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Authors

An, Yutian

Fan, Yingjie

Qian, Xuancheng

et al.

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From Visibility to Shadows: The Impact of Police Discretion on Prostitution in Response to Legal Changes*

Yutian An[†] Yingjie Fan[‡] Xuancheng Qian[§] Leo Yang Yang[¶]

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Abstract

Criminal law is typically seen as the domain of judges and prosecutors, yet police officers often act as de facto policymakers through their enforcement discretion. This paper explores the impact of police discretion on prostitution regulation in China, following a 2017 judicial interpretation that lowered the threshold for prosecuting pimps. Using novel datasets of over 110,000 administrative penalties and 3,300 criminal judgments related to prostitution, we find that heightened criminal liability for pimps has led to intensified police crackdowns in visible venues such as clubhouses, massage parlors, and karaoke bars. This enforcement shift was driven by police incentives to meet criminal investigation quotas, now facilitated by the eased criteria for accumulating evidence against pimps, which disproportionately affected prostitution in “visible” locations and pushed prostitution activities underground in the long run. Overall, these findings highlight the significance of grass-roots police incentives in delivering policy objectives and shaping regulatory outcomes.

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[†]Climenko Fellow and Lecturer on Law, Harvard Law School; Ph.D. Candidate in Politics, Princeton University, yan@law.harvard.edu

[‡]Ph.D. Candidate, Princeton University, yingjie@princeton.edu

[§]Ph.D. Candidate, Princeton University, xuancheng.qian@princeton.edu

[¶]Postdoctoral Scholar, Stanford University, leoyang@stanford.edu

1 Introduction

“A little error in the beginning leads to a great one in the end.”

– St. Thomas Aquinas

Throughout history, governments, driven by moral, health, or political concerns, have employed various policy tools to regulate the sex industry. In recent decades, there has been a noticeable shift towards implementing nationwide laws and regulations as blanket solutions to address the complexities associated with the prostitution industry. This approach often aims to standardize practices and enforcement patterns across regions, attempting to streamline legal frameworks and public health measures (Coleman, 2022).

Whether these laws and regulations could achieve their intended objectives often depends on street-level bureaucrats, specifically police officers, who wield considerable power in regulatory enforcement. In Micheal Lipsky’s words, police officers are “the ultimate policymakers”: law enforcement has significant discretion that allows them to make critical decisions that directly affect the implementation of these laws on the ground (Lipsky, 1983). Specifically, police officers determine the timing, location, and targets of enforcement actions. Beyond the implementation of a regulatory framework in the sex industry, law enforcement decisions can significantly impact the safety, health, and legal standing of sex workers, as well as influence the broader public’s perception and the social stigma associated with the industry (Gertler and Shah, 2011; Dewey and St. Germain, 2014; Jorgensen, 2018; He and Peng, 2022).

This paper examines how police discretion has systematically shaped the selective implementation of prostitution regulations in China, resulting in the displacement of prostitution activities. We leveraged a change in the judicial interpretation of “organized prostitution,” which significantly lowered the threshold for convicting pimps. Under the new interpretation, any individual found to be managing or controlling **three** or more sex workers would

qualify for the “organized prostitution” charge, a serious felony punishable by a minimum of five years in prison.

We find that the incentive structure of police enforcement performance led to selective implementation in response to the legal change and, subsequently, led to a displacement rather than deterrence effect on the sex industry in China. First, because the judicial interpretation has made it easier to impose criminal liability on pimps, law enforcement officers initially concentrated their efforts on traditional, visible “business locations” such as massage parlors, clubhouses, and karaoke bars, where police are more likely to arrest more people per search and gather sufficient evidence for criminal charges. This shift was largely driven by the officers’ desire to achieve their internal performance evaluation goals, which often emphasize measurable outcomes such as felony arrests. In contrast, “non-business locations” such as private apartments often have less than three sex workers on the scene, therefore rendering the pimps operating in those locations less susceptible to the criminal liability of “organized prostitution”.

Second, we find that police re-oriented their enforcement efforts after a period of time, driven by a subsequent and significant shift in the prostitution market itself. As traditional “business” venues became increasingly risky for pimps, the market began to move underground, transitioning into “non-business” locations like private apartments. The police, motivated by their desire to meet administrative quotas for arresting sex workers and clients, pivoted their enforcement efforts to less visible, non-business venues.

Overall, this paper seeks to make several contributions to the literature on bureaucratic politics, policing, and policy implementation. Discretion is known to be a key factor in determining the success of laws or policy changes ([Brodkin, 1997](#); [Brehm and Gates, 1999](#); [Knowles, Persico and Todd, 2001](#); [Hupe and Hill, 2007](#); [Portillo and Rudes, 2014](#); [Abrams, Fang and Goonetilleke, 2022](#)). However, there remains a scarcity of quantitative studies that evaluate how such discretion affects policy implementation. This gap is primarily attributed

to the difficulties associated with identifying sources of bureaucratic discretion (Hupe and Buffat, 2014; Zang, 2016; Portillo and Rudes, 2014; Tummers and Bekkers, 2014; Skolnick and Fyfe, 1993) and measuring the implications of their discretionary authority (Du Gay and Pedersen, 2020; Hupe and Buffat, 2014; Nielsen, 2006; Portillo and Rudes, 2014; Vedung, 2015). Furthermore, in studies aiming to evaluate the effectiveness of policy changes in shaping bureaucrats’ behaviors, it is often challenging to ascertain whether the policy changes themselves are endogenous to the internal dynamics of a given bureaucracy. This introduces complexity in determining whether changes in administrative behaviors are truly the result of exogenous policy design or merely a reflection of existing, inherent bureaucratic dynamics.

In addition, our study seeks to fill these gaps. First, we are able to measure the impact of institutional incentives (such as performance goals) (Brodkin, 1997) by separating them from individual ones (such as individual biases) (Evans, 2011, 2020). In the instant case, both individual and institutional incentive structures are constant and fixed before and after the change in judicial interpretation. But the institutional incentive related to criminal arrests was activated only after the judicial interpretation lowered the threshold for “organized prostitution”. Thus, this unique setup allows us to isolate the effect of this specific institutional incentive on street-level implementation of the legal change. Furthermore, by leveraging an external policy change (a change in judicial interpretation) that was outside the police’s influence, we were able to empirically assess the magnitude of police discretion by observing changes in enforcement activities and their subsequent impact on the sex industry in China.

Secondly, this paper underscores the importance of comprehending the incentives that influence police behavior in the administration of criminal law. In Skolnick’s words, “[o]n the street, the policeman has the greatest potential for discretionary judgment not to invoke the criminal law, a decision of major legal consequences for those involved.” (Skolnick, 1966) While much scholarship on policing focuses on the individual attributes of police officers

in exercising their discretion (Donohue III and Levitt, 2001; Goncalves and Mello, 2021; Rabe-Hemp, 2008; Sun, Payne and Wu, 2008), our study highlights that well-established institutional incentives such as police quotas should be scrutinized or taken into account when promulgating changes in criminal law (Ossei-Owusu, 2021).

Finally, we emphasize the necessity of inter-branch coordination for effective policy changes. Without a systematic consideration of the incentive structure, efforts at policy transformation are likely to falter (Brodkin, 1997). As this paper demonstrates, a judicial interpretation made without the police’s involvement can have significant public policy implications, such as driving the sex industry underground. Policymakers, when legislating changes to criminal law, must consider how these legal changes intersect with police incentives and how such intersections might affect law enforcement practices on the ground.

This paper will proceed in the following manner. Section II provides background information on different legal regimes governing prostitution worldwide, the legal change that lowers the standard of prosecuting pimps in China, as well as the regulatory framework of prostitution in China. Section III provides a formal model of crime deterrence and displacement after the promulgation of a legal change.¹ Section IV presents empirical evidence to test the formal model’s hypotheses. Section V concludes.

2 Regulating Sex Industry in China

2.1 Prostitution-related Regulatory Framework and Enforcement in China

What is the most “optimal” way of regulating the sex business? Influenced by a multitude of policy objectives and varying social conditions, governments across the globe adopt different approaches to prostitution regulation. Overall, most regulatory frameworks fall under one of

¹All omitted proofs are in the Appendix.

the following four types, ranging from legalization to criminalization, summarized in [Table 1](#).²

Legal Status	Pimps	Sex Workers	Clients
Legalization	No Criminal Liability	No Criminal Liability	No Criminal Liability
Decriminalization	Criminal	No Criminal Liability	Criminal
Criminalization	Criminal	Criminal	Criminal
Dual Model	Criminal	Administrative Sanction	Administrative Sanction

Table 1: Legal Status of Various Parties in the Prostitution Industry

China adopts a dual administrative-criminal approach. Sex workers and clients are subject to administrative penalties, but not criminal liability. Third parties, however, might be subject to criminal charges if they meet the criteria specified in the penal code; if not, they are subject to administrative penalties.

Sex workers and clients: First, people who buy or sell sex are subject to administrative punishment. Article 66 of the Public Security Administration Punishment Law gives the police the authority to sanction sex workers and their clients:

Article 66 of the Public Security Administrative Punishment Law:

Those involved in prostitution or solicitation shall be detained for a period of not less than ten days but not more than fifteen days and may also be fined

²The first model is the legalization model, observed in countries like the Netherlands and Germany ([Post, Brouwer and Vols, 2019](#)). Under this system, the sex industry is legal, provided that establishments and workers register with relevant government authorities.

The second model is the decriminalization model, adopted by countries including Sweden, Norway, and France ([Kingston and Thomas, 2019](#)). The decriminalization model aims to control the industry through demand reduction. Hence, prostitution businesses (brothels), third-party involvement (such as pimping), and clients are subject to criminal penalties. However, sex workers are not subject to criminal sanctions.

The third model is the criminalization model, prevalent in most U.S. states (with the exception of Nevada) and many Middle Eastern countries ([Davis, 2015](#)). All aspects of prostitution are deemed criminal offenses; consequently, sex workers, pimps, and clients are all subject to criminal liabilities.

The fourth model is the dual administrative-criminal model, which is adopted by countries such as China and Russia. Under this approach, sex workers and clients face administrative penalties, which are considerably less severe than criminal charges. (Russia: Code of Administrative Offences of the Russian Federation No. 195-FZ of December 30, 2001, art. 6.11.) In contrast, third-party involvement, including pimping, is subject to criminal liabilities. (Russia: Penal Code art. 240 - 241.)

an amount not exceeding five thousand yuan; if the circumstances are relatively minor, they shall be detained for not more than five days or fined an amount not exceeding five hundred yuan.

