A Hole at the Center of the State:
Prison Gangs and the Limits to Punitive Power[*]

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Abstract

The state's central function is to establish authority through its monopoly on violence; the very attempt, however, can be counterproductive. Punishment incapacitates and deters individuals, but can empower collective anti-state forces. Prison gangs, their ranks swelled by mass incarceration policies, transform the core of the coercive apparatus into a 'stateless' area and headquarters for organizing criminal activity on the streets and supplanting state authority in communities. Drawing on a formal model, qualitative fieldwork and case studies from the US and Latin America, I show how gangs use control over prison life, plus the state-provided threat of incarceration, to project power beyond prison, organizing and taxing drug markets and coordinating armed violence. The model reveals that common state responses–crackdowns and harsher sentencing–can actually strengthen prison gangs' leverage over outside actors. These countervailing effects can have increasing returns, implying a point beyond which additional incarceration erodes state authority.

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Introduction

> "Before [El Salvador's Mano Dura mass incarceration policy] began it was different. We hadn't gotten to seeing things collectively. The system has united us… like it or not, we cannot look at things individually, because they haven't treated us individually, nor have they pursued or locked us up individually"
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> – "El Viejo Lin", imprisoned national leader of the 18th St. mara gang in El Salvador. (Quoted in Miguel Cruz 2010, 393).

Of the dilemmas that face the state in asserting its monopoly on the legitimate use of force, administering punishment might seem, at first, a minor one. If crime is an affront to or violation of the state's authority, then punishment is what restores that authority. Beyond any symbolic value, it both incapacitates individual lawbreakers and hurts them, making the threat of such hurt a credible deterrent to others, and presumably resulting in some marginal reduction in crime. At the same time, prisons are costly, and mass incarceration may generate negative social externalities, especially within heavily affected sub-populations. The debate, such as it is, centers on the relative size, value, and unforeseen costs of these individual-level effects of incarceration.

But incarceration also has *collective* effects; these, as the quote above suggests, often favor the consolidation of prison-based criminal groups. The dirty little secret of prison life has long been that, more often and in more ways than not, inmates not guards run the show. Increasingly though, and across a variety of national contexts, well-organized prison gangs are leveraging that control to project power from within the prison walls out onto the street. Outside criminal actors do the prison gang's bidding because they know that one day they will likely go to jail, and will then want the protection and benefits the gang provides. Worse, the harsher, longer and more likely a jail sentence, the stronger the gang's leverage over outside actors. This quite simply turns the logic of punishment on its head, and presents the state with a very serious dilemma indeed: unable to punish gang members without strengthening the gang. As a soberingly candid FBI agent said of her 10-year investigation of a Texas prison gang that led to life sentences for three leaders, "I think I've made them stronger." (Sherman 2010)

The implications go well beyond the realm of 'corrections' or even law-enforcement, threatening the state and society as a whole. In 2006, São Paulo became the first major metropolis to be held hostage by a prison gang. On May 12 of that year, the Primeiro Comando da Capital (PCC) launched a wave of synchronized bombings, arson, and armed attacks on hundreds of police and civilian targets, along with intentional riots at more than 90 prisons, bringing the world's third-largest city to a standstill. Four years earlier, official claimed to have "dismantled" the PCC (Folha de S. Paulo 2005); in reality, the gang had been quietly consolidating its control over the state's expanding prison population, amassing an 80,000-strong membership, and building a network of outside cells whose operational efficacy the attacks were making frighteningly evident. Backed into a corner, the government made a series of concessions, and the attacks and riots abruptly ceased (Penteado, Caramante, and Machado 2006). Such parlaying of control over prison life into tactical power on the streets was not unprecedented: the PCC modeled itself on the Comando Vermelho (CV), which 30 years earlier arose within and took control of Rio de Janeiro's prisons, before expanding beyond the prison walls to militarily dominate the city's *favelas* (slums) and the drug trade that operates out of them. For more than a generation, the CV has maintained this *de facto* rule over hundreds of thousands of residents, in the face of civil-war levels of armed confrontation with state forces and rival prison-based gangs.

