

# The Partisan Politics of Law Enforcement\*

9,722 Words

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## Abstract

Tough-on-crime policies are often attributed to conservative parties. Yet, left-wing politicians sometimes invest heavily in law enforcement. This paper explores the incentives of political parties to spend on law enforcement when citizens can rely on private alternatives. The paper presents a model that features a continuum of citizens who are differentiated by income. Citizens choose whether to commit crime and purchase private protection. Police spending is determined by a left- or a right-wing party. The model predicts that both parties may over- and under-invest in policing relative to the social optimum. In relatively affluent societies where the rich are privately protected, right parties are prone to spend too little and left parties too much on policing. The model also shows that the availability of private protection increases the impact of election outcomes on social welfare in rich societies but limits it in poor ones.

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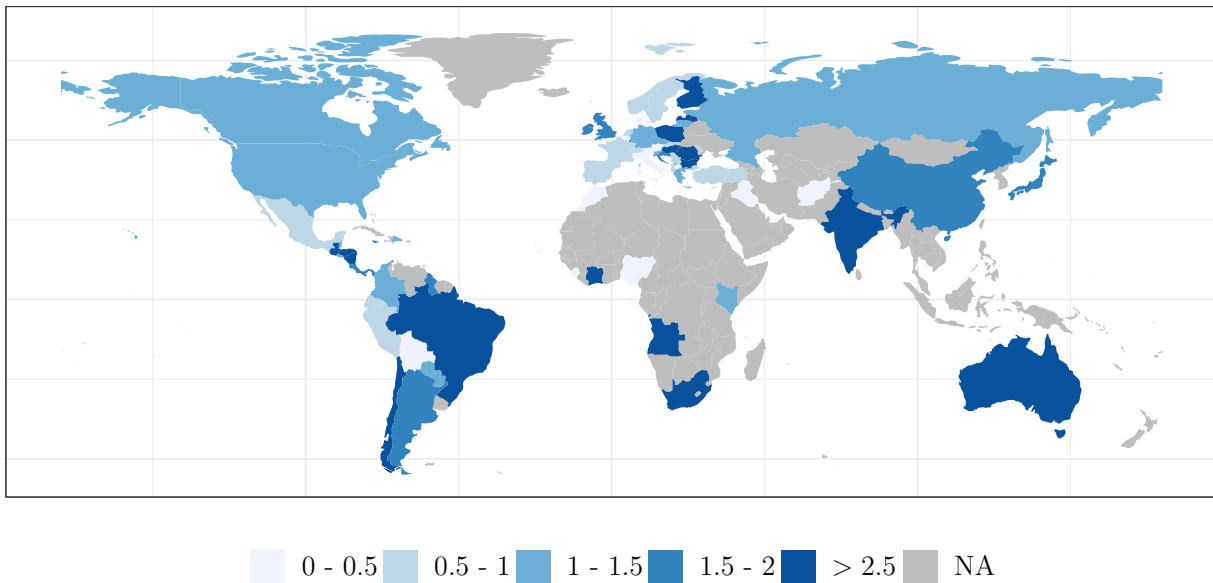
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# 1 Introduction

Tough-on-crime policies such as militarized policing and harsh sentences are common throughout the world. Prominent examples include the American “war on drugs,” the anti-drug campaign of President Duterte in the Philippines and *mano dura* policies in El Salvador. In addition to their consequences for the rights of criminal suspects, such policies are criticized for diverting a disproportionate amount of government resources towards law enforcement (Gottschalk, 2008; Soss and Weaver, 2017). Elsewhere, concerns about crime control are of the opposite nature. Insufficient police staff, resources and training are said to contribute to insecurity in parts of Africa (Baker, 2017), Latin America (Dammert, 2019), Asia (Human Rights Watch, 2009) and Europe.<sup>1</sup> What determines how much public officials spend on law enforcement?

Figure 1: Private security personnel per police officer



Data source: Provost, Claire. May 12, 2017. “The Industry of Inequality: Why the World Is Obsessed with Private Security.” The Guardian. <https://pulitzercenter.org/stories/industry-inequality-why-world-obsessed-private-security>.

<sup>1</sup>E.g., Dodd, Vikram. July 4, 2019. “Police resources ‘drained to dangerously low levels’, say former top officers.” The Guardian. <https://www.theguardian.com/uk-news/2019/jul/04/police-watchdog-reforms-chief-inspector-constabulary>.

Many attribute law and order politics to the ideology of conservative parties (Caldeira and Cowart, 1980; Jacobs and Carmichael, 2001; Smith, 2004). Yet, even though tough-on-crime policies are often implemented by conservative politicians, leftists have not been entirely passive. Consider the current president of Mexico, Andrés Manuel López Obrador. As mayor of Mexico City (2000 - 2005), Obrador relied on advice from Rudolph Giuliani, former mayor of New York City known for his “zero-tolerance” approach to crime, to address Mexico City’s crime problem. Obrador increased prison terms and defined new crime categories which led to a drastic increase in prison populations. At the time, Obrador was a member of the social democratic Partido de la Revolución Democrática. Similar examples exist in many contexts.<sup>2</sup>

From a theoretical perspective too there are reasons to suspect the relationship between partisan politics and law enforcement to be more complicated. Around the world, citizens invest in private security to shield themselves against crime. Examples include burglar alarms, camera systems, armed response teams, and gated communities. Figure 1 shows private security personnel often outnumber police – sometimes by a factor of more than two-to-one. Those who can afford private protection typically belong to high-income segments that also form the base of conservative parties. Where the rich can reduce their dependence on public efforts to maintain order, it appears less obvious that conservative parties will emphasize law enforcement.

This paper sheds light on the incentives of right and left parties to spend public funds on policing when citizens can invest in private alternatives. I present a theoretical model consisting of three elements. The first is a model of the supply of property crimes like burglary or theft, which private security measures are typically meant to prevent. The second is a model of the demand for private protection and the third a model of the political process that determines law enforcement expenditures. Each element is kept extremely simple to study the combination of all three.

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<sup>2</sup>Holland (2013) and Bonner (2019) provide other examples from Latin America. South Africa, which has been ruled by the center-left African National Congress since 1994, has one of the highest incarceration rates worldwide (Super, 2016). Forman Jr (2017) describes how Democratic African American officer holders pushed for tough-on-crime policies in the United States.

The model features a continuum of citizens who are differentiated by how much income they earn through legal means. Citizens choose whether to commit crime. Those who do earn additional income by expropriating others. Crime is costly, even in the absence of investments in the police, because those who steal may face social in addition to legal sanctions. The social costs of crime increase with income. For example, communities may refuse to cooperate with law breakers which leads to loss of future earnings.

Citizens can shield themselves from expropriation by purchasing private protection. The cost of private protection decreases with income, because private security tends to be tailored to the lives of the rich. Security cameras, for example, require electricity. Low-income households in developing countries often lack access to a stable electricity supply. Similarly, gated community tend to be in remote locations. Living there entails a significant increase in travel costs for those who cannot afford a car. The subsequent section shows that private security is indeed concentrated among the wealthy.

There are two political parties in the model. The left party represents the lower and the right party the upper half of the income distribution. The party in power chooses how much of an exogenous budget to spend on policing. Investments in law enforcement increase the costs of crime, thereby reducing the need for private protection. Whatever is not spent on policing is invested in an alternative public good that yields the same benefit for all citizens. Parties maximize the welfare of their base, taking into account how crime and protection choices change as a result of police spending.

The model predicts that both parties may spend suboptimal amounts on policing and that parties' choices depend on societal wealth. If society is not too rich, the left party's base contains a mix of criminally active and relatively poor individuals who are less concerned about protecting their income against crime. The right party's base is dominated by law-abiding citizens who are rich enough to care about protecting their incomes but not so rich that they purchase private protection. Thus, left parties may under- and right parties over-invest in law enforcement.

As society grows richer, the right party's base becomes increasingly dominated by

individuals who are rich enough to purchase private protection and thus opposed to police spending. The left party's base becomes less dominated by those who commit crime. Left party supporters also become richer and hence more concerned with keeping their incomes safe, though not rich enough to purchase private protection. Ultimately, left parties become prone to over-, and right parties to under-invest in law enforcement. If private protection becomes more affordable, right parties become less and left parties more willing to invest in policing. Hence, the set of circumstances under which left parties invest too much and right parties too little expands.

These results are of direct relevance for empirical work. As I discuss below, evidence on the relationship between partisanship and law enforcement is mixed. Some authors find right-wing parties spend more on policing than left-wing ones, others find no difference and yet others a difference in the opposite direction. My model predicts that the relationship between partisan control and anti-crime policy is conditional on the income level and private security cost in the polity under consideration. The model may thus help account for these contradictory findings.

Demand for policing in the model is strongest among the middle class who is sufficiently affluent to care about protecting incomes but not rich enough to purchase private protection. That such middle class demand can lead left parties to invest in law enforcement is consistent with anecdotal evidence. Forman Jr (2017), for example, traces demand for anti-crime measures in the United States to African American middle class voters. Their demand, he argues, led mostly Democratic African American officer holders to push for tough-on-crime policies. In a recent example, the 2021 mayoral race in New York City was won by Eric Adams, a Democratic pro-law-enforcement candidate and former police captain. Adams built a coalition of lower income voters and is known to oppose the “defund the police” movement.<sup>3</sup>

In addition to party platforms, the model sheds light on the conditions under which partisan control matters more or less for social welfare. This part of the paper

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<sup>3</sup>Lahut, Jake. Apr 27, 2021. “NYC mayoral candidate Eric Adams says ‘young white affluent people’ lead the ‘defund the police’ movement.” Insider. <https://www.businessinsider.com/eric-adams-defund-the-police-young-white-affluent-people-2021-4>

presumes that left and right parties are elected with exogenous probabilities and that parties make spending choices after the value of their alternative spending option has been drawn from a distribution. Whenever the value of the alternative option falls into a medium range, one party will invest too much or too little in policing. Hence, the election determines whether the level of social welfare diverges from the optimum. Increased availability of private protection decreases the likelihood that one of the parties spends suboptimally and hence the stakes of elections in relatively poor societies, but has the opposite effect in rich ones.

