Lawful Roots, Lawless Routes: The Paradox of Litigation-Related Petitions in China

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Abstract

In the absence of a robust legal framework, petitions in China present significant governance challenges. Counter-intuitively, among specific types of petitions, litigation-related petitions are particularly more prone to escalate into unauthorized forms compared to others without clear legal boundaries. Why does a law-rooted system eventually generate universal lawless behaviors? This study offers a theoretical explanation and examines factors contributing to this problematic type of petitions. We incorporate petitioners into a Bayesian learning process with a biased legal signal structure. Concurrently, the local government interacts by setting a Poisson-distributed arrival rate of returns. Our findings highlight an amplification mechanism where petitioners misinterpret legal norms and form biased posterior beliefs. As a practical application, the model suggests that adjusting how information is conveyed and modifying the governance environment could serve as preventive strategies in local governance.

1 Introduction

The petition system in China, also named letters and visits or *Xinfang*, is an administrative system with unique Chinese characteristics. It serves multiple functions, including collecting public grievances, supervising state organizations, resolving citizen disputes, and maintaining social stability.

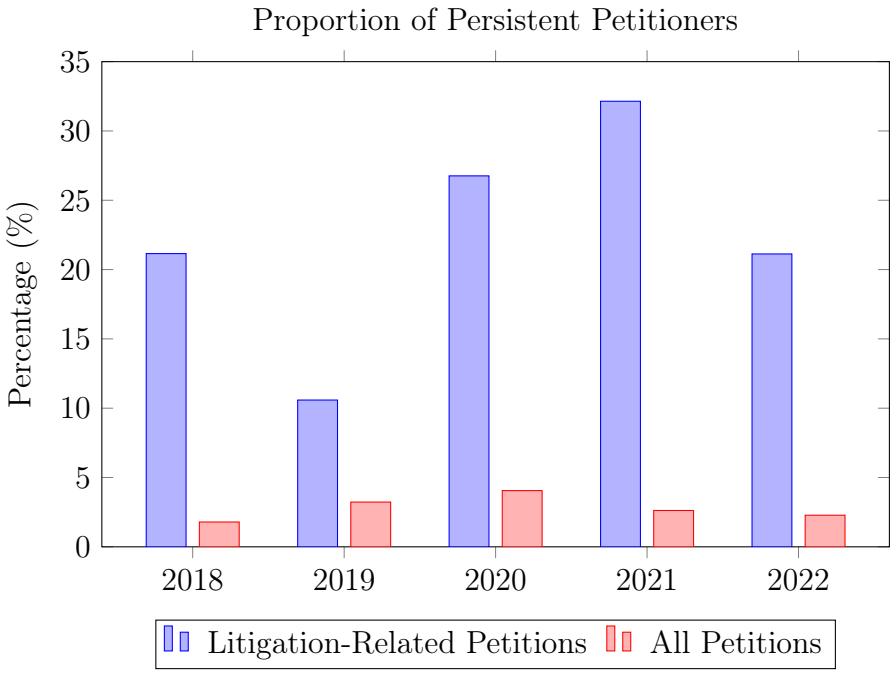
While the petition system in China was established with benevolent intentions, it is often perceived as an alternative to formal legal institutions, attracting numerous vexatious

petitioners pursuing their own interests. This sentiment is reflected in a common Chinese saying, which translates to: "Trust petitions more than the law, trust the central government more than the local authorities, and trust in causing trouble more than being rational" (Gao and Long, 2015).

An interesting phenomenon is that while petitions often pose challenges for government officials due to limitations in legal remedy proceedings (e.g., lack of clarity in the law), the opposite is true when examining specific types of petitions. Litigation-related petitions, which are closely tied to the law and should theoretically be more straightforward to address within a clear legal framework, are expected to have a more solvable nature. However, empirical evidence shows that litigation-related petitions have a higher propensity for escalation compared to other types. Figure 1 presents data from a county-level government in Jiangsu province, showing the proportion of persistent petitions over the past five years. The rate for all petitions is 2.80%, while litigation-related petitions have a significantly higher rate of 22.35%, nearly ten times greater. In practice, litigation-related petitions are the most difficult to resolve and have the longest processing cycles in local governance.

During the past decades, the discussion surrounding China's petition system has primarily been dominated by sociological literature. In recent years, there has been a growing interest in this area within economic literature. Existing empirical studies have confirmed the paradoxical outcomes of China's petition system, which have led to increased repression within the authoritarian system and heightened citizens' distrust toward the government (Li, 2008; Wong and Peng, 2015). Theoretical literature largely consists of case analyses focused on specific issues such as petitions related to residential quarters or land expropriation (Su, 2011; Tan and Qi, 2010). Methodologically, researchers such as Chen (2014), Li (2012), Yu (2009), and Yu (2011) proposed static game models for theoretical interpretation, assuming perfect information. In contrast, Chaoqiang et al. (2015) introduced an evolutionary game model to interpret petitions as a dynamic process characterized by imperfect information and bounded rationality, thereby seeking to understand the underlying causes of universal unauthorized petitions. However, there has been a lack of in-depth studies examining specific petition types and their characteristics, with litigation-related petitions being particularly significant for research due to their practical implications.

Figure 1: County-level Petitioning Statistics in Jiangsu Province



Note: 1. Persistent petitioners refer to those who have made repetitive petitions for the same appeal; 2. The unit of measurement is the number of cases instead of petitioners. For example, there might be two petitioners in a collective petition, which accounts for one case in actual statistics.

This study aims to fill this research gap by offering a theoretical analysis to explain the propensity for escalation of litigation-related petitions and providing policy insights for local government officials. For simplicity, we focus primarily on disturbing and disruptive petitions, which are characterized by repeated appeals and prolonged processing times among all unauthorized petitions. By constructing a theoretical model, this study reveals the amplification mechanism within the legal context, where inaccurate legal signals skew petitioners' interpretations of the law, leading to a greater likelihood of escalation for litigation-related petitions. Consequently, improving information delivery within courts can serve as a crucial strategy for addressing this issue. Additionally, after considering the interactions between local government and petitioners, we provide a numerical example and suggest two preventive approaches from the perspectives of justice pursuit and administrative costs.

The content is structured as follows: Section 2 provides a comprehensive literature review of the petition system in China. Section 3 establishes the benchmark model involving petitioners and conducts a preliminary analysis. Section 4 incorporates the interaction of

the local government and illustrates the result by a numerical example. Section 5 concludes with a discussion of policy implications.