In other words, sex workers and clients, once arrested, are often subject to penalties like detention and fines. Because the Public Security Administration Punishment Law falls under the purview of administrative law in China, the police have full authority when issuing these penalties and do not need to obtain the prosecutor's or court's approval.³

Pimps: While the act of buying or selling sex is not generally in itself criminal, these sanctions can serve as crucial evidence for prostitution-related criminal charges of organized prostitution. As Article 358 of the Penal Code stipulates:

Article 358 of the Penal Code: Those who “administer or control **multiple** prostitutes” through various means such as “recruitment, hiring, and gathering” can be convicted under the “organized prostitution” charge. Organized prostitution is a felony offense subject to at least five years of sentencing.

In many cases, police conduct searches of cellphone devices to examine communications between sex workers and clients. These records are often utilized to identify and investigate potential third-party involvement, including assessing whether there is any probable cause of “organized prostitution”. Administrative penalties issued to sex workers and clients, along with other evidence collected during these law enforcement activities, can then be used to support the prosecution of pimps under charges of organized prostitution in the criminal justice system.

While third-party involvement in prostitution generally falls under the purview of criminal law, the Penal Code is silent on what “multiple prostitutes” mean. This ambiguity in the threshold for “multiple,” as mentioned in Article 358, largely leaves its interpretation to

³Sex workers or clients, if dissatisfied with the police penalties, can bring an administrative lawsuit against the police in court, and the court can either uphold or overrule the police penalty afterward.

the discretion of law enforcement officials. Consequently, when law enforcement officers are uncertain about whether they have gathered sufficient evidence to prosecute a third party for more severe charges under criminal law, they often resort to imposing sanctions under Article 67 of the Public Security Administration Punishment Law:

Article 67 of the Public Security Administrative Punishment Law:

Those who entice, harbor, or introduce others to engage in prostitution shall be detained for a period of not less than ten days but not more than fifteen days and may also be fined an amount not exceeding five thousand yuan; if the circumstances are relatively minor, they shall be detained for not more than five days or fined an amount not exceeding five hundred yuan.

In summary, prostitution is itself illegal; however, not all aspects of prostitution activities are criminalized in China, where the discretion of law enforcement largely determines the penalties against third-party involvement. [Table 2](#) provides an overview of the regulatory framework against prostitution-related offenses in China.

	Criminal Law Organized Prostitution $\geq$: 5 Yr Sentencing	Administrative Penalty Detention: < 15 Days; Fine: < \$700
Sex Workers	No	Yes
Clients	No	Yes
Third-party	Yes $\geq$ convicting criteria	Yes < convicting criteria

Table 2: Regulatory Framework against Prosecution-related Offenses

2.2 A Stricter Judicial Interpretation to Crackdown Prostitution: The 2017 Guidelines

Given the significant disparity in penalties between criminal offenses and administrative penalties for third parties, the threshold for conviction pimps becomes a critical factor that

greatly influences the discretionary powers of police and prosecutors. This discretion, however, results in a lack of standardization in how prosecutorial and judicial authorities handle and decide on prostitution-related offenses.

Given the legal indeterminacy, the Supreme People’s Court and the Supreme People’s Procuratorate, the highest court and the highest prosecutorial authority in China, decided to clarify the threshold to convict third parties for organized prostitution under criminal charges. On July 4, 2017, the highest court and highest prosecutorial authority jointly issued a guideline on handling prostitution-related criminal cases, entitled “The Interpretation of Several Issues Regarding the Application of Law in the Handling of Criminal Cases Involving Organizing, Forcing, Enticing, Sheltering, or Introducing Prostitution” (hereinafter the “2017 Guidelines”), which became effective on July 25, 2017.⁴

The 2017 Guidelines then provided much-needed clarity by setting the “multiple” threshold as a number of **three**. In other words, if a pimp is found to control or administer three or more sex workers, this person would be found liable under the criminal charge of organized prostitution. In other words, the 2017 Guidelines standardizes the convicting criteria for the criminal charge of organized prostitution and minimize the discretion of prosecutors when bring charges against third-parties.

In practice, the 2017 Guidelines signifies a systematic shift toward a more stringent stance on organized prostitution. Our interviews with multiple police officers and prosecutors reveal that, prior to the 2017 Guidelines’s issuance, most localities had thresholds higher than three sex workers for the organized prostitution charge, and prosecutors would decide the “threshold” for prosecuting pimps under this charge. With the introduction of the 2017 Guidelines, this threshold of three has elucidated the prosecution standard, therefore obligating prosecutors to prosecute a pimp as long as substantial evidence to demonstrate that the pimp has controlled or administered three sex workers.⁵

⁴The original Chinese judicial interpretation document can be found here: https://www.spp.gov.cn/spp/zd gz/201707/t20170724_196584.shtml

⁵There are very few exceptions where the localities used a threshold of two as the headcount, but they

2.3 Police Incentives and the 2017 Guidelines

Police wield enormous discretion in their daily law enforcement activities. In the case of prostitution, police determine where to crack down on such activities: whether they choose to conduct crackdowns in a “business” location such as massage parlors or “non-business” locations such as private apartments. Such decisions are often reflective of the institutional incentives that police face.

In the instant case, interviews with multiple police officers and police reports⁶ suggest that the Chinese police confront three sets of performance goals or quotas relating to prostitution enforcement:

1. **Number of arrested sex workers and clients:** how many sex workers or clients police arrest (who are subject to administrative sanctions).
2. **Number of arrested pimps:** how many pimps police arrest, regardless of whether they are subject to administrative sanctions or criminal prosecution.
3. **Number of “criminal groups” apprehended:** how many “organized crime” cases

were typically peripheral or less developed areas where prostitution-related activities were already low. Even among these localities, interviewees suggested that after the issuance of the 2017 Guidelines, the threshold has also become lower in practice. For instance, before the 2017 Guidelines, an organized prostitution charge would require corroborative evidence of arresting two prostitutes and two clients at the same time and in the same venue. Subsequent to the 2017 Guidelines, police can operationalize the increased headcount threshold as an accumulative criterion. In other words, if the police are able to document three incidents of prostitution on the same property within a specified time frame (like a year), rather than catching two incidents all at once, this accumulation of prostitution could serve as evidence to support an organized prostitution charge.

⁶Interview details are included in [Appendix B](#). For example, in the “2020 Performance Evaluation Report” by Xinzhou Police Sub-Bureau, Wuhan City”, the police department specifically listed the following as their accomplishments: “We conducted dedicated prostitution and gambling crackdowns more than 20 times, during which we identified more than 300 personnel involved in these illegal activities, arrested 17 people for potential criminal persecution, ..., cracked down 2 prostitution hideouts, and concluded 22 prostitution and gambling-related cases.” See <https://www.whxinzhou.gov.cn/ztzl/yjs/2021/qzfgzbm/qgafj/sndjs/202112/P020240508407129709615.pdf>. In another “2022 Performance Self-Evaluation Report” by “Huadu Police Sub-Bureau, Guangzhou City”, the police department listed the following as their accomplishments: “We conducted strong campaigns against prostitution and gambling. We established a system of weekly analysis and monthly research/judgment of prostitution and gambling incidents; for high-crime areas and venues, we conducted enforcement focusing on hideout shutdowns and criminal group crackdowns. In this year, we crack down on 96 groups and hideouts related to gambling and prostitution, thereby reducing prostitution incidents by 19.2%...” See <https://www.huadu.gov.cn/attachment/7/7534/7534752/9262445.pdf>.

police could bring to the prosecutors. This includes the pimp who is apprehended under the “organized prostitution” charge. In practice, this performance goal yields a higher career benefit than the number of pimps arrested (Quota 2).⁷

Before the 2017 Guidelines, a given police enforcement activity would allow the police to meet both quotas on 1) penalizing sex workers and clients (Quota 1) and 2) arresting pimps (Quota 2). However, whether the police could establish organized prostitution was uncertain. This was because the threshold for establishing organized prostitution was unclear before the issuance of the 2017 Guidelines. Thus, if the police were to conduct crackdowns in “business” locations, the unknown threshold of criminalizing third parties left it unclear to law enforcement whether arrests of third parties at business locations would qualify for organized prostitution (Quota 3). Yet, if the police were to conduct crackdowns in “non-business” locations, it would be unlikely for the police to establish organized prostitution because the discrete nature of these locations entails that they typically host only 1 or 2 sex workers.

However, immediately following the 2017 Guidelines, the new threshold of three sex workers to establish an organized prostitution charge has rendered pimps who oversee brothels of “business” locations more likely to be criminalized. Therefore, raiding “business” locations would enable law enforcement to meet their Quota 3 more easily and likely without additional effort. We thus hypothesize that the 2017 Guidelines would lead to an increased allocation of policing efforts to business locations. We operationalize this measure as the number and proportion of arrests at business locations.

An increased chance of getting arrested at business locations could alert and re-shape the sex industry. It is in pimps’ interests to relocate to non-business locations where the chance of being arrested is lower. As pimps started relocating to non-business locations to evade criminal repercussions, police would not be able to meet any quotas (Quotas 1,

⁷Based on multiple interviews with police officers.

	Q1: sex worker and client arrest	Q2: pimp arrest	Q3: criminal org
Before	(High, High)	(High, High)	(Medium, Low)
Immediately After	(High, High)	(High, High)	(High, Low)
After a Period	(Low, High)	(Low, High)	(Low, Low)

Table 3: 2017 Guidelines and Police Quotas by Prostitution Locations

2, 3) if they insisted on raiding business locations. In other words, the benefit of raiding business locations shrank over time as the prostitution industry diffused into more discrete and obscure forms. For these reasons, police pivoted their enforcement efforts back to non-business locations in order to meet regular prostitution enforcement quotas (Quotas 1 and 2, arresting sex workers, clients, and pimps). In the long run, the crime market should reach a new equilibrium between business and non-business locations, where policing efforts should be reflective of the crime market. A summary of the 2017 Guidelines on police’s likelihood of meeting various quotas is found below at Table 4.⁸

Overall, the 2017 Guidelines, on paper, seek to minimize prosecutor’s discretion and standardize the charging decisions of pimps in organized prostitution. In practice, however, how it affects police behavior remains to be empirically examined. After all, police enforcement decisions are often heavily influenced by their existing incentive structures, such as performance quotas. By leveraging an external legal change promulgated by the highest court and prosecutorial authority, we evaluate how the police’s incentive structure might shape their discretion in their enforcement activities and how such exercises of discretion has transformed the industry regulated here.

⁸In the parentheses, the first entry refers to the police’s likelihood of meeting the quota in business locations, and the second entry refers to the police’s likelihood of meeting the quota in non-business locations. For example, (High, High) means that the police is likely to meet its quota in a business or non-business location.