This paper adds to a growing theoretical literature on law enforcement, much of which derives optimal law enforcement policies under the assumption of welfare maximizing governments (e.g. Garoupa, 1997; Garoupa and Jellal, 2002; Polinsky and Shavell, 2000). Only few papers consider objective functions that reflect political processes (Garoupa and Klerman, 2002; Langlais and Obidzinski, 2017; Mungan, 2017; Obidzinski, 2019; Yahagi, 2021). While several papers ask whether law enforcement should be privatized (e.g. Garoupa, 1997; Landes and Posner, 1975; Garoupa and Klerman, 2002), only a handful study how the availability of private protection impacts law enforcement policy (Helsley and Strange, 2005; Mendoza, 1999). The latter do not consider the role of partisan politics. Another strand focuses on racial disparities in policing (e.g. Hübert and Little, 2021; Knowles, Persico and Todd, 2001; McCall, 2019, 2020; Persico, 2002). While undoubtedly a major concern, this paper abstracts from racial aspects to home in on partisanship and private security.

My model resembles existing models of public and private service provision (e.g. De la Croix and Doepke, 2009; Epple and Romano, 1996*a,b*; Glomm and Ravikumar, 1998). As is the case here, the presence of private provision in these models results in non-single peakedness of citizens' preferences over the level of public provision. Previous papers characterize majority voting equilibria in such settings. I instead introduce political parties that care about the welfare of their base. Papers that derive the behavior of political actors from a general equilibrium model of citizen behavior are rare. The approach is similar to that in Austen-Smith (2000) where parties represent

endogenously formed occupational groups.

The paper proceeds as follows. Section 2 describes the model’s empirical motivation. Section 3 presents the model. Section 4 derives parties’ spending choices. Section 5 analyzes conditions under which partisan control matters more or less for social welfare. Section 6 shows robustness to alternative assumptions. Section 7 concludes.

## 2 Background

This section describes three empirical patterns that motivate the model. Data on private security ownership is sparse. I concentrate on two contexts where such data is available – South Africa and the United States. I show first that private protection is most prevalent among the rich, and second that the demand for law enforcement spending appears greatest among the middle class. Third, I review empirical studies from around the world to demonstrate that conservative parties do not necessarily spend more on law enforcement.

### 2.1 Private security is concentrated among the rich

Private protection takes varying forms including technological devices such as alarm or camera systems and security personnel like guards and armed response teams. Central to my notion of private protection is that it can be purchased at a monetary cost. The model assumes that this cost decreases with income. For example, those who cannot afford a car may face an increase in travel costs when moving to a suburban gated community, and residents of low-income neighborhoods may need to supplement an unstable electricity supply with a generator to power security equipment. This section provides evidence that private security is concentrated among the rich.

South Africa has one of the largest private security industries in the world. The leftmost panel of Figure 2 plots data from a nationally representative public opinion survey which asked South Africans whether they had taken several measures to protect themselves against crime, among them “Private security (e.g. paid armed response).”

“Paid armed response” refers to subscription services that dispatch armed security officers at the press of a button. The data are aggregated to the police precinct level. The panel plots the share of privately protected respondents against the median household income of each precinct. The black line represents smoothed conditional means with confidence intervals shaded in grey. Clearly, there is a positive association between median household income and the share of privately protected respondents. The relationship is quite strong with a correlation coefficient of  $\rho = 0.73$ .

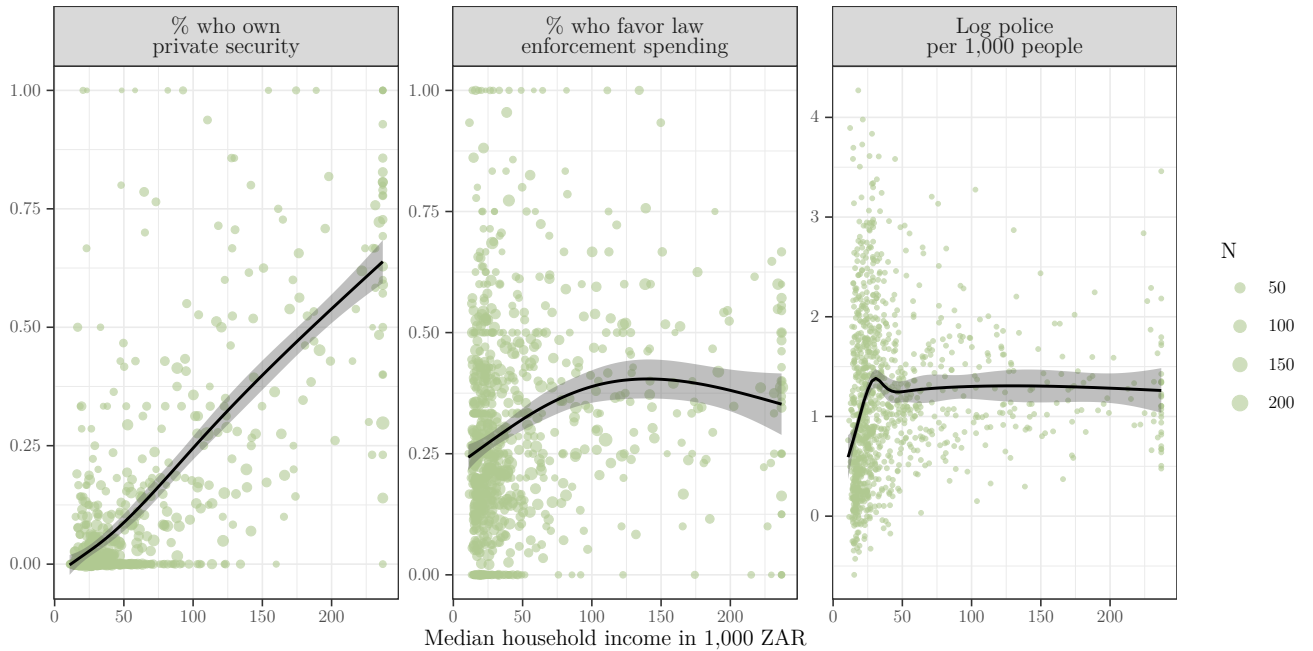


Figure 2: Private security, demand for law enforcement and police personnel in South Africa. Dots represent police precincts. Left and middle panels plot data from Victims of Crime Survey 2016/2017 by StatsSA ( $N = 21,095$ ). Respondents were matched to 845 precincts. Left panel plots share of respondents per precinct whose house is protected by private security. Middle panel plots share who wants government to spend money on police or courts to fight crime. Dot sizes correspond to number of respondents per precinct. Right panel plots number of police officer positions per 1,000 people allocated to each of 1,135 police stations in 2015/2016. See online appendix for details.

A common form of private protection in the United States are gated communities – “residential areas with restricted access in which normally public spaces are privatized” (Blakely and Snyder, 1997, p. 2). Data on gated communities are collected by the nationally representative American Housing Survey. The survey asks whether a housing



unit is located in a community surrounded by fences or walls and whether access is controlled through a special entry system like security guard approval.<sup>4</sup> In 2009, home owners who fulfilled both criteria had an average household income of 104,016 USD ( $N = 1,061$ ) per year – around 35% more than the 76,598 USD ( $N = 28,896$ ) among other home owners. Residents of gated communities seem to be particularly affluent.

## 2.2 Demand for policing is strongest among the middle class

What are the consequences of the concentration of private security among the rich? The rich in the model care little about policing, because they are privately protected. Neither do the poor, because they have little income to protect. The demand for law enforcement is strongest among the middle class.

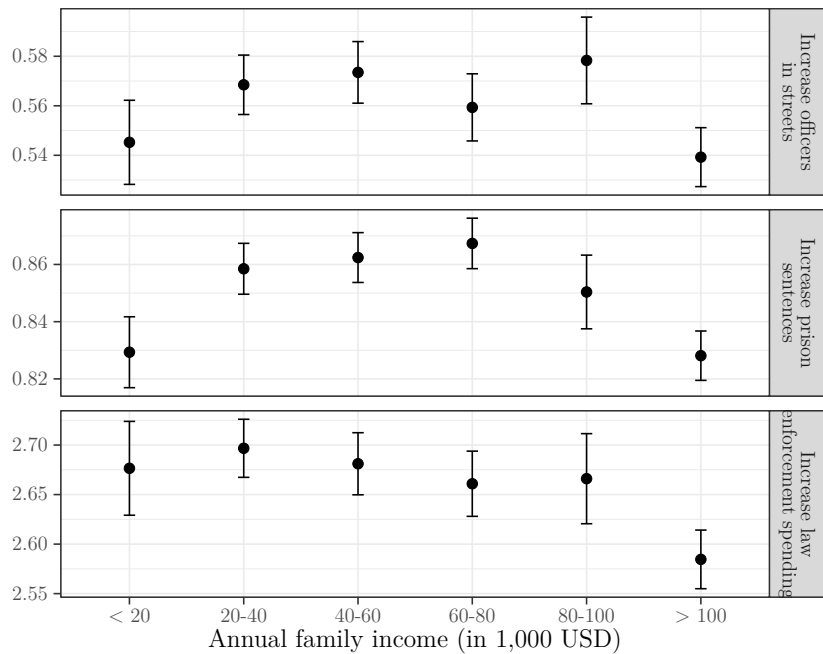


Figure 3: Demand for law enforcement in the US

Based on the 2016 Cooperative Congressional Election Survey ( $N = 64,600$ ). Dots represent sample means among income categories. Bars represent 95% confidence intervals. Panel 1 and 2 plot means of a binary indicator (0 = Oppose and 1 = Support). The outcome in panel 3 runs from 0 = Greatly decrease to 4 = Greatly increase. See online appendix for details.

<sup>4</sup>See the online appendix for details.

Figures 2 and 3 show that empirical patterns are broadly consistent with this logic. The middle panel of Figure 2 is based on the same survey from South Africa and plots precinct-level shares of respondents who would like the government to spend money on law enforcement as opposed to social or economic development. Even though the confidence intervals are relatively wide, the smoothed conditional means clearly trace an inverse u-shape. The share of respondents who demand spending on law enforcement is greatest in precincts located in the middle of the distribution of median household incomes. The rightmost panel shows that this pattern is, to some extent, born out when it comes to the allocation of police posts across precincts.

Figure 3 displays similar patterns for the United States. The figure is based on the 2016 Cooperative Congressional Election Survey. Dots represented sample averages calculated within six income categories. Vertical bars represent 95% confidence intervals. Respondents were asked whether they favor a 10 percent increase in the number of police officers in the street, an increase in prison sentences for felons who have committed two or more serious crimes and a general increase in law enforcement spending. All three measures trace an inverse u-shape consistent with the notion that demand for law enforcement is highest in the middle of the income distribution.