2 Literature Review

According to the definition in the Rules and Regulations for Petitions (*Xinfang Tiaoli*) issued in 2005 by the State Council of the Chinese government, a petition refers to the activities in which citizens, legal persons, or other organizations provide information, make comments or suggestions, or lodge complaints to relevant government administrative departments through various channels, including correspondence, emails, faxes, phone calls, and in-person visits.

As summarized by Shen (2015), the state bureau overseeing the petition system aligns with China's administrative hierarchy and can be divided into five levels: provincial, prefectural, county, township, and village. Petitions can be classified based on their content, form, or the number of petitioners; however, the most common classification is based on the nature of the state authority with jurisdiction. Accordingly, Sun et al. (2012) classified petitions into three types: litigation-related petitions, prosecutor-related petitions, and administrative petitions. Litigation-related petitions (*Shesu Shangfang*) involve judicial organs or decisions, with the primary distinguishing factor being whether petitioners enter judicial proceedings. Prosecutor-related petitions are addressed by procuratorial organs and typically involve petitioners exposing illegal acts committed by civil servants, enterprises, or public institutions. Administrative petitions provide non-litigation remedies and involve various administrative organs, making them the most closely related to the interests of the public.

Unlike petitions in Western democracies, Chinese petitioning institutions and practices are rooted in a blend of imperial and Communist history. According to Guo (2012), the highly developed bureaucracy and the absence of professional judicial organs in ancient China shaped local governments to possess both judicial and administrative authority. This hybrid nature has profoundly influenced the petition system post-1949, which was established almost immediately after the founding of the People's Republic of China as a continuation of Communist practices to connect with the population through the mass line (Minzner, 2006). Although the Rules and Regulations for Petitions enacted in 2005 aimed to standardize the

system, they retained this fundamental nature.

The petition system in China serves as a multipurpose governance tool. For policymakers, it provides information in two key ways: it gathers public opinions and uncovers illicit behaviors for local governance, while also offering a measurable metric for the central government to assess local officials' performance and reinforce local control (Huang, 1995). Overall, it contributes to an internal assessment of governance quality and acts as a self-correcting mechanism, enabling authoritarian regimes to identify public discontent and mitigate potential threats to social stability (Dimitrov, 2015). For citizens, the system serves as an official channel for voicing concerns and resolving disputes (Gao and Long, 2015) and provides a legal avenue for participation in political affairs (Xu et al., 2018).

Since the early 1990s, the volume of mass petition activities has dramatically increased, partially due to the rapid economic development following market reforms in China (Paik, 2012) and the subsequent rise in rights awareness under a liberalized political opportunity structure (Bruckner, 2008). However, the prevalence of petitions in modern China also stems from their hybrid nature, which many scholars interpret as an institutional flaw. Gao and Long (2015) noted that the petition system has gradually become a more favored alternative to formal legal institutions for citizens, owing to its advantages over judicial remedies, including simpler procedures, lower economic and time costs, higher efficiency in extreme cases (e.g., overstepping petitions), and ambiguous judgments in the absence of law. Consequently, the rise in petitions, especially collective ones filed by the public, has created significant governance challenges in recent years (Dai and Kilian, 2009).

The effectiveness of China's petition system in managing social grievances is compromised by its informal mechanisms and the strategic responses of petition officials. Bruckner (2008) concluded that the paradoxical role of the petition system lies in the discrepancy between its informality in dispute resolution and its dominance as a method for addressing citizens' grievances. Petition officials often serve to absorb complaints in an effort to maintain social stability without solving actual problems, utilizing emotional repression strategies such as emotional defusing, emotional constraint, and emotional reshaping, as generalized by Hou (2020). In many instances, the system exhibits limited and unreliable efficiency, a conclusion supported by empirical evidence that shows regional disparities (Hurst et al., 2014).

Although the petition system appears well-designed, its consultative element has increasingly transformed into a repressive one (Huirong, 2020). This systematic failure to meet rising citizens' expectations has led to a growing population of disaffected, sophisticated, and organized petitioners, whose escalating and destabilizing behaviors contribute to social unrest (Bruckner, 2008; Minzner, 2006).

In this context, the Chinese government typically classifies petitions into two additional categories: authorized and unauthorized petitions (Winckler, 2013). The latter, also referred to as abnormal or irregular petitions by some scholars (Gao and Long, 2015; Liao and Tsai, 2019), can be further divided into disturbing petitions (*chanfang*), disruptive petitions (*naofang*), and other illegal petitions, including overstepping petitions (*yueji shangfang*) and petitions to Beijing (*jinjing shangfang*). This specific classification overlaps with the previously mentioned types. According to Zhang (2009), litigation-related and certain administrative petitions tend to be less innocuous. Sun et al. (2012) also observed that litigation-related petitions, in particular, are more prone to escalate into unauthorized petitions, especially overstepping petitions and petitions to Beijing.

Based on interviews with petitioners and petition officials in Chinese courts, He and Feng (2016) introduced the concept of mismatched discourses, where petitioners attempt to frame their disputes in legal terms. With their self-learning process and accumulated experiences in the legal system, petitioners often begin to describe themselves as legal experts, perceiving petition officials as incompetent and unprofessional due to their limited knowledge and misunderstandings of the law. This observation suggests that access to judicial proceedings may distort petitioners' perceptions rather than provide accurate information. While this perspective explores contextual reasons at the linguistic level, our study focuses on petitioners' beliefs at the conscious level. Section 3 presents the model in detail.

3 Model and Preliminary Analysis

3.1 Model Setup

In this section, we model the movement of petitioners into a two-period Bayesian learning process. Assume each potential petitioner is endowed with an unobservable true state ω, where $\omega \in \Omega = \{L, I\}$. L represents that the petitioner's appeal is legal in nature and I represents illegal. The prior belief of the petitioner toward his true state is a function $\mu : \Omega \to [0, 1]$. Specifically, we assume $\mu(L) = \alpha$ and $\mu(I) = 1 - \alpha$ where $\alpha \in [0, 1]$. Besides, each petitioner appeals for an economic remedy V which is observable to himself. The value of V for all petitioners is uniformly distributed over the interval $[\underline{V}, \bar{V}]$.

In the first period, the petitioner has two actions J and N. J stands for entering judicial proceedings while N stands for the others (e.g., administrative proceedings, direct negotiation). The former induces a fixed cost of F due to the additional lawsuit and time cost (Gao and Long, 2015), while the latter charges 0 cost. In both cases, the petitioner receives a result of judgment as a signal, either *win* or *lose*. The signal *win* is accompanied by a positive return V, while the signal *lose* returns 0 benefits.