Brazil's prison gangs are brazen but hardly unique: the same underlying dynamic—consolidation and

propagation within the prison system, then projection of power onto the streets—can be observed in state-of-the-art US prisons, as well as the decrepit jails of Central America. Most street gangs in California and the Southwest Border area have now been brought under the direction of one of a handful of prison gangs (US Department of Justice 2010). Jailed leaders—often held in maximum-security lockdown—have managed to organize the region's drug trade: buying wholesale from Mexican cartels, divvying up drug turf among street gangs and taxing the profits, handing down death sentences on non-paying members and troublesome officials, and orchestrating campaigns of violence against rivals. In El Salvador, independent neighborhood gangs have similarly been transformed into 'cliques' or franchises of two prison-based *maras* (gangs), paying taxes on their take in an organized extortion racket and local drug sales. In a frightening echo of Brazil, cliques appear to have received orders to assassinate a monthly quota of police, army and correctional officers (Flores and Perez 2011).

In all three cases, the expansion of prison gangs—into what are more accurately described as 'prison-based criminal networks'—occurred during periods of rapid, unprecedented growth in incarceration rates and prison populations (Figures 1 & 2).[1]
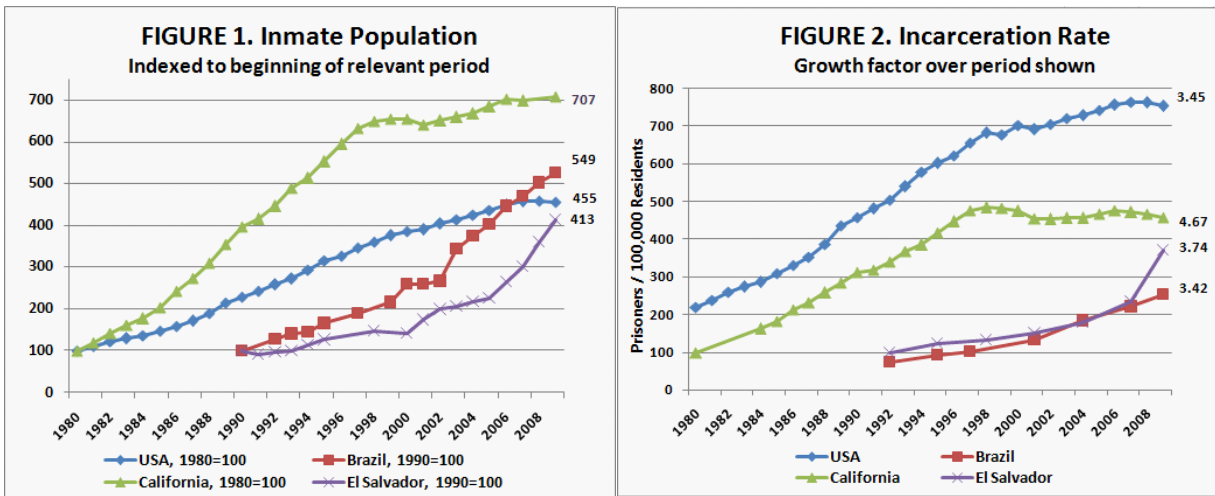
The sheer scope of modern mass incarceration, "The great public works project of our time" (Donohue 2007, 385), has prompted increased attention by economists, sociologists, and lately, political scientists. Yet despite important recent research into the origins, politics and consequences of the 'carceral state' (e.g. Gottschalk 2008; Raphael and Stoll 2009; Weaver and Lerman 2010), the concurrent ascension of prison gangs has not been systematically explored. This is somewhat surprising. Prison gangs radically alter the experience and, ultimately, the function of incarceration, transforming what in theory should be a locus of total control over citizens and the core of the coercive apparatus into a place of limited state penetration that can spawn, nurture, and serve as base of operations for organized crime and collective armed defiance.

Taking prison gangs seriously means rethinking the relationship between crime, punishment, and state authority. Becker's seminal model of crime (1968) continues to underlie much economic and criminological research, but with no accounting for prison gangs' fundamental role in shaping the experience of incarceration (for better or worse), it fails to adequately capture the choices that potential crimi-

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[1]Sources, US and CA: Bureau for Justice Statistics (2011), California Department of Corrections and Rehabilitation (1997, 2008); Brazil: INFOPEN data in (Macedo 2011); El Salvador: Dirección General de Centros Penales data in (Paredes 1997, Cáceres 2009); all: International Center for Prison Studies (2011). Data for CA excludes local jails.

nals face. Incorporating prison gang dynamics reveals that increasing punishment can strengthen gangs' leverage and cohesion even as it deters individuals and reduces crime overall.

