



# Law enforcement with rent-seeking government under voting pressure

Ken Yahagi<sup>a,\*</sup>, Yohei Yamaguchi<sup>b</sup>

<sup>a</sup> Faculty of Economics, Seikei University, 3-3-1 Kichijoji-kitamachi, Musashino-shi, Tokyo 180-8633, Japan

<sup>b</sup> Graduate School of Economics, Waseda University, 1-6-1 Nishiwaseda, Shinjuku-ku, Tokyo 169-8050, Japan

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## ABSTRACT

This paper investigates how political accountability with voting pressure disciplines rent-seeking behaviors of the government (i.e., fine revenue maximization) by incorporating a two-period retrospective voting model into a law enforcement setting. For minor/major crimes where the pure rent-seeking enforcement is too strict/weak, the democratic process that provides disciplining incentives (e.g., lower discount rates, higher political rents, and fewer forgone collected fines the government must give up in exchange for reelection) makes the rent-seeking government weaken/strengthen enforcement. However, such discipline can still be insufficient and cause inefficient consequences. Additionally, for intermediate crimes, the democratic process can lead to the government's inefficient pandering to voters and cause welfare deterioration, even compared to the pure rent-seeking enforcement case. The result shows that different types of distortions happen from previous studies when we consider the conflict between the rent-seeking government and citizens.

## 1. Introduction

The general public delegates policy-making to politicians in the government, but they do not always have the same motivations. Similarly, while citizens delegate the law enforcement task to the government as executives of public law enforcement, the government may use this power in ways that are not consistent with the interests of the electorate. In this respect, as traditional public choice literature, e.g., Brennan and Buchanan (1980), has indicated that public officials tend to pursue budget maximization, it also is important to consider the profit motivation of policing of public law enforcers. The presence of profit-motivated law enforcers has been widely discussed in the law and economics literature. Law enforcement is an important source of revenue for many local governments (Baicker and Jacobson, 2007). For example, Makowsky and Stratmann (2011) use municipal budgetary shortfalls as an instrumental variable to identify the effect of traffic citations on traffic safety and show that budgetary shortfalls lead to more frequent issuances of tickets to drivers. Makowsky et al. (2019) also discuss profit-motivated law enforcers by exploring local deficits and state-level differences in police revenue retention from civil asset forfeitures and find that local fine and forfeiture revenue increases at a faster rate with drug arrests punished with fines than with arrests for violent crimes punished with nonmonetary sanctions, which can differ among black, Hispanic, and white citizens.<sup>1</sup> This discussion has common ideas for the concept of a rent-seeking government as originally

proposed by Buchanan (1980) and Tullock (1967). While they propose the concept of rent-seeking in a regulatory/special interest group context, this has similarities to law enforcement literature in that the abuse of state monopolistic power in modern democratic institutions to obtain special privileges causes social costs rather than social benefits at the expense of the general public's beneficial gains. Thus, we consider this profit-driven behavior of law enforcers as "rent-seeking" behavior.

Under the possibility that the profit-driven motivation of public enforcers may distort law enforcement, citizens can resort to the electoral process with voting pressure to discipline them and enhance the interests of the general public (Lenz, 2012; Oliver and Ha, 2007; Burnett and Kogan, 2017). The characteristic features of the modern democratic voting process are no full commitment and enforceability of electoral promises, as Barro (1973), Ferejohn (1986), and Persson and Tabellini (2000) indicated. Thus, (incumbent) politicians and governments have complete discretion once in office, and all citizens can do is punish their bad performances and oust them from office at the next election. That is, while the short-run incentive makes the (incumbent) rent-seeking government choose opportunistic behaviors with the possibility to be rejected in the next elections, the desire to be reelected for future political office rents may induce the government to pander to citizens' interests, which indicates the importance of the interplay in the electoral process between disciplining incentives for future reelection rents and incentives for opportunistic behavior in the present.<sup>2</sup> Makowsky

\* Corresponding author.

E-mail addresses: [ken-yahagi@econ.seikei.ac.jp](mailto:ken-yahagi@econ.seikei.ac.jp) (K. Yahagi), [cw9183@fuji.waseda.jp](mailto:cw9183@fuji.waseda.jp) (Y. Yamaguchi).

<sup>1</sup> Please see Graham and Makowsky (2021) for an overview.

<sup>2</sup> Please see an overview from Duggan and Martinelli (2017).

and Stratmann (2009) analyze the determinants of speeding tickets and indicate that police officers, as agents of elected officials, care about not only their local government's fiscal condition but also the drivers' ability to vote in local elections (e.g., voter satisfaction), which suggests that police officers engage in their activities to disproportionately raise revenues from nonvoters more than from local voting citizens.

To evaluate the effects of delegated rent-seeking law enforcers from normative viewpoints, we extend the standard law enforcement model, e.g., Becker (1968), Garoupa (1997a), and Polinsky and Shavell (2000). Then, we investigate how political accountability with voting pressure by citizens affects rent-seeking behaviors of profit-driven law enforcers by focusing on the interplay between disciplining incentives for future reelection rents and incentives for opportunistic behavior in the present. First, we consider the rent-seeking enforcer that pursues the collection of fine revenues without concern for harm reduction, following the basic framework in Garoupa and Klerman (2002). Furthermore, by incorporating the essence of the dynamic elections setting into the law enforcement model, the (incumbent) enforcer also has the motivation to be reelected for future rewards, including rents from collected fine revenues and holding office with a privileged position. This dynamic election follows the retrospective voting model proposed by Barro (1973) and Ferejohn (1986) and provides important insights into how the general public can incentivize law enforcers by providing future rewards to take actions beneficial for them and sanctioning rent-seeking performance with rejection in the next election. The electoral process may mitigate conflicts of interest. This can be related to agency problems, although we do not consider asymmetric information as in the usual principal-agent problems (i.e., moral hazards).

We show that, in the case of no political accountability as a benchmark, the enforcer purely pursues maximizing collected fine revenues and chooses overly strict enforcement for crimes with less negative externality (minor crimes) and overly weak enforcement for crimes with severe negative externality (major crimes) compared to a social welfare-maximizing enforcement level, which is similar to the results of Garoupa and Klerman (2002). This is because the rent-seeking government chooses the preferred policies without concern for externalities, even though social welfare requires more severe enforcement as negative externalities worsen. This corresponds to the short-run and opportunistic incentive of the rent-seeking enforcer without considering the desire to be reelected for political office rents.

This can be different if the enforcer responds to political accountability with voting pressure and cares about the disciplining incentives for future reelection rents (e.g., lower holding office rents, higher future discount rates, and more forgone collected fines the enforcer must give up in exchange for reelection) under the democratic process. In the case of crimes with small negative externalities, while pure rent-seeking law enforcement can be strict, the majority of citizens (i.e., potential offenders) who care about their punishment costs, enforcement costs, and harm reduction prefer weak enforcement, which indicates that the disciplining incentives make the enforcer weaken enforcement to pander to the majority. This can provide positive welfare effects, especially for externalities that are too small, where pure rent-seeking enforcement causes unnecessary overenforcement. However, it can still be inefficiently strict if the enforcer does not evaluate future reelection rents and disciplining incentives. Furthermore, as the negative externalities of offenses become nonnegligible (i.e., intermediate), the law enforcement representing only the majority's interests becomes inefficiently weak compared to the socially efficient level considering both offenders' and law-abiding citizens' utility. Especially if the enforcer has more disciplining incentives, this underenforcement is likely to happen. In the case of crimes with a large negative externality, while pure fine revenue-maximizing law enforcement can be weak, the majority of citizens (i.e., law-abiding citizens) who care about both harm reduction and enforcement costs prefer strict enforcement, indicating that the disciplining incentives make the enforcer strengthen enforcement to pander to the majority. This can provide positive welfare effects as

the externality becomes too severe when pure rent-seeking enforcement causes underenforcement. However, it can still be inefficiently weak when citizens cannot completely discipline the enforcer's opportunistic behavior if the enforcer does not evaluate future reelection benefits. Furthermore, even if the majority can discipline the enforcer, considering only the majority's interests leads to unnecessarily strict enforcement, especially for relatively large (i.e., intermediate) offense externalities compared to the social welfare-maximizing level. If the enforcer has more disciplining incentives, this overenforcement is likely to happen.

In summary, these results indicate that the presence of political accountability can provide opportunities to discipline the rent-seeking law enforcer and have several welfare implications. Providing disciplining incentives can prevent opportunistic behaviors in the present and make the enforcer respond to the majority's interests. In particular, political accountability has positive welfare impacts when rent-seeking law enforcement without political accountability is strict for too small a negative externality or weak for too large a negative externality. However, if the disciplining incentives are weak because of lower reelection motivations, it is still strict for small negative externalities and weak for large negative externalities. Furthermore, electoral accountability provides opportunities for the majority to follow their demands for crimes with intermediate negative externalities, which is not always consistent with efficiency and worsens social welfare compared to pure rent-seeking law enforcement without political accountability.

We contribute to the literature on rent-seeking law enforcers, e.g., Friedman (1999), Dittmann (2006), Yahagi (2018), Rajabiun (2009), Polinsky (1980), Besanko and Spulber (1989), Garoupa (1997b), and Cooter and Garoupa (2014).<sup>3</sup> With a similar motivation, Garoupa and Klerman (2002) consider the fine revenue-maximizing government. We extend their approach to consider how political accountability can mitigate the conflict between rent-seeking enforcers and citizens. Our results indicate that rent-seeking enforcers can respond to the interests of citizens, as empirically shown by Makowsky and Stratmann (2009, 2011), and provide several welfare implications. Some papers consider political competition in the law enforcement-making process, e.g., Langlais and Obidzinski (2017), Mungan (2017), Friehe and Mungan (2021), Obidzinski (2019) and Yahagi (2021). In particular, Langlais and Obidzinski (2017) consider another voting process that follows the Downsian model (Downs, 1957) in which potential law enforcers (e.g., political candidates) commit to policies ahead of elections and have only a motivation to win elections. In contrast to their approach, we employ a different approach, called a retrospective voting model and proposed by Barro (1973) and Ferejohn (1986), and assume the presence of profit-driven law enforcers. The retrospective voting model has the following characteristic features. While the Downsian model assumes the enforceability and commitment assumption of electoral promise, the retrospective voting model drops these assumptions, which indicates that the political constitution is viewed as an incomplete contract where (incumbent) politicians have complete discretion once in office and all citizens can do is punish their bad performances and oust them from the office at the next election. Then, the central tension is between policies that please citizens and rents appropriated by politicians (Persson and Tabellini, 2000). Thus, it is important to assume the presence of law enforcers having their own rent-seeking preference (i.e., profit-driven fine revenue-maximizing motivation) and consider their long-run incentives, such as future reelection rents by pandering to citizens' interests, and short-run incentives for opportunistic behavior in the present. Then, while Langlais and Obidzinski (2017) show that whereas major crimes will be strongly punished and

<sup>3</sup> Originally, Becker and Stigler (1974) argued that we should consider a private enforcement agency rather than a public-motivated agent. Friedman (1999) proposes the possibility of a rent-seeking government selecting a penal policy.

minor crimes will be weakly punished, our research provides different implications; while political accountability can discipline the rent-seeking law enforcer, insufficient disciplining incentives can still cause overenforcement for minor crimes and underenforcement for major crimes because of the presence of rent-seeking enforcers. This can be consistent with some empirical results by Makowsky and Stratmann (2009, 2011) and Makowsky et al. (2019) in that profit-motivated issuance of speeding tickets and profit-motivated arrests for drug possession and prostitution, which can be called “victimless crimes”, seem to remain strict. Furthermore, we also note that for intermediate crimes, the democratic process can lead to the government’s inefficient pandering to voters and cause welfare deterioration, even compared to the pure rent-seeking enforcement case. If disciplining incentives are weak, this kind of distortion is less likely to occur. These results are different from Langlais and Obidzinski (2017). Additionally, our results show the mechanisms by which a society cares about the interests of criminals from political and economic perspectives; these issues were originally discussed by Dau-Schmidt (1990) and Lewin and Trumbull (1990).