We consider the information structure π_J and π_N as displayed in Table 1. For the petitioner with true state L, he wins with probability β in the judicial proceedings and with probability β' in the non-judicial proceedings. For the petitioner with true state L, he loses with the same probability. In other words, β and β' represent the accuracy of the judgment. We further assume $\frac{1}{2} < \beta' < \beta < 1$ to imply our two assumptions:

Assumption 1. *Both proceedings exist inaccuracy to a limited extent in the execution of justice due to multiple factors (e.g., procedural compliance, the sufficiency of the evidence, competence of lawyers, defense of the counterpart, etc).*

Assumption 2. *For legal petitioners, the judicial proceedings usually result in more accurate verdicts.*

After receiving the signal, the petitioner updates his belief about his true state based on the Bayesian belief-updating rule. If the petitioner wins in the first period, he then receives the return V and will not further enter the petition system. If the petitioner loses in the first period, he needs to decide the time for petitioning, denoted by $t \in [0, +\infty)$. At the

Table 1: Signal Structures Under Judicial and Non-judicial Proceedings

		Signal	
	π_J	*win*	*lose*
State	L	β	$1-\beta$
	I	$1-\beta$	β

		Signal	
	π_N	*win*	*lose*
State	L	β'	$1-\beta'$
	I	$1-\beta'$	β'

Notes: 1. π_J denotes the signal structure under judicial proceedings and π_N under non-judicial proceedings; 2. The number in the matrix represents the probability of receiving the signal given state ω; 3. We assume $\frac{1}{2} < \beta' < \beta < 1$.

same time when he stays in the petition system, he pays a flow cost of c, so staying for time t costs the petitioner ct. Given state I, the petitioner will still receive a 0 return in the whole process. Given state L, the petitioner receives the return V at a Poisson arrival rate λ, where $\lambda \in [0, 1]$. In this section, we ignore the interaction of the local government and assume that λ is exogenous and identical for both proceedings. By deciding the optimal t, the petitioner maximizes his expected utility.

3.2 Petitioners' Optimal Strategy

We adopt a backward induction approach to determine the petitioners' optimal strategy. In the second period, the initial belief about the true state being L given the signal *lose*, denoted as P_0 generally, is the posterior belief after the first period. Given the Poisson arrival rate of V, the waiting time before the arrival follows an exponential distribution $exp(\lambda)$. The probability of receiving V before time t is, therefore, $F(T \leq t) = 1 - e^{-\lambda t}$. By deciding the optimal t, the petitioner maximizes his utility U_p, the function of which can be specified as

$$U_p(t) = P_0(1 - e^{-\lambda t})V - ct \tag{1}$$

By the second derivative $U_p''(t) = -P_0 V \lambda^2 e^{-\lambda t} < 0$ for any $t \in [0, +\infty)$, we conclude that the solution to the first-order condition $U_p'(t) = P_0 V \lambda e^{-\lambda t} - c = 0$ is a global maximum, which is the petitioner's best choice of t. The sign of the solution $\frac{1}{\lambda} ln(\frac{P_0 V \lambda}{c})$ depends on four parameters: P_0, V, λ, and c. When the petitioner is skeptical about his legal type with a small P_0, the value of remedy V is too small, the rate of return λ is too low, or the flow

cost c for staying in the petition system is too high, the utility from the petition is always negative and the petitioner's best choice is never entering the system by choosing t^* to be 0. Combining the results, we have:

$$t^* = \max\{0, \frac{1}{\lambda} ln \frac{P_0 V \lambda}{c}\} \tag{2}$$

In the following analysis, we focus on the more interesting case where $t^* > 0$ by assuming that the condition $\frac{P_0 V \lambda}{c} > 1$ is always satisfied.

In the first period, the petitioner compares the expected utility of entering the judicial proceedings and that of non-judicial proceedings. For both proceedings, the expected utility from petitions given state L and I are $E_L[U_p(t^*)] = \int_0^{t^*} (V - ct)\lambda e^{-\lambda t} \mathrm{d}t + e^{-\lambda t}(-ct^*)$ and $E_I[U_p(t^*)] = -ct^*$, respectively. After plugging in $t^* = \frac{1}{\lambda} ln(\frac{P_0 V \lambda}{c})$ and simplification, we obtain $E_L[U_p(t^*)] = (V - \frac{c}{\lambda})(1 - \frac{c}{P_0 V \lambda})$ and $E_I[U_p(t^*)] = -\frac{c}{\lambda} ln \frac{P_0 V \lambda}{c}$. For ease of distinction, we distinguish P_0 in judicial and non-judicial proceedings by P_0^J and P_0^N. Specifically, according to the Bayesian updating rule,

$$P_0^J = P_J(L|lose) = \frac{\pi_J(lose|L)\mu(L)}{\pi_J(lose|L)\mu(L) + \pi_J(lose|I)\mu(I)} = \frac{(1-\beta)\alpha}{(1-\beta)\alpha + \beta(1-\alpha)} \tag{3}$$

$$P_0^N = P_N(L|lose) = \frac{\pi_N(lose|L)\mu(L)}{\pi_N(lose|L)\mu(L) + \pi_N(lose|I)\mu(I)} = \frac{(1-\beta')\alpha}{(1-\beta')\alpha + \beta'(1-\alpha)} \tag{4}$$

Then the expected utility of entering the judicial proceedings EU_J is calculated by $EU_J = \mu(L)(\beta V + (1-\beta)E_L[U_p(t^*)]) + \mu(I)((1-\beta)V + \beta E_I[U_p(t^*)]) - F$. The expected utility of entering the non-judicial proceedings is calculated similarly, except that there is no fixed cost. After simplification, we obtain:

$$EU_J = \alpha(\beta V + (1-\beta)(V - \frac{c}{\lambda})(1 - \frac{c}{P_0^J V \lambda})) + (1-\alpha)[(1-\beta)V + \beta - \frac{c}{\lambda} ln \frac{P_0^J V \lambda}{c}) - F \tag{5}$$

$$EU_N = \alpha(\beta V + (1-\beta)(V - \frac{c}{\lambda})(1 - \frac{c}{P_0^N V \lambda})) + (1-\alpha)[(1-\beta)V + \beta - \frac{c}{\lambda} ln \frac{P_0^N V \lambda}{c}) \tag{6}$$

Comparing the two expected utilities leads to a threshold of V, denoted as V^*, which

determines the petitioner's binary decision in the first period. For ease of analysis, consider the function $h(V) := EU_J - EU_N$ and focus on the case where $h(V) = 0$ has solutions on $[\underline{V}, \bar{V}]$. Denote the solution of $h(V) = 0$ as V^*.