### **2.3 Right parties do not necessarily spend more on law enforcement**

Conventional wisdom holds that right parties are tough on crime. Yet, existing empirical evidence suggests right parties do not necessarily spend more on law enforcement. In the US, Republican control of state and federal levels correlates with increased incarceration rates and law enforcement expenditures (Caldeira and Cowart, 1980; Jacobs and Carmichael, 2001; Jacobs and Helms, 1996, 2001; Smith, 2004; Yates and Fording, 2005). Work that focuses on the local level and pays close attention to causal identification, however, produces findings that are less clear-cut. Several papers use regression discontinuity designs to identify the effect of mayoral partisanship on spend-

ing patterns in US municipalities. Each paper relies on a slightly different sample. Gerber and Hopkins (2011) show that Democratic mayors spend less on public safety than Republican ones, Ferreira and Gyourko (2009) do not uncover any difference; and de Benedictis-Kessner and Warshaw (2016) find that, if anything, Democratic mayors spend more on policing. Outside the US, the picture looks similarly mixed. Block (2019) shows that whether right-wing governors in Mexico spend more on policing depends on their opponent’s party. Guillamón, Bastida and Benito (2013) demonstrate that conservative parties in Spain increase local police spending. A study of law enforcement legislation in the UK, however, assigns greater “toughness scores” to Labor governments under Blair and Brown than to preceding and subsequent conservative governments (Staff, 2018). These mixed findings provide motivation for a formal exploration of the relationship between partisan control and law enforcement spending.

### 3 Model

#### 3.1 Income, crime, and private protection

There is a continuum of individuals with population size normalized to 1. Individuals are distinguished by the amount of income they earn through legal means.  $\theta_i \in \Theta = [0, \bar{\theta}]$  denotes the legal income of individual  $i$ . The distribution of income is uniform with support  $\Theta$ . Citizens have risk-neutral preferences over income.

Each individual  $i$  makes a choice  $x_i^c \in \{0, 1\}$  of whether to commit crime and a choice  $x_i^p \in \{0, 1\}$  of whether to purchase private protection. Let  $\lambda_j$  denote the subset of types in  $\Theta$  that engages in activity  $j \in \{c, p\}$ . A citizen who commits crime expropriates the legal income of exactly one victim. This victim is chosen at random from the set of unprotected individuals, i.e., from those with  $\theta_{i'} \notin \lambda_p$ . The expected return to crime is thus given by  $\mathbb{E}[\theta_{i'} \mid \theta_{i'} \notin \lambda_p]$ . Income from crime cannot itself be expropriated.

Citizens who commit crime suffer cost  $d\theta_i$ , which captures a loss in status or rep-

utation. Sociologists have long argued that the loss of respect that may result from breaking the law acts as a powerful deterrent (Grasmick and Bursik Jr, 1990). Where communities refuse to do business with norm violators (Milgrom, North and Weingast, 1990), these costs consist of lost future earnings and thus increase with income. The same applies to contexts where law breakers risk physical punishment through vigilante violence which often leaves them unable to work (Smith, 2019). I assume  $d > 1$ , which accords with the notion that these costs can be substantial. My analysis of party platforms below will require a slightly more restrictive assumption.

Citizens who purchase private protection are immune to expropriation and keep their legal income with certainty. Private protection comes at cost  $c - e\theta_i$  with  $c > 0$  and  $0 < e < \frac{1}{2}$ .<sup>5</sup> The cost of private protection decreases with income, because private security often caters to the lives of the rich. For example, richer citizens are more likely to have a stable electricity supply that can power security equipment.

Citizens without private protection lose their legal income  $\theta_i$  if they are the target of crime. Denote the share of unprotected citizens by  $\pi = \int_{\theta \notin \lambda_p} \frac{1}{\theta} d\theta$  and the share of citizens who commit crime by  $\gamma = \int_{\theta \in \lambda_c} \frac{1}{\theta} d\theta$ . Recall that each citizen who commits crime expropriates one victim who is randomly chosen from the set of unprotected individuals. It is thus intuitive to assume that an unprotected individual  $i$  is the target of crime with probability  $\frac{\gamma}{\pi}$ . Equation 1 summarizes citizen  $i$ 's expected income as a function of her own and society-wide crime and protection choices.

$$y_i(x_i^c, x_i^p, \lambda_c, \lambda_p) = \begin{cases} \theta_i(1 - \frac{\gamma}{\pi}) & \text{if } x_i^c = 0 \text{ and } x_i^p = 0 \\ \theta_i(1 - \frac{\gamma}{\pi}) + \mathbb{E}[\theta_{i'} \mid \theta_{i'} \notin \lambda_p] - d\theta_i & \text{if } x_i^c = 1 \text{ and } x_i^p = 0 \\ \theta_i - c + e\theta_i & \text{if } x_i^c = 0 \text{ and } x_i^p = 1 \\ \theta_i - c + e\theta_i + \mathbb{E}[\theta_{i'} \mid \theta_{i'} \notin \lambda_p] - d\theta_i & \text{if } x_i^c = 1 \text{ and } x_i^p = 1. \end{cases} \quad (1)$$

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<sup>5</sup>It is possible that  $c < e\theta_i$  for types at the top of the income distribution. That said, in equilibrium, there are always privately protected types who do not receive a subsidy. Changing the cost function to  $\min\{c - e\theta_i, 0\}$  does not alter the results.

### 3.2 Policing and public goods

There is an exogenous government budget of size 1 which can be spent in two ways. First, it can be spent on policing which increases the cost of crime. Individuals who commit crime face a marginal utility loss  $s$  with  $0 < s < c$  from each dollar spent on law enforcement. This loss represents the expected legal cost of crime. Law enforcement spending may increase the rate of criminal convictions or cover the costs of harsher sentences such as increased prison terms.  $s$  can be interpreted as a measure of law enforcement sector effectiveness. Second, government revenue can be spent on a public good unrelated to policing that has marginal benefit  $b > 0$  for all citizens. Given a budget share  $\alpha \in [0, 1]$  of policing, citizens earn the following expected utility:

$$u_i(x_i^c, x_i^p, \lambda_c, \lambda_p; \alpha) = y_i(x_i^c, x_i^p, \lambda_c, \lambda_p) - x_i^c \alpha s + (1 - \alpha)b \quad (2)$$

For any share  $\alpha \in [0, 1]$  spent on policing, I derive a sorting equilibrium in the form of two cutpoints  $\theta_j(\alpha) \in \Theta$  for  $j \in \{c, p\}$ . Each cutpoint  $\theta_j(\alpha)$  partitions the type space  $\Theta$  into two intervals  $\lambda_j^*(\alpha)$  and  $\lambda_{-j}^*(\alpha)$  such that, in equilibrium, individuals with  $\theta_i \in \lambda_j^*(\alpha)$  find it optimal to engage in activity  $j$  and individuals with  $\theta_i \in \lambda_{-j}^*(\alpha)$  find it optimal not to engage in activity  $j$ . Formally,  $\theta_c$  must be such that for each individual  $i$ ,  $u_i(1, x_i^{p*}, \lambda_c^*, \lambda_p^*, \alpha; \theta_i) \geq u_i(0, x_i^{p*}, \lambda_c^*, \lambda_p^*, \alpha; \theta_i)$  if  $\theta_i \in \lambda_c^*(\alpha)$  and  $u_i(0, x_i^{p*}, \lambda_c^*, \lambda_p^*, \alpha; \theta_i) \geq u_i(1, x_i^{p*}, \lambda_c^*, \lambda_p^*, \alpha; \theta_i)$  if  $\theta_i \in \lambda_{-c}^*(\alpha)$ . The conditions for  $\theta_p$  are analogous. Individuals thus take the interval  $\lambda_c(\alpha)$  of types that commit crime and  $\lambda_p(\alpha)$  of types that purchase private protection as given and, for a given  $\alpha$ , choose optimally whether to engage in crime and buy private protection.

In addition to the setup presented so far, I make the following assumption about the upper bound of the income distribution  $\bar{\theta}$ :

$$\bar{\theta}_{min} := \frac{2(cd + s)}{1 + 2de} < \bar{\theta} < \frac{4dc}{1 + 2de} =: \bar{\theta}_{max}. \quad (3)$$

This assumption ensures that the equilibrium cutpoints are always interior, and that

median types with income  $\frac{\bar{\theta}}{2}$  never commit crime and always remain unprotected.

### 3.3 Politics

There are two political parties indexed by  $k \in \{L, R\}$ . The base of party  $L$  is the lower half of the income distribution, i.e., citizens with  $\theta_i \in \left[0, \frac{\bar{\theta}}{2}\right]$ . The base of party  $R$  is the upper half of the income distribution, i.e., citizens with  $\theta_i \in \left[\frac{\bar{\theta}}{2}, \bar{\theta}\right]$ . Party  $k$  chooses a share  $\alpha_k$  of government revenue that is spent on policing. Parties seek to maximize the welfare of their base in the resulting sorting equilibrium.

## 4 Equilibrium

### 4.1 Sorting Equilibrium

Consider first the decision to engage in crime, which requires a citizen to trade off the benefit of additional income from expropriation against the cost of crime. The net benefit of engaging in crime is given by

$$\mathbb{E}[\theta_{i'} \mid \theta_{i'} \notin \lambda_p] - d\theta_i - \alpha s. \quad (4)$$

For a given set of privately protected individuals  $\lambda_p$ , this expression decreases in an individual's legal income  $\theta_i$ . Richer individuals thus have less incentive to commit crime. Hence, in any sorting equilibrium with a single indifferent type  $\theta_c(\alpha)$ , low income individuals with  $\theta_i \leq \theta_c(\alpha)$  commit crime and high income individuals with  $\theta_i > \theta_c(\alpha)$  do not.

Next, consider the decision to purchase private protection. Unprotected individuals lose their legal income to crime with probability  $\frac{\gamma}{\pi}$ . The benefit of private protection is that one gets to keep one's legal income with certainty. Yet, private protection comes

at cost  $c - e\theta_i$ . Hence, citizens choose to purchase protection if

$$\theta_i - c + e\theta_i \geq \theta_i \left(1 - \frac{\gamma}{\pi}\right).$$

The left side of this expression increases faster with  $\theta_i$  than the right. Intuitively, protecting oneself against expropriation is more important the more one stands to lose. Private protection also becomes less costly the higher one's legal income. For a given crime rate, richer individuals thus have a greater incentive to purchase private protection. In a sorting equilibrium with a single indifferent type  $\theta_p(\alpha)$ , high income individuals with  $\theta_i > \theta_p(\alpha)$  purchase protection. Low income individuals with  $\theta_i \leq \theta_p(\alpha)$  do not.