Our results also provide welfare implications of the electoral cycle on law enforcement policies. According to Levitt (1997), increases in the size of police forces are related to mayoral and gubernatorial elections. Huber and Gordon (2004) show that elected judges become more punitive as their reelections approach. Dyke (2007) shows that defendants face a higher probability of conviction and a lower probability of having all charges dismissed in an election year. Berdejo and Yuchtman (2013) show that Washington state judges respond to political pressure by sentencing people convicted of serious crimes more severely. Bandyopadhyay and McCannon (2014) show that the number of convictions obtained in jury trials increases in the year before an incumbent runs for reelection. Nadel et al. (2017) investigate the relation between the local state attorney election and the punitiveness decision. Bandyopadhyay and McCannon (2015) investigate the relation between reelection concerns and the number of taken cases. McCannon (2013) shows that the popular election of prosecutors is related to inaccurate sentences, wrongful convictions, and successful appeals. Stashko and Garro (2021) investigate police use by prosecutors and show that for close elections, deaths decrease after a new district attorney ousts an incumbent. At the same time, law enforcement can be weakened by voting pressure. Even if illegal downloading and piracy can be punished, there seems to be fewer deterrence effects.<sup>4</sup> Especially, as in Makowsky and Stratmann (2009, 2011) and Makowsky et al. (2019), profit-driven law enforcers care about political accountability, although our results indicate that this may provide positive and negative welfare implications.

Our results can be helpful to understand the relation between democracy and crimes. Lin (2007) shows that whereas a less democratic society sets severe punishments for minor crimes, a more democratic society sets severe punishments for major crimes. Dusek (2012) shows that the collapse of communism in the Czech Republic in 1989 indicated strong deterrence effects for robbery, theft and intentional injury but not for murder or rape. Stamatel (2009) used postcommunist East-Central European datasets to show that homicide rates were negatively related to GDP per capita and positively related to ethnic diversity and population density. This author also concludes that progressive reforms toward democratization and marketization decreased homicide rates. Our paper contributes to understanding these empirical results by extending the discussion of Garoupa and Klerman (2002) that considers only rent-seeking law enforcers (i.e., less democratic society) to add political accountability, providing disciplining incentives for the rent-seeker to represent citizens’ interests (i.e., more democratic society).<sup>5</sup> Additionally, if the political institutions become stable in

<sup>4</sup> For example, please see Adermon and Liang (2014) for discussing the effects of an anti-piracy law.

<sup>5</sup> This approach is similar to McGuire and Olson (1996) comparing autocracy and democracy with the majoritarian rule.

more democratic countries, the government evaluates the future payoff and has more disciplining incentives, and then we can expect that citizens’ interests will be more represented, leading to weak/harsh law enforcement against minor/major crimes as society democratizes.<sup>6</sup>

The rest of this paper is organized as follows. In Section 2, we provide a law enforcement model incorporating the retrospective voting model. In Section 3, we compare the equilibrium outcomes with the social welfare efficiency level and discuss some extensions. In Section 4, we summarize our findings.

## 2. Model

We follow the model of law enforcement originally proposed by Becker (1968) and extend it to consider that citizens delegate law enforcement tasks to the government, which oversees law enforcement policies. Then, law enforcement policies such as detection efforts and monetary fines can be determined by the government that is chosen by citizens in the political process.<sup>7</sup>

### 2.1. Citizens

Let us consider a population of risk-neutral individuals who live for two periods, where the size of the population is normalized to 1. In the 1st period and 2nd period, each individual considers the opportunity to engage in legal activity (and earn 0) or to engage in illegal activity, which yields a benefit  $b$  in the 1st period and  $b'$  in the 2nd period that varies in the population. Let us assume that  $b$  and  $b'$  are independent of each other and uniformly distributed in  $[0, 1]$ . The government does not observe the type  $b$  and  $b'$  but knows only its distribution function. The detection probability is  $p \in [0, 1]$  in the case that citizens commit an offense in the 1st period and  $p' \in [0, 1]$  in the 2nd period. This monitoring of illegal activity entails a cost, i.e.,  $c(p) = cp^2/2$  and  $c(p') = c(p')^2/2$ . We assume  $0 < c < 1$ , which helps us perform a simple analysis. Even if we assume  $c$  is larger than 1, our main implications do not change. When punished, individuals must pay a monetary sanction  $f \in [0, 1]$  in the case of committing a crime in the 1st period and  $f' \in [0, 1]$  in the case of committing a crime in the 2nd period.<sup>8</sup> Finally, we introduce  $t$  and  $t'$  as a lump sum tax levied on citizens to finance enforcement costs  $c(p)$  and  $c(p')$  in the 1st and 2nd periods, i.e., the budget constraints are  $t = c(p)$  in the 1st period and  $t' = c(p')$  in the 2nd period. In contrast to Langlais and Obidzinski (2017), we assume that law enforcers use collected fine revenue for their own purposes rather than using it to finance the enforcement cost because our framework assumes that the law enforcers are rent-seekers with complete discretionary power once in office and can arrange budgets for their own purposes. In other words, rent-seeking law enforcers implicitly choose how to use all expected fine revenues for their own purposes rather than using it for financing enforcement costs.

Let  $q$  (and  $q'$ ) be the proportion of citizens who commit an offense or the crime rate in society in the 1st period (and in the 2nd period). The external harm and loss to the rest of society in the event of an offense is  $h > 0$ , regardless of the private benefits for the offender. Therefore, an offense hurts citizens through a purely external term that affects

<sup>6</sup> Please see Grilli et al. (1991) for the relation between political stability and how policy-makers weigh the future (their rate of time discount) and Feng (1997) for the relation between democracy and political stability.

<sup>7</sup> In our framework, we do not consider nonmonetary sanctions such as imprisonment. For a more general discussion about voting issues associated with imprisoned criminals and disenfranchisement laws under political competition, see Mungan (2017), who shows that the removal of ex-convicts from the pool of eligible voters reduces the pressure politicians may otherwise face to protect the interests of this group and thereby causes overincarceration.

<sup>8</sup> If we consider the maximal fine to be larger or smaller than 1, our main messages in the following analysis will not change dramatically.

individuals' utility level, which is defined as  $qh$  in the 1st period (and  $q'h$  in the 2nd period). This negative effect hurts both offenders and people who do not commit an offense, following the concept in [Langlais and Obidzinski \(2017\)](#). For example, these effects include polluting the air, speeding or double parking, car theft, throwing out cigarette butts, and drug consumption.

The population of citizens is distributed along the value  $b \in [0, 1]$  in the 1st period ( $b' \in [0, 1]$  in the 2nd period), but only those who commit an offense (i.e., offenders) will retain  $b$  (and  $b'$ ), while those who do not violate the law (i.e., nonoffenders) will forgive their  $b$  (and  $b'$ ). Thus, while the expected utility for those who choose to commit an offense in the 1st period is  $b - pf - hq - t$ , the expected utility for law-abiding citizens in the 1st period is  $-hq - t$ . Similarly, while the expected utility for those who choose to commit an offense in the 2nd period is  $b' - p'f' - hq' - t'$ , the expected utility for law-abiding citizens in the 2nd period is  $-hq' - t'$ .

Then, we define the utilities of citizens and consider the following four situations. We denote the utility of citizens as  $V^{i,j}$ , where  $i$  is 0 or 1 and stands for committing an offense in the 1st period ( $i = 1$ ) or not ( $i = 0$ ) and  $j$  is 0 or 1 and stands for committing an offense in the 2nd period ( $j = 1$ ) or not ( $j = 0$ ).

First, let  $V^{11}$  be the utility of risk-neutral citizens who choose to commit an offense in both periods with the benefits of committing an offense  $b$  in the 1st period and  $b'$  in the 2nd period. Thus, we have

$$V^{11} = b - pf - hq - t + \beta(b' - p'f' - hq' - t'), \tag{1}$$

where  $\beta \in (0, 1)$  is a discounted factor of citizens.

Second, let  $V^{10}$  be the utility of risk-neutral citizens who choose to commit an offense only in the 1st period with illegal benefits  $b$ . Thus, we have

$$V^{10} = b - pf - hq - t + \beta(-hq' - t'). \tag{2}$$

Third, let  $V^{01}$  be the utility of risk-neutral citizens who choose to commit an offense only in the 2nd period with illegal benefits  $b'$ . Then, we have

$$V^{01} = -hq - t + \beta(b' - p'f' - hq' - t'). \tag{3}$$

Finally, let  $V^{00}$  be the utility of risk-neutral citizens who choose not to commit an offense in either period. Then, we have

$$V^{00} = -hq - t + \beta(-hq' - t'). \tag{4}$$

## 2.2. Government

Here, we introduce the motivations of the (incumbent) government in charge of enforcement policies  $p$  and  $f$  in the 1st period and  $p'$  and  $f'$  in the 2nd period. The objective function of enforcer  $L$  becomes

$$L = m + R + w\delta(m + R'), \tag{5}$$

The exogenous political rent  $m$  includes monetary and nonmonetary benefits such as rents from holding office, privileged positions and reputation for improving career concerns, the success of their projects, payment and so on. In addition to achieving political rent, the government pursues maximizing the revenue from collected fines. The fine revenue in the 1st period is  $R = pfq$ , where  $q$  is the crime rate in the 1st period, and the fine revenue in the 2nd period is  $R' = p'f'q'$ , where  $q'$  is the crime rate in the 2nd period, which follows [Garoupa and Klerman \(2002\)](#). Let  $w$  be the probability that the incumbent is reelected and  $\delta \in (0, 1)$  be the exogenous discounted factor of the government in case the government is reelected in the 2nd period. For simplicity, we assume that the government does not care about the external harm produced by the crime because the government is assumed to be just motivated by profit-driven rents. Even if the government partially cares about harm reduction, our main messages do not change. Furthermore, we assume that the enforcement costs are financed by only taxation on citizens and that the government does not use fine revenues to finance

the costs, based on the assumption that the rent-seeking government has complete discretionary power once in office and can arrange its budgets by using collected fine revenues for its own purposes rather than using it for citizens. Thus, although we do not formalize the choice of the government for whether collected fine revenues are used to finance enforcement costs, the government chooses not to use them to finance costs implicitly in our analysis.