Lemma 1. *There exists a unique $\alpha^* \in (0,1)$ such that when $\alpha < \alpha^*$, $h(V)$ is monotone decreasing; when $\alpha > \alpha^*$, $h(V)$ is monotone increasing.*

Proof. Note that $h(V) = (2\alpha - 1)(\beta - \beta') + \alpha(V - \frac{c}{\lambda})(\beta' - \beta + \frac{c(1-\beta')}{P_0^N V\lambda} - \frac{c(1-\beta)}{P_0^J V\lambda}) + (1-\alpha)\beta'\frac{c}{\lambda} ln\frac{P_0^N V\lambda}{c} - (1-\alpha)\beta\frac{c}{\lambda} ln\frac{P_0^J V\lambda}{c}$. Plug in P_0^J and P_0^N and take the derivative of V, we obtain $\frac{\partial h}{\partial V} = (\beta - \beta')[(2\alpha - 1)(\frac{c}{V\lambda})^2 - (1-\alpha)(1 + \frac{c}{V\lambda})]$. To analyze the sign of $\frac{\partial h}{\partial V}$ under a specific prior α, we consider $g(\alpha) := \frac{\partial h}{\partial V}$ and further take the derivative of α. Since $\frac{\partial g}{\partial \alpha} = \alpha(\beta - \beta')(1 + \frac{c}{V\lambda}) + 2(\beta - \beta')(\frac{c}{V\lambda})^2 > 0$ for $\forall\ \alpha \in [0,1]$, $g = \frac{\partial h}{\partial V}$ is monotone increasing on $[0,1]$, as well as continuous due to its differentiability. We observe that $g(0) = -(\beta - \beta')((\frac{c}{V\lambda})^2 + \frac{c}{V\lambda} + 1) < 0$ and $g(1) = (\beta - \beta')(\frac{c}{V\lambda})^2 > 0$. By the Intermediate Value Theorem, there must exist $\alpha^* \in (0,1)$ such that $g(\alpha^*) = 0$. Since $g(\alpha)$ is continuous and monotone increasing, this α^* is unique over the interval $(0,1)$. When $\alpha < \alpha^*$, $g(\alpha) = \frac{\partial h}{\partial V} < 0$, which implies $h(v)$ decreases monotonically with V. When $\alpha > \alpha^*$, $g(\alpha) = \frac{\partial h}{\partial V} > 0$, which implies $h(v)$ increases monotonically with V. □

The property in this lemma is intuitive. When the petitioner strongly believes his true state is L, the judicial proceedings discern his state more accurately. Thus, endowed with a higher V, the petitioner favors the judicial proceedings to pursue a higher probability of receiving that remedy. But when the petitioner holds a weak belief, entering the judicial proceedings becomes unlikely to be profitable. The higher V the petitioner has, the more likely he is to enter the non-judicial proceedings to exploit its loopholes of inaccurate judgments.

Based on this lemma and the above analysis, we conclude that the best strategy for petitioners is that in the first period, choose J when $V > V^*$ and N when $V < V^*$ given $\alpha > \alpha^*$, and choose N when $V > V^*$ and J when $V < V^*$ given $\alpha < \alpha^*$; in the second period, choose $t^* = \max\{0, \frac{1}{\lambda} ln\frac{P_0 V\lambda}{c}\}$.

3.3 Comparative Statics of the Additional Legal Signal

Firstly we assume there is no additional legal signal in the judicial proceedings as a baseline for the later comparison. To compare the two groups of petitioners after the two proceedings,

we calculate their expected waiting time, respectively. Specifically, we take the expectation of $t_J^*(V)$ and $t_N^*(V)$ conditional on V. For ease of analysis, we first discuss the case when $\alpha > \alpha^*$. For the judicial proceedings, $E_V[t_J^*(V)] = \int_{V^*}^{\bar{V}} \frac{1}{\lambda} ln \frac{P_0^J V \lambda}{c} \frac{1}{\bar{V}-V^*} \mathrm{d}V$. For the non-judicial proceedings, $E_V[t_N^*(V)] = \int_{\underline{V}}^{V^*} \frac{1}{\lambda} ln \frac{P_0^N V \lambda}{c} \frac{1}{V^*-\underline{V}} \mathrm{d}V$. We define the difference between the two expected waiting times as $\Delta_0 := E_V[t_J^*(V)] - E_V[t_N^*(V)]$. After simplification, we obtain:

$$\begin{aligned} \Delta_0 = & \frac{1}{\lambda(\bar{V}-V^*)}[(\bar{V}ln\bar{V}-\bar{V}) - (V^*lnV^*-V^*) + (\bar{V}-V^*)ln\frac{P_0^J\lambda}{c}] \\ & - \frac{1}{\lambda(V^*-\underline{V})}[(V^*lnV^*-V^*) - (\underline{V}ln\underline{V}-\underline{V}) + (\bar{V}-\underline{V})ln\frac{P_0^N\lambda}{c}] \end{aligned} \tag{7}$$

Now we assume the petitioner receives an additional legal signal $s \in [0,1]$ in the judicial proceedings, which stands for the strength and credibility of observed legal evidence or justification. The probability density function of s is $f(s|L) = 2s$ and $f(s|I) = 2-2s$, respectively. A petitioner with legal appeals will be more likely to receive a higher s, and vice versa. The posterior belief for petitioners in the non-judicial proceedings P_0^N is unchanged, and for petitioners in the judicial proceedings, it becomes:

$$\begin{aligned} P_0^{J(s)} &= P_J(L|lose,s) = \frac{f(lose,s,L)}{f(lose,s)} = \frac{f(s|L)\pi_J(lose|L)\mu(L)}{f(s|L)\pi_J(lose|L)\mu(L) + f(s|I)\pi_J(lose|I)\mu(I)} \\ &= \frac{2s(1-\beta)\alpha}{2s(1-\beta)\alpha + (2-2s)\beta(1-\alpha)} = \frac{s(1-\beta)\alpha}{s(1-\beta)\alpha + (1-s)\beta(1-\alpha)} \end{aligned} \tag{8}$$