Because the equilibrium takes this form, we can use the properties of the uniform distribution to express the quantities in citizens' utility function that depend on society-wide crime and protection choices as a function of the equilibrium cutpoints  $\theta_c(\alpha)$  and  $\theta_p(\alpha)$ . Recall that the probability that an unprotected citizen loses her legal income to crime is given by  $\frac{\gamma}{\pi}$ , where  $\gamma$  denotes the share of citizens who commit crime and  $\pi$  the share that remains unprotected. Since, in equilibrium, all individuals with  $\theta_i \leq \theta_c(\alpha)$  commit crime, we can write the criminally active share as  $\gamma = \frac{\theta_c(\alpha)}{\theta}$ . Similarly, the unprotected share can be expressed as  $\pi = \frac{\theta_p(\alpha)}{\theta}$ . Finally, recall that the expected return to crime equals the expected income among unprotected citizens. Criminally active individuals thus expect to earn  $\mathbb{E}[\theta_{i'} \mid \theta_{i'} \notin \lambda_p(\alpha)] = \frac{\theta_p}{2}$  in equilibrium.

Solving for the sorting equilibrium entails substituting these expressions into the utility function in equation 2 and finding values of  $\theta_c(\alpha)$  and  $\theta_p(\alpha)$  which ensure that type  $\theta_c(\alpha)$  is indifferent between committing and not committing crime, while type  $\theta_p(\alpha)$  is indifferent between purchasing and not purchasing private protection.  $\theta_c(\alpha)$  and  $\theta_p(\alpha)$  thus need to solve the following system of equations:

$$\begin{aligned} u_i(x_i^c = 1, x_i^p; \theta_c) &= u_i(x_i^c = 0, x_i^p; \theta_c) \\ u_i(x_i^c, x_i^p = 1; \theta_p) &= u_i(x_i^c, x_i^p = 0; \theta_p). \end{aligned}$$

Lemma 1 characterizes the sorting equilibrium. All proofs are in the appendix.

**Lemma 1** (Sorting Equilibrium). *For all  $\alpha \in [0, 1]$ , there is a unique sorting equilibrium with two cutpoints*

$$\theta_c(\alpha) = \frac{c - 2e\alpha s}{1 + 2de} \quad (5)$$

$$\theta_p(\alpha) = \frac{2(cd + \alpha s)}{1 + 2de} \quad (6)$$

such that

$$x_i^{c*} = \begin{cases} 1 & \text{if } \theta_i \in [0, \theta_c(\alpha)] = \lambda_c^*(\alpha) \\ 0 & \text{if } \theta_i \in (\theta_c(\alpha), \bar{\theta}] = \lambda_{-c}^*(\alpha) \end{cases}$$

and

$$x_i^{p*} = \begin{cases} 0 & \text{if } \theta_i \in [0, \theta_p(\alpha)] = \lambda_{-p}^*(\alpha) \\ 1 & \text{if } \theta_i \in (\theta_p(\alpha), \bar{\theta}] = \lambda_p^*(\alpha). \end{cases}$$

For all  $\alpha \in [0, 1]$ , the cutpoints satisfy the following inequalities:<sup>6</sup>

$$0 < \theta_c(\alpha) < \frac{\bar{\theta}}{2} < \theta_p(\alpha) < \bar{\theta}.$$

$\theta_c(\alpha)$  and  $\theta_p(\alpha)$  are sufficient to characterize citizens' equilibrium behavior. Hence, I will subsequently dispense with  $\lambda_j^*(\alpha)$  and  $\lambda_{-j}^*(\alpha)$  and refer to the cutpoints only. The cutpoints are always interior and  $\theta_c(\alpha) < \theta_p(\alpha)$  for all  $\alpha$ . The sorting equilibrium thus divides the type space into three intervals (see Figure 4). Individuals with  $\theta_i \in [0, \theta_c(\alpha)]$  at the bottom of the income distribution remain unprotected and commit crime. Individuals with  $\theta_i \in (\theta_c(\alpha), \theta_p(\alpha)]$  in the middle of the distribution also remain unprotected but do not commit crime. Individuals with  $\theta_i \in (\theta_p(\alpha), \bar{\theta}]$  at the top do not commit crime but purchase private protection. No one finds it optimal to do both,

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<sup>6</sup>This result requires the parameter restrictions introduced above:  $d > 1$ ,  $0 < e < \frac{1}{2}$ ,  $c > s$  and  $\bar{\theta}_{min} < \bar{\theta} < \bar{\theta}_{max}$ .



commit crime and purchase private protection. The median of the income distribution remains unprotected and never commits crime.

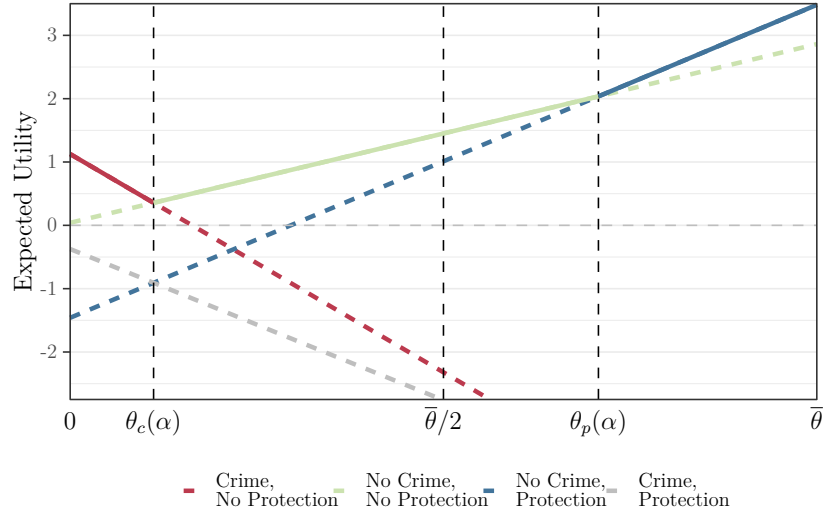


Figure 4: Sorting equilibrium for a given budget share  $\alpha$  spent on policing

$\alpha = 0.1$ ,  $s = 1$ ,  $c = 1.5$ ,  $d = 2.9$ ,  $e = 0.475$ ,  $b = 0.045$ ,  $\bar{\theta} = 3.35$ . Figure shows expected utility of individual  $i$  conditional on crime and protection choices, as a function of legal income, and assuming other individuals make optimal choices. Dashed lines represent utility from deviations from optimal behavior. Solid lines represent expected utility in equilibrium.

How does equilibrium behavior change as more is spent on policing?  $\theta_c(\alpha)$  decreases in  $\alpha$ . Increased law enforcement spending shrinks the criminal sector, because crime becomes more costly.  $\theta_p(\alpha)$  increases in  $\alpha$ . As the criminal sector contracts, fewer citizens at the top of the income distribution purchase private protection. By shifting both equilibrium cutpoints outwards, an increase in  $\alpha$  expands the middle segment which does not commit crime or purchase private protection. The decrease in the share of criminally active and the increase in the share of unprotected citizens both contribute to a reduction in the probability that an unprotected citizen loses her income to crime, which is given by

$$\frac{\gamma}{\pi} = \frac{\theta_c(\alpha)}{\theta_p(\alpha)} = \frac{c - 2e\alpha s}{2(cd + \alpha s)}.$$

Note that neither  $\theta_c(\alpha)$  nor  $\theta_p(\alpha)$  depends on the upper bound  $\bar{\theta}$  of the income distribution. An increase in  $\bar{\theta}$  thus simply adds types who purchase private protection at the top of the distribution. The returns to crime and behavior in the sorting equilibrium remain unaffected. This insight will be relevant for the results below.

## 4.2 Induced Preferences Over Police Spending

Next, I discuss citizens' preferences over the budget share  $\alpha$  of policing that result from this sorting equilibrium. Note first that some but not all citizens change their behavior with  $\alpha$  (see Figure 6 below). Individuals with  $\theta_i < \theta_c(1)$  always commit crime, even if the entire budget is invested in policing. Individuals with  $\theta_c(0) < \theta_i < \theta_p(0)$  never commit crime and always remain unprotected, even if none of the budget is invested in policing. Individuals with  $\theta_i > \theta_p(1)$  always purchase private protection even if all of the budget is invested in policing. The crime and protection choices of citizens with  $\theta_i \in (\theta_c(1), \theta_c(0)]$  and  $\theta_i \in (\theta_p(0), \theta_p(1)]$ , in contrast, change as  $\alpha$  changes.

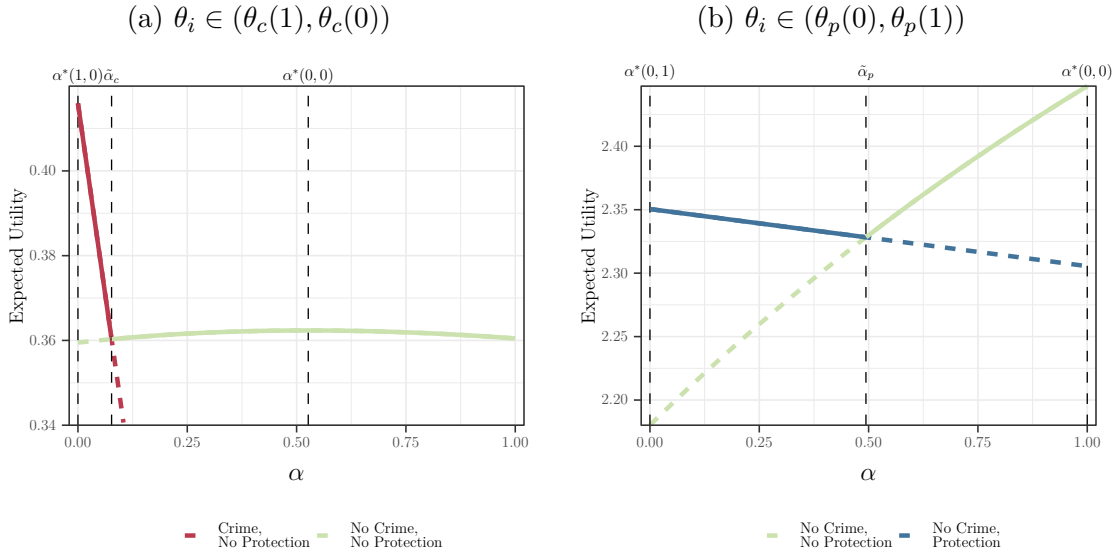


Figure 5: Indirect utility for type  $\theta_i$  as a function of policing budget share  $\alpha$   
 $s = 1, c = 1.5, d = 2.9, e = 0.475, b = 0.045, \bar{\theta} = 3.35$ .  $\theta_i = 0.38$  on the left.  $\theta_i = 2.58$  on the right.  $\tilde{\alpha}_c$  denotes budget share for which  $\theta_c(\alpha) = 0.38$ .  $\tilde{\alpha}_p$  denotes budget share for which  $\theta_p(\alpha) = 2.58$

Substituting the expressions for  $\theta_c(\alpha)$  and  $\theta_p(\alpha)$  into equation (2) reveals that the indirect utility of types whose behavior does not depend on  $\alpha$  is concave in  $\alpha$ .

