation.

5.1 | Additional Hypotheses

First, ethnic diversity is pervasive in China where there are 56 ethnic groups (Gong et al. 2011). In the survey by Alesina and La Ferrara (2005), they report that the effects of ethnic diversity on economic performance are mixed. On the negative side, ethnic diversity decreases social trust because people are more likely to run into misunderstandings and lack coordination. Previous studies find a higher interest rate when the bank and borrower come from a more diverse culture (Giannetti and Yafeh 2012) and a lower likelihood of merger when the acquirer and target are located in places with more diverse cultures (Ahern et al. 2015, for cross-country evidence; Li and Huang 2018, for evidence between Chinese firms). Thus, lower social trust driven by ethnic diversity leads to a stronger friction for the lawyer and client entering into a transaction.

On the positive side, ethnic diversity can form a skill complement. People from different ethnicities bring in a diverse range of experience, skills and information sets. As a result, ethnic diversity promotes innovation and new approaches to problem-solving (Page 2007). Previous studies find that ethnic diversity among traders is better at discovering the true value of assets (Levine et al. 2014), ethnic diversity among scientists produces a

TABLE 5 | Informal institutions.

Informal =	(1) CEI	(2) ELF	(3) Buddhist	(4) Taoist
ln (Law firm) × informal	0.0487**	−0.4054*	−0.0004	−0.0010
	(0.0214)	(0.2130)	(0.0003)	(0.0007)
Informal	−0.1981**	1.7585**	−0.0017	0.0048
	(0.0875)	(0.8628)	(0.0014)	(0.0033)
ln (Law firm)	−3.0424*	0.9872***	0.9670***	0.9605***
	(1.6212)	(0.1680)	(0.1849)	(0.1972)
City-specific control	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	3112	2749	3112	3112
R-squared	0.497	0.499	0.493	0.493

Note: This table presents the results of Equation (2). In columns 1–4, Informal refers to CEI, ELF, log of temple number and log of Taoism temple number, respectively. Standard errors are listed in parentheses below the coefficients. ***, ** and* denote statistical significance levels of 1%, 5% and 10%, respectively.

higher impact of their research (AlShebli et al. 2018) and ethnic diversity among analysts produces a higher quality consensus forecast (Merkley et al. 2020). In our context, ethnic diversity generates a higher value of transaction between lawyer and client. Thus, we hypothesise as follows:

H3A. *The positive relationship between litigation demand and supply of legal services is weaker in cities with a higher ethnic diversity.*

H3B. *The positive relationship between litigation demand and supply of legal services is stronger in cities with higher ethnic diversity.*

Second, religiosity is a driver of social trust (Guiso et al. 2006). Previous studies find that religiosity improves work ethics and trust and is rewarded by investors and creditors. Specifically, religiosity reduces financial reporting irregularities (McGuire et al. 2012), equity financing cost (El Ghoul et al. 2012), stock crash risk (Callen and Fang 2015) and loan interest rate (He and Hu 2016).

In the context of China, Buddhism has a long history and has a far-reaching impact on Chinese society (Kieschnick 2005). Buddhist temples organise activities (burning incense and worshipping Buddha on the first day and the fifth day, etc.) regularly, which can increase communication and trust among members of the organisation (Jayasinghe and Soobaroyen 2009; Glazier 2015). Cities with more Buddhist temples are expected to have a higher degree of social trust (Jayasinghe and Soobaroyen 2009; Chuah et al. 2016). Similarly, as a religion with popularity behind Buddhism, we expect Taoism to serve a similar function of enhancing social trust, but with a weaker impact. Thus, we hypothesise as follows:

H4. *The positive relationship between litigation demand and supply of legal services is stronger in cities with a stronger religiosity.*

5.2 | Variable Measurement

We employ the ethno-linguistic fractionalisation measure that takes the form of the Herfindahl index as follows

$$ELF = 1 - \sum_{j=1}^{N} S_{ji}^2$$

where S_{ji} refers to the proportion of the population using dialect j in city i. We collect the number of dialects in each city from the Chinese Dialects Dictionary[13]. The higher the index, the higher the degree of ethnic diversity[14]. The variable *ELF* ranges from close to zero to 0.78. It indicates some cities with people speaking almost the same dialect, whereas some cities with people speaking a wide range of dialects.