As described in section 2, the signal in the legal context is observed to be biased upwards. Therefore, the petitioner in the judicial proceedings receives a biased signal $s' = s^\theta$, where $\theta \in [0,1]$. $\theta = 1$ represents the signal s is accurate and there is no bias in the legal context. $\theta = 0$ represents the signal s is completely biased. For $\theta \in (0,1)$, the bias is partial. Hence, this parameter indicates the amplification mechanism that under the legal framework, the petitioner tends to misinterpret the law or the judge's explanation and amplify the legal grounds he possesses. With the bias, the petitioner forms a biased posterior belief:

$$P_0^{J(s,\theta)} = \frac{s^\theta(1-\beta)\alpha}{s^\theta(1-\beta)\alpha + (1-s^\theta)\beta(1-\alpha)} \tag{9}$$

Meanwhile, the conditional probability density function of s for petitioners who will enter the petition system (i.e., have received the signal *lose*) is specified as:

$$\begin{aligned} f(s|lose) &= \frac{f(s, lose)}{P(lose)} \\ &= \frac{f(s|L)\pi_J(lose|L)\mu(L) + f(s|I)\pi_J(lose|I)\mu(I)}{\pi_J(lose|L)\mu(L) + \pi_J(lose|I)\mu(I)} \\ &= \frac{2s(1-\beta)\alpha + (2-2s)\beta(1-\alpha)}{(1-\beta)\alpha + \beta(1-\alpha)} \end{aligned} \tag{10}$$

With the additional biased legal signal s^θ, define the new expected waiting time difference as $\Delta_1 := E_{s,V}[t_J^*(s,V)] - E_V[t_N^*(V)]$. For ease of analysis, we first consider the pure effects of the biased signal s^θ. That is, we ignore the adjustment of petitioners' strategies in the first period for now and only focus on the change of time difference in the second period. Denote this partial difference as Δ_1'.

Proposition 1. *$\Delta_1' - \Delta_0$ decreases monotonically with θ and has a unique solution $\theta^* \in (0,1)$. Moreover, $\Delta_1' - \Delta_0 > 0$ when $\theta^* \in [0, \theta^*)$ and $\Delta_1' - \Delta_0 < 0$ when $\theta^* \in (\theta^*, 1]$.*

Proof. Consider the two extreme values with $\theta = 1$ and $\theta = 0$. When $\theta = 1$, we first take the expectation of $t_J^*(s,V)$ conditional on s and obtain $E_s[t_J^*(s,V)] = \int_0^1 \frac{1}{\lambda} ln \frac{P_0^{J(s,1)} V\lambda}{c}$ $\frac{2s(1-\beta)\alpha+(2-2s)\beta(1-\alpha)}{(1-\beta)\alpha+\beta(1-\alpha)} \mathrm{d}s = \frac{1}{\lambda}(ln\frac{V\lambda}{c} - \frac{\beta(1-\alpha)}{(1-\beta)\alpha+\beta(1-\alpha)}(1 + \frac{\beta(1-\alpha)}{\alpha-\beta} ln\frac{(1-\beta)\alpha}{\beta(1-\alpha)}))$. Then take the expectation of $E_s[t_J^*(s,V)]$ and $t_N^*(V)$ conditional on V, respectively and take the subtraction to obtain $\Delta_1^{\prime(\theta=1)} = \frac{1}{\lambda(\bar{V}-V^*)}[(\bar{V}ln\bar{V} - \bar{V}) - (V^*lnV^* - V^*) + (\bar{V} - V^*)(ln\frac{\lambda}{c} - \frac{\beta(1-\alpha)}{(1-\beta)\alpha+\beta(1-\alpha)}(1 +$ $\frac{\beta(1-\alpha)}{\alpha-\beta} ln\frac{(1-\beta)\alpha}{\beta(1-\alpha)}))] + \frac{1}{\lambda(V^*-\underline{V})}[(V^*lnV^* - V^*) - (\underline{V}ln\underline{V} - \underline{V}) + (V^* - \underline{V})ln\frac{P_0^N\lambda}{c}]$. Furthermore, subtract the baseline difference Δ_0 from $\Delta_1^{\prime(\theta=1)}$ and obtain:

$$\Delta_1^{\prime(\theta=1)} - \Delta_0 = \frac{1}{\lambda}[-\frac{\beta(1-\alpha)}{(1-\beta)\alpha+\beta(1-\alpha)}(1 + \frac{\beta(1-\alpha)}{\alpha-\beta} ln\frac{(1-\beta)\alpha}{\beta(1-\alpha)}) - ln\frac{(1-\beta)\alpha}{(1-\beta)\alpha+\beta(1-\alpha)}] \tag{11}$$

Let $x = ln\frac{(1-\beta)\alpha}{(1-\beta)\alpha+\beta(1-\alpha)} \in (0,1)$ and the term in the square bracket is equivalent to $-(1-x)(1+\frac{1-x}{2x-1}ln\frac{x}{1-x}) - lnx$. We verify the inequality $(1-x)(1+\frac{1-x}{2x-1}ln\frac{x}{1-x}) + lnx > 0$ holds for $\forall\ x \in (0,1)$. Therefore, we have $\Delta_1^{\prime(\theta=1)} - \Delta_0 < 0$.

Similarly, when $\theta = 0$, $P_0^{J(s,0)} = 1$. The expectation of waiting time conditional on s is $E_s[t_J^*(s,V)] = \int_0^1 \frac{1}{\lambda} ln\frac{V\lambda}{c}\frac{2s(1-\beta)\alpha+(2-2s)\beta(1-\alpha)}{(1-\beta)\alpha+\beta(1-\alpha)}\mathrm{d}s = \frac{1}{\lambda}ln\frac{V\lambda}{c}$. Then, $\Delta_1^{\prime(\theta=0)} = \frac{1}{\lambda(\bar{V}-V^*)}[(\bar{V}ln\bar{V} - \bar{V}) - (V^*lnV^* - V^*) + (\bar{V}-V^*)ln\frac{\lambda}{c}] + \frac{1}{\lambda(V^*-\underline{V})}[(V^*lnV^*-V^*) - (\underline{V}ln\underline{V}-\underline{V}) + (V^*-\underline{V})ln\frac{P_0^N\lambda}{c}]$. Subtract the baseline difference Δ_0 from $\Delta_1^{\prime(\theta=0)}$ and we obtain:

$$\Delta_1^{\prime(\theta=0)} - \Delta_0 = \frac{1}{\lambda}[-ln\frac{(1-\beta)\alpha}{(1-\beta)\alpha+\beta(1-\alpha)}] \tag{12}$$

Since $\frac{(1-\beta)\alpha}{(1-\beta)\alpha+\beta(1-\alpha)} \in (0,1)$, the term in the square bracket is always positive, implying that $\Delta_1^{\prime(\theta=0)} - \Delta_0 > 0$.