3 Model

3.1 Setup

In this section, we provide a theoretical framework to examine the effect of legal changes on police officers, pimps, and the overall prostitution industry. The model consists of a population of police officers and another large population of N potential pimps.

Prostitution locations: In the context of prostitution activities, we define business locations as places often associated with prostitution client-facing purposes, such as hair salons, massages, and clubhouses. To be more specific, these are areas where the police may reasonably expect to conduct searches of the entire premise because they believe additional sex workers and clients may be there. For instance, establishments offering services such as bathing, relaxation, and sometimes even massage or sauna facilities, like bathhouses or spas, are often frequented by individuals seeking sex services directly. Conversely, non-business locations are places not associated with prostitution purposes. In other words, in these locations, the probability of the police discovering other offenders within the same property unit or neighboring units is low. The detailed definition of business and non-business locations is in [Appendix A](#).

Pimps: A potential pimp chooses whether to commit a crime (organizing prostitution activities) or not. If a pimp commits such a crime, there are two types of locations where the crime can take place: $l \in \{b, nb\}$, where $l = b$ represents a business location and $l = nb$ represents a non-business location.

Police: Each police officer conducts searches for prostitution activities, allocating police resources σ_b at business locations and σ_{nb} at non-business locations. The probability $p_l = f(\sigma_l) \in [0, 1]$ denotes the probability that a pimp at location l commits a crime and is apprehended given police resource σ_l . Greater policing resources increase the probability of apprehension among pimps operating at the same location, hence the partial derivative

$$f_{\sigma_l} > 0.$$

Prostitution market: Given the segmented crime market, pimps are partitioned into two groups: n_b is the measure of pimps operating at business locations and n_{nb} is the measure of pimps operating at non-business locations. The payoff for the pimp at business locations is structured as follows:

$$v_b = b(n_b) - c(p_b, p_{s|b}) \quad (1)$$

$b(n_b)$ and $c(p_b, p_{s|b})$ are the benefit and cost of being a pimp at a business location. The benefit of being a pimp depends on the total number of pimps at business locations. The cost function depends on two components: p_b , the probability of apprehension at a business location and $p_{s|b}$, the subsequent probability of being prosecuted under the criminal code for organized prostitution after apprehension at a business location.

The payoff for pimps at the non-business locations follows the same logic:

$$v_{nb} = b(n_{nb}) - c(p_{nb}, p_{s|nb}) \quad (2)$$

p_{nb} is the probability of apprehension at a non-business property and $p_{s|nb}$ is the probability of prosecution given apprehension at a non-business property. $b(n_b)$ and $c(p_{nb}, p_{s|nb})$ denote the benefit and cost for the pimp at the non-business property. We assume that:

Assumption 1. $\frac{db}{dn_l} < 0$ for $l = b$ or nb .

Assumption 2. $\frac{\partial c}{\partial p_l} > 0$, $\frac{\partial c}{\partial p_{s|l}} > 0$ for $l = b$ or nb .

[Assumption 1](#) means that a pimp's individual benefit diminishes as the total number of pimps increases. [Assumption 2](#) means that the cost of being a pimp increases when the probability of apprehension or the probability of prosecution after apprehension rises.

3.2 Pimp problem

We begin by solving the economic problem faced by potential pimps. Based on evidence from the field interview, we restrict our attention to the parameters where the market has a dual structure and the equilibrium is interior. Pimps will organize prostitution activities in a given location l only if it yields the highest payoffs. The interior optimal outcome is determined by the following conditions. First, pimps must be indifferent between organizing prostitution in business locations and non-business locations (Equation 3). The second is a market-clearing condition, stating that the total number of pimps in the prostitution industry equals the sum of the number of pimps in business and non-business locations (Equation 4). We assume an upward-sloping supply curve at the level of payoff for pimps $S(v)$.⁹

$$v^e = v_b = v_{nb} \quad (3)$$

$$n_b(v^e, p_b, p_{s|b}) + n_{nb}(v^e, p_{nb}, p_{s|nb}) = S(v) \quad (4)$$

3.3 Police problem

Now we turn to the optimization problem for the police. The police have the following concave objective function (Equation 5), and they aim to maximize their payoff, which consists of four components. These components include (i) the payoff from arresting sex workers and clients, (ii) the payoff from apprehending pimps, (iii) the payoff from prosecuting pimps as part of organized crime, and (iv) the cost of policing.

The first component involves the benefits the police receive from cracking down on sex work, including the arrest of both the sex workers and clients, which is captured by the term $\pi_1 * k_l(n_l) * p_l$. The term π_1 represents the benefit the police receive for each sex worker and

⁹Alternatively, we can conceptualize the supply curve by assuming that every potential pimp has a legal employment opportunity $\theta \geq 0$, which follows distribution $F(\theta)$ with density $f(\theta) = F'(\theta)$ over the nonnegative interval. Then the fraction of potential pimps that commit a crime is $F(v^e)$.

client apprehended. $k_l(n_l)$ denotes the number of sex workers and clients in location l who are apprehended by the police in one enforcement activity. Again, because different locations have different business structures, even with the same number of pimps (n_l) operating at one location, the number of sex workers and clients that they can accommodate can still vary. And p_l is the probability of apprehension in that location.

The second component refers to the benefits the police receive from apprehending pimps, given by the term $\pi_2 * n_l * p_l * (1 - p_{s|l})$. The term π_2 is a constant benefit per pimp (or a third-party in general) apprehended but not prosecuted. p_l refers to the probability of apprehension, and $(1 - p_{s|l})$ refers to the probability of non-prosecution upon apprehension.

The third component captures the benefits when pimps are apprehended and prosecuted as part of organized crime, where $p_{s|l}$ is the probability that a pimp will be prosecuted in location l and π_3 captures the benefit per pimp apprehended and prosecuted and we assume that $\pi_3 > \pi_2$ ¹⁰.

The fourth component $c(\sigma_l)$ denotes the policing cost in location l . where σ_l denotes the policing effort (search intensity).

Given these components, the police officer's objective is to choose the level of policing effort (σ_b, σ_{nb}) that maximizes their utility function $U(\sigma_b, \sigma_{nb})$:

$$\begin{aligned} \max U(\sigma_b, \sigma_{nb}) = & \sum_{l \in \{b, nb\}} \pi_1 * k_l(n_l) * p_l + \pi_2 * n_l * p_l * (1 - p_{s|l}) + \pi_3 * n_l * p_l * p_{s|l} - c(\sigma_l) \\ \text{s.t.} \quad & \sum_{l \in \{b, nb\}} \sigma_l \leq \bar{\sigma} \end{aligned} \tag{5}$$

The constraint ensures that the total policing effort does not exceed the available resources, denoted by $\bar{\sigma}$ ¹¹. Thus, any optimal search intensity for a police officer satisfies the first-order condition:

$$U_{\sigma_b} = U_{\sigma_{nb}} \tag{6}$$

¹⁰Our interviews with multiple police officers confirm this assumption.

¹¹We then explore the variation when the resource constraints are relaxed after the legal change

3.4 Legal change

The legal change pursuant to the 2017 Guidelines yields the critical assumption in [Assumption 3](#), where we assume that the legal change disproportionately increases the probability of being prosecuted after arrest for pimps operating at business properties compared to those at non-business properties. We provide empirical evidence for this assumption by calculating the probability of prosecution after apprehension in business and non-business locations ($p_{s|b}$ and $p_{s|nb}$) using the administrative and criminal records in Zhejiang in [Appendix C.3](#).

Assumption 3. $\Delta p_{s|b} > \Delta p_{s|nb} \geq 0$

Proposition 1. *(short run) The legal change*

- (i) increases the level of arrest rate at business locations.*
- (ii) decreases the level of arrest rate at non-business locations.*
- (iii) increases the level of arrest rates at both business and non-business locations when the resource constraint expands.*

In the short run, we treat the actions of pimps as fixed.¹² Hence as the legal change disproportionately increases the prosecution probability in business locations ($p_{s|b}$) compared with that of non-business locations ($p_{s|nb}$). Correspondingly, to maximize their utility in [Equation 5](#), police officers should substitute policing efforts in non-business locations for efforts in business locations to increase their payoff as $\frac{U_{\sigma_b}}{U_{\sigma_{nb}}}$ increases. Hence, the legal change shifts more policing efforts towards business locations given the constraints on the total available policing efforts. Without the resource constraints (hiring more police officers or increasing number of hours per police officer), we predict an increase in search intensity at both business and non-business locations to maximize police' utility function, as both

¹²We provide a detailed justification for this assumption in [subsection 5.3](#).

the probability of prosecution after apprehension increase in both business and non-business locations ([Assumption 3](#)).

In the long run, pimps optimize their behavior based on the legal change and the subsequent change in policing behaviors. From [Equation 3](#) and [Equation 4](#), we take the partial derivative with respect to $p_{s|l}$. [Equation 7](#) states that the increase in prosecution probability $p_{s|l}$ leads to a lower equilibrium payoff for pimps. [Equation 8](#) indicates that the number of pimps operating at business locations decreases due to the increase of prosecution probability at business location $p_{s|b}$. [Equation 9](#) means that the number of pimps operating at business locations increases if the prosecution probability at non-business location $p_{s|nb}$ increases and the prosecution probability at business location $p_{s|b}$ remains the same.

$$\frac{\partial v^e}{\partial p_{s|i}} < 0 \quad (7)$$

$$\frac{dn_b^e}{dp_{s|b}} = \frac{\partial n_b^e}{\partial v} \frac{\partial v^e}{\partial p_{s|b}} + \frac{\partial n_b^e}{\partial p_{s|b}} < 0 \quad (8)$$

$$\frac{\partial n_b^e}{\partial p_{s|nb}} = \frac{\partial n_b^e}{\partial v} \frac{\partial v^e}{\partial p_{s|nb}} > 0 \quad (9)$$

Proposition 2. (*deterrence and displacement*) *The legal change*

- (i) *decreases the number of pimps operating at business locations.*
- (ii) *increases the number of pimps operating at non-business locations.*
- (iii) *decreases the total aggregate number of pimps.*

According to Proposition 2, [Figure 1](#) illustrates the impact of different probabilities of prosecution after apprehension on both the total number of pimps and the number of pimps in each type of location, respectively. The demand curves for pimps who organize prostitution