## 2.3. Retrospective voting

In the setting we mentioned above, conflicts of interest exist between citizens and the profit-driven government, indicating that the government with complete discretionary power may choose rent-seeking behaviors without considering citizens' interests. In the following analysis, we employ the traditional retrospective voting model, e.g., [Barro \(1973\)](#) and [Ferejohn \(1986\)](#), to investigate how the democratic political process mitigates these conflicts.<sup>9</sup>

In the beginning stage of this model, citizens announce reelection criteria for proposed law enforcement policies  $p$  and  $f$ . Citizens' motivation is to oust the government (an incumbent politician) in the next election if it does not follow the proposal. The (incumbent) government can either follow or not follow the criteria since it has complete discretion and freely sets the law enforcement policy. If the incumbent is not reelected, a challenger will take office.

In this model, the citizens' announcement works as a threat to the government, even though the announcement is not necessarily binding. The reason for this mechanism is based on the assumption that an incumbent and a passive challenger are indifferent to citizens: both an incumbent and a challenger are rent-seekers and take the same action in the 2nd period. Since the incumbent and the challenger are completely identical for citizens, their voting decision does not affect the payoff in the 2nd period. Therefore, there are an infinite number of subgame perfect Nash equilibria for citizens, including that citizens make voting decisions based on the announced reelection criteria. This is because citizens weakly prefer voting decisions based on reelection criteria to other voting decisions. Among the infinite number of equilibria, the Barro-Ferejohn type of retrospective voting model focuses on the equilibrium where voters choose their ballots depending on the announced criteria. Under those settings, citizens' announcements can discipline the (incumbent) government to take appropriate action in the 1st period, even though the voting decision itself is fully retrospective.

## 2.4. Timing of the game

The game follows the simple two-period retrospective voting model.<sup>10</sup> The timing of the game can be summarized as follows.

### 1st period

- Stage 0: Nature moves and selects the type of citizens  $b$ .
- Stage 1: Each citizen sincerely announces a preferred law enforcement policy, promising to reelect the government (incumbent) if and only if the demand is met.<sup>11</sup>
- Stage 2: The government chooses law enforcement policies  $p$  and  $f$ .
- Stage 3: The citizens choose whether to reelect the government based on the announcement in Stage 1.

<sup>9</sup> Please see [Healy and Malhotra \(2013\)](#) for more detailed overviews of the retrospective voting model.

<sup>10</sup> Please see [Persson and Tabellini \(2000\)](#) and [Gehlbach \(2021\)](#).

<sup>11</sup> In Stage 1, we assume that citizens announce the preferred policy as a reelection criteria given the government response. This assumption has some similarities with the notion of "sincerely voting", whereby citizens vote based on their own preferences without direct strategic consideration of the voting intentions of others. We use this assumption to omit the direct strategic relation between voter groups, as discussed in Section 4 of [Ferejohn \(1986\)](#).

- Stage 4: The law is enforced, and the citizens choose whether to abide the law.

**2nd period**

- The winner in the 1st period becomes the (incumbent) government, and Stages 0–4 are repeated. Then, the game ends.

All citizens are electors and participants. At Stage 1 of the 1st period, each citizen announces the most favored law enforcement policies as a reelection criterion, considering their future law-abiding/breaking decision-making.<sup>12</sup> Then, he or she promises to reelect the government if and only if this demand is met. Since we apply a majority rule, only the announcement by the majority of citizens can credibly make the government follow the proposal. As we explained in the previous subsection, the announcement has credible threats because citizens weakly prefer the voting decision based on the announcement, and we focus on the equilibrium where citizens are binding to the announced criteria.

In Stage 2 of the 1st period, after observing the demands, the government chooses enforcement policies  $p$  and  $f$  (and resulting enforcement cost  $t = c(p)$ ). The enforcement policies are observable to the citizens. In Stage 3 of the 1st period, the citizens choose whether to reelect and approve the (incumbent) government. Only when the government follows the announcement proposed by the majority of citizens will it be reelected. Otherwise, an indifferent challenger will win the race. In Stage 4 of the 1st period, the law is enforced, and the citizens choose whether to abide by the law. In the 2nd period, the winner in the election becomes the government, and Stages 0–4 are repeated. Then, the game ends.

**3. Analysis**

**3.1. 2nd period**

By solving the game with backward induction, we derive the subgame perfect Nash equilibria. First, given the citizens' choice in the 1st period, we consider the condition of citizens committing an offense in the 2nd period. Those who commit an offense in the 1st period also choose to commit an offense in the 2nd period if and only if  $V^{11}$  is larger than  $V^{10}$ , or

$$\underbrace{b - pf - hq - t + \beta(b' - p'f' - hq' - t')}_{V^{11}} \geq \underbrace{b - pf - hq - t + \beta(-hq' - t')}_{V^{10}}. \tag{6}$$

Then, we have  $b' \geq p'f'$ , which indicates that those who have higher benefits of committing an offense in the 2nd period  $b'$  than the expected sanction in the 2nd period  $p'f'$  choose to commit an offense in the 2nd period. Similarly, those who do not commit an offense in the 1st period choose to commit an offense in the 2nd period if and only if

$$\underbrace{-hq - t + \beta(b' - p'f' - hq' - t')}_{V^{01}} \geq \underbrace{-hq - t + \beta(-hq' - t')}_{V^{00}}. \tag{7}$$

Then, we also have  $b' \geq p'f'$ , which also indicates that individuals with higher criminal benefits choose to commit an offense in the 2nd period. Therefore, since the illegal benefits in the 2nd period  $b'$  are uniformly distributed in 0 and 1, the total crime rate in the 2nd period is  $q' = 1 - p'f'$ .

Given the citizens' choice, the (elected) government in office has a payoff in the 2nd period  $\delta(m + R')$ , where  $m$  stands for the exogenous

<sup>12</sup> Citizens are dynamically consistent players in this game who account for their own types. Each citizen chooses his or her own strategy and anticipates his or her future behavior, i.e., whether he or she will behave as an offender or a law-abiding citizen.

political rent,  $\delta \in (0, 1)$  is the exogenous discount factor, and fine revenue in the 2nd period is  $R' = p'f'q' = p'f'(1 - p'f')$ .<sup>13</sup> The elected government chooses policies  $p'$  and  $f'$  to maximize the payoff. Note that in the 2nd period, the government in office does not care about political accountability for future elections and voting pressure because the government has term limits. Therefore, the government implements its own most preferred policies that maximize the fine revenues of the payoff. Then, the optimal conditions for maximizing revenue in the 2nd period with respect to  $p'$  and  $f'$  become

$$\frac{\partial R'}{\partial p'} = \frac{\partial p'f'q'}{\partial p'} = f'(1 - 2p'f') = 0. \tag{8}$$

$$\frac{\partial R'}{\partial f'} = \frac{\partial p'f'q'}{\partial f'} = p'(1 - 2p'f') = 0. \tag{9}$$

Therefore,  $p'$  and  $f'$  satisfying  $p'f' = 1/2$  are optimal for the rent-seeking government. Assuming  $f' = 1$  for simplicity, the best policy for the government  $p'$  is  $1/2$ , which maximizes fine revenue and satisfies the second-order conditions:  $\partial^2(p'f'q')/\partial(p')^2 = -2(f')^2 = -2 < 0$ . Thus, if the government is elected, the government implements its own policies  $p' = 1/2$  (with  $f' = 1$ ) and achieves maximized fine revenue rent for the government  $R^* = 1/4$ , which is derived by incorporating  $p' = 1/2$  and  $f' = 1$  into  $R' = p'f'q' = p'f'(1 - p'f')$ . Finally, the government's payoff in the 2nd period becomes  $\delta(m + R^*) = \delta(m + 1/4)$ .

In the following analysis, we focus more on the 1st period stage game. As we explained, in the 2nd period, the government chooses opportunistic behavior  $p' = 1/2$  and obtains maximized rents  $R^* + m$  regardless of citizens' voting behaviors. This means that political interactions between the government and citizens emerge only in the 1st period. Thus, analysis of the 1st period is important for our main interest in how voting pressure disciplines the policy choice of the government.

**3.2. 1st period**

**3.2.1. Stage 4**

Next, we consider the 1st period. In Stage 4, we consider the choice of citizens to commit an offense. Therefore, those who commit an offense in the 2nd period also have utility  $b' - p'f' - hq' - t'$  with  $b' \geq p'f' = 1/2$  and choose to be offenders in the 1st period if and only if  $V^{11} \geq V^{01}$ ;

$$\underbrace{b - pf - hq - t + \beta(b' - p'f' - hq' - t')}_{V^{11}} \geq \underbrace{-hq - t + \beta(b' - p'f' - hq' - t')}_{V^{01}}. \tag{10}$$

The important part is the comparison between  $b - pf - hq - t$  in  $V^{11}$  and  $-hq - t$  in  $V^{01}$ , which corresponds to utility in the 1st period.

Those who do not commit an offense in the 2nd period have utility  $-hq' - t'$  with  $b' < p'f' = 1/2$  and choose to be offenders in the 1st period if and only if  $V^{10} \geq V^{00}$ .

$$\underbrace{b - pf - hq - t + \beta(-hq' - t')}_{V^{10}} \geq \underbrace{-hq - t + \beta(-hq' - t')}_{V^{00}}. \tag{11}$$

The important part also is the comparison between  $b - pf - hq - t$  in  $V^{10}$  and  $-hq - t$  in  $V^{00}$ , which also corresponds to utility in the 1st period.

These results indicate that citizens' decision-making in the 1st period does not depend on their actions in the 2nd period; thus, we focus on each citizen's decision-making and utility in only the 1st period. We introduce  $V^{NO}$  as the utility of law-abiding citizens (i.e., nonoffenders) in the 1st period and  $V^O$  as the utility of law-breaking citizens (i.e., offenders) in the 1st period. Based on the above analysis, by incorporating

<sup>13</sup> This corresponds to the objective function of the government in the 2nd period, assuming the government is elected (i.e.,  $w = 1$ ).

the condition that enforcement costs are financed through taxes on citizens, i.e.,  $t = cp^2/2$ , each citizen's 1st period utility becomes:

$$V^{NO} = -hq - t = -hq - \frac{cp^2}{2}. \tag{12}$$

$$V^O = b - pf - hq - t = b - pf - hq - \frac{cp^2}{2}. \tag{13}$$

Then, the condition to commit an offense in the 1st period is  $V^O \geq V^{NO}$ , which indicates that  $b \geq pf$ . Thus, since the illegal benefits in the 1st period  $b$  are uniformly distributed in  $[0, 1]$ , the realized crime rate in the 1st period becomes  $q = 1 - pf$ .