This points to a conceptual problem: "reducing the crime rate" alone does not capture all of what we mean by "restoring state authority". Whatever our analytical starting point—the state as holder of the monopoly on the use of force (Weber 1946), legitimacy as primacy among protection rackets (Tilly 1985), rule of law as a coherent, interlocking web of institutions (O'Donnell 2004), or authority as the ability to solve collective 'equilibrium-selection problems' (Myerson 2008)—authority is generally thought of as involving the ability to organize behavior of 'subjects' into self-reinforcing patterns. The growth of gangs that can use their control over prison life, plus the state-provided threat of incarceration, to organize outside criminal actors and orchestrate mass violence thus threatens state authority, over and above any direct effect on the crime rate.

The collective, gang-strengthening effects of incarceration may be manageable when groups are nascent or punishment levels are low. This article will make the case that, beyond some point, these effects can swamp incapacitation and deterrence, fundamentally threatening the efficacy of punishment in restoring state authority. The argument proceeds via three main findings:

(i) Prison gangs use control over prison life to project power outward: organizing and taxing outside criminal activity, especially drug traffic; orchestrating coordinated violence; and establishing 'parallel power' over communities.

(ii) Increases in law enforcement and incarceration can *strengthen* prison gangs' capacity to project power even as it lowers overall crime rates.

(iii) The incapacitation and deterrent effects of incarceration are visible but subject to diminishing marginal returns, while the collective, gang-strengthening effects are hard to observe and likely to have increasing returns.

Pragmatically, these findings point to a vicious political circle in which states are, at best, tempted to punish more in response to problems that punishment itself is exacerbating. At worst, collective effects can go unperceived or ignored, leading a government to systematically over-punish and thus inadvertently incubate the powerful anti-state forces it hopes to subdue. Theoretically, they imply an inflection point beyond which additional punishment fails to restore and may actively undermine state authority, constituting a fundamental limit to the state's punitive power.

I begin with some conceptual groundwork on authority and punishment. Next, I present case-study evidence for (i) from original fieldwork, ethnographies, and reportage on prison gangs in Brazil, the US, and Central America. This is a convenience sample of all-positive cases,[2] but the cases are substantively important in their own right, and provide the stylized facts that the formal model seeks to explain. The model's comparative statics yield the central result of the paper (ii): more punishment can lead to stronger gangs. The logic is simple yet under-appreciated: the more likely potential criminal actors are to go (or return) to jail, the more advantageous it is to be in good standing with the gang, and so the greater the gang's coercive power over them. 'Coercion' can mean taxation and recruitment, but also the leverage needed to induce cooperative equilibria among outside actors, often with coordinating signals emanating

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[2]The potential lack and/or deliberate suppression of information on the extent of gang control over prisons makes it difficult to distinguish true negative cases from missing data. We know little about prison gangs, for example, in high-incarceration autocratic regimes like Russia and China.

from the prison leadership. This self-reinforcing process generates an illicit surplus, which leaders can use to further consolidate power, bribe guards and officials, and invest in expansion.

The model pins down the conditions under which increases in law enforcement and incarceration strengthen prison gangs' coercive and recruiting power. In general, the stronger a gang is in prison relative to on the street, the more a crackdown must target gang members vs. non-members in order to avoid strengthening the gang. If police do not observe whether outside actors have cooperated or defected (e.g., whether people of certain ethnicities or appearances are indeed gang members, or whether a street gang has paid its "taxes" to the prison leadership), it may be impossible to sufficiently target enforcement, and *all* crackdowns will strengthen the prison gang. A third key factor is the severity of punishment; since prison-gang membership reduces the pain of imprisonment, the longer or harsher the sentence, the more membership is worth. Moreover, even a seemingly well-targeted crackdown, if it inadvertently increases overcrowding, can be gang-strengthening. Turning to the question of recruitment and incorporating a Beckerian outside (non-criminal) option, the model captures the tension between individual and collective effects of incarceration: the same policies that lower the overall crime rate can increase the gang's ability to recruit. A secondary finding contributes to a long-standing debate over the optimal balance of 'certainty' vs. 'severity' in penology (Beccaria 1819, Becker 1968, Donohue 2007). The model supplements Kleiman's (2009) case for shorter but more certain sentences by showing that a sufficiently large reduction in severity offsets the gang