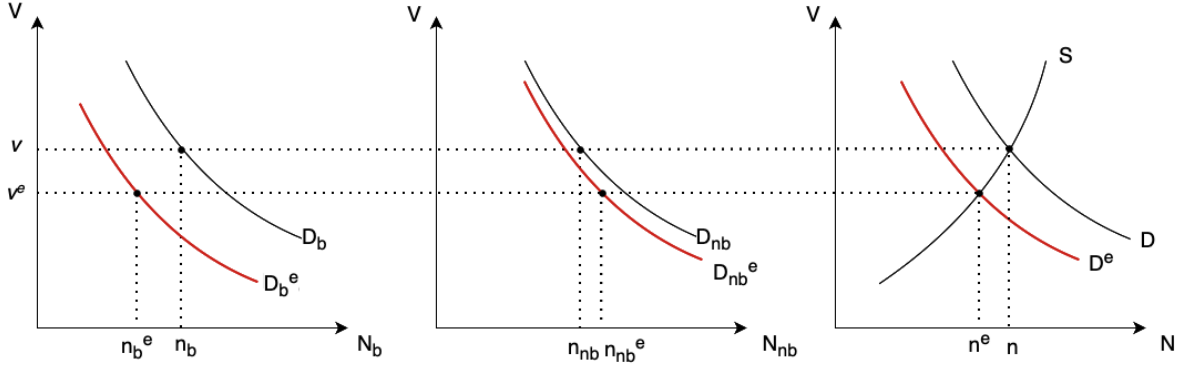


Figure 1: The effects of legal changes on equilibrium outcomes of pimps.

in business locations (left panel) and non-business locations (central panel) both exhibit a downward slope. An increase in the probability of prosecution after apprehension for pimps ($p_{s|nb}$) in non-business properties shifts the curve to the left (from D_{nb} to D_{nb}^e). A larger increase in the probability of prosecution after apprehension for pimps at business locations ($p_{s|b}$) shifts the demand curve to the more left position (from D_b to D_b^e). Given that $S'(v) > 0$ (because the supply curve is an upward slope) we see a decrease in the overall number of pimps in the prostitution industry (from n to n^e). However, the implications for each type of location are less optimistic. Due to the difference in probabilities of prosecution after apprehension at business and non-business locations, the number of pimps operating in non-business locations increases compared to the previous level (from n_{nb} to n_{nb}^e) (the right panel). While there is an overall deterrence effect due to the legal change, unintended displacement occurs between different locations, leading to an unexpected redistribution of pimp activities.

4 Data

Benefiting from the interim measures in Zhejiang Province and the 2008 Open Government Information (OGI) regulations, we are able to utilize public record on 113,939 administra-

tive penalty decisions from Zhejiang Province¹³ from January 1st 2016 to December 31st, 2019 and 3,300 criminal judgments nationwide from January 1st 2014 to December 31st, 2019 to empirically investigate the effects of the 2017 Guidelines on prostitution solicitation and organized prostitution. The administrative penalty features arrested clients, sex workers, and third-party involvement, and the criminal judgement features prosecuted pimps who are charged with organized prostitution.

4.1 Administrative Penalty Decision

For each case, the Administrative Penalty Decision includes: 1) the offender’s name (often anonymized), 2) the main facts of the violation, including the time of the event and the address of prostitution activity, 3) the legal basis of the administrative penalty, 4) the content of the administrative penalty (detention, fine, or both), and 5) penalty execution. An example of an administrative penalty judgment is below:

Main Facts of Violation: On January 1st, 2016, around 10:40 AM, Yang **, introduced by Liu **, engaged in sexual relations with Yang ** for a negotiated price of 50 yuan per encounter, with Liu ** profiting 20 yuan from the arrangement. Later, Yang ** followed Liu ** to a room at the Pudong Hotel on Yuhuai Road, where they engaged in sexual relations. Both individuals were apprehended by police officers from the Chengxiang Police Station on January 1st, 2016, and one condom was seized on the spot.

Legal Basis and Content of the Administrative Penalty: Pursuant to Ar-

¹³The administrative penalty data used in this study primarily come from Zhejiang Province, which has been implementing the “Interim Measures for the Online Public Disclosure of Administrative Penalty Results in Zhejiang Province” since July 1, 2015. According to these measures, all administrative penalty information should be publicly disclosed within 20 working days, unless the cases involve special circumstances such as state secrets, commercial secrets, or personal privacy. Importantly, cases related to prostitution and solicitation are fully disclosed without reservation, as they typically do not involve personal privacy concerns due to the anonymization process applied to the disclosed cases. Censorship and selection bias should not be a concern given this category of administrative penalty.

ticle 66, Paragraph 1 of the "Public Security Administration Punishment Law of People's Republic of China," Yang ** is hereby given an administrative detention of ten days as an administrative penalty.

Administrative Penalty Execution: The administrative detention will be carried out at the Xiaoshan District Detention Center in Hangzhou City.

We have derived a set of key variables for our analysis. These variables of interest encompass the following aspects:

1. the date of the case,
2. the time of the prostitution activity,
3. details on the prostitution activities;
4. the category of location where the offense occurred (whether in business or non-business locations),
5. the specific provisions of the Public Security Administrative Penalty Law, which is cited as the legal basis of the penalty,
6. the amount of the imposed fine (if imposed),
7. the duration of detention days,
8. whether the solicitation was initiated through online platforms from the administrative penalty judgment.

Specifically, we categorize the offense location as either a business location or a non-business location. Consistent with our definition in [section 3](#), we define business locations as places where the location is often associated with prostitution client-facing purposes, such as hair salons, massages, and clubhouses. Conversely, non-business locations are places that are not associated with prostitution purposes. After pre-processing, we identified a total of 113,939 administrative penalty decisions relevant to our analysis from Zhejiang Province from January 1st 2016 to December 31st, 2019.

4.2 Criminal Judgments

Criminal judgments are usually divided into several standardized sections. The first section describes the facts of the case and the criminal procedure, including the nature and extent of criminal conduct as well as the criminal investigation and prosecution process. Overall, this section provides a detailed summary of the events leading up to the judicial proceeding. The second section focuses on the evidentiary proof. It contains both physical evidence and courtroom testimony. The final section is the court’s decision. This section explains the court’s findings and judgment in the case, including the verdict and sentencing decisions.

Important metadata can also be found in criminal judgments. We specifically use elements such as the specific criminal charge(s), the date of police arrest, the date of prosecution, the date of sentencing, and the location of prostitution activity (using the same classification method to categorize business and non-business locations).

In criminal cases, the judicial interpretation would directly impact the prosecutor’s decisions about 1) whether to prosecute and 2), if so, what charges to bring. As previously mentioned, prior to the 2017 Guidelines, various regions used different standards to establish the legal threshold for the organized prostitution charge (such as the number of sex workers that a pimp was required to administer or control).¹⁴ The 2017 Guidelines thus standardized the threshold for prosecuting arrested third parties as organized prostitution crimes to commanding or controlling three sex workers or more. This change in legal standard was immediately reflected in prosecutors’ decisions to prosecute under the organized prostitution charge. Therefore, we consider the prosecution filing date as the starting point to interpret the direct impact of the 2017 Guidelines.

We have identified a total of 3,300 trial-level criminal cases nationwide related to organized prostitution that occurred between January 1st, 2014, and December 31st, 2019, based on the prosecution date.¹⁵

¹⁴Interviews with prosecutors and law professors in different localities.

¹⁵We only include trial (or first-instance) cases, and all cases on appeal have been excluded. We begin with

5 Empirical Results

5.1 Segmented Prostitution Patterns

Prostitution takes place in different types of venues. Typically, business venues such as massage parlors are hubs for such activities because of their ability to accommodate a greater influx of clients and sex workers. This study corroborates this trend by utilizing administrative penalty decisions: the mean number of people arrested per successful police enforcement activity is notably higher within business locations compared to non-business locations. [Table 4](#) compares the average number of arrests per successful search by police in a business and a non-business location before the promulgation of the 2017 Guidelines.¹⁶ Before the 2017 Guidelines, on average, a successful police search at a business location would yield an arrest of 2.58 people, while 0.40 to 0.49 fewer individuals were arrested at non-business locations. This reflects the segmented patterns of prostitution activities at business and non-business locations. In other words, the nature of business locations allows more sex workers and clients to be present together at the same time. In other words, it is easier for police to arrest more sex workers and clients during a search at a business location. Consequently, because there is more corroborating evidence in a police search at a business location, police are more likely to turn over a possible criminal case for “organized prostitution” against the pimp.

4,491 criminal cases on organized prostitution, with judgment dates from August 14th, 2007 to September 17th, 2021. Due to privacy concerns, 359 cases do not disclose any detailed information in their criminal judgments and are hence excluded from our analysis. In instances where no prosecution filing date was available in the criminal judgments, we utilized the arrest date ordered by the prosecution. We then excluded 144 cases where we could not identify any prosecution filing or arrest date. We finally excluded judgments entered before January 1st, 2014, since this is the date when the Supreme People’s Court, the highest court in China, implemented the open government initiative of publicizing judicial decisions online.

¹⁶Model 1 regresses the number of people arrested by location category. Model 2 incorporates the police department fixed effect based on Model 1.

Table 4: Number of Arrested per Successful Search

	<i>Dependent variable:</i>	
	(1)	(2)
Non-business Location	−0.40*** (0.04)	−0.49*** (0.05)
Constant	2.58*** (0.03)	
Police Department Fixed Effect	No	Yes
Observations	10,937	10,937
R ²	0.01	0.01
Adjusted R ²	0.01	−0.12
F Statistic	90.91*** (df = 1; 10935)	103.22*** (df = 1; 9626)

Note:

*p<0.1; **p<0.05; ***p<0.01

5.2 Differential Effects of Legal Changes: Analyzing Shifts in Prosecution Rates

The primary goal of the 2017 Guidelines is to strengthen legal measures against organized prostitution through deterrence by increasing the likelihood of prosecuting pimps after apprehension. The current interpretation of criminalization standards for organized prostitution makes it easier to prosecute arrested pimps than before. The number of pimps being prosecuted (n^C) is jointly determined by the total number of pimps (n_b and n_{nb}), the probability of being arrested by the police (p_b and p_{nb}), and the probability of being prosecuted ($p_{s|b}$ and $p_{s|nb}$) in business and non-business locations ([Equation 10](#)).

$$n^C = n_b^C + n_{nb}^C = n_b * p_b * p_{s|b} + n_{nb} * p_{nb} * p_{s|nb} \quad (10)$$

Because the 2017 Guidelines lowered the threshold for prosecuting pimps under the organized prostitution charge, holding everything else constant, it results in an increase in

the probability of prosecution after apprehension ($p_{s|b}$ and $p_{s|nb}$). The magnitude of the 2017 Guidelines on the probability of prosecution after apprehension, however, is not uniform between pimps operating in business locations and pimps operating in non-business locations. As shown in Table 4, in business locations, it is easier to arrest multiple sex workers on site during a police search, whereas it is more difficult to arrest more than 2 sex workers concurrently at a non-business location. Therefore, the 2017 Guidelines have differential impacts on the probability of prosecution for pimps in business locations and pimps in non-business locations. We hypothesize the effect of treatment as follows:

H1a : The probability of prosecution under the organized prostitution charge given apprehension increases for all pimps: $\Delta p_{s|b} \geq 0$ and $\Delta p_{s|nb} \geq 0$.