### 3.2.2. Best policies of offenders, nonoffenders and the government in the 1st period

Before solving the game, we investigate the utility-maximizing best policies for each economic actor in the 1st period without considering the electoral process in the game. Although these policies may not be optimal when political interactions among actors take place in the game, it is important to indicate conflicts of interest between citizens and the government.

First, we investigate the utility-maximizing best policy for a citizen who anticipates that he or she will not violate the law (i.e., a nonoffender) in the 1st period. Since a nonoffender has the utility function  $V^{NO} = -hq - cp^2/2$  and the crime rate in the 1st period is  $q = 1 - pf$ , the marginal effects with respect to  $p$  and  $f$  are

$$\frac{\partial V^{NO}}{\partial p} = hf - cp \tag{14}$$

$$\frac{\partial V^{NO}}{\partial f} = hp. \tag{15}$$

Let  $\bar{p}^{NO}$  be the best policies without an electoral process for a nonoffender. Therefore, we have the following lemma.

**Lemma 1.** *The best policies for a nonoffender are the following: (1)  $\bar{p}^{NO} = h/c$  (with  $f = 1$ ) if  $h < c$  and (2)  $\bar{p}^{NO} = 1$  (with  $f = 1$ ) if  $c \leq h$ .*

**Proof.** First, since the marginal effect of  $p$  on a nonoffender's utility is  $\partial V^{NO}/\partial p = hf - cp$ , then at  $p = 0$ , we have  $\partial V^{NO}/\partial p = hf > 0$ , which indicates that we have  $\bar{p}^{NO} > 0$ . If we have  $\partial V^{NO}/\partial p = hf - c \geq 0$  at  $p = 1$ , or  $h \geq c/f$ ,  $\bar{p}^{NO}$  must be a corner solution, i.e.,  $\bar{p}^{NO} = 1$ . If  $h < c/f$ , we have an interior solution  $0 < \bar{p}^{NO} < 1$ , which satisfies  $\partial V^{NO}/\partial p = hf - cp = 0$ , or  $\bar{p}^{NO} = (hf)/c$ . In this case, the second-order condition is satisfied;  $\partial^2 V^{NO}/\partial p^2 = -c < 0$ . Furthermore, in these cases, the marginal effects of  $f$  on a nonoffender's utility are  $\partial V^{NO}/\partial f = hp > 0$  for any  $p > 0$ . Thus,  $f = 1$  are the best policies for a nonoffender.  $\square$

For monetary sanctions,  $f = 1$  is optimal because imposing fines is costless. The best policies for a nonoffender  $\bar{p}^{NO}$  are an interior solution  $\bar{p}^{NO} = h/c$  if negative externality  $h$  is not too large (i.e.,  $h < c$ ). In other cases, we have a corner solution  $\bar{p}^{NO} = 1$  if the negative externality is large (i.e.,  $c \leq h$ ).

Next, we investigate the utility-maximizing best policies for a citizen who anticipates that he or she will violate the law (i.e., an offender) in the 1st period. Because an offender has the utility function  $V^O = b - pf - hq - cp^2/2$  and the crime rate in the 1st period is  $q = 1 - pf$ , the marginal effect of enforcement on such a citizen is

$$\frac{\partial V^O}{\partial p} = -f + hf - cp \tag{16}$$

$$\frac{\partial V^O}{\partial f} = -p + hp. \tag{17}$$

Then, let  $\bar{p}^O$  be the best policies for these citizens in this situation. Then, we have the following Lemma.

**Lemma 2.** *The best policies for an offender are the following: (1)  $\bar{p}^O = 0$  (with  $f = 0$ ) if  $h \leq 1$ , (2)  $\bar{p}^O = (h-1)/c$  (with  $f = 1$ ) if  $1 < h < 1+c$  and (3)  $\bar{p}^O = 1$  (with  $f = 1$ ) if  $1+c \leq h$ .*

**Proof.** First, since the marginal effect of  $p$  on an offender's utility is  $\partial V^O/\partial p = -f + hf - cp$ , then at  $p = 0$ , we have  $\partial V^O/\partial p = -f + hf = f(h-1)$ . Therefore, if  $h \leq 1$ , we have  $\bar{p}^O = 0$  with  $\partial V^O/\partial p < 0$ . On the other hand, if we have  $\partial V^O/\partial p = -f + hf - c \geq 0$  at  $p = 1$  or  $h \geq (c+f)/f$ , then  $\bar{p}^O = 1$ . If  $1 < h < (c+f)/f$ , we have an interior solution  $0 < \bar{p}^O < 1$ , which satisfies  $\partial V^O/\partial p = -f + hf - cp = 0$ , or  $\bar{p}^O = (hf-f)/c$ . In this case, the second-order condition is satisfied;  $\partial^2 V^O/\partial p^2 = -c < 0$ . Furthermore, in these cases, the marginal effect of  $f$  on an offender's utility is  $\partial V^O/\partial f = -p + hp = p(-1+h)$ . According to the above analysis, as long as  $h > 1$ , we have  $\bar{p}^O > 0$ , which indicates that  $\partial V^O/\partial f = -p + hp = p(-1+h) > 0$ . Thus, we have  $f = 1$  as the best policy for an offender in the case of  $h > 1$ . In other cases (i.e.,  $h \leq 1$ ), we have  $f = 0$  as the utility-maximizing best policies.  $\square$

First, as for monetary sanctions,  $f = 1$  is optimal because imposing fines is costless. Second, the best policy for an offender  $\bar{p}^O$  can be an interior solution  $\bar{p}^O = (h-1)/c$  if negative externality  $h$  is not too small or large (i.e.,  $1 < h < 1+c$ ). In other cases, offenders prefer  $\bar{p}^O = 1$  if the negative externality is too large (i.e.,  $1+c \leq h$ ). On the other hand, we have  $\bar{p}^O = 0$  if the negative externality is small (i.e.,  $h \leq 1$ ) because an offender cares about being punished and prefers zero enforcement. Last, since we assume  $0 < c < 1$ , while nonoffenders prefer  $\bar{p}^{NO} = 1$ , offenders prefer  $\bar{p}^O = 0$  in  $c < h < 1$ , indicating the wider gap of each preferred policy. If we assume  $1 < c$ , although this kind of conflict (i.e., the gap of each preferred policy) becomes small, our main implications do not change.

Finally, we investigate the (incumbent) government's payoff maximizing the best policy in the 1st period. Because the government's objective function in the 1st period is  $L = m + R$  with exogenous political rent  $m$  and fine revenue  $R = pfq = pf(1 - pf)$ , the marginal effects of  $p$  and  $f$  for the government are

$$\frac{\partial L}{\partial p} = \frac{\partial R}{\partial p} = f(1 - 2pf) = 0 \tag{18}$$

$$\frac{\partial L}{\partial f} = \frac{\partial R}{\partial f} = p(1 - 2pf) = 0. \tag{19}$$

These conditions indicate that as long as the best detection probability  $p$  and monetary sanction  $f$  satisfy  $pf = 1/2$ , any  $p$  and  $f$  can lead to maximized fine revenues. Let  $p^G$  be the best policies, such as the detection probability for the rent-seeking government in the 1st period. For simplicity, in the following discussion, we focus on  $f = 1$ . Thus, the first-order condition with respect to  $p$  assuming  $f = 1$  is  $\partial L/\partial p = \partial R/\partial p = 1 - 2p = 0$ , which indicates that the rent-seeking government employs  $p^G = 1/2$ . This also satisfies the second-order condition  $\partial^2 L/\partial p^2 = -2 < 0$ . In summary, we have the following Lemma.

**Lemma 3.** *Assuming that the rent-seeking government employs  $f = 1$ , the best policy for detecting the probability that the rent-seeking government employs is  $p^G = 1/2$  to maximize the objective function in the 1st period.*

### 3.2.3. Stages 2 and 3

In Stage 3, citizens vote based on the announcement in Stage 1. Let us investigate the behavior of the government at Stage 2. We focus on the median voters' (and the majority of citizens') announcement since only the announcement preferred by the median voters has credible power to make the government respond to the proposed policies. Assume that the announced law enforcement policies by the median voters are  $(p, f)$  in the 1st stage, and the government considers whether to choose opportunistic behaviors by giving up reelection in the 2nd period or to follow the announcement  $(p, f)$  to be reelected by the majority citizens for future political rents. When the government chooses opportunistic behavior that is different from the proposed policy  $(p, f)$  by the median voters and gives up being reelected, the government

chooses  $p^G = 1/2$  (with  $f = 1$ ) to maximize the fine revenues in the 1st period. Then, the government obtains  $m + R^*$ , where  $R^* = 1/4$  is the maximized fine revenues in the 1st period, and obtains nothing in the 2nd period. On the other hand, when the government follows the proposed announcements by the median voters  $(p, f)$ , the government chooses  $(p, f)$  in the 1st period and gets reelected in the 2nd period. In this case, the government obtains the political rent  $m$  and fine revenues  $R = pfq = pf(1 - pf)$ , where  $p$  and  $f$  are proposed by the median voters in the 1st period. When the government is reelected in the 2nd period, it does not care about voting pressure for the next election. Then, the government implements its own most preferred policies  $p^G = 1/2$  (with  $f = 1$ ) in the 2nd period, which provides maximized fine revenues  $R^* = 1/4$ . Thus, the government's benefit from pandering to the median voters' announcements and retaining office is  $m + pf(1 - pf) + \delta(m + R^*)$ , where  $m + pf(1 - pf)$  is the benefit from following the median voters' announcement in the 1st period and  $\delta(m + R^*)$  is the outcome of full extraction in the 2nd period.  $\delta$  is the discount rate of the government.

Therefore, the condition that the government has the incentive to be reelected for future rents by choosing the median voters' preferred policies  $(p, f)$  (i.e., disciplining incentive) rather than choosing opportunistic law enforcement policies  $p^G = 1/2$  (with  $f = 1$ ) and giving up being reelected (i.e., short-run incentives) is

$$m + pf(1 - pf) + \delta(m + R^*) \geq m + R^*, \tag{20}$$

where  $R^* = 1/4$  stands for the maximized fine revenues. This can be rewritten as:

$$\Leftrightarrow -(R^* - pf(1 - pf)) + \delta(m + R^*) \geq 0, \text{ or} \tag{21}$$

$$\Leftrightarrow \delta \geq \frac{R^* - pf(1 - pf)}{m + R^*}. \tag{22}$$

Condition (21) indicates that if the government evaluates a future payoff in the 2nd period with large  $\delta(m + R^*)$ , the government has the desire to be reelected for future rents and a more disciplining incentive to pander to the majority of citizens' interests in the 1st period. Additionally, if "forgone fine revenues that the government must give up in exchange for being reelected  $R^* - pf(1 - pf)$ ", where  $R^*$  stands for the maximized fine revenue and  $pf(1 - pf)$  is the proposed fine revenue by the median voters, is large, the government tends to choose opportunistic behaviors in the 1st period, which leads to short-run incentives. In particular, since the fine revenue in the case of pandering  $pf(1 - pf)$  is maximized at  $p = 1/2$  (and  $f = 1$ ), which is equal to rent-maximizing policies (i.e.,  $p^G = 1/2$  and  $f = 1$ ), if  $p$  is too low or too high (with  $f = 1$ ) compared to  $p = 1/2$ , the fine revenue in the case of pandering  $pf(1 - pf)$  in the 1st period is lower, and the government has less incentive to be reelected. If we rearrange the condition of the discount rate of the government, we have the condition (22), which also indicates that if the forgone fine revenues are large and the exogenous political rent  $m$  is small, only the patient government with higher  $\delta$  has the incentive to be reelected.