Next, we prove that $\Delta_1' - \Delta_0$ is monotone decreasing with θ continuously. Note that $P_0^{J(s)}$ is monotone increasing with s. To see so, $\frac{\partial P_0^{J(s)}}{\partial s} = \frac{\alpha\beta(1-\alpha)(1-\beta)}{(s(1-\beta)\alpha+(1-s)\beta(1-\alpha))^2} > 0$. This property reserves through the integral since the function $P_0^{J(s)}$ is bounded and integrable. Therefore, when θ goes from 1 to 0, s^θ increases, making both $P_0^{J(s,\theta)}$, $E_s[t_J^*(s,V)]$, and Δ_1' increase. Thus, $\Delta_1' - \Delta_0$ decreases monotonically and continuously with θ.

Since $\Delta_1^{\prime(\theta=1)} - \Delta_0 < 0$ and $\Delta_1^{\prime(\theta=0)} - \Delta_0 > 0$, by the Intermediate Value Theorem and the continuity of $\Delta_1' - \Delta_0$, there exists a $\theta^* \in (0,1)$ such that $\Delta_1' - \Delta_0 = 0$. By the monotonicity, $\theta*$ is unique. Combining the analysis above, $\Delta_1' - \Delta_0 > 0$ when $\theta^* \in [0, \theta^*)$ and $\Delta_1' - \Delta_0 < 0$ when $\theta^* \in (\theta^*, 1]$. □

One can easily verify that Proposition 1 also holds when $\alpha < \alpha^*$, as the two extreme case of the time difference does not depend on the range of V, as shown in the proof.

Alternatively, $\Delta_1' - \Delta_0$ can be expressed in the following form, where $M(\theta)$ is a continuous and monotone decreasing function changing from positive to negative as θ goes from 0 to 1:

$$\Delta_1' - \Delta_0 = \frac{1}{\lambda}M(\theta) \tag{13}$$

Proposition 1 reveals the core argument in this study. When there is no bias and the legal signal is delivered accurately through the court, the expected waiting time for litigation-related petitions is theoretically shorter, and this holds for both $\alpha > \alpha^*$ and $\alpha < \alpha^*$. This

is because the accuracy of the signal assists petitioners in having a more precise judgment about their true states on average and further optimizes their choice of time in the petition system. Given the signal *lose*, petitioners are more likely to be illegal. With the accurate signal, illegal petitioners form a clearer perception and tend to reduce their waiting time to minimize the costs since there is no hope of receiving a remedy. This reduces the expected waiting time for litigation-related petitions on average. However, in reality, the legal signal is biased upwards. Petitioners, especially illegal ones, hold a stronger belief about their states being legal and mistake that they have a high chance of getting the remedy. This mechanism increases the expected waiting time for litigation-related petitions, making them escalate into unauthorized petitions.

Now we consider the complete change of the difference in time difference and evaluate how the additional legal signal in the second period affects the choice of petitioners in the first period. Denote the effects of the adjustment of threshold V^* as ΔT.

Proposition 2. *The additional legal signal s decreases the decision threshold V^* when $\alpha > \alpha^*$ and increases V^* when $\alpha < \alpha^*$, both making $\Delta T > 0$.*

Proof. With the additional legal signal s, the expected utility in the judicial proceedings $EU'_J = E_s[U_J|L]\mu(L)+E_s[U_J|I]\mu(I) = \alpha(\beta V+(1-\beta)(V-\frac{c}{\lambda})(1-\frac{c}{P_0^{J(s)}V\lambda}))+(1-\alpha)[(1-\beta)V+\beta-\frac{c}{\lambda}ln\frac{P_0^{J(s)}V\lambda}{c})-F$. Compare the results with the original EU_J and we obtain $EU'_J-EU_J = (1-\alpha)\beta\frac{c}{\lambda}(ln\frac{(1-\beta)\alpha}{(1-\beta)\alpha+\beta(1-\alpha)}-\beta(1-\alpha)[\frac{1}{\alpha-\beta}-\frac{\alpha-\beta+\alpha(1-\beta)}{(\alpha-\beta^2)}ln\frac{\alpha(1-\beta)}{\beta(1-\alpha)}]$. Let $x=\alpha(1-\beta)\in(0,1)$ and $y=\beta(1-\alpha)\in(0,1)$. The expression is equivalent to $ln\frac{x}{x+y}-y[\frac{1}{x-y}-\frac{2x-y}{(x-y)^2}ln\frac{x}{y}]$, which is verified to be positive for $\forall\ x,y\in(0,1)$. Thus, $EU'_J > EU_J$. The expected in the non-judicial proceedings EU_N is unchanged. Then, $h'(V) = EU'_J - EU_N > EU_J - EU_N = h(V)$, implying that $h(V)$ moves upwards when the additional legal signal s is added.

By Lemma 1, when $\alpha < \alpha^*$, $h(V)$ is monotone decreasing. The upward shift of $h(V)$ leads to a higher threshold V^*. We verify that $\frac{(V^*lnV^*-V^*)-(\underline{V}ln\underline{V}-\underline{V})}{V^*-\underline{V}}-\frac{(\bar{V}ln\bar{V}-\bar{V})-(V^*lnV^*-V^*)}{\bar{V}-V^*}$ increases with $V^*\in[\underline{V},\bar{V}]$, thus a higher V^* makes $\Delta'_1-\Delta_0$ larger, implying that $\Delta T>0$. Similarly, when $\alpha>\alpha^*$, $h(V)$ is monotone increasing. The upward shift of $h(V)$ leads to a lower threshold V^*. Then, $\frac{(\bar{V}ln\bar{V}-\bar{V})-(V^*lnV^*-V^*)}{\bar{V}-V^*}-\frac{(V^*lnV^*-V^*)-(\underline{V}ln\underline{V}-\underline{V})}{V^*-\underline{V}}$ decreases with $V^*\in[\underline{V},\bar{V}]$, making $\Delta'_1-\Delta_0$ larger and $\Delta T>0$. □

The threshold of the binary decision in the first period is influenced by the prior α, while