As most Chinese are non-religious, we measure religiosity with the number of Buddhist temples and the number of Taoist temples. We collect a list of those two types of temples and their locations from the Chinese Research Data Services (CNRDS). On average, there are 98 and 27 Buddhist and Taoist temples in a city, respectively.

Figure 3 plots the other three measurements of informal institutions, including *ELF* index, the number of buddhists and taoists. Specifically, *x*-axis displays the distribution of the *ELF* index, with cities such as Shanghai having a lower *ELF* index, indicating less ethnic diversity and cities such as Lijiang having a higher *ELF* index, indicating greater ethnic diversity. The size of each bubble represents the number of Buddhists and the colour indicates the number of Taoists. Cities such as Wenzhou have more Buddhists and Taoists and cities such as Karamay have fewer.

5.3 | Results

In this section, we replace social trust with ethnic diversity and religiosity and re-estimate Equation (2). The results are presented in columns 2–4 in Table 5. Column 2 reports that the coefficient of ln (*Law Firms*) × *ELF* is negative and significant, indicating that an increase in the number of law firms is associated with a decrease in litigation in cities with higher *ELF* scores. This result supports Hypothesis 3A. It supports the idea that in cities with more diverse populations, the matching of lawyers and clients may be weakened because they may find it more challenging to connect. In terms of economic significance, compared to cities with a lower *ELF* value, the litigation rate in cities with a higher *ELF* value decreases by 4.05% when the number of law firms increases by 10%.

Column 3 reports the coefficient of ln (*Law Firms*) × *Buddhist* whereas column 4 reports the coefficient of ln (*Law Firms*) × *Taoist*, both showing insignificant effects. This suggests that the impact of the number of law firms on litigation does not significantly vary between cities with a higher number of Buddhist or Taoist temples and those with fewer temples. This finding contrasts with Hypothesis 4.

In summary, the strength of supply-induced litigation depends on local informal institutions. In other words, ethnic diversity (and hence social distrust) serves as a market friction impeding the matching between lawyer and client. Thus, we conclude that there is a complementary relationship between formal and informal institutions.

6 | Conclusion

This paper examines the supply-induced litigation hypothesis, focussing on the role of informal institutions. We begin our analysis by developing the hypotheses of supply-induced litigation, that is, how litigation demand responds to an increased supply of legal services. We propose two mechanisms through which legal supply may induce litigation demand: the competition effect and the matching effect. We then test the hypotheses with a newly constructed dataset across Chinese cities from 2013 to 2023.

We reach several conclusions. First, we find that a 1% increase in law firms could bring about a 0.63% increase in litigation rate, supporting the supply-induced litigation hypothesis. This result is robust to the use of IV estimation and several robustness checks. Further, we find support for the matching effect but no evidence for the competition effect. Second, we find that a higher level of social trust enhances the facilitation effect of supply-induced litigation.

Our results highlight the complementarity between formal and informal institutions. The policy that aims to increase the use of the judicial system can increase the supply of legal services. Nonetheless, the impact of such policy depends on local informal institutions, such as social trust and ethnic diversity.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from data vendors. Restrictions apply to the availability of these data, which were used under licence for this study. Data are available from https://www.qcc.com with the permission of the data vendor.

Endnotes

[1] Do et al. (2023) examine shareholder litigation through an environmental lens. They document that constraining access to legal services significantly increases toxic emissions, with the effect strongest among poorly governed firms. This result conversely underscores both the importance of accessible legal services and the disciplinary power of supply-induced litigation.

[2] Carmignani and Giacomelli (2010) suggest that more competition tends to drive down the cost of legal services, lowering the total expense of litigation for individuals and, all else equal, making them more inclined to take a dispute to court.

[3] Many literature has examined the role of market intermediating mechanisms—such as regulation and signals—in the market for legal services. For example, Iossa and Jullien (2007) analyse the impact of quality certification systems on lawyer behaviour, highlighting a trade-off: whereas better information improves a client-lawyer match, it may also induce a bias into adjudicators' decisions, thereby affecting the social values of information. Similarly, Oyer and Schaefer (2016) study the role of observable professional signals and referral networks. They find that large law firms rely on law school concentration (a signal of quality) and school-based networks (a form of professional referral network) for hiring.