H1b : The increase in the probability of prosecution under the organized prostitution charge given apprehension for pimps in business locations is higher than the increase for pimps in non-business locations: $\Delta p_{s|b} > \Delta p_{s|nb}$.

We estimate the effect of the 2017 Guidelines using the six-month lag between apprehension and prosecution. The 2017 Guidelines took effect on July 25, 2017, which means arrested pimps are subject to a higher probability of being prosecuted immediately. However, there is an average of 6-month lag between the investigation and prosecution phases (which is the time between the criminal arrest and the criminal prosecution). In other words, if a pimp was arrested before the 2017 Guidelines but prosecuted after the 2017 Guidelines, he would be subject to the new 2017 Guidelines. During the six-month interval post-2017 Guidelines, both the police and pimps did not have any incentives to change their behavior, because the 2017 Guidelines had not taken its legal effects except at the judgment/sentencing stage. Leveraging the six-month lag, we can estimate the 2017 Guidelines' effect on the changing prosecution probability (or, $p_{s|b}$ and $p_{s|nb}$) independent of other factors.

Figure 2 provides the number of pimps prosecuted under the organized prostitution charge from 2014 to 2019. Overall, the total number of pimps prosecuted under the organized

prostitution charge has increased since the 2017 Guidelines in both business and non-business locations. Prior to the 2017 Guidelines, the number of cases prosecuted under organized prostitution exhibited a consistent average of 26.7 cases per month. In contrast, following the 2017 Guidelines, there was a distinct surge in the prosecution of organized prostitution cases, with an average of 46.3 cases per month within the 6-month period post-implementation.

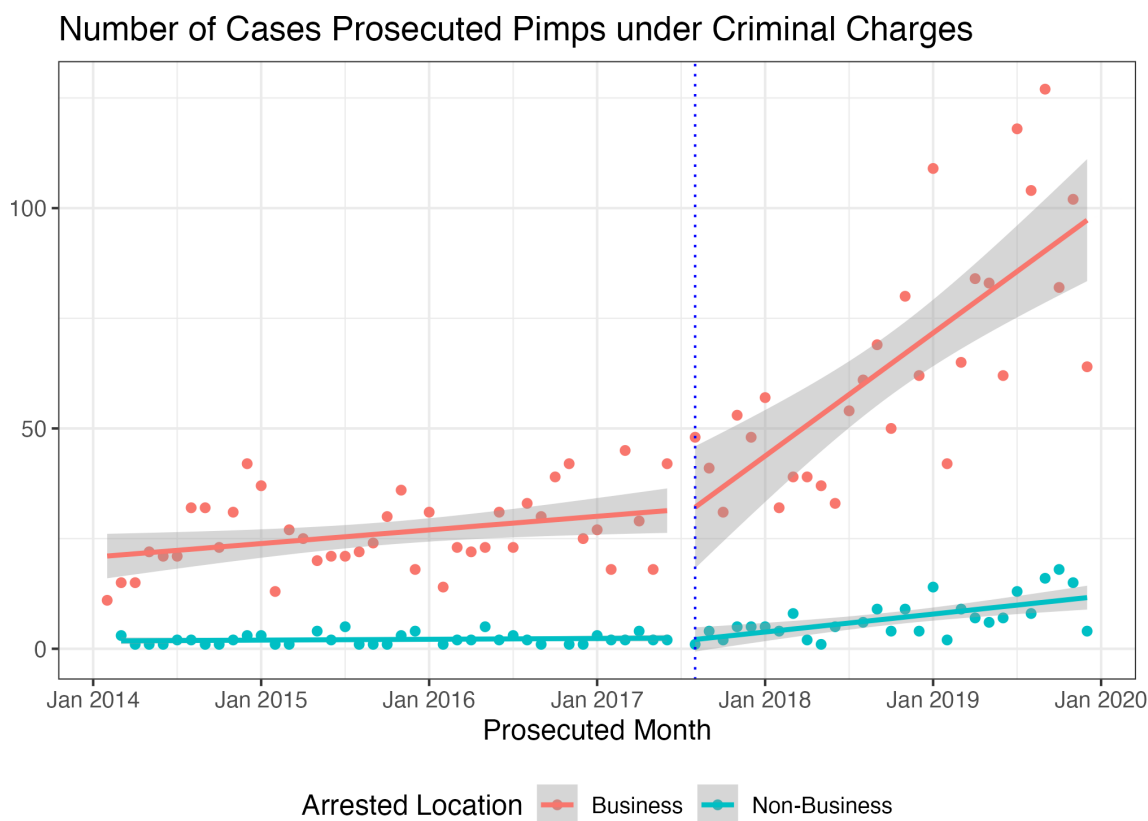


Figure 2: Number of Prosecuted Pimps under Criminal Charges

Note: This figure provides the number of prosecutions against arrested pimps under organized prostitution nationwide in business (red) and non-business (blue) locations. The dotted vertical line is the effective date of the 2017 Guidelines.

Furthermore, we find that the 2017 Guidelines have disproportionate prosecution impacts on pimps operating in different locations. We conducted an interrupted time series analysis (ITSA), employing a segmented regression model to examine the change in the number of pimps being prosecuted nationwide after the treatment. As presented in [Table 5](#), the

release of the judicial interpretation resulted in an average monthly increase of 2 cases when pimps were arrested in business locations. In contrast, the increase was only 0.3 cases for non-business locations. Both coefficients are statistically significant, corroborating the deterrence effect as a result of the legal change. However, the difference in the magnitude of these coefficients highlights the differential effects of the legal change in business and non-business areas of the prostitution industry.

Table 5: The Number of Prosecuted Organized Pimps under Criminal Charge

	<i>Dependent variable:</i>			
	Criminal: Organized Prostitution Cases by Month			
	<i>OLS</i>		<i>GLS</i>	
	Business	Non-Business	Business	Non-Business
	(1)	(2)	(3)	(4)
Baseline Trend	0.22 (0.18)	0.02 (0.04)	0.22 (0.18)	0.02 (0.03)
Level Change	-0.67 (6.84)	-0.71 (1.33)	-0.86 (6.70)	-0.76 (1.20)
Trend Change	2.11*** (0.35)	0.32*** (0.07)	2.12*** (0.34)	0.33*** (0.06)
Baseline	30.45*** (4.51)	2.48*** (0.89)	30.50*** (4.41)	2.48*** (0.80)
Observations	69	64	69	64
R ²	0.76	0.60		
Adjusted R ²	0.74	0.58		
Log Likelihood			-272.96	-152.55
Akaike Inf. Crit.			557.92	317.10
Bayesian Inf. Crit.			570.96	329.66
Residual Std. Error	13.49 (df = 65)	2.55 (df = 60)		
F Statistic	67.20*** (df = 3; 65)	30.43*** (df = 3; 60)		

Note:

*p<0.1; **p<0.05; ***p<0.01

In addition, we computed the probability of pimps being prosecuted after arrest. [Figure 3](#) presents the empirical estimation of the probability of being prosecuted after arrest in

business and non-business locations ($p_{s|b}$ and $p_{s|nb}$). We can clearly see that the legal changes have differential effects on business and non-business locations. The legal changes can successfully increase the probability of being prosecuted after pimps are arrested in business locations, but the effectiveness of the legal changes in non-business locations is extremely limited. This result is especially robust since there is a six-month delay between arrest and prosecution on average. In other words, all the pimps being prosecuted under the latest judicial interpretation were arrested six months beforehand, in which both police and pimps' behaviors were not under the treatment of the judicial interpretation.

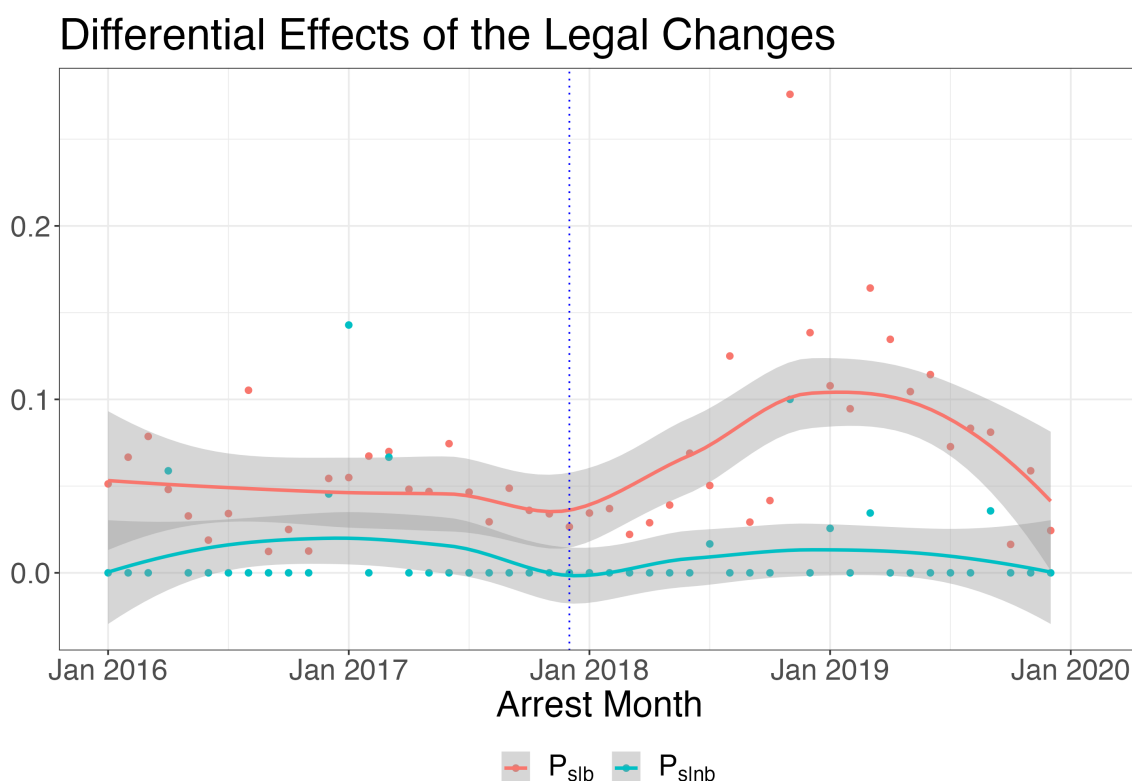


Figure 3: Probability of Pimps being Prosecuted after Arrest

5.3 Reshuffling of Policing Effects

The lowered conviction standard not only leads to more prosecutions of pimps but also incentivizes the police to increase their policing efforts in the prostitution industry.