That is, even if the citizens would like to propose laxer law enforcement for too small  $h$  or strict law enforcement for too high  $h$ , they have to compromise to some extent because the government does not follow such demands and rent-seeking policy  $p^G$  will be realized. Then, the level at which citizens can discipline the behavior of the rent-seeking government is derived by the following condition by rearranging (21):

$$\Leftrightarrow pf(1 - pf) \geq -\delta m + (1 - \delta)R^*. \tag{23}$$

This condition indicates that the fine revenue in the 1st period  $pf(1 - pf)$  has to be large to discipline the government. If the exogenous political rent  $m$  is larger (compared to the maximized fine revenues  $R^*$  as the benefits of opportunistic behavior in the 1st period) and the discount rate  $\delta$  is large, citizens can propose much less fine revenue  $pf(1 - pf)$  because the government has more chances to propose any policies  $p$  and  $f$ . Then, if the right-hand side of (23) is smaller than

0 (i.e.,  $-\delta m + (1 - \delta)R^* < 0 \Leftrightarrow \delta > R^*/(m + R^*)$ ), the government has the incentive to follow any  $pf \in [0, 1]$  proposed by the median voters (and the majority of citizens). On the other hand, if the right-hand side of (23) is larger than 0 (i.e.,  $-\delta m + (1 - \delta)R^* > 0 \Leftrightarrow \delta < R^*/(m + R^*)$ ), indicating that the exogenous political rent  $m$  is smaller (compared to the maximized fine revenues  $R^*$  as the benefits of opportunistic behavior in the 1st period) and the discount rate  $\delta$  is small, the government has an incentive not to follow some  $p$  and  $f$ . By incorporating  $R^* = 1/4$ , which stands for the maximized fine revenues in Condition (23), we have the condition that the government follows only proposal  $pf \in [p\underline{f}, \overline{p}f]$ , where  $p\underline{f} = (1 - \sqrt{\delta(1 + 4m)})/2$  and  $\overline{p}f = (1 + \sqrt{\delta(1 + 4m)})/2$ .<sup>14</sup> Then, the median voters (and the majority of citizens) can discipline the government by proposing  $(p, f)$  and satisfying  $pf \in [p\underline{f}, \overline{p}f]$ , which means they cannot fully discipline the behaviors of the rent-seeking government with the use of voting pressure. If the government chooses  $p$  and  $f$  out of  $pf \in [p\underline{f}, \overline{p}f]$ , it obtains the political rent  $m$  and fine revenues  $R = pfq = pf(1 - pf)$  in the 1st period and obtains nothing in the 2nd period by being ousted by citizens in the election. Thus, if the government has no incentive to be reelected, it implements  $p^G = 1/2$  and  $f = 1$  rather than  $p$  and  $f$  out of  $[p\underline{f}, \overline{p}f]$  to have more rents.

Then, to investigate Stage 1 of the 1st period, we consider two situations: (1) high reelection motivation ( $\delta > R^*/(m + R^*) \Leftrightarrow \delta > 1/(1 + 4m)$ ) by incorporating  $R^* = 1/4$ ) and (2) low reelection motivation ( $\delta < R^*/(m + R^*) \Leftrightarrow \delta < 1/(1 + 4m)$ ) by incorporating  $R^* = 1/4$ ).

### 3.2.4. Stage 1: High reelection motivation ( $\delta > R^*/(m + R^*)$ )

In this case, where the government evaluates the future payoff in the 2nd period with large  $\delta$  and more political rent  $m$  (compared to the maximized fine revenue  $R^*$  as the benefits of opportunistic behavior in the 1st period), citizens can propose for any  $p \in [0, 1]$  and  $f \in [0, 1]$  to discipline the government. Then, a citizen who anticipates that he or she will not commit an offense (i.e., a nonoffender) in the 1st period will demand the following policies  $p^{NO}$  and  $f^{NO}$ . As we explored in Lemma 1, imposing fines is costless for citizens; thus,  $f^{NO} = 1$ . Then,  $p^{NO}$  (with  $f^{NO} = 1$ ) becomes

$$p^{NO} = \begin{cases} \frac{h}{c} & \text{if } h < c \\ 1 & \text{if } c \leq h \end{cases} \tag{24}$$

A citizen who anticipates that he or she will commit an offense (i.e., an offender) in the 1st period will demand the following policies  $p^O$  and  $f^O$ . Following the analysis for Lemma 2, they also demand  $f^O = 1$  in the case of  $p > 0$  because imposing fines is costless. Therefore,  $p^O$  (with  $f^O = 1$ ) becomes

$$p^O = \begin{cases} 0 & \text{if } h \leq 1 \\ \frac{h-1}{c} & \text{if } 1 < h < 1 + c \\ 1 & \text{if } 1 + c \leq h \end{cases} \tag{25}$$

For simplicity, in the following analysis, we focus on only  $p$  as a policy platform variable, assuming  $f = 1$ . This is because costly detection activity  $p$  is the most important voting issue related to conflicts among citizens.

Then, we consider whether the median voter anticipates committing an offense (i.e., an offender) or not (i.e., a nonoffender). Since we apply a majority rule in an election, if the median voter anticipates committing an offense, the government has an incentive to pander to the announcement  $p^{NO}$ . On the other hand, if the median voter anticipates not committing an offense, the government has an incentive to pander  $p^O$ . If the negative externality of crimes is large (i.e.,  $1 + c \leq h$ ), offenders and nonoffenders prefer strict law enforcement (i.e.,  $p^O = p^{NO} = 1$ ), indicating no conflict among citizens. However, in the case

<sup>14</sup> This can be calculated by  $pf$  satisfying  $pf(1 - pf) = -\delta m + (1 - \delta)R^*$ , where the maximized fine revenue is  $R^* = 1/4$ .

of a negative externality that is not too large (i.e.,  $h < 1 + c$ ), offenders and nonoffenders have different interests because while offenders care about not only being punished but also harm reduction, nonoffenders care only about harm reduction. Let  $b^M = 1/2$  be the median voter in this society and  $p^V$  be the political equilibrium policies supported by the median voters (and the majority of citizens). Then, we have the following proposition.

**Proposition 1.** Assume  $\delta > R^*/(m + R^*)$ . In  $h < h^* = (1 + c)/2$ ,  $p^V = 0$  (with  $f = 0$ ). In  $h^* < h$ ,  $p^V = 1$  (with  $f = 1$ ).

**Proof.** We need to compare maximized offenders' utility with  $p^O$  and maximized nonoffenders' utility with  $p^{NO}$ . Offenders' utility is  $V^O = b - pf - hq - cp^2/2$  and nonoffenders' utility is  $V^{NO} = -hq - cp^2/2$  in the 1st period. The crime rate is  $q = 1 - pf$ , which is derived by the fact that the crime benefit  $b$  is uniformly distributed between 0 and 1. Thus, offenders' maximized utility under  $p^O$  (with  $f = 1$ ) is  $V^O = b - p^O - h(1 - p^O) - c(p^O)^2/2$ , and nonoffenders' maximized utility under  $p^{NO}$  (with  $f = 1$ ) is  $V^{NO} = -h(1 - p^{NO}) - c(p^{NO})^2/2$ . The condition for those who support  $p^O$  rather than  $p^{NO}$  is

$$b - p^O - h(1 - p^O) - c(p^O)^2/2 \geq -h(1 - p^{NO}) - c(p^{NO})^2/2. \tag{26}$$

$$\Leftrightarrow b \geq \bar{b} = p^O + h(p^{NO} - p^O) - c(p^{NO} - p^O)(p^O + p^{NO})/2. \tag{27}$$

Those who have higher illegal benefits (i.e.,  $b \geq \bar{b}$ ) prefer  $p^O$  rather than  $p^{NO}$ . Then, we investigate whether the median voters  $b^M = 1/2$  are larger or smaller than the threshold  $\bar{b}$ . According to Lemmas 1 and 2, we have the following analysis.

- In  $c \leq h < 1$ ,  $p^O = 0$  and  $p^{NO} = 1$  indicate  $\bar{b} = h - c/2$ . Then,  $\bar{b} < b^M = 1/2$  if  $c < h < h^* = (1 + c)/2$  and  $\bar{b} > b^M = 1/2$  if  $h^* < h < 1$ . Thus,  $p^V = p^O = 0$  if  $c < h < h^*$  and  $p^V = p^{NO} = 1$  if  $h^* < h < 1$ .
- In  $0 < h < c$  with  $p^O = 0$  and  $p^{NO} = h/c$ , we always have  $\bar{b} < b^M = 1/2$ . Then, in  $0 < h < c$ ,  $p^V = p^O = 0$ .
- In  $1 < h < 1 + c$  with  $p^O = (h - 1)/c$  and  $p^{NO} = 1$ , we always have  $\bar{b} > b^M = 1/2$ . Then, in  $1 < h < 1 + c$ ,  $p^V = p^{NO} = 1$ .
- If  $1 + c \leq h$ , according to our previous analysis, there is no conflict of interest between offenders and nonoffenders. Then, the politically chosen policy is  $p^V = p^O = p^{NO} = 1$ .  $\square$

This indicates that when citizens have less concern about reducing crime ( $h < h^*$ ), citizens do not need harsh law enforcement. Therefore, offenders' preferred policies, such as zero enforcement to decrease their expected cost from punishment, are supported by the median voters (and the majority of citizens) compared to law-abiding citizens' preferred strict policies. On the other hand, as citizens care about social harm ( $h^* < h$ ), they demand strict enforcement to reduce negative externalities. Then, law-abiding citizens' interests are likely to be supported by the median voters.

Finally, note that the assumption  $0 < c < 1$  simplifies our analysis. This is because the assumption makes the threshold  $h^* = (1 + c)/2$  fall in  $c < h < 1$ , where nonoffenders prefer the corner solution  $p^{NO} = 1$  and offenders also prefer the corner solution  $p^O = 0$ . However, even if we assume  $1 < c$  and the threshold  $h^*$  is in the set where each nonoffender and offender prefer the interior solutions  $0 < p^O < p^{NO} < 1$ , our main results do not change.