[4] In the literature, the number of received cases is often used to measure the litigation rate. To verify our measure is consistent with that used in the literature, we perform a cointegration test between the number of closed cases and the number of received cases using aggregate data. We find cointegration between those two variables and support the use of the number of closed cases (see Appendix for details).

[5] In the literature, the number of lawyers is often used to measure the supply of legal services. To verify our measure is consistent with that used in the literature, we perform a cointegration test between the number of law firms and the number of lawyers using aggregate data. We find cointegration between those two variables and support the use of the number of law firms (see Appendix for details).

[6] Due to the data availability, the 2013 China City Business Credit Environment Index Blue Book only reports the *CEI* index for 286 cities, excluding cities such as Lhasa.

[7] We use the *CEI* index from 2012, one year prior to our sample period, to help ensure exogeneity.

[8] The China City Statistical Yearbook does not include economic variables for the entire city in 2017, so we use data for the city's central district for this year. Moreover, the GDP growth rate for Chongqing City in 2017 is missing and the economic variables for Zunyi City in 2018 are absent for both the entire city and the central district.

[9] We also use *ELF*, *Buddhist*, or *Taoist* as *Informal* and provide related empirical analyses in Section 5.

[10] Mora-Sanguinetti and Garoupa (2015) construct two IVs, namely the number of law schools founded in Spain by 1968 and the distance between the current provincial capitals to the historical capital of their university district (where it was possible to study law) in 1845. Bielen and Marneffe (2018) also use the number of law schools as an IV.

[11] Buonanno and Galizzi (2014) construct an IV by using the distance of the province from the three closest law schools.

[12] In conducting heterogeneity analyses, we collect the data on GDP per capita and internet access information for the year 2012 from the China City Statistic Yearbook.

[13] The Dictionary of Chinese Dialects, based on the classification of administrative regions in 1986, compiles a short list of Chinese dialects in counties and cities. It shows that there are 17 dialects and 105 sub-dialects in China. The *ELF* index is computed by Xu et al. (2015) using the number of dialects and the population speaking the dialects.

[14] Wolfram (2017) proposed that dialect can be used to refer to any regional or ethnic variety of a language.

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Appendix

This appendix presents the results of unit root tests and cointegration tests based on the aggregate data over the period 1986–2022. The data from 1986 to 2018 is sourced from the Law Yearbook of China. The information regarding law firms and lawyers for the years 2019–2022 comes from the Ministry of Justice. The litigation data for the same period is obtained from the Bulletin of the Supreme People's Court. Additionally, the population data are provided by the National Bureau of Statistics.

Unit root test: In order to determine the time series properties of the variables, we apply the augmented Dickey and Fuller (1981) (ADF) test to test the existence of the unit root Table A1.

Engle–Granger cointegration test: We then follow the steps by Engle and Granger (1987) to test the existence of long-run equilibrium between (1) Law firms and Lawyers and (2) Closed cases and Received cases. For each paired variable, we estimate a bivariate regression and then use the ADF test to test for the existence of unit roots in the residuals. We reject the unit root hypothesis for both relationships, we conclude that Law firms and Lawyers are cointegrated and Closed cases and Received cases are cointegrated Table A2.

TABLE A1 | Unit root test.

Variable	Description	Test statistics	10% C.V.
Law firms	Number of law firms per 100,000 inhabitants	−1.481	−2.617
Lawyers	Number of lawyers per 100,000 inhabitants	−2.406	−2.617
Closed cases	Number of closed litigious cases	−1.507	−2.617
Received cases	Number of received (incoming) litigious cases	−1.491	−2.617

Note: We apply natural logs to our data series.

TABLE A2 | Cointegration test.

Regression residual from	Test stats	10% C.V.
(1) ln (lawyers) - 2.434–1.030*ln (law firms)	−6.066	−3.214
(2) ln (received cases) - 0.006–1.000*ln (closed cases)	−4.751	−2.617

Note: The first column reports the estimated cointegrating vector.