As mentioned before, police have several quotas to fulfill: (1) the number of arrests of sex workers and clients, (2) the number of pimps arrested, and (3) the number of “criminal groups.” This then translates into a heightened police incentive to arrest pimps because doing so would entail a higher likelihood of fulfilling quotas (1), (2), and (3)¹⁷. In other words, holding everything else constant, apprehending more pimps would allow the police to easily meet their quotas. Therefore, we hypothesize the treatment would lead to an increase in the total number of pimps being apprehended ($n_b * p_b + n_{nb} * p_{nb}$).

Again, the total number of pimps who are subject to criminal liability under “organized prostitution” (Equation 10) depends on the number of pimps, the policing efforts, and the probability of being prosecuted at business and non-business locations, respectively. As the above formulation suggests, only the policing efforts (p_b and p_{nb}) are determined by police, while the number of pimps (n_b and n_{nb}) and the probability of prosecution ($p_{s|b}$ and $p_{s|nb}$) are determined by pimps and the law/judicial interpretation itself.

At this stage, we assume that once the 2017 Guidelines were published, the law would deterministically dictate in which cases pimps would be considered criminals for organized prostitution.¹⁸ Moreover, we assume that pimps are not highly attentive to the 2017 Guidelines or legal changes in general (such as monitoring the legal development on a daily basis) and that they would not immediately reevaluate their choice of operation locations immediately after any legal change. Even for those who might be attentive to the judicial interpretation, we conjure that the fixed cost at business locations would make any immediate shift in operational locations difficult.

¹⁷The apprehension of a pimp alone isn’t sufficient evidence to establish the existence of a “criminal group”; only the arrest of sex workers and clients could ascertain the pimping activity. A detailed discussion can be found in Section 2.3: Police Incentives and the 2017 Guidelines.

¹⁸Interviews with prosecutors.

Holding these two factors constant, the police could achieve their objective of increasing the total number of pimps apprehended ($n_b * p_b + n_{nb} * p_{nb}$) in two ways. First, the police could alter their distribution of policing efforts in business and non-business locations.¹⁹ In this scenario, by calculating the partial derivative of the formula, the marginal return on increasing policing efforts in business or non-business markets would be $n_b \cdot p_{s|b}$ and $n_{nb} \cdot p_{s|nb}$, respectively. Since $p_{s|b}$ is strictly greater than $p_{s|nb}$ ²⁰, it is more efficient to augment policing efforts in business locations.

The other option to increase the total number of pimps apprehended is to relax the constraints on the total policing effort dedicated to prostitution. In other words, police precincts can allocate more time or assign more police officers to combat the prostitution industry. Formally, we hypothesize that

H2a : The treatment leads to redistribution of policing efforts towards business locations after the treatment.

H2b : The treatment leads to an increase in policing efforts against prostitution.

Figure 4 provides validation for *H2a*, indicating a discernible shift in policing efforts towards business locations immediately after the promulgation of the 2017 Guidelines. We operationalize the measure for policing efforts using the number of administrative penalties issued to sex workers and clients to approximate the police’s enforcement efforts. We are confident in this measurement for two reasons. First, the ascertainment of “pimp” requires identifying sex workers and clients, as police require the arrest of prostitution clients and sex workers as evidence for apprehending pimps. Second, the number of arrests of third parties is much smaller due to the first reason. Therefore, the arrest of third parties alone is less representative of the policing efforts dedicated to the prostitution industry. This

¹⁹This option takes into account the constraints on fixed policing efforts, acknowledging that it might not be feasible to allocate additional policing resources to prostitution.

²⁰This is because the evidentiary burden of prosecuting pimps under the organized prostitution charge is easier to meet. See Section 5.1 for a detailed discussion.

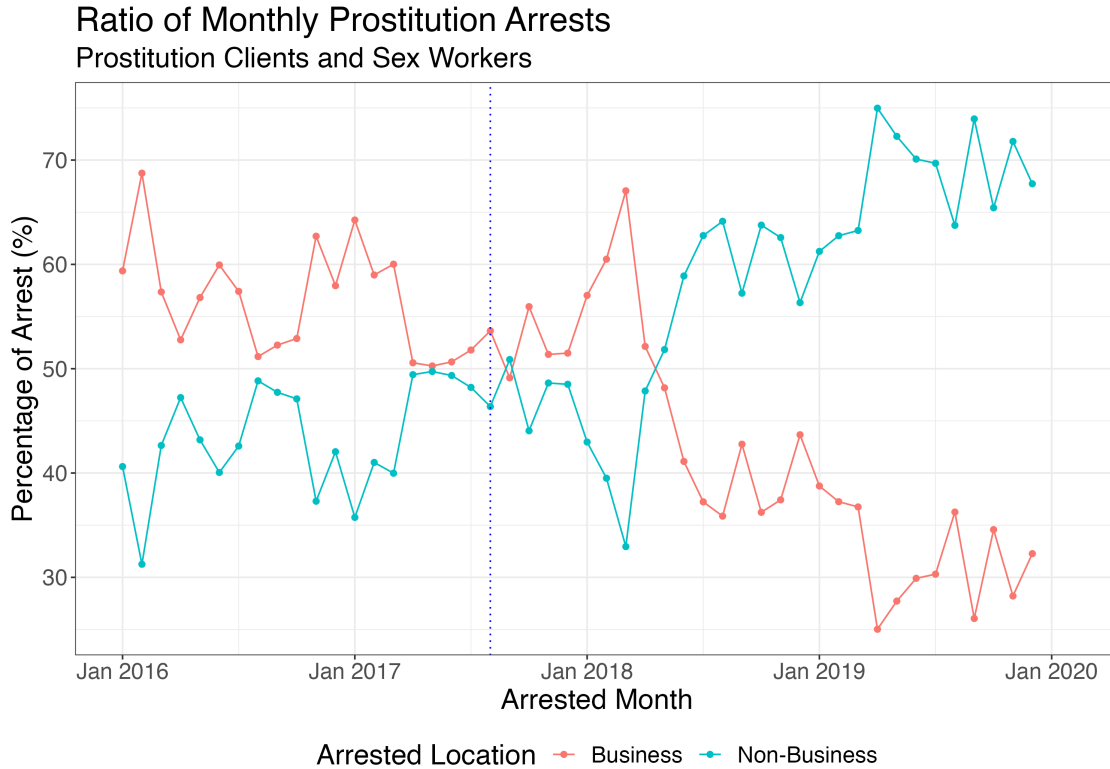


Figure 4: The allocation of policing efforts has shifted towards business locations in the short run.

Note: This figure provides the ratio of arrests of prostitution clients and sex workers in business (red) and non-business (blue) locations, respectively. The blue dotted vertical line is the effective date of the 2017 Guidelines.

choice of measurement is supported by the fact that the ratio of arrested clients and sex workers to arrested pimps is approximately 16.7:1. The data shows a gradual increase in the allocation of policing resources, rising from approximately 50% prior to the release of the judicial interpretation to its peak of 67.1% in March 2018. This trend aligns with the model's accurate characterization of the legal change, which exerts a more pronounced influence on the prosecution of pimps in business locations. Consequently, law enforcement agencies promptly responded to these incentives by directing their efforts more prominently towards policing business locations.

Figure 5 lends support to *H2b*, indicating a notable escalation in overall policing efforts



Figure 5: The total policing efforts for prostitution increased.

Note: This figure provides the total number of arrests of prostitution clients and sex workers. The blue dotted vertical line is the effective date of the 2017 Guidelines.

dedicated to prostitution enforcement. We observe a noticeable uptick in the number of arrests of prostitution clients and sex workers following the release of the 2017 Guidelines, with the peak occurring in March and April 2018. During these two months, arrests exceeded 4,000 cases each, more than double the preceding figures. This substantial increase in arrests of clients and sex workers serves as compelling evidence of the heightened policing efforts directed toward the crackdown on prostitution activities.

In summary, the 2017 Guidelines not only heighten the probability of prosecution of pimps after apprehension but also create incentives for law enforcement agencies to ramp up their policing efforts in combating prostitution activities. Empirically, we observe a substantial increase in the overall level of policing efforts dedicated to addressing organized

prostitution following the legal change. Notably, a significant portion of these increased efforts is directed towards combating prostitution at business locations, indicating a strategic shift in law enforcement priorities in response to the legal changes.

5.4 Deterrence or Displacement?

Considering the changes in the probabilities of arrest and prosecution, it becomes evident that the utility of engaging in pimping has significantly diminished over time. Moreover, this reduction in utility is more pronounced at business locations than at non-business locations. The final question is whether this decrease in the utility of pimping will effectively deter prostitution or merely result in its displacement from business to non-business locations as our model predicted. Evaluating the impact of these legal changes on the fight against organized prostitution hinges on this critical assessment.

For all the pimps present in the prostitution industry before the release of the judicial interpretation, the utility of being a pimp ($v_b = v_{nb}$) outweighs the utility of pursuing alternative exit options (v_{exit}) for all the pimps working for the prostitution industry, as indicated as follows: $v_b = v_{nb} > v_{exit}$. If the treatment yields a deterrence effect, it means that $v_b < v_{exit}$ and $v_{nb} < v_{exit}$. Pimps would not continue to be pimps. However, if the treatment yields a displacement effect, it means that $v_b < v_{exit}$ and $v_{nb} > v_{exit}$ so that pimps from business locations will operate in more discrete non-business locations. We hypothesize the two potential outcomes as follows:

H3a : Deterrence: Pimps choose to exist the crime market since $v_b < v_{exit}$ and $v_{nb} < v_{exit}$.

H3b : Displacement: Pimps choose to displace their criminal activities since $v_b < v_{nb}$.

To evaluate these two hypotheses, we turn to the total number of arrested pimps in [Equation 11](#). As discussed in Section 2.3, police have various performance goals related to prostitution-related enforcement; therefore, we hypothesize that the change in the number of

pimps and the policing effort in business and non-business locations should be proportionate. In other words, if there are more pimps operating in one type of location, then the policing efforts in such locations should be greater. Therefore, if the deterrence effect is present (the number of pimps in both business and non-business locations decreases), then the number of arrested pimps in business ($n_b * p_b$) and non-business locations $n_{nb} * p_{nb}$ should both decrease. If the displacement effect is present (the number of pimps increases in non-business locations and decreases in business locations), we should observe a decrease in the number of pimps arrested in business locations and an increase in the number of pimps arrested in non-business locations.

$$n^A = n_b^A + n_{nb}^A = n_b * p_b + n_{nb} * p_{nb} \quad (11)$$

We consider two time periods when the market is at equilibrium conditions: one-year duration prior to the legal change (July 2016 to June 2017) and one-year duration after the one-year enactment of the legal change (July 2018 to July 2019).²¹ We assume that during both time periods, the prostitution market is at equilibrium status, meaning that any sequential move between pimps and policing efforts has settled.