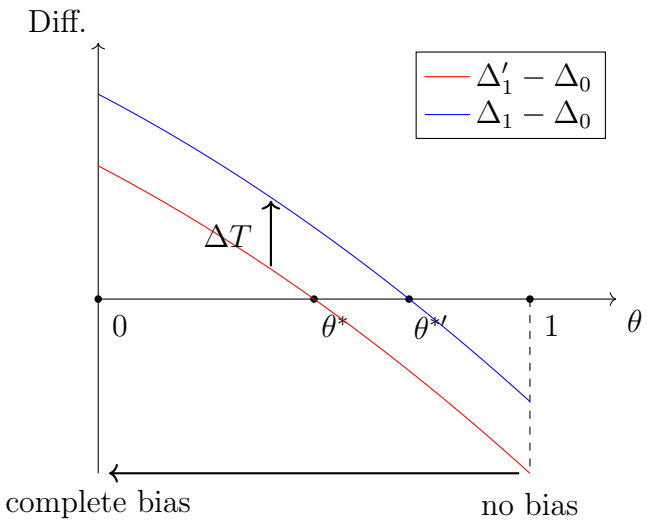
both lead to a positive ΔT.

Corollary 1. $\Delta_1 - \Delta_0 = (\Delta_1' - \Delta_0) + \Delta T$

Combining the Proposition 1 and 2, we have the above corollary. The overall difference between the petitioning time difference of the two proceedings with and without the additional legal signal can be decomposed into two parts: the first one is the pure effects from the biased signal and the second is the effects from threshold adjustment. Figure 2 illustrates the decomposition in Corollary 1.

From the above analysis, we can deduce that the pure effect of the biased signal in litigation-related petitions is further exacerbated by the threshold adjustment. Even when ΔT is small, it leads to a larger θ^*, which implies that even a small bias in the legal signal can lead to a longer waiting time in the petition system. When ΔT is large, the escalation phenomenon is more universal regardless of the bias.

Figure 2: Illustration for Corollary 1



4 Interaction with the Government

4.1 Equilibrium Analysis

In this section, we incorporate the interplay between petitioners and the local government. In section 3, the Poisson-distributed rate of return is assumed to be exogenous. Now we

make it endogenous and assume it is set by the government.

The interaction forms a three-period Bayesian game involving two players: the petitioner and the local government. In the first period, the petitioner chooses J and N. He then receives a signal *win* or *lose* sent by the courts which is observable by both players. If he wins, he receives V and ends the game, otherwise the game proceeds. In the judicial proceedings, the petitioner further receives the private signal s in the legal context. In the second period, the government determines the Poisson arrival rate of return $\lambda \in [0, +\infty)$ for the petitioner's remedy. In the third period, the petitioner decides the time t to stay in the petition system.

Assumption 3. *The local government upholds justice and only cares about letting the legal petitioners receive the remedies.*

Based on the assumption, we define the utility the government gains from justice by R. Meanwhile, setting the arrival rate λ is accompanied by a unit cost of k. By deciding the optimal level of λ, the government maximizes its utility, the function of which is defined as $U_G(\lambda) = E_V[P_0(1 - e^{-\lambda t^*})R] - k\lambda$, where P_0^J is the shared posterior belief about the petitioner's state after receiving the signal sent by the courts and t^* is the optimal choice of the petitioner in the third period.

We solve the perfect Bayesian equilibrium using the backward induction again. The strategy of the petitioner in the third period remains t^* as analyzed in section 3. In the second period, for the government involved with petitioners in the judicial proceedings, its expected utility $U_G^J(\lambda)$ is specified as $U_G^J(\lambda) = \int_{V^*}^{\bar{V}} P_0^J(1-e^{-\lambda}t^*)R\frac{1}{\bar{V}-V^*}\mathrm{d}V - k\lambda = P_0^J R - \frac{c(ln\bar{V}-lnV^*)}{R(\bar{V}-V^*)}\frac{1}{\lambda} - k\lambda$. Since the second derivative $U_G^{J''}(\lambda) = -2\frac{c(ln\bar{V}-lnV^*)}{R(\bar{V}-V^*)}\frac{1}{\lambda^3} < 0$ for any $\lambda \in [0, +\infty)$, we conclude that the solution to the first-order condition $U_G^{J'}(\lambda) = \frac{c(ln\bar{V}-lnV^*)}{R(\bar{V}-V^*)}\frac{1}{\lambda^2} - k = 0$ is a global maximum, which is the government's best choice of λ. Solving the equation, we obtain:

$$\lambda_J^* = \sqrt{\frac{c(ln\bar{V} - lnV^*)}{Rk(\bar{V} - V^*)}} \tag{14}$$

Similarly, we have $\lambda_N^* = \sqrt{\frac{c(lnV^* - ln\underline{V})}{Rk(V^* - \underline{V})}}$ for the government involving with petitioners in the non-judicial proceedings.

In the first period, the analysis is similar, except that the arrival rate λ becomes different for judicial and non-judicial proceedings and is no longer a parameter but a function of V in $h(V)$. By solving the condition $h(V) = 0$, we determine the threshold V^* for the binary decision of the petitioner in the first period.

In conclusion, the equilibrium is reached when V^* makes the petitioner indifferent between entering the judicial or non-judicial proceedings in the first period, the government chooses λ_J^* and λ_N^* respectively in the second period, and the petitioner chooses t^* in the third period.

4.2 Numerical Example

With the same procedure, we obtain:

$$\Delta_1' - \Delta_0 = \frac{1}{\lambda_J^*} M(\theta) \tag{15}$$

Since the functional form of $h(V)$, in this case, is complicated, we provide a brief numerical example to sketch the pattern of how the government interaction further influences the result in section 3. We set specific parameters as $\alpha = 0.8$, $\beta = 0.7$, $\beta' = 0.6$, $c = 100$, $k = 300$, $R = 1000$, $\bar{V} = 1000000$, $\underline{V} = 1$, and $F = 500$ as the benchmark for comparison. Then we vary R and k to see their effects on the government choice of λ_J^* and the coefficient in $\Delta_1' - \Delta_0$.