Preferences of citizens who change their behavior with  $\alpha$ , however, are not necessarily well behaved. Figure 5 plots citizens' indirect utility as a function of  $\alpha$ . The left panel pertains to a citizen with  $\theta_i \in (\theta_c(1), \theta_c(0)]$  who commits crime only at low levels of police spending ( $\alpha \leq \tilde{\alpha}_c$ ). The red line depicts citizen  $i$ 's indirect utility as long as she commits crime, which, in this example, is maximized at  $\alpha = 0$ . At  $\alpha = \tilde{\alpha}_c$ , individual  $i$  begins to obey the law. Her indirect utility, depicted by the green line, now increases with  $\alpha$  and is maximized at  $\alpha = \alpha^*(0, 0)$ .

The right panel displays the indirect utility of a citizen with  $\theta_i \in (\theta_p(0), \theta_p(1)]$  who purchases private protection as long as police spending is sufficiently low ( $\alpha \leq \tilde{\alpha}_p$ ). The blue line shows that the individual's indirect utility decreases in  $\alpha$  as long as she purchases private protection. At  $\alpha = \tilde{\alpha}_p$ , the citizen begins to remain unprotected. Now, her indirect utility increases with  $\alpha$ . In fact, conditional on being unprotected, the individual prefers that the entire budget be spent on policing.

In both examples, citizens' preferences are not concave in  $\alpha$ . It is well known in the literature that the presence of private provision can induce non-single peakedness in the preferences over a publicly provided service. Hence, a majority voting equilibrium may not exist or the median voter may not be pivotal. Others have characterized majority voting equilibrium in such settings (Epple and Romano, 1996a).

Here, I concentrate on party platforms. Parties' choices ultimately take into account both, how citizens' behavior and, conditional on that, how their utility changes with  $\alpha$ . To develop intuition, this section characterizes citizens' preferences over police spending *conditioning* on their crime and protection choices. For example, presuming that an individual of type  $\theta_i$  commits crime and remains unprotected, and taking into account how the behavior of *other* individuals changes with  $\alpha$ , what is citizen  $i$ 's preferred budget share of policing? This is a partial equilibrium exercise because type  $\theta_i$  may not want to commit crime or remain unprotected, even at the budget share that maximizes her utility given these actions. Conditional on citizen  $i$ 's choices, her equilibrium utility is concave in  $\alpha$ . Lemma 2 summarizes citizens' preferences.

**Lemma 2** (Preferences over police spending). *Conditional on her choices, citizen  $i$*

prefers the following budget shares:

- $\alpha^*(1, 0; \theta_i) = \min \left\{ \max \left\{ 0, \sqrt{\frac{\theta_i c(1+2de)^2}{2(b+2de(b+s))s}} - \frac{cd}{s} \right\}, 1 \right\}$
- $\alpha^*(0, 0; \theta_i) = \min \left\{ \max \left\{ 0, \sqrt{\frac{\theta_i c(1+2de)}{2bs}} - \frac{cd}{s} \right\}, 1 \right\}$
- $\alpha^*(0, 1; \theta_i) = 0.$

$$\alpha^*(0, 1; \theta_i) \leq \alpha^*(1, 0; \theta_i) \leq \alpha^*(0, 0; \theta_i) \text{ for all } \theta_i \in [0, \bar{\theta}].$$

Privately protected citizens prefer zero law enforcement spending. These citizens do not reap benefits from policing, because their income is already immune to expropriation. Hence, they prefer investments in the alternative public good.

Unprotected citizens may prefer non-zero levels of police spending irrespective of whether they commit crime. When considering increased police spending, unprotected citizens trade off the benefit of a decrease in the risk of expropriation against the utility loss from reduced spending on the alternative public good. Unprotected citizens prefer higher levels of police spending the lower the marginal benefit  $b$  of the alternative public good, and the higher their legal income,  $\theta_i$ . Intuitively, a decrease in  $b$  makes police spending relatively more attractive. Citizens with a higher legal income desire more law enforcement spending because they stand to lose more to crime.

Unprotected citizens who commit crime face two additional considerations. First, increased police spending reduces the incentives to purchase private protection. As the poorest protected type  $\theta_p$  shifts to the right, the average income among unprotected individuals increases and so do the returns to crime. However, an increase in police spending also increases the legal cost of crime. Ultimately, an unprotected citizen of type  $\theta_i$  always prefers less police spending if she commits crime than if she does not.

Taken together, a citizen of type  $\theta_i$  demands most police spending if she remains unprotected and does not commit crime, less if she remains unprotected but commits crime and least if she purchases private protection. These relationships are strict unless the preferences without protection lie at the corner.

Figure 6 plots preferred budget shares as a function of citizens' choices and income. For types whose behavior changes with  $\alpha$ , the figure shows the preferred budget share

under each of the two choice profiles that can be optimal in equilibrium.

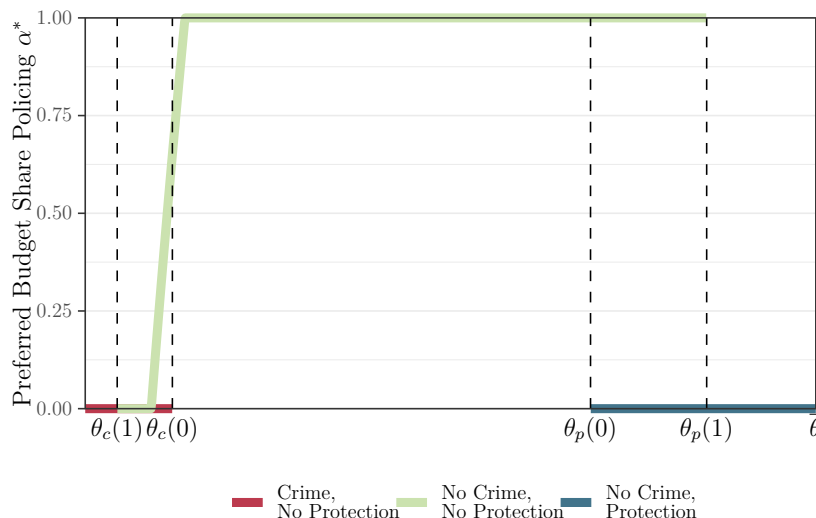


Figure 6: Induced preferences over budget share of policing as a function of type  $\theta_i$   
 $s = 1, c = 1.5, d = 2.9, e = 0.475, b = 0.045, \bar{\theta} = 3.35$

Individuals with  $\theta_i < \theta_c(1)$  always buy protection and commit crime. Hence, they prefer relatively little policing. Individuals with  $\theta_c(1) < \theta_i < \theta_c(0)$  stop committing crime once law enforcement spending is high enough and then prefer weakly more policing. Individuals with  $\theta_c(0) < \theta_i < \theta_p(0)$  are always unprotected and never commit crime. Demand for policing is high among this group. In fact, any unprotected type who does not commit crime in equilibrium is always richer and hence always prefers weakly more policing than types who do commit crime. Citizens with  $\theta_p(0) < \theta_i < \theta_p(1)$  prefer high levels of policing until they begin to purchase private protection. Then, their demand for policing falls to zero. Individuals with  $\theta_i > \theta_p(1)$  always purchase private protection and thus never desire any policing.

Demand for policing is thus highest among the middle class that is rich enough to care about losing its income but not so rich that it buys private protection. At the bottom of the income distribution, demand is muted because citizens have little income to lose and are criminally active. Demand at the top is low because citizens

own private protection.

### 4.3 Platform Choice

Before turning to party platforms, I ask what level of police spending a welfare maximizing social planner would chose. Social welfare is given by the following expression:

$$\begin{aligned}
 W(\alpha) = & \int_0^{\theta_c(\alpha)} \frac{u_i(1, 0, \theta_c(\alpha), \theta_p(\alpha); \alpha)}{\bar{\theta}} d\theta + \int_{\theta_c(\alpha)}^{\theta_p(\alpha)} \frac{u_i(0, 0, \theta_c(\alpha), \theta_p(\alpha); \alpha)}{\bar{\theta}} d\theta \\
 & + \int_{\theta_p(\alpha)}^{\bar{\theta}} \frac{u_i(0, 1, \theta_c(\alpha), \theta_p(\alpha); \alpha)}{\bar{\theta}} d\theta.
 \end{aligned} \tag{7}$$

Social welfare depends in several ways on the budget share  $\alpha$  that is spent on policing. First, police spending changes the limits of the integrals. As more is spent on policing, fewer people commit crime and purchase private protection, i.e., the limits of the first and third integral move closer together, while the limits of the middle integral move apart. Second, police spending affects the utility functions over which the integrals are taken.  $\alpha$  enters citizens' utility functions directly and citizens' utility also depends on the set of types who commit crime and purchase private protection.

Social welfare is convex and can increase or decrease in  $\alpha$ . Hence, the welfare optimum lies at one of the corners. A welfare maximizing social planner will either spend the entire budget on policing or on the alternative public good. Lemma 3 summarizes the conditions under which each alternative obtains. The result depends on the following threshold on the marginal value  $b$  of the alternative public good:

$$\bar{b}_W = \frac{s(c + 2de^2s)}{(1 + 2de)^2\bar{\theta}}. \tag{8}$$

**Lemma 3** (Welfare maximization). *The welfare maximizing policing budget share is*

$$\alpha_W^* = \begin{cases} 1 & \text{if } b \leq \bar{b}_W \\ 0 & \text{if } b > \bar{b}_W. \end{cases} \tag{9}$$

$\bar{b}_W$  decreases in  $\bar{\theta}$ .