Figure 4 illustrates a significant switch in the number of arrests of pimps at business and non-business locations, suggesting that pimps reacted to the 2017 Guidelines, which eventually led to the police's subsequent adjustment in their distribution of policing efforts. This change in policing efforts stabilized around a year after the 2017 Guidelines, suggesting the end of the adaptation process within the organized prostitution landscape in response to the legal changes. In other words, pimps have either selected to relocate to non-business locations or exited the pimping market for outside options. Policing efforts were also optimized in response to such a change.

²¹As depicted in Figure 5 and Figure 4, it becomes apparent that the shifts and alterations in policing efforts remained stable over these two periods. While we do not have direct observations of criminal activities, the empirical evidence strongly indicates that both pimps and law enforcement have reached a state of equilibrium. The response to the 2017 Guidelines settled, with no discernible further adjustments in respective behaviors attributable to this legal change.

Table 6: The legal changes have primarily led to a displacement effect rather than a deterrence effect.

	<i>Dependent variable:</i>		
	Number of Arrested Pimps		
	Total	Business	Non-Business
	(1)	(2)	(3)
Treatment Effect	−2.25 (12.29)	−23.08** (10.28)	20.83*** (3.30)
Constant	121.33*** (8.69)	108.75*** (7.27)	12.58*** (2.34)
Observations	48	48	48
R ²	0.001	0.10	0.46
Adjusted R ²	−0.02	0.08	0.45
Residual Std. Error (df = 46)	42.58	35.62	11.45
F Statistic (df = 1; 46)	0.03	5.04**	39.75***

Note:

*p<0.1; **p<0.05; ***p<0.01

Table 6 provides further evidence to support the displacement effect rather than the deterrence effect. The total number of arrested pimps, which represents the overall supply in the prostitution industry, does not significantly decrease. However, following the 2017 Guidelines, there is a statistically significant decrease of approximately 23 arrested pimps per month in business locations, while a statistically significant increase of about 20.8 arrested pimps per month occurs in non-business locations, as predicted by the displacement effect.

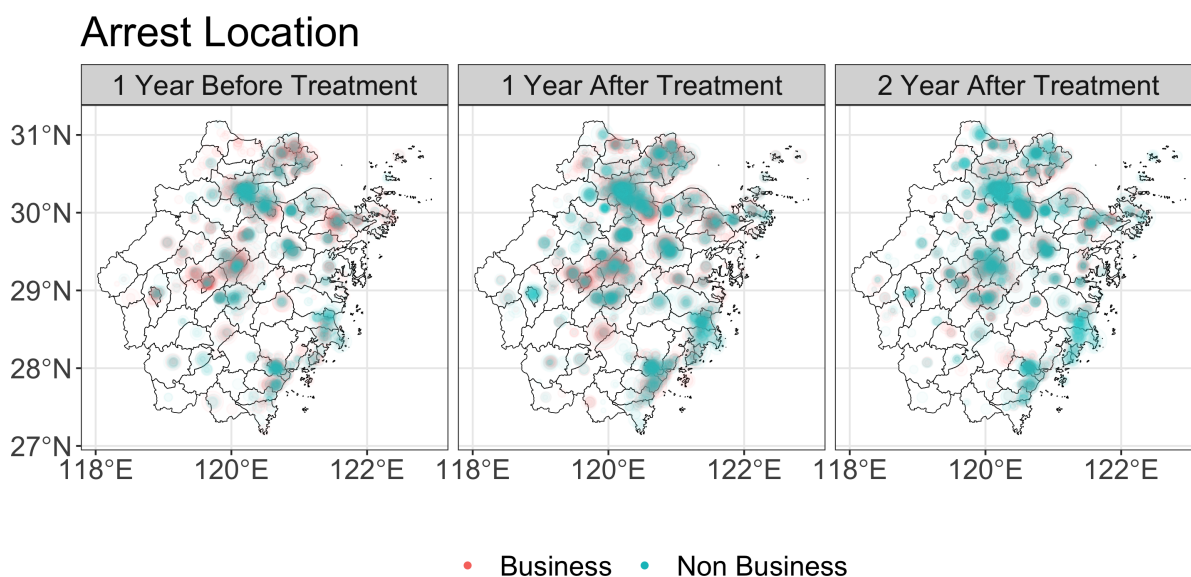


Figure 6: Geographic Distribution of Arrests

Note: The red dots represent the business locations, whereas the blue dots represent the non-business locations during the three periods. The size represents the number of administrative penalty cases related to prostitution in each geographic area. The left side shows the one-year duration before the legal change, the middle depicts the one-year duration after the legal change, and the right side represents the second year after the legal change.

In addition, we map the geographic locations of each administrative penalty relating to

prostitution and overlay the non-business arrests on top of the business arrests to illustrate the displacement effect. The mapping of arrests clearly displays the transition from business to non-business locations. The left panel of [Figure 6](#) has extensive overlap between business and non-business locations, and the number of cases from business locations still stands out despite the overlays before the treatment. However, business locations are barely visible in the right panel after restoring equilibrium post-treatment.

In summary, the differential impact of the legal changes in the business and non-business prostitution markets leads pimps to continue perceiving operating prostitution businesses as a more favorable option compared to the alternative of exiting the market. Instead of achieving the ideal deterrence effect, the 2017 Guidelines only resulted in an unintended displacement effect in the sex industry in the long run.

6 Discussion

As Lipsky argued, street-level bureaucrats are indeed the ultimate policymakers. In this paper, we empirically demonstrate how the incentive structure of law enforcement distorted the implementation of a legal change aiming to combat prostitution. As demonstrated in our analysis, police are more likely to concentrate their law enforcement efforts in areas that promise “higher” career gains, whereas areas yielding “lower” career benefits might see less enforcement activity. The discretionary power that police hold allows them to prioritize certain activities over others, potentially leading to a misalignment between the goals of new legal provisions and actual policing practices due to the lack of any inter-branch coordination among courts, prosecutors, and the police regarding how the legal change might intersect with existing police incentives.

And the discrepancy between the actual legal provision and the policing practices might result in the persistence or displacement of criminal activities rather than their reduction. As the economic model of crime pioneered by [Becker \(1968\)](#) and subsequent generations of

scholars have demonstrated, stringent anti-crime measures, rather than effectively reducing criminal activities, might lead to their displacement in various forms (Clarke, 2011; Bronars and Lott, 1998; Lazzati and Menichini, 2016; Maheshri and Mastrobuoni, 2021; Vollaard, 2017; Benson and Rasmussen, 1991; Yang, 2008; Carrillo, Lopez-Luzuriaga and Malik, 2018). The cause of the crime displacement is the uneven distribution of policing resources (Helsley and Strange, 2005; Lazzati and Menichini, 2016; Maheshri and Mastrobuoni, 2021), which are often caused by the existing incentive structure of law enforcement and the lack of coordination between localities in terms of their allocation of law enforcement forces (Vasquez, 2022). In the instant case, the harsher legal measure has minimal deterrence effects, as the overall number of pimps arrested has not decreased. The displacement effect, however, is significant, with the majority of prostitution activities relocating to private residences. In other words, the legal change, instead of curbing organized prostitution, simply “moves the crime around the corner.”

Such a displacement effect is quite concerning. Driving the prostitution industry underground has the potential to increase sexually transmitted diseases (Cameron, Seager and Shah, 2020; Gertler and Shah, 2011) and crime occurrences like rape (Ciacci, 2018). It also poses additional challenges for future policing and prosecution efforts against organized prostitution, as the industry has only been driven further underground, making it more difficult to prosecute pimps in the long run. While prostitution might be deemed as an immoral “vice” by the state, curbing such norm-violating behaviors might be potentially futile or even backfire if the state doesn’t address the problem from the demand side and align the police’s institutional incentive with its legal change.²²

Overall, this paper underscores the critical importance of inter-branch coordination in effectively curtailing norm-violating behaviors and criminal activities more broadly. The

²²In this case, the seemingly high moral standard imposed by the Chinese government might deviate significantly from that of its male population, especially in light of the unbalanced gender ratio and 35 million more single men than women.<https://www.newsweek.com/china-has-nearly-35-million-more-single-men-women-1592486>.

reliance on a top-down mandate alone may prove inadequate, as it risks merely displacing criminal activities from one locality to another, thereby rendering them less visible but no less pernicious. For the government to achieve meaningful regulatory outcomes, it is imperative to identify the various institutional stakeholders that are integral to this regulatory process, heed grass-roots enforcement agents' incentives and constraints, and analyze how these factors might interact with the proposed policy change. Such a comprehensive approach is vital for the long-term reduction of criminal activity and recidivism.

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Supplemental Information Appendix

A Categorization of Business Properties

We categorized the following properties as business properties, including Foot Bath, Clubhouse, Bathing Center, and Beauty and Hair Salon. Table S1 presents the full list of keywords we used to categorize business properties. We performed handcoding verification on 1% randomly selected administrative penalties, and keyword matching correctly assigned categories to the properties 98.9% of the time.

Table S1: Translation of Chinese Terms

Category	Chinese Keywords	English Translations
Foot Bath 足浴	足, 按摩, 保健, 足道, 敲背, 推拿	Foot, Massage, Health Care, Foot Reflexology, Back Tapping, Tuina
Clubhouse 会所	会所, 茶楼, 会馆, 舒压馆, SPA	Clubhouse, Tea House, Meeting Hall, Pressure Relief Center, SPA
Bathing Center 洗浴中心	洗浴, 澡堂, 水会, 水疗, 汗蒸, 桑拿, 油压店, 养生, 指压店, 卖淫店	Bathing, Bathhouse, Water Club, Hydrotherapy, Steam Bath, Sauna, Oil Pressure Shop, Wellness, Acupressure Shop, Brothel
Beauty and Hair Salon 美容美发店	美容, 发廊, 理发, 洗头, 舞厅, 歌厅, 化妆店	Beauty, Hair Salon, Haircut, Hair Washing, Dance Hall, Karaoke Bar, Makeup Shop

B Quotes from Interviews

We conducted semi-structured interviews with more than twenty police officers, prosecutors, and legal academics specializing in criminal law and criminal procedure in multiple cities and provinces in China in 2023. For privacy concerns and interviewee requests, we do not provide the exact quotes, but paraphrased relevant information below.