• Comparison to a Benevolent Government

We investigate the welfare implications of politically chosen law enforcement by comparing them with those of social welfare-maximizing policies. When the government acts as a benevolent government whose objective function is social welfare in the 1st period, we have

$$SW = \int_{pf}^1 (b - h)db - \frac{cp^2}{2}. \tag{28}$$

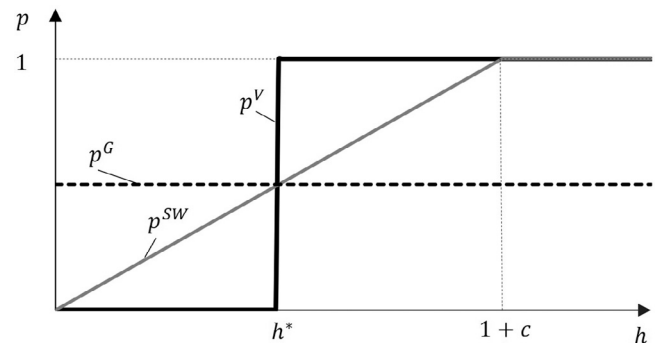


Fig. 1. Case (1)  $\delta > R^*/(m + R^*)$ .

This function contains the welfare of citizens who commit and do not commit an offense. In this case, the fine revenue in the 1st period does not appear because this is just a monetary transfer from a social welfare viewpoint. First,  $f = 1$  is optimal as long as  $p > 0$  because imposing fines is costless. Let  $p^{SW}$  be a social welfare-maximizing detection level. Then, the social welfare-maximizing policy is the following, which is the same in Garoupa (1997a, 2001) and Polinsky and Shavell (2000):

$$p^{SW} = \begin{cases} \frac{h}{1+c} & \text{if } h < 1+c \\ 1 & \text{if } 1+c \leq h \end{cases} \tag{29}$$

Then, we have the following results in terms of comparing  $p^V$  and  $p^{SW}$  under  $f = 1$ .

**Proposition 2.** Assume  $\delta > R^*/(m + R^*)$ . In  $h < h^* = (1 + c)/2$ ,  $p^V < p^{SW}$ . In  $h^* < h < 1 + c$ ,  $p^{SW} < p^V$ . In  $1 + c \leq h$ ,  $p^V = p^{SW}$ .

**Proof.** In  $h < h^* = (1 + c)/2$ , we always have  $p^V = 0 < p^{SW} = h/(1 + c)$ . In  $h^* < h < 1 + c$ ,  $p^{SW} = h/(1 + c) < p^V = 1$ . In  $1 + c \leq h$ ,  $p^V = p^{SW} = 1$ .  $\square$

Fig. 1 shows the result. This proposition indicates that as long as offenders' preferred policies are supported by the median voters (and the majority of citizens) in  $h < h^*$ , insufficient enforcement can be realized in the democratic process. This is because social welfare-maximizing policies require caring about not only offenders' but also nonoffenders' utility. Then, offenders' interests, such as reducing sanction costs, are represented by ignoring nonoffenders' interests, which causes under-enforcement. On the other hand, if policies favored by law-abiding citizens are supported by the majority in  $h^* < h$ , overenforcement will be implemented. This is because the social welfare function requires caring for not only law-abiding citizens but also offenders; law-abiding citizens' interests, such as reducing social harm, are represented by ignoring offenders' interests, such as reducing sanction costs.

This result indicates that compared to the pure fine revenue-maximizing  $p^G$  chosen under a lack of political accountability, the presence of political accountability with voting pressure by citizens can or cannot contribute to social welfare enhancement. (1) In the case of the small negative externality of crimes, while the pure fine revenue-maximizing law enforcement without accountability can be strict, the majority of citizens (i.e., potential offenders) care about their punishment costs and prefer weak enforcement, indicating that the disciplining incentives make the enforcer weaken enforcement to pander to the majority. This can provide positive welfare effects, especially for small externalities. However, it leads to too weak enforcement because it represents only the majority's (i.e., offenders') interests, especially for relatively small (i.e., intermediate) negative externalities compared to the socially efficient level. (2) On the other hand, in the case of the large negative externality of crimes, while the pure fine revenue-maximizing law enforcement without accountability can be weak, the majority of citizens (i.e., law-abiding citizens) care about harm



reduction without concern for punishment costs and prefer strict enforcement, indicating that the disciplining incentives make the enforcer strengthen enforcement to pander to the majority. Although disciplining incentives can provide positive welfare effects as the externality becomes too severe, considering only the majority's (nonoffenders') interests leads to unnecessarily strict enforcement, especially for relatively large (i.e., intermediate) offense externalities compared to the social welfare-maximizing level. That is, while political accountability provides positive welfare effects for offenses with too small and too large negative externalities where opportunistic rent-seeking behaviors cause severe welfare detrimental effects, it also provides negative welfare effects for offenses with intermediate negative externality levels compared to the lack of political process.

3.2.5. Stage 1: Low reelection motivation ( $\delta < R^*/(m + R^*)$ )

Following the previous analysis, we focus only on  $p$  as a law enforcement policy (with  $f = 1$  for  $p > 0$ ). In the low reelection motivation case, the future expected payoff in the 2nd period is not sufficiently large due to low  $\delta$ , small political rent  $m$ , and more forgone fine revenues. As a result, citizens cannot fully discipline the rent-seeking government because it has insufficient disciplining incentives to follow the announcement. More specifically, if median voters announce  $p \notin [p, \bar{p}]$ , where  $\underline{p} = (1 - \sqrt{\delta(1+4m)})/2$  and  $\bar{p} = (1 + \sqrt{\delta(1+4m)})/2$ , the government does not follow the reelection criteria because choosing opportunistic behavior  $p^G = 1/2$  and giving up reelection bring a higher payoff than  $p \notin [p, \bar{p}]$ . Then, given the government's behavior, median voters can obtain a higher utility by choosing  $p \in [p, \bar{p}]$  rather than  $p^G = 1/2$ . For example, it is better for citizens to announce  $p = \underline{p} > 0$  even if  $h$  is eventually small and all citizens prefer  $p = 0$ . This is because citizens know that the government does not follow the announcement and implements  $p^G = 1/2$  if they announce  $p = 0$ , while if they announce  $p = \underline{p}$ , the government follows the announcement. Since  $p = \underline{p} < 1/2$  brings a higher payoff than  $p^G = 1/2$  for all citizens, they do not have the incentive to deviate. Along the same logic, median voters always obtain a higher payoff by choosing  $p \in [p, \bar{p}]$  rather than  $p \notin [p, \bar{p}]$ . Since the previous analysis (i.e., Lemma 1, Lemma 2, and Proposition 1) indicates that the best policy of median voters (and majority citizens) is determined as  $p = 0$  or  $p = 1$  and  $\underline{p} < p^G < \bar{p}$  holds, median voters can obtain a higher payoff by choosing  $p \in [p, \bar{p}]$ , which is close to their best policy, rather than  $p^G = 1/2$ . As a result, median voters always choose law enforcement policies given the constraint  $p \in [p, \bar{p}]$ .

Under the constraint  $p \in [p, \bar{p}]$ , a citizen who anticipates that he or she will not commit an offense in the 1st period will prefer the following policy  $p^{NO}$ :

$$p^{NO} = \begin{cases} \underline{p} & \text{if } h < \underline{h}^{NO} = \frac{c[1-\sqrt{\delta(1+4m)}}{2} \\ \frac{h}{c} & \text{if } \underline{h}^{NO} < h < \bar{h}^{NO} = \frac{c[1+\sqrt{\delta(1+4m)}}{2} \\ \bar{p} & \text{if } \bar{h}^{NO} < h \end{cases} \quad (30)$$

As long as the best policies for nonoffenders as in Lemma 1 are in  $[p, \bar{p}]$ , it should be chosen. However, if it is not allowed by the constraint, citizens should propose  $\underline{p}$  or  $\bar{p}$ . Then, the threshold  $\underline{h}^{NO}$  is derived by calculating the point where  $\underline{p}$  is equal to the preferred policy  $h/c$ . Similarly,  $\bar{h}^{NO}$  is derived by calculating the point where  $\bar{p}$  is equal to the preferred policy  $h/c$ .

A citizen who anticipates that he or she will commit an offense in the 1st period will prefer the following policy  $p^O$ :

$$p^O = \begin{cases} \underline{p} & \text{if } h < \underline{h}^O = 1 + \frac{c[1-\sqrt{\delta(1+4m)}}{2} \\ \frac{h-1}{c} & \text{if } \underline{h}^O < h < \bar{h}^O = 1 + \frac{c[1+\sqrt{\delta(1+4m)}}{2} \\ \bar{p} & \text{if } \bar{h}^O < h \end{cases} \quad (31)$$

As long as the best policies for offenders as in Lemma 2 are in  $[p, \bar{p}]$ , it should be chosen. However, if it is not allowed by the constraint, citizens should propose  $\underline{p}$  or  $\bar{p}$ . Then, the threshold  $\underline{h}^O$  is derived by calculating the point where  $\underline{p}$  is equal to the preferred policy  $(h-1)/c$ . Similarly,  $\bar{h}^O$  is derived by calculating the point where  $\bar{p}$  is equal to the preferred policy  $(h-1)/c$ .

In the following analysis, we consider whether the median voters prefer  $p^{NO}$  or  $p^O$ , which also indicates that the majority of citizens also support the policy, and the government has an incentive to pander to  $p^{NO}$  or  $p^O$ . Simple calculation indicates that we have  $\underline{h}^{NO} < \bar{h}^{NO} < \underline{h}^O < \bar{h}^O$ . If the negative externality  $h$  is eventually small (i.e.,  $h < \underline{h}^{NO}$ ), both offenders and nonoffenders have the same preference, and  $p^O = p^{NO} = \underline{p}$  holds. If the negative externality  $h$  is eventually large (i.e.,  $\bar{h}^O < h$ ), both offenders and nonoffenders have the common preference, and  $p^O = p^{NO} = \bar{p}$  holds. In these cases, there is no conflict among citizens. However, in  $\underline{h}^{NO} < h < \bar{h}^O$ , offenders and nonoffenders have different interests. Then, following the previous analysis, we investigate whether offenders or nonoffenders are the median voter  $b^M = 1/2$  in society. Let  $p^V$  be the political equilibrium policies supported by the median voters (and the majority of citizens), and we have the following proposition.

**Proposition 3.** Assume  $\delta < R^*/(m + R^*)$ . In  $h < h^* = (1 + c)/2$ ,  $p^V = \underline{p}$  (with  $f = 1$ ). In  $h^* < h$ ,  $p^V = \bar{p}$  (with  $f = 1$ ).

**Proof.** We need to compare offenders' maximized utility with  $p^O$  and nonoffenders' maximized utility with  $p^{NO}$ . Offenders' utility is  $V^O = b - pf - hq - cp^2/2$  and nonoffenders' utility is  $V^{NO} = -hq - cp^2/2$  in the 1st period, where the crime rate is  $q = 1 - pf$ . Thus, offenders' maximized utility under  $p^O$  (with  $f = 1$ ) is  $V^O = b - p^O - h(1 - p^O) - c(p^O)^2/2$ , and nonoffenders' maximized utility under  $p^{NO}$  is  $V^{NO} = -h(1 - p^{NO}) - c(p^{NO})^2/2$ . Thus, the condition for those who support  $p^O$  rather than  $p^{NO}$  is

$$b \geq \bar{b} = p^O + h(p^{NO} - p^O) - c(p^{NO} - p^O)(p^O + p^{NO})/2. \quad (32)$$

Those who have higher illegal benefits (i.e.,  $b \geq \bar{b}$ ) prefer  $p^O$  rather than  $p^{NO}$ . Then, we investigate whether the median voters  $b^M = 1/2$  are larger or smaller than the threshold  $\bar{b}$ . According to Lemmas 1 and 2, we have the following analysis.