If  $b$  is high, all citizens gain more from investments in the alternative public good. Unprotected citizens – the only group that demands non-zero police spending – thus prefer less police spending.  $\theta_c(\alpha)$  and  $\theta_p(\alpha)$  are independent of  $b$ , i.e., an increase in  $b$  reduces demand for policing among unprotected citizens but does not change the size of this group. Hence, the overall demand for policing falls. If  $b$  exceeds the threshold  $\bar{b}_W$ , it is socially optimal to spend the entire budget on the alternative public good. Otherwise, a social planner would invest the entire budget in policing.

The threshold  $\bar{b}_W$  is always positive and decreases with the upper bound  $\bar{\theta}$  of the income distribution. As society becomes wealthier, the range of  $b$  for which it is socially optimal to invest in policing shrinks. Recall that, for a given  $\alpha$ , all individuals with  $\theta_i \in (\theta_p(\alpha), \bar{\theta}]$  purchase private protection. Because  $\theta_p(\alpha)$  is unaffected by  $\bar{\theta}$ , an increase in  $\bar{\theta}$  expands the set of privately protected types at the top of the income distribution. Hence, a greater share of the population is immune to expropriation and prefers that the budget be spent on the alternative public good.

Next, I turn to party platforms. Party  $L$  seeks to maximize the welfare of citizens in the lower half of the income distribution. Party  $R$  maximizes the welfare of the upper half. Parties' objective functions are given by

$$V_L(\alpha) = \int_0^{\theta_c(\alpha)} \frac{u_i(1, 0, \theta_c, \theta_p; \alpha)}{\bar{\theta}} d\theta + \int_{\theta_c(\alpha)}^{\frac{\bar{\theta}}{2}} \frac{u_i(0, 0, \theta_c, \theta_p; \alpha)}{\bar{\theta}} d\theta \quad (10)$$

$$V_R(\alpha) = \int_{\frac{\bar{\theta}}{2}}^{\theta_p(\alpha)} \frac{u_i(0, 0, \theta_c, \theta_p; \alpha)}{\bar{\theta}} d\theta + \int_{\theta_p(\alpha)}^{\bar{\theta}} \frac{u_i(0, 1, \theta_c, \theta_p; \alpha)}{\bar{\theta}} d\theta. \quad (11)$$

$V_R(\alpha)$  is always convex in  $\alpha$ . To guarantee convexity of  $V_L(\alpha)$ , it is sufficient to assume, in addition to parameter restrictions which have already been introduced, that the exogenous cost of crime decrease fast enough with a citizen's legal income:

**Assumption 1.**  $d > \frac{1}{2e}(1 + \sqrt{3}) = \underline{d}$ .

Then, both party platforms – like the social optimum – lie at the corner. Whether

parties spend on policing or the alternative public good again depends on its marginal benefit  $b$ . If  $b$  is high, citizens gain a lot from spending on the alternative public good and parties do not invest in policing. The central result of this paper concerns the respective relationships of  $\bar{b}_L$  and  $\bar{b}_R$ , the thresholds at which parties switch from police spending to spending on the alternative public good, and the socially optimal threshold  $\bar{b}_W$ . Figure 7 shows that these relationships depend on the upper bound  $\bar{\theta}$  of the income distribution.

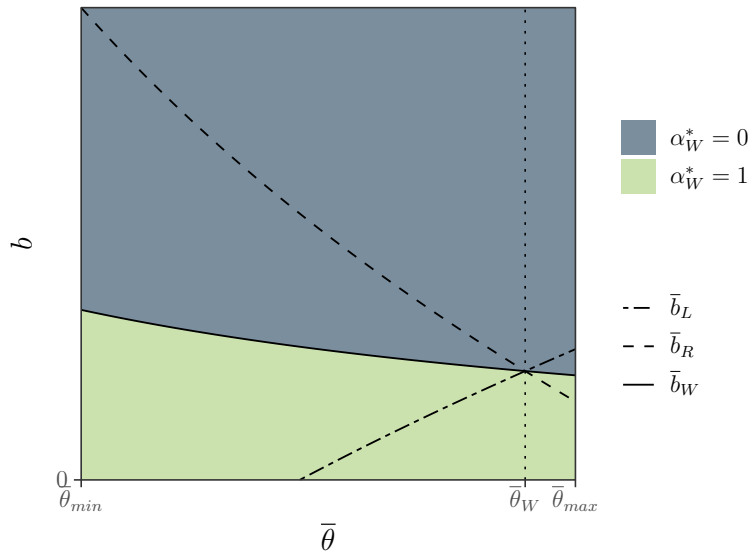


Figure 7: Welfare optimum and party platforms as a function of  $b$  and  $\bar{\theta}$   
 $s = 1, c = 1.5, d = 2.9, e = 0.475$

If  $\bar{\theta} = \bar{\theta}_W$ , all three thresholds coincide. Hence, both parties invest in policing if and only if it is socially optimal to do so. If  $\bar{\theta}$  lies to the left of  $\bar{\theta}_W$ , however,  $\bar{b}_R$  exceeds  $\bar{b}_W$  and  $\bar{b}_W$  exceeds  $\bar{b}_L$ . Hence, there exists a range of  $b$  for which it is socially optimal to invest in the alternative public good, and yet party  $R$  invests in policing. Similarly, party  $L$  may invest in the alternative public good even though it is socially optimal to invest in policing. In other words, if society is not too rich, the right party may over- and the left party may under-invest in policing.

If  $\bar{\theta}$  exceeds  $\bar{\theta}_W$ , the relationship between each party's platform and the social optimum is reversed, i.e.,  $\bar{b}_L$  exceeds  $\bar{b}_W$  and  $\bar{b}_W$  exceeds  $\bar{b}_R$ . Now party  $L$  may invest



in policing even though it is socially optimal to invest in the alternative public good, and party  $R$  may invest in the alternative public good even though it is socially optimal to invest in policing. In sufficiently affluent societies, the right party may under- and the left party may over-police.

Proposition 1 summarizes the party platforms and their relationship to the welfare optimum. The result makes use of the following thresholds of  $b$ :

$$\bar{b}_L = \frac{\bar{\theta}s(1+2de)}{8d(cd+s)} - \frac{4des(c-se)}{\bar{\theta}(1+2de)^2} \quad (12)$$

$$\bar{b}_R = \frac{2cs}{(1+2de)\bar{\theta}} - \frac{\bar{\theta}s(1+2de)}{8d(cd+s)}. \quad (13)$$

**Proposition 1** (Platform Choice). *Party  $k$ 's optimal platform is given by*

$$\alpha_k^* = \begin{cases} 1 & \text{if } b \leq \bar{b}_k \\ 0 & \text{if } b > \bar{b}_k. \end{cases} \quad (14)$$

The ordering of party platforms and the social optimum depends on the following threshold on the upper bound  $\bar{\theta}$  of the income distribution:

$$\bar{\theta}_W = \frac{2\sqrt{2d(cd+s)(2de(2c-es)+c)}}{\sqrt{(1+2de)^3}}.$$

- If  $\bar{\theta} \in (\bar{\theta}_{min}, \bar{\theta}_W)$ , then  $\bar{b}_L < \bar{b}_W < \bar{b}_R$ .
- If  $\bar{\theta} = \bar{\theta}_W$ , then  $\bar{b}_L = \bar{b}_W = \bar{b}_R$ .
- If  $\bar{\theta} \in (\bar{\theta}_W, \bar{\theta}_{max})$ , then  $\bar{b}_R < \bar{b}_W < \bar{b}_L$ .

To gain intuition, consider Figure 8 which shows how each party's base changes with  $\bar{\theta}$ . If  $\bar{\theta}$  is low, the base of party  $L$  includes a non-trivial share of individuals who commit crime and thus prefer police spending to be low. All other party  $L$  supporters do not commit crime and are unprotected. This group demands more police spending but the demand remains muted, because incomes are relatively low. Taken together,

a left party in a relatively poor society has few incentives to invest in law enforcement. The base of party  $R$ , in contrast, is dominated by law-abiding citizens who are relatively rich but not rich enough to purchase private protection – the group with the greatest demand for policing. Right parties in relatively poor societies thus have incentives to over-spend on policing.

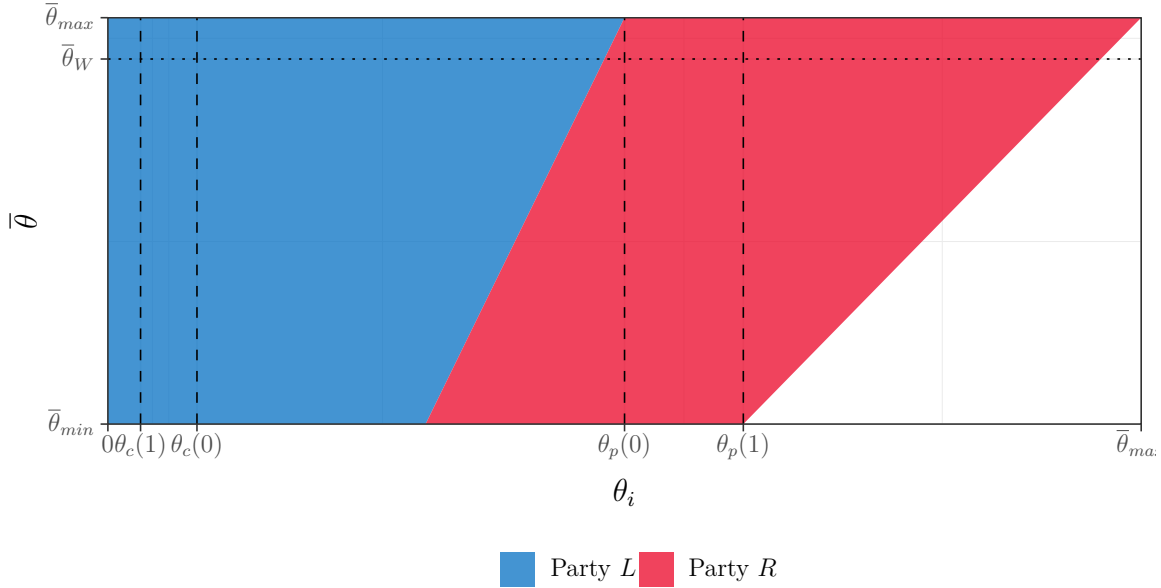


Figure 8: Composition of party bases for different values of  $\bar{\theta}$   
 $s = 1, c = 1.5, d = 2.9, e = 0.475$

As society grows richer, a smaller share of party  $L$  supporters commits crime and a greater share is rich enough to demand substantial police spending though not sufficiently rich to buy private protection. The base of party  $R$  becomes increasingly dominated by individuals who are privately protected. As  $\bar{\theta}$  moves past  $\bar{\theta}_W$ , the left party becomes prone to over- and the right party prone to under-invest in policing.