Table 2 presents the computational results. From the table, λ_J^* tends to increase as R increases and decrease as k increases. The result is intuitive. When the government puts a higher value on justice, it will strive to set a higher rate of return to benefit legal petitioners. But when the cost is high, it will set a lower rate of return. Besides, the difference coefficient tends to decrease as R increases and increase as k decreases, which implies that when there is great bias, the government's pursuit of justice tends to mitigate the escalation of litigation-related petitions through a higher λ_J^*, but also exacerbate this phenomenon when the cost of return rate is high. This result sheds light on policy recommendations for the central leaders and policymakers that by making the local government value more justice or helping it to reduce the administrative costs in the petition system, this phenomenon can be effectively

Table 2: Numerical Example with Specific Values

	Variation of R					Variation of k				
	R=1000	R=1500	R=2000	R=2500	R=3000	k=100	k=150	k=200	k=250	k=300
λ_J^*	0.086	0.107	0.125	0.141	0.156	0.086	0.069	0.059	0.052	0.048
Diff. Coefficient	11.644	9.347	7.995	7.082	6.414	11.644	14.495	16.920	19.062	21.018

alleviated and resolved to maintain social stability.

5 Discussion and Conclusion

This study focuses on a specific type of petition in China, litigation-related petitions, and offers a theoretical explanation for its escalation propensity. By the legal feature, litigation-related petitions are expected to have a more solvable nature. However, the biased information structure in the legal framework biases the perceptions and behaviors of petitioners, causing the escalation phenomenon.

As model implications, popularizing legal knowledge for citizens should be carried out simultaneously with the increasing awareness of rights to obligation sense. The government should provide legal training for petition officials and help petitioners form a correct legal cognition. For central leaders, enhancing the importance of justice in local governments and reducing the administrative burden of petitioning can be viewed as another two preventive strategies.

In future studies, the interplay between petitioners, the local government, and the central government can be further explored. Unlike disturbing and disruptive petitions, the other types of unauthorized petitions such as overstepping petitions and petitioning Beijing involve interaction between multiple levels of government (Li et al., 2012; Wang, 2012,0). For example, the local government may choose petition interception and abduction since it faces the pressure transmission under the government performance appraisal set by the central government in the political tournament.

In conclusion, economic studies in this field are still fresh but worth exploring, not only because petition is an interesting system and phenomenon in China, but also because the improvement and refinement of this administrative system is of great social significance and

plays an important role in promoting the cooperation and mutual assistance of public power and private rights, executing two-way persuasions, improving error corrections and regulating the settlement of disputes (Tang, 2010).

References

Bruckner, M. (2008). The paradox of social instability in china and the role of the xinfang system. *Cambridge Student L. Rev.*, 4:92.

Chaoqiang, X., Jin, C., and Wenyuan, L. (2015). A study of law-based chinese petition system from the perspective of evolutionary game model. *Canadian Social Science*, 11(9):76–85.

Chen, H. R. (2014). Performance of petition system and upgrading of petition visit strategy. *Journal of Shanghai Jiaotong University (Philosophy and Social Sciences)*, 3:42–50.

Dai, C. T. and Kilian, H. (2009). The petitioning system: A major challenge to social harmony? *China Perspectives*, (80):112–113.

Dimitrov, M. K. (2015). Internal government assessments of the quality of governance in china. *Studies in Comparative International Development*, 50:50–72.

Gao, X. and Long, J. (2015). On the petition system in china. *U. St. Thomas LJ*, 12:34.

Guo, J. (2012). *Chinese legal history*. Higher Education Press.

He, X. and Feng, Y. (2016). Mismatched discourses in the petition offices of chinese courts. *Law & Social Inquiry*, 41(1):212–241.

Hou, R. (2020). Maintaining social stability without solving problems: emotional repression in the chinese petition system. *The China Quarterly*, 243:635–654.

Huang, Y. (1995). Administrative monitoring in china. *The China Quarterly*, 143:828–843.

Huirong, C. (2020). Institutional complexity and the conversion of china's petition system. *China: An International Journal*, 18(2):1–25.

Hurst, W., Liu, M., Liu, Y., and Tao, R. (2014). Reassessing collective petitioning in rural china: civic engagement, extra-state violence, and regional variation. *Comparative Politics*, 46(4):459–482.

Li, H. B. (2012). An adventurous game—analysis of modern chinese petition game in the perspective of sociology of law. *Tsinghua Law Review*, 6(1):127–153.

Li, L. (2008). Political trust and petitioning in the chinese countryside. *Comparative Politics*, 40(2):209–226.

Li, L., Liu, M., and O'Brien, K. J. (2012). Petitioning beijing: the high tide of 2003–2006. *The China Quarterly*, 210:313–334.

Liao, X. and Tsai, W.-H. (2019). Managing irregular petitions in china: Two types of social control strategy within the authoritarian regime. *Journal of East Asian Studies*, 19(1):1–18.

Minzner, C. F. (2006). Xinfang: an alternative to formal chinese legal institutions. *Stan. J. Int'l l.*, 42:103.

Paik, W. (2012). Economic development and mass political participation in contemporary china: Determinants of provincial petition (xinfang) activism 1994–2002. *International Political Science Review*, 33(1):99–120.

Shen, X. (2015). A system with two faces–a bureaucracy case study of chinese petitioning system.

Su, M. Y. (2011). Case analysis of petition related to the real estate development in shanghai – petition cases of a residential quarter in shanghai. *Economic Research Guide*, 24:118–119.

Sun, B., Ling, C., Zhang, T., and Zhang, X. (2012). A study on the types of petitioning problems and an analysis of their management measures. *Legal System and Society*, 17:106–137.

Tan, S. K. and Qi, T. (2010). Building and analysis of the game model for land expropriation conflict in china. *China Land Sciences*, 3:25–29.

Tang, X. (2010). Reforms in the petition letter and visit system of china and construction of a harmonious society. *Frontiers of Law in China*, 5(1):77–90.

Wang, J. (2012). Shifting boundaries between the state and society: Village cadres as new activists in collective petition. *The China Quarterly*, 211:697–717.

Wang, J. (2015). Managing social stability: The perspective of a local government in china. *Journal of East Asian Studies*, 15(1):1–25.

Winckler, H. (2013). Risking one's life to petition the authorities: The black jail industry in china. *China Perspectives*, 2013(2013/4):3.

Wong, S. H.-w. and Peng, M. (2015). Petition and repression in china's authoritarian regime: Evidence from a natural experiment. *Journal of East Asian Studies*, 15(1):27–67.

Xu, P., Ye, Y., and Zhang, M. (2018). Assessing political participation on the internet in contemporary china. *Chinese Journal of Communication*, 11(3):243–266.

Yu, J. R. (2009). "paradox of petition" and its solution. *South Reviews*, 8:42–43.

Yu, J. R. (2011). Law consideration of "irregular petition". *Theory Journal*, 10:86–88.

Zhang, T. (2009). Why the chinese prefer administrative petitioning over litigation. *Sociological Stud*, 3:139.