Police quotas:

- Police A: Police quotas are very prevalent and are main determinants of our performance evaluations. We have to hit the quotas.
- Police B: We have many, many types of police quotas. There are probably dozens of them, if not more. Some are weekly, some are monthly, and some are yearly.

Different level of importance of quotas

- Police C: Criminal cases are always more important than administrative penalties. We would certainly prioritize criminal cases over administrative cases.
- Police D: Criminal cases carry a much higher weight in our evaluation. I would say probably 90% of our performance is based on criminal law-related cases, and the rest is administrative penalty cases.

Segmented prostitution market:

- Police E: There are two types of prostitution locations. One is places like massage parlors. The other is like private apartments.
- Police F: We often categorize these prostitution activities by place. Yes, there are the traditional places like karaokes. But there are also ones in apartments running as a side business. In these instances, for prostitution crackdown in these places, we would get calls from residents in these private apartments and residential areas.

The “organized prostitution” charge:

- Prosecutor A: The 2017 Guidelines definitely lowers the threshold of prosecuting the organized prostitution charge. Before the guideline, we have leeway in terms of deciding how many sex workers a pimp must control/manage when bringing the organized prostitution count, and the number was higher than 3. But we don’t have such discretion after the 2017 Guidelines; if a pimp is found to control 3 sex workers, we must prosecute him/her.
- Police G: Say, if you go to a private apartment for a prostitution crackdown, you would apprehend 1 or 2 sex workers max, and the pimp is often not even on the spot. But if you go to a massage parlor, you can apprehend more than that, and the manager is definitely not innocent. Then the group can be considered as a organized criminal group.

C Proof

C.1 Proof of Proposition 1

Proposition 1. *(short run) The legal change*

- (i) *increases the level of arrest rate at business locations.*
- (ii) *decreases the level of arrest rate at non-business locations.*
- (iii) *increases the level of arrest rates at both business and non-business locations when the resource constraint expands.*

Proof. We consider the optimization problem for police officers. We form the Lagrangian function of this problem:

$$L(\sigma_b, \sigma_{nb}, \lambda) = \sum_{l \in \{b, nb\}} [\pi_1 k_l(n_l) + \pi_2 n_l(1 - p_{s|l}) + \pi_3 n_l p_{s|l}] f(\sigma_l) - c(\sigma_l) - \lambda \left(\sum_{l \in \{b, nb\}} \sigma_l - \bar{\sigma} \right) + \sum_{l \in \{b, nb\}} \mu_l \sigma_l \quad (C1)$$

where $\lambda \geq 0$ and $\mu_l \geq 0$ denote the multipliers. Hence the first-order conditions are

$$[\partial \sigma_l] : [\pi_1 * k_l(n_l) + \pi_2 * n_l * (1 - p_{s|l}) + \pi_3 * n_l * p_{s|l}] * f'(\sigma_l) - c'(\sigma_l) - \lambda = 0 \quad \forall l \in \{b, nb\} \quad (C2)$$

$$\begin{aligned} [\partial \lambda] : \sum_{l \in \{b, nb\}} \sigma_l - \bar{\sigma} &\leq 0 \\ \lambda &\geq 0 \\ \lambda \left(\sum_{l \in \{b, nb\}} \sigma_l - \bar{\sigma} \right) &= 0 \end{aligned} \quad (C3)$$

We want to show there exists $((\sigma_l^*)_{l \in \{b, nb\}}, \lambda, (\mu_l)_{l \in \{b, nb\}})$ that satisfies the conditions. First, since $\sigma_l > 0$ for $l \in \{b, nb\}$, we set $\mu_l = 0$ for $l \in \{b, nb\}$. Second, consider the resource constraint holds with $\lambda > 0$. Additionally,

$$U_{\sigma_b} = U_{\sigma_{nb}} \quad (C4)$$

Then $(\sigma_b^*, \sigma_{nb}^*)$ solves the FOC. Hence the profiles satisfy the Karush-Kuhn-Tucker (KKT) conditions and (σ_b, σ_{nb}) is an optimal solution.

Now we turn to the optimization problem for the police officer after the legal change, we first treat $p_{s|b}$ as the model parameter and define the value function as follows:

$$V(p_{s|b}) = \max U(\sigma_b, \sigma_{nb}, p_{s|b}) \text{ s.t. } \sum_{l \in \{b, nb\}} \sigma_l \leq \bar{\sigma} \quad (C5)$$

By using the envelope theorem, we can get

$$V'(p_{s|b}) = U_{p_{s|b}}(\sigma_b^*, \sigma_{nb}^*, p_{s|b}) > 0 \quad (C6)$$

Consider $\Delta p_{s|b} > \Delta p_{s|nb} \geq 0$, since $\frac{U'_{\sigma_b}}{U'_{\sigma_{nb}}}$ increases, we have σ_b increasing relative to σ_{nb} to equalize the marginal utilities again given the constraint:

$$\frac{\sigma_b'}{\sigma_{nb}'} > \frac{\sigma_b}{\sigma_{nb}} \quad (C7)$$

In addition, consider $\bar{\sigma}$ as the model parameter, the envelope theorem states that

$$V'(\bar{\sigma}) = \lambda^*(\bar{\sigma}) \quad (C8)$$

Hence the police officer increases the level of police resources at both business and non-business locations when the resource constraint expands, and arrest rates increase accordingly. $\square$

C.2 Proof of Proposition 2

Proposition 2. (*deterrence and displacement*) *The legal change*

- (i) *decreases the number of pimps operating at business locations.*
- (ii) *increases the number of pimps operating at non-business locations.*
- (iii) *decreases the total aggregate number of pimps.*

Proof. We consider the market-clearing condition for pimps and define v^e as a function of p_b , p_{nb} , $p_{s|b}$ and $p_{s|nb}$, $v^e(p_b, p_{nb}, p_{s|b}, p_{s|nb})$

$$n_b(v^e, p_b, p_{s|b}) + n_{nb}(v^e, p_{nb}, p_{s|nb}) - S(v^e) = 0 \quad (C9)$$

Differentiating the condition with respect to $p_{s|b}$ and $p_{s|nb}$

$$[\partial p_{s|b}] : \frac{\partial n_b}{\partial v} \frac{\partial v^e}{\partial p_{s|b}} + \frac{\partial n_b}{\partial p_{s|b}} + \frac{\partial n_{nb}}{\partial v} \frac{\partial v^e}{\partial p_{s|b}} + \frac{\partial n_{nb}}{\partial p_{s|b}} - S'(v^e) \frac{\partial v^e}{\partial p_{s|b}} = 0 \quad (C10)$$

$$[\partial p_{s|nb}] : \frac{\partial n_b}{\partial v} \frac{\partial v^e}{\partial p_{s|nb}} + \frac{\partial n_b}{\partial p_{s|nb}} + \frac{\partial n_{nb}}{\partial v} \frac{\partial v^e}{\partial p_{s|nb}} + \frac{\partial n_{nb}}{\partial p_{s|nb}} - S'(v^e) \frac{\partial v^e}{\partial p_{s|nb}} = 0 \quad (C11)$$

$$\frac{\partial v^e}{\partial p_{s|b}} = - \frac{\frac{\partial n_b}{\partial p_{s|b}} + \frac{\partial n_{nb}}{\partial p_{s|b}}}{\frac{\partial n_b}{\partial v} + \frac{\partial n_{nb}}{\partial v} - S'(v^e)} \quad (C12)$$

$$\frac{\partial n_l}{\partial p_{s|b}} = \frac{\partial c / \partial p_{s|b}}{\partial b / \partial n_l} < 0 \quad (C13)$$

$$\frac{\partial n_b}{\partial v} + \frac{\partial n_b}{\partial v} = \frac{1}{db/dn_b} + \frac{1}{db/dn_{nb}} < 0 \quad (\text{C14})$$

Hence we have

$$\frac{\partial v^e}{\partial p_{s|l}} = - \frac{\frac{\partial n_i}{\partial p_{s|i}}}{\sum_i \frac{\partial n_i}{\partial v^e} - S'(v^e)} < 0 \quad (\text{C15})$$

$$\frac{dn_b^e}{dp_{s|b}} = \frac{\partial n_b^e}{\partial v} \frac{\partial v^e}{\partial p_{s|b}} + \frac{\partial n_b^e}{\partial p_{s|b}} < 0 \quad (\text{C16})$$

$$\frac{\partial n_b^e}{\partial p_{s|nb}} = \frac{\partial n_b^e}{\partial v} \frac{\partial v^e}{\partial p_{s|nb}} > 0 \quad (\text{C17})$$

Consider $\Delta p_{s|b} > \Delta p_{s|nb} \geq 0$, the equilibrium payoff decreases after the legal change, which reduces the total number of pimps. Additionally, Δn_b decreases and $\Delta(n_{nb})$ increases. $\square$

C.3 Proof of Differential Effects of the Legal Changes

As mentioned earlier, law enforcement officers arrest pimps and gather evidence to determine their eligibility for criminal prosecution. In cases where prosecution is not warranted, administrative penalties are imposed by the police. Therefore, the number of total arrested pimps are constituted by two parts: the number of pimps facing criminal prosecution (n^C) and the number of pimps subjected to administrative penalties (n^A), as outlined below.

$$n^C = n_b^C + n_{nb}^C = n_b * p_b * p_{s|b} + n_{nb} * p_{nb} * p_{s|nb} \quad (C18)$$

$$n^A = n_b^A + n_{nb}^A = n_b * p_b * (1 - p_{s|b}) + n_{nb} * p_{nb} * (1 - p_{s|nb}) \quad (C19)$$

After simplifying the system of equations, we can empirically calculate the probability of being prosecuted after arrest ($p_{s|b}$ and $p_{s|nb}$) for pimps.

$$p_{s|b} = \frac{n_b^C}{n_b^C + n_b^A}; p_{s|nb} = \frac{n_{nb}^C}{n_{nb}^C + n_{nb}^A} \quad (C20)$$

Figure 3 presents the empirical estimation of the probability of being prosecuted after arrest in business and non-business locations ($p_{s|b}$ and $p_{s|nb}$). We can clearly see that the legal changes have differential effects in business and non-business locations. The legal changes can successfully increase the probability of being prosecuted after pimps being arrested in business locations, but the effectiveness of the legal changes in non-business locations is extremely limited. This result is especially robust since there is a six-month delay between arrest and prosecution on average. In other words, all the pimps being prosecuted under the latest judicial interpretation were arrested six months beforehand, in which both police and pimps' behaviors were not under the treatment of the judicial interpretation.