Having described how parties' platform choices relate to societal income, I next consider the effects of changes in the fixed costs  $c$  of private protection.

**Proposition 2** (Platforms and Cost of Private Security). *The welfare optimum and*

party platforms change in the following ways with  $c$ :

$$\frac{\partial \bar{b}_L}{\partial c} < 0 < \frac{\partial \bar{b}_W}{\partial c} < \frac{\partial \bar{b}_R}{\partial c}.$$

The threshold  $\bar{\theta}_W$  at which  $\bar{b}_W = \bar{b}_R = \bar{b}_L$  increases with  $c$ , i.e.,  $\frac{\partial \bar{\theta}_W}{\partial c} > 0$ .

An increase in  $c$  reduces the share of individuals who purchase private protection, which increases the crime rate. Hence, there is a greater need for public policing to deter crime and  $\bar{b}_W$  shifts upwards, i.e., the set of circumstances under which it is welfare maximizing to invest in policing expands. Most of the increased demand for law enforcement spending is concentrated in the base of the right party, which now contains a greater share of relatively rich and unprotected citizens. Thus,  $\bar{b}_R$  shifts upward even more than  $\bar{b}_W$ .  $\bar{b}_L$ , on the other hand, shifts downwards, because the left party's base now contains a greater share of criminally active citizens who do not favor police spending. As a result of these changes the threshold  $\bar{\theta}_W$  depicted by the dotted line in Figure 7 moves to the right. If private security is costly relative to citizens' income, the range of circumstances under which we may see the familiar pattern of right parties over- and left parties under-spending expands.

## 5 Elections and Welfare

In this section, I consider the conditions under which partisan control matters more or less for social welfare. To do so, I presume that an election decides which of the two parties sets policy and introduce randomness in the benefit  $b$  of the alternative public good. I then derive an expression for the expected level of welfare in the polity.

The changed game begins with the election. Party  $R$  is elected with exogenous probability  $r$ . Party  $L$  wins with complementary probability  $1 - r$ . Then, nature draws the benefit  $b$  of the alternative public good. With probability  $h$ , investments in the alternative public good are more valuable than investments in policing, i.e.,

$b \geq \bar{b}_W$ . In this case,  $b \sim U [\bar{b}_W, \bar{b}_W + \epsilon]$  with  $\epsilon > |\bar{b}_R - \bar{b}_W|$ .<sup>7</sup> With probability  $1 - h$ , the alternative public good is less valuable than policing, i.e.,  $b \leq \bar{b}_W$ . In this case,  $b \sim U [\bar{b}_W - \epsilon, \bar{b}_W]$ . Once  $b$  is revealed, the party that won the election chooses the budget share  $\alpha$  of policing. Citizens make crime and protection choices as before.

Proposition 1 implies that party  $k$  spends the budget on policing whenever the benefit of the alternative public good is lower than the threshold  $\bar{b}_k$ . Recall that  $\bar{b}_R \geq \bar{b}_W$  when  $\bar{\theta} \leq \bar{\theta}_W$ , i.e., party  $R$  may overspend relative to the social optimum. If  $\bar{\theta} > \bar{\theta}_W$ , on the other hand,  $\bar{b}_R < \bar{b}_W$  and party  $R$  may underspend. The distributional assumptions on  $b$  then imply the following probability that party  $R$  invests in policing:

$$\Pr(\alpha_R^* = 1) = \begin{cases} (1 - h) + h \frac{\bar{b}_R - \bar{b}_W}{\epsilon} & \text{if } \bar{\theta} \leq \bar{\theta}_W \\ (1 - h) \frac{\bar{b}_R - \bar{b}_W + \epsilon}{\epsilon} & \text{if } \bar{\theta} > \bar{\theta}_W. \end{cases}$$

This expression reflects that, in a relatively poor society, party  $R$  may spend on policing even though  $b > \bar{b}_W$ . In a relatively rich society party  $R$  spends on policing in only a subset of cases where  $b < \bar{b}_W$ . Replacing  $\bar{b}_R$  with  $\bar{b}_L$  and switching the cases yields the probability that party  $L$  invests in policing. Expected welfare can then be written as

$$\begin{aligned} \Omega = & r \left( \Pr(\alpha_R^* = 1) \mathbb{E} [W(1) \mid b \leq \bar{b}_R] + (1 - \Pr(\alpha_R^* = 1)) \mathbb{E} [W(0) \mid b > \bar{b}_R] \right) \\ & + (1 - r) \left( \Pr(\alpha_L^* = 1) \mathbb{E} [W(1) \mid b \leq \bar{b}_L] + (1 - \Pr(\alpha_L^* = 1)) \mathbb{E} [W(0) \mid b > \bar{b}_L] \right), \end{aligned} \tag{15}$$

where the conditional expectations are taken over the possible realizations of  $b$ . Taking these expectations is easy, because welfare  $W(\alpha)$  is linear in  $b$ .

Note that the cutoffs  $\bar{b}_L$  and  $\bar{b}_R$  that characterize party platforms are always equidistant from the cutoff  $\bar{b}_W$  that defines the welfare optimum (see Figure 7). The range of values of  $b$  for which a party spends suboptimally is thus of equal size for both parties.

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<sup>7</sup>The restriction ensures that either party invests in policing with a probability strictly between 0 and 1.

Denote the absolute distance between each party's cutoff and  $\bar{b}_W$  by  $\Delta$ :

$$\Delta := |\bar{b}_R - \bar{b}_W| = |\bar{b}_L - \bar{b}_W|.$$

Next, we can take the partial derivative of expected welfare with respect to the probability  $r$  that the right party is elected:

$$\frac{\partial \Omega}{\partial r} = \begin{cases} \frac{\Delta^2(1-2h)}{2\epsilon} & \text{if } \bar{\theta} \leq \bar{\theta}_W \\ \frac{\Delta^2(2h-1)}{2\epsilon} & \text{if } \bar{\theta} > \bar{\theta}_W. \end{cases} \quad (16)$$

Inspecting this partial derivative reveals that expected welfare behaves as one would predict given the results in proposition 1:

**Proposition 3** (Welfare and Election Probabilities). *Expected welfare  $\Omega$  changes in the following way with the probability  $r$  that party  $R$  is elected:*

- For  $\bar{\theta} \leq \bar{\theta}_W$ 
  - $\frac{\partial \Omega}{\partial r} > 0$  if  $h < \frac{1}{2}$
  - $\frac{\partial \Omega}{\partial r} < 0$  if  $h > \frac{1}{2}$
- For  $\bar{\theta} > \bar{\theta}_W$ 
  - $\frac{\partial \Omega}{\partial r} < 0$  if  $h < \frac{1}{2}$
  - $\frac{\partial \Omega}{\partial r} > 0$  if  $h > \frac{1}{2}$
- $\frac{\partial \Omega}{\partial r} = 0$  if  $h = \frac{1}{2}$

Suppose society is not too rich ( $\bar{\theta} \leq \bar{\theta}_W$ ). If it is socially optimal to invest in policing, the right party always does so, while the left party may not. Hence, expected welfare increases with the probability that party  $R$  is elected if investments in policing tend to be welfare enhancing ( $h < \frac{1}{2}$ ). Conversely, the left party never spends on policing when it is socially harmful to do so, but the right party may. Hence, expected welfare increases with the probability that party  $L$  is elected if investments in policing are likely to be socially harmful ( $h > \frac{1}{2}$ ).

The situation is reversed if society is affluent ( $\bar{\theta} > \bar{\theta}_W$ ). Now, the left party is more prone to investing in policing than the right. Hence, expected welfare increases with the probability that party  $R$  is elected when investments in policing are expected to decrease welfare ( $h > \frac{1}{2}$ ) and decreases with this probability when investments in policing tend to be welfare enhancing ( $h < \frac{1}{2}$ ). Because both parties are ex ante equally likely to stray from the social optimum, expected welfare is independent of election probabilities if police spending and investments in the alternative public good are expected to be equally valuable ( $h = \frac{1}{2}$ ).

Note that, while both may behave optimally, both parties never act in a socially harmful way. Whenever  $b$  is such that one party would spend suboptimally, the other party would make the welfare optimal choice. Which party is elected thus matters a lot for social welfare whenever  $b$  falls in between  $\bar{b}_R$  and  $\bar{b}_L$ . Indeed, equation (16) reveals that the absolute value of the slope of expected welfare with respect to the election probability  $r$  increases in  $\Delta$ . Intuitively, electoral stakes are higher if the range of  $b$  for which one of the parties would behave suboptimally is big.

What are the conditions under which  $\Delta$  is large? The answer again depends on the upper bound of the income distribution (see also Figure 7). In poor societies ( $\bar{\theta} \leq \bar{\theta}_W$ ), the ordering of cutpoints is  $\bar{b}_L \leq \bar{b}_W \leq \bar{b}_R$ . Reducing  $\bar{b}_R$  and increasing  $\bar{b}_L$  thus brings party platforms closer to the social optimum and decreases the impact of electoral probabilities on welfare. In rich societies ( $\bar{\theta} > \bar{\theta}_W$ ), the ordering is  $\bar{b}_R < \bar{b}_W < \bar{b}_L$ . Here, reducing  $\bar{b}_R$  and increasing  $\bar{b}_L$  moves party platforms further apart, thereby increasing the stakes of the election.

Proposition 1 states that  $\bar{b}_R$  decreases and  $\bar{b}_L$  increases with  $\bar{\theta}$ . As relatively poor societies become richer, election probabilities thus matter less for social welfare. Once societies become so rich that  $\bar{\theta} > \bar{\theta}_W$ , however, additional increases in societal income increase the welfare stakes of elections. Electoral stakes are highest in very poor and very rich societies. Similarly, we know from proposition 2 that  $\bar{b}_R$  increases and  $\bar{b}_L$  decreases with the fixed costs  $c$  of private protection. Hence, an increase in this cost increases the impact of election probabilities on social welfare in relatively poor but

decreases it in relatively rich societies.