- If  $h < \underline{h}^{NO}$ ,  $p^O = p^{NO} = \underline{p}$ , and if  $\bar{h}^O < h$ ,  $p^O = p^{NO} = \bar{p}$ .
- In  $\underline{h}^{NO} < h < \underline{h}^O$  with  $p^O = \underline{p}$  and  $p^{NO} = \bar{p}$ , we have  $\bar{b} = [1 - \sqrt{\delta(1+4m)}(1 + c - 2h)]/2$ . Then, we have  $\bar{b} < b^M = 1/2$  indicating that the median voters prefer offenders' preferred policies if  $\bar{h}^{NO} < h < h^* = (1 + c)/2$  and  $\bar{b} > b^M = 1/2$  indicating that the median voters prefer nonoffenders' preferred policies if  $h^* < h < \underline{h}^{NO}$ . Thus,  $p^V = p^O = \underline{p}$  in  $\bar{h}^{NO} < h < h^* = (1 + c)/2$  and  $p^V = p^{NO} = \bar{p}$  if  $h^* < h < \underline{h}^O$ .
- In  $\underline{h}^{NO} < h < \bar{h}^{NO}$  with  $p^O = \underline{p}$  and  $p^{NO} = h/c$ , we always have  $\bar{b} < b^M = 1/2$ , indicating that the median voters prefer offenders' preferred policies. Then, in  $\underline{h}^{NO} < h < \bar{h}^{NO}$ ,  $p^V = p^O = \underline{p}$ .
- In  $\underline{h}^O < h < \bar{h}^O$  with  $p^O = (h-1)/c$  and  $p^{NO} = \bar{p}$ , we always have  $\bar{b} > b^M = 1/2$ , indicating that the median voters prefer nonoffenders' preferred policies. Then, in  $\underline{h}^O < h < \bar{h}^O$ ,  $p^V = p^{NO} = \bar{p}$ . □

This indicates that when citizens are less concerned about reducing crime ( $h < h^*$ ), offenders' preferred policies obtain the support of the median voters (and the majority) because this demands a lower enforcement level. Then, they demand less strict enforcement policies given the constraint  $p \in [p, \bar{p}]$ , and  $\underline{p}$  is realized. On the other hand, as citizens care about social harm ( $h^* < h$ ), they demand strict enforcement to reduce negative externalities. Then, law-abiding citizens' interests are likely to be supported by the median voters

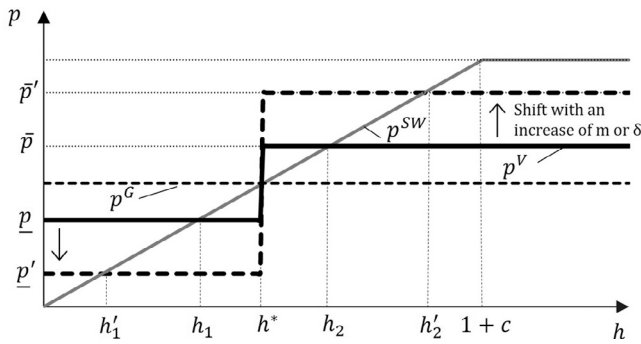


Fig. 2. Case 2  $\delta < R^*/(m + R^*)$ .

compared to offenders' favored policies, which results in  $\bar{p}$ . In contrast to Proposition 1, the citizens must compromise on enforcement policies because the citizens cannot fully discipline the government's behavior with insufficient disciplining incentives.

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Then, because social welfare-maximizing enforcement policies are  $p^{SW} = h/(1 + c)$  if  $h < 1 + c$  and  $p^{SW} = 1/(1 + c)$  if  $1 + c \leq h$ , we have the following result.

**Proposition 4.** Assume  $\delta < R^*/(m + R^*)$ . In  $h < h_1 = (1 + c)(1 - \sqrt{\delta(1 + 4m)})/2$ ,  $p^{SW} < p^V$ . In  $h_1 < h < h^*$ ,  $p^V < p^{SW}$ . In  $h^* < h < h_2 = (1 + c)(1 + \sqrt{\delta(1 + 4m)})/2$ ,  $p^{SW} < p^V$ . In  $h_2 < h$ ,  $p^V < p^{SW}$ .

**Proof.** In  $h < h^* = (1 + c)/2$ ,  $p^V = \underline{p}$  and  $p^{SW} = h/(1 + c)$ . Then, at  $h_1 = (1 + c)(1 - \sqrt{\delta(1 + 4m)})/2$ ,  $p^{SW} = p^V$ . Thus,  $h < h_1$ ,  $p^{SW} < p^V$  and in  $h_1 < h < h^*$ ,  $p^V < p^{SW}$ . In  $h^* < h < 1 + c$ ,  $p^V = \bar{p}$  and  $p^{SW} = h/(1 + c)$ . Then, at  $h_2 = (1 + c)(1 + \sqrt{\delta(1 + 4m)})/2$ ,  $p^{SW} = p^V$ . Thus,  $h < h_2$ ,  $p^{SW} < p^V$  and in  $h_2 < h < 1 + c$ ,  $p^V < p^{SW}$ . In  $1 + c < h$ ,  $p^V = \bar{p} < p^{SW} = 1$ . □

Fig. 2 shows the result. While Proposition 2 indicates that the government evaluates future reelection rents and citizens can prevent it from participating in rent-seeking behaviors, Proposition 4 provides some different implications.

If  $h$  is small enough (i.e.,  $h < h_1$  in Fig. 2), the presence of political accountability provides positive welfare implications by comparing political equilibrium  $p^V$  and the pure fine revenue-maximizing policies  $p^G$  chosen by the government without political accountability. This is because while the pure fine revenue-maximizing law enforcement without accountability can be strict, the majority of citizens (i.e., potential offenders) care about being punished and prefer weak enforcement. This indicates that the disciplining incentives make the enforcer weaken enforcement to pander to the majority rather than choosing opportunistic behaviors. This can provide positive welfare effects, especially for externalities that are too small, where a lack of political accountability causes unnecessary overenforcement. However, it can still be inefficiently strict when citizens cannot completely discipline the enforcer's opportunistic behavior and must allow rent-seeking behaviors to some extent if the enforcer does not sufficiently evaluate future reelection rents (i.e., lower holding office rents  $m$ , small  $\delta$ , and more forgone collected fines the enforcer must give up).

Furthermore, as the negative externalities of offenses become non-negligible (i.e.,  $h_1 < h < h^*$  in Fig. 2), law enforcement representing only the majority's (i.e., potential offenders) interests becomes inefficiently weak compared to the socially efficient level, which considers both offenders' and law-abiding citizens' utility. Additionally, the presence of political accountability with voting pressure may provide negative welfare implications compared to a lack of political accountability. In particular, if the enforcer has more disciplining incentives

(i.e., higher holding office rents  $m$ , more patience  $\delta$ , and lower forgone fine revenues), this underenforcement is likely to happen, which is described as lowering  $p$  to  $p'$  (and changing  $h_1$  to  $h_1'$ ) in Fig. 2. These results indicate that providing more attractive reelection motivation is not always good from the social welfare perspective because this may induce unnecessary and inefficient government pandering, causing underenforcement.

As  $h$  becomes relatively large (i.e.,  $h^* < h < h_2$  in Fig. 2), political equilibrium  $p^V$  representing only the majority (i.e., law-abiding citizens) is larger than social welfare-maximizing level  $p^{SW}$ . Then, the presence of political accountability with voting pressure may provide negative welfare implications compared to the pure fine revenue-maximizing policy  $p^G = 1/2$  because of pandering to the majority. In particular, if the enforcer has more disciplining incentives (i.e., more political rents  $m$ , more patience  $\delta$ , and lower forgone fine revenues), this overenforcement is likely to happen, which is described as  $\bar{p}$  to  $\bar{p}'$  (and change  $h_2$  to  $h_2'$ ) in Fig. 2. These results also indicate that providing more disciplining incentives is not always good from the social welfare perspective because this may induce unnecessary and inefficient government pandering.

If  $h$  is large enough (i.e.,  $h_2 < h$  in Fig. 2), the presence of political accountability provides positive welfare implications by comparing political equilibrium  $p^V$  and the pure fine revenue-maximizing policies  $p^G$  chosen by the government without political accountability and concern for harm reduction. This is because while the pure fine revenue-maximizing law enforcement without accountability can be lower, the majority of citizens (i.e., law-abiding citizens) care about harm reduction and prefer strict enforcement, indicating that the disciplining incentives make the enforcer strengthen enforcement to pander to the majority rather than choosing opportunistic behaviors. This can provide positive welfare effects for large externalities where a lack of political accountability causes unnecessary underenforcement. However, it can still be inefficiently weak when citizens cannot completely discipline the enforcer's opportunistic behavior and have to allow rent-seeking behaviors to some extent if the enforcer does not evaluate future reelection rents (e.g., lower holding office rents  $m$ , small  $\delta$ , and more forgone collected fines the enforcer must give up), indicating the difficulty of fully internalizing the interests of citizens to the behaviors of the rent-seeking government.

These have some similar implications with Proposition 2. The main difference is that while the presence of political accountability could provide positive welfare implications for small (i.e.,  $h < h_1$  in Fig. 2) and large externalities (i.e.,  $h_2 < h$  in Fig. 2), it can still be inefficiently strict for small externalities and weak for large externalities. This is because the government does not evaluate future reelection rents so much, and it is more likely to engage in rent-seeking behavior. In contrast to Proposition 2, while the democratic process can cause negative welfare implications compared to the lack of political accountability for intermediate negative externalities (i.e.,  $h_1 < h < h_2$  in Fig. 2), insufficient disciplining incentives make the government have fewer incentives to choose pandering policies, which indicates that the level of distortions can be mitigated, especially for offenses with intermediate negative externalities.