**Proposition 4** (Electoral Stakes). *The slope of  $\Omega$  w.r.t. the probability  $r$  that party  $R$  is elected changes as follows with the upper bound  $\bar{\theta}$  of the income distribution:*

- $\frac{\partial^2 \Omega}{\partial r \partial \bar{\theta}} \leq 0$  if  $h < \frac{1}{2}$
- $\frac{\partial^2 \Omega}{\partial r \partial \bar{\theta}} = 0$  if  $h = \frac{1}{2}$
- $\frac{\partial^2 \Omega}{\partial r \partial \bar{\theta}} \geq 0$  if  $h > \frac{1}{2}$

*The slope of  $\Omega$  w.r.t. the probability  $r$  that party  $R$  is elected changes as follows with the fixed cost  $c$  of private protection:*

- $\frac{\partial^2 \Omega}{\partial r \partial c} \geq 0$  if  $h < \frac{1}{2}$
- $\frac{\partial^2 \Omega}{\partial r \partial c} = 0$  if  $h = \frac{1}{2}$
- $\frac{\partial^2 \Omega}{\partial r \partial c} \leq 0$  if  $h > \frac{1}{2}$

Proposition 4 summarizes the previous discussion. Recall from proposition 3 that the sign of the slope of expected welfare with respect to the election probability  $r$  depends on the relationship of  $\bar{\theta}$  and  $\bar{\theta}_W$ . A positive (negative) cross-partial derivative can thus imply an increase or decrease in the absolute value of this slope. Proposition 4 highlights that the effects of an increase in  $\bar{\theta}$  resemble those of a decrease in  $c$ . Both changes decrease the absolute value of the slope of expected welfare with respect to  $r$  in poor societies ( $\bar{\theta} \leq \bar{\theta}_W$ ) but increase it in rich ones ( $\bar{\theta} > \bar{\theta}_W$ ).

The reason is that both changes make private protection more affordable. As a result, demand for policing falls among right party but grows among left party supporters, who are less likely to be criminally active. In relatively poor societies, access to private protection thus counters the tendency of right parties to over- and of left parties to underspend. The same change exacerbates each parties' tendency for wasteful spending in relatively rich societies. Since each party acts suboptimally precisely when the respective other party would spend optimally, the availability of private protection reduces the stakes of elections in relatively poor societies and increases them in relatively rich ones.

## 6 Robustness

### 6.1 Interior Solutions

In the above model, solutions always lie at the corner. One way to generate interior solutions is to assume that the alternative public good yields decreasing marginal returns. Let us return to the original model in which the benefit  $b$  of the alternative public good is fixed. Presume that citizens' expected utility is given by

$$u_i(x_i^c, x_i^p, \lambda_c, \lambda_p; \alpha) = y_i(x_i^c, x_i^p, \lambda_c, \lambda_p) - x_i^c \alpha s + b\sqrt{1 - \alpha}.$$

Then, assumption 1 and the following assumption on  $b$  are sufficient to ensure that social welfare and the objective functions of both parties are concave in  $\alpha$ :

**Assumption 2.**  $b > \frac{32de^2s^2}{(1+2de)^{2\bar{\theta}}} = \underline{b}$ .

Even though the changed model does not yield explicit solutions for party platforms and the welfare optimum, one can use the implicit function theorem to show that the general logic of proposition 1 extends to this model.

**Proposition 5** (Interior Solutions). *There exist a unique  $\alpha_W^*$  that maximizes social welfare, and a unique platform  $\alpha_k^*$  for each party  $k$ . Comparative statics with respect to the upper bound  $\bar{\theta}$  of the income distribution are as follows:*

$$\frac{\partial \alpha_R^*}{\partial \bar{\theta}} \leq \frac{\partial \alpha_W^*}{\partial \bar{\theta}} \leq 0 \leq \frac{\partial \alpha_L^*}{\partial \bar{\theta}}.$$

In line with proposition 1, the welfare maximizing share  $\alpha_W^*$  of police spending decreases with the upper bound  $\bar{\theta}$  of the income distribution. Similarly, the left party prefers to spend more and the right party to spend less on policing as society becomes richer. Finally, the right party's preferred budget share  $\alpha_R^*$  decreases faster with  $\bar{\theta}$  than the welfare optimal share  $\alpha_W^*$ . These relationships are weak, because neither the welfare optimum nor the party platforms are guaranteed to be interior.



Figure 9 shows that these comparative statics can yield the same reversal as the main model. Here, the left party spends less and the right party more than the socially optimal amount on policing when society is not too rich. As the upper bound of the income distribution increases, party platforms move closer together and closer to the social optimum. Ultimately, as society becomes very rich, the right party under- and the left party overspends on policing.

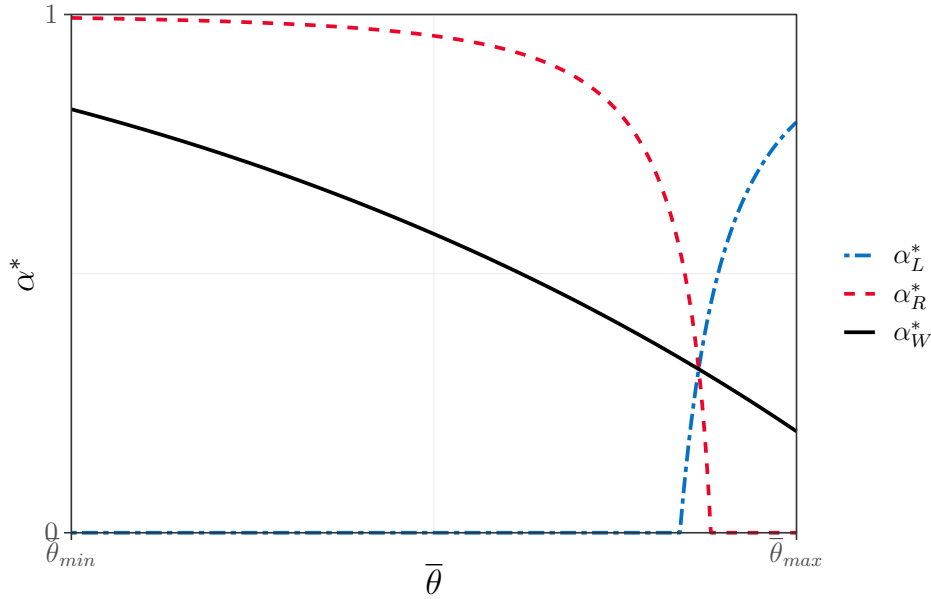


Figure 9: Interior solutions as a function of  $\bar{\theta}$   
 $s = 52, c = 57, d = 70, e = 0.02, b \sim 0.089$

## 6.2 Turnout Maximization

Parties in this model maximize the welfare of their base. This assumption fits well with contexts where crime is not the primary focus of electoral competition such that parties do not adjust their law enforcement platforms to cater to swing voters. Another way to microfound this assumption is to model an election in which party supporters choose whether to turn out. Consider the following version of the model.

As before, each party  $k$  chooses a share  $\alpha_k$  to spend on policing. Yet, now parties do so to compete in an election. They can commit to their platforms and still repre-

sent their respective halves of the income distribution. Voters have strong ideological attachments to their parties. Therefore, conditional on turning out, voters always vote for the party to whose base they belong. With vote choices being fixed, parties choose platforms to affect voter turnout. Denote voter  $i$ 's turnout choice by  $z_i \in \{0, 1\}$ . A party  $k$  supporter who turns out earns the following utility

$$u_i(x_i^{c*}, x_i^{p*}, \theta_c, \theta_p; \alpha_k) - u_i(x_i^{c*}, x_i^{p*}, \theta_c, \theta_p; \alpha_{-k}).$$

Hence, voters like to express their policy preferences. They gain more from voting the more their utility from the sorting equilibrium induced by their own party's platform exceeds their utility from the opposing party's platform. Voters also face a utility shock  $w_i \sim U[-w, w]$  which represents an idiosyncratic benefit or cost of voting. Voter  $i$  in the base of party  $k$  then earns the following utility:

$$v_{ik} = \begin{cases} u_i(x_i^{c*}, x_i^{p*}, \theta_c, \theta_p; \alpha_k) - u_i(x_i^{c*}, x_i^{p*}, \theta_c, \theta_p; \alpha_{-k}) + w_i & \text{if } z_i = 1 \\ 0 & \text{otherwise.} \end{cases}$$

Parties maximize their expected vote share and choose platforms prior to the realization of voters' utility shocks.

**Proposition 6** (Turnout Maximization). *Parties' optimal platforms in the turnout maximization model are equivalent to those given in proposition 1.*

Party platforms in this version of the model turn out to be equivalent to those in the main one. The framework thus speaks to both, situations where electoral competition happens along dimensions other than law enforcement and contexts where parties' objective is the mobilization of core supporters.

## 7 Discussion

Where governments fail to invest in law enforcement, citizens suffer from insecurity. Over-investment, on the other hand, diverts scarce public resources that could be used

to provide other services. This paper develops a model in which political parties decide how much of an exogenous government budget to spend on policing as opposed to other public goods. Given a level of police spending, citizens decide whether to commit crime and purchase private protection.

The central distributional conflict in the model arises because citizens have different incomes. The higher their income the less inclined citizens are to commit crime and the more interested they become in police spending that reduces the risk of criminal expropriation. Those who are very rich, however, use private means of protection and lose all interest in public law enforcement. The demand for policing is strongest among middle class citizens who own enough to care about losing what they have to crime but not so much that they would invest in private protection.

Contrary to conventional wisdom, the model predicts that the champions of law and order politics are not always parties on the right. In relatively poor societies, the unprotected yet affluent middle class that has the strongest demand for policing forms part of the base of right parties. In societies where the rich are affluent enough to buy private protection, however, the locus of demand for policing shifts to the base of left parties, who become prone to over-emphasize law enforcement. The set of circumstances where left parties are prone to over- and right parties prone to underinvest in policing is large if private security is widely affordable.

The model also predicts that access to private protection mitigates the impact of electoral outcomes on social welfare in relatively poor societies but enhances this impact in relatively rich ones. When society is poor, the availability of private security counters the tendency of right parties to over- and left parties to underspend on policing. When society is rich, the same change increases the likelihood that one of the two parties behaves suboptimally.

This paper studies crime, protection and police spending choices in a single framework. Two avenues for further research stand out. First, the model assumes a uniform distribution of income. Future work may explore the impact of income inequality on law enforcement policy. Second, the model assumes that parties choose platforms to

maximize the welfare of their base. This assumption seems adequate if law enforcement policy is not the primary focus of electoral competition or if voters have strong partisan attachments such that parties seek to maximize turnout among their base. A natural next step is to explore the conditions under which electoral competition can mitigate or exacerbate over- and under-investment in law enforcement.

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