3.3. Discussion

3.3.1. Implications

First, our results can be helpful for understanding the economic consequences when a government reacts to general public demands in choosing law enforcement policies.<sup>15</sup> Additionally, we point out several

<sup>15</sup> This mechanism is consistent with empirical research, such as Levitt (1997), Dyke (2007), Berdejo and Yuchtman (2013), Bandyopadhyay and McCannon (2014), Nadel et al. (2017), McCannon (2013), Makowsky and Stratmann (2009, 2011) and Makowsky et al. (2019), which reveals the positive relationship between a politician's reelection motives and the enforcement of crimes, such as the relationship between the electoral cycle and law enforcement.

types of welfare implications that help us understand the relations between democracy and crimes. While Garoupa and Klerman (2002) argue that a democratic government is welfare maximizing but a non-democratic government is rent seeking, we take a different approach to consider democracy effects by incorporating political accountability with the electoral process into the framework of the rent-seeking government by Garoupa and Klerman (2002). Then, we assume that a democratic government has its own preference that is not necessarily welfare maximizing and can be disciplined by majority rule, which represents actual democratic political institutions. Furthermore, even if the interests of citizens can be represented by disciplining the rent-seeking government (i.e., more democratization), the economic outcome can be inconsistent with the social welfare perspective. For example, when the government evaluates future reelection rents because of the stability of the political institution, as in Feng (1997), the government is likely to pander to the majority citizens' interests, and policies that citizens can choose, i.e.,  $p \in [p, \bar{p}]$ , become large.<sup>16</sup> However, since law enforcement reflects only the majority's interests (law-abiding or law-breaking citizens'), strict/weak enforcement in major/minor crimes can emerge by indicating deteriorated social welfare implications. This provides welfare implications for empirical results exploring the relationship between democracy and crime, such as Lin (2007), Dusek (2012) and Stamatel (2009).

Second, our paper provides a new formal model investigating the relationship between law enforcement and the political process. We incorporate political accountability with a dynamic electoral process into Garoupa and Klerman (2002), who consider a fine revenue-maximizing government. Especially under the possibility that profit-driven motivation may distort law enforcement, the electoral process is important to discipline rent-seeking law enforcement executives. We introduce the retrospective voting model proposed by Barro (1973) and Ferejohn (1986) with several characteristic features. For example, it does not assume any full commitment and enforceability of electoral promises, indicating that (incumbent) governments have complete discretion once in office and that all citizens can do is punish their performances and oust them from office at the next election. Then, while the short-run incentive makes the (incumbent) rent-seeking government choose opportunistic behaviors by giving up being reelected, the desire to be reelected for future political rents may induce the government to pander to citizens' interests. Langlais and Obidzinski (2017) also have similar motivations to ours and consider a political process where political parties compete for maximizing their winning probability following the Downsian model, which is different from the retrospective voting model that we employ.<sup>17</sup>

<sup>16</sup> For example, if political institutions are unstable, future rent and the discount rate can be smaller. Then, the government is likely to underestimate the future payoff, which induces myopic behaviors. Please see Grilli et al. (1991).

<sup>17</sup> There are several differences in frameworks between Langlais and Obidzinski (2017) and ours. For example, they assume that politicians can commit to their proposed policies ahead of elections; we drop the commitment assumption and assume that no electoral promises can be enforced, which means that governments cannot make binding electoral promises and can cause political agency problems between politicians and citizens. Furthermore, Langlais and Obidzinski (2017) consider that law enforcers are motivated by maximizing the probability of winning in elections without concern for policy outcomes. Our model assumes that law enforcers have profit-driven motivations, as indicated by Makowsky and Stratmann (2009, 2011) and Makowsky et al. (2019), and do not always have the incentive to win the election because they choose opportunistic behaviors in the present. Propositions 1 and 2 are similar to their analysis. In this case, the government has more reelection motivation, citizens can discipline the enforcer, and minor/major crimes tend to be punished more/less severely. That is, our analysis with the retrospective voting model has similar implications to their analysis with the Downsian model. However, if there are less attractive reelection motivations, our results

### 3.3.2. Extensions

There are some limitations in our model. First, our framework focuses on the fine revenue-maximization behavior of a government and does not consider crimes with nonmonetary sanctions, e.g., violent felonies and murders. Fine revenue motivation may have a spillover effect on the policing of crimes with nonmonetary sanctions, but our framework does not provide a clear answer to this point. For example, if a government is more motivated toward fine revenue maximization, it draws away resources from violent felonies and murders. To fill this gap, the following analysis will provide a simple model that addresses how fine revenue maximization affects the policing of crimes with nonmonetary sanctions. Suppose that there are two types of offenses: one is an offense with a monetary sanction such as violating traffic rules, and the other is an offense with a nonmonetary sanction such as violent felonies and murders. We assume that the former provides illegal benefits  $b_1$  with an expected sanction cost  $p_1 f_1$ , where  $p_1$  is the detection probability and  $f_1$  is the monetary sanction, and the latter provides illegal benefits  $b_2$  with an expected sanction cost  $p_2 f_2$ , where  $p_2$  is the detection probability and  $f_2$  is a nonmonetary sanction. As long as these benefits  $b_1$  and  $b_2$  are uniformly distributed in  $[0, 1]$ , following the previous analysis, each crime rate becomes  $q_1 = 1 - p_1 f_1$  and  $q_2 = 1 - p_2 f_2$ . Therefore, the fine revenue rent for the government becomes  $p_1 f_1 q_1$ , which is obtained from only monetary-sanctioned crime. If the government cares about the reputation loss caused by an increase in crimes with nonmonetary sanctions, a reduction in those crimes will contribute to enhancing the government's reputation. Let  $-r q_2 = -r(1 - p_2 f_2)$ , where  $r > 0$ , be the reputation loss for the government. Then, we consider a situation in which the government with the objective function  $m + p_1 f_1 q_1 - r q_2$  (in the 1st period), where  $m$  is the general political rent as we introduced in the main section, must allocate the detection activities between these two kinds of crimes. That is, we assume that the government must allocate law enforcement activities  $p_1$  and  $p_2$  subject to the constraint  $p_1 + p_2 = k$ , where  $k$  can be interpreted as the budget constraint or the maximal (total) activity level for enforcers. Then, there can be spillover effects: the government that does not care about the reputation loss (lower  $r$ ) has less incentive to employ severe enforcement  $p_2$  against crimes with nonmonetary sanctions.<sup>18</sup> If we apply our framework to consider this kind of problem, voting pressure may contribute to resolving such negative spillover effects between crimes with monetary sanctions and crimes with nonmonetary sanctions by setting appropriate enforcement allocations.

will be different from their analysis. Propositions 3 and 4 suggest that political accountability can discipline rent-seeking law enforcers and provide positive welfare implications when rent-seeking law enforcement without accountability is too strict for negative externalities that are too small or too weak for negative externalities that are too large. However, if the disciplining incentives are weak because of fewer reelection motivations, it is still strict for offenses with small negative externalities and weak for offenses with large negative externalities. In this respect, as Makowsky and Stratmann (2009, 2011) and Makowsky et al. (2019) have shown, we point out different implications such that the profit-motivated issuing speeding tickets or profit-motivated arrests for drug possession and prostitution for some citizens, which can be called "victimless crimes", may remain strict. Furthermore, we also note that for intermediate crimes, the democratic process can lead to the government's inefficient pandering to voters and cause welfare deterioration, even compared to the pure rent-seeking enforcement case. If disciplining incentives are weak, this kind of distortion is less likely to occur. These results are different from Langlais and Obidzinski (2017).

<sup>18</sup> This can be confirmed by the following simple calculation. By incorporating the constraint  $p_1 + p_2 = k$  into the objective function  $m + p_1 f_1 q_1 - r q_2$  with  $q_1 = 1 - p_1 f_1$  and  $q_2 = 1 - p_2 f_2$ , we have  $p_1^* = (f_1 - r f_2) / 2(f_1)^2$  and  $p_2^* = k - (f_1 - r f_2) / 2(f_1)^2$ . Thus, if  $r$  is small,  $p_1^*$  becomes large, which is one kind of spillover effect causing misallocation of enforcement efforts by a rent-seeking government.

Second, although one important feature of law enforcement schemes is the increasing severity of punishments for repeat offenders, as in Garoupa (1997a), Polinsky and Shavell (2000), Mungan (2010), Emons (2007), and other papers, we do not consider the possibility that law-breaking behavior may influence future enforcement. To fill this gap, we will provide some examples and implications for how citizens' incentives to commit an offense and the rent-seeking government's choice can be modified. For example, suppose that if potential offenders commit an offense in both the 1st and 2nd periods, their expected utility will be  $b - pf - hq - t + \beta(b' - p'f' - hq' - t')$ . However, if potential offenders choose to commit an offense only in the 2nd period, their expected utility will be  $-hq - t + \beta(b' - p''f'' - hq'' - t'')$ . In the case of repeat offenses, the expected sanction costs in the 2nd period are  $p'f'$ , which can be different from the expected sanction costs  $p''f''$  in the case that the first offense is engaged in the 2nd period. Then, if considering that law enforcement is conditioned on past enforcement and the expected sanction in the case of repeat offenses is severe (i.e.,  $p'f' > p''f''$ ), an incentive to commit an offense in the 1st period can be weakened. Under this situation, the fine revenue-maximizing government may have less incentive to set the detection probability in the 1st period higher because of a reduction in the marginal effect of raising the detection probability to maximize fine revenues.

#### 4. Concluding remarks

This paper provides an inclusive framework for the contemporary law enforcement system based on citizens (i.e., potential offenders and law-abiding citizens) in society and law enforcers who do not have the same motives as citizens. Then, we explore how the general public can discipline the rent-seeking law enforcer's performance and resolve conflicts of interest by considering the reelection motives of the enforcer and the voting pressure of the general public. Finally, we investigate how these political processes have distorted law enforcement policies compared to the social welfare efficiency level.

We show that the strength of the reelection motivation allows citizens to discipline a government, but it does not necessarily improve social welfare. When the enforcer does not evaluate the future payoff, it is unlikely to respond to citizens' interests with causing positive and negative welfare implications. In contrast, if the law enforcement government evaluates the future payoff and has more reelection motivation, such welfare implications can or cannot be strengthened. Although sufficient reelection motivations provide an opportunity for citizens (i.e., law-abiding/law-breaking citizens) to discipline the rent-seeking enforcer, majorities' interests are not always consistent with the social welfare perspective. That is, distorted enforcement policies still exist under democratic processes.

Our paper has some limitations. For example, the model allows the case where potential criminals as median voters demand lax law enforcement and a government panders to the demand. However, in reality, it is not always the case that median voters' interests are reflected in political platforms. In the U.S., for example, political parties tend to run on tough-on-crime platforms regardless of citizens' interests. Future analysis can be extended by considering political parties' preferences and explaining when median voters' interests seem not so important. Additionally, although we provide some comments on spillover effects between crimes with monetary and nonmonetary sanctions, we should discuss this point more in future analyses. Our framework has limitations with respect to the problem that there can be another agency problem between police leadership and the officers on the streets conducting the work (as well as conflicts between police and prosecutors). Future analysis should consider those multiple principal-agent relationships. Finally, there exists no political pressure once the enforcer can be reelected in our model because the model has a simple two-period structure. However, this may not be true in some cases; for example, collective political parties might care about future elections and refrain from implementing their favorite policies in some cases. In that case, our finite period model can be extended in other directions.

#### CRedit authorship contribution statement

**Ken Yahagi:** Conceptualization, Methodology, Formal analysis, Writing – original draft, Writing – review & editing, Funding acquisition. **Yohei Yamaguchi:** Conceptualization, Methodology, Visualization, Formal analysis, Writing – original draft, Writing – review & editing.

#### Data availability

No data was used for the research described in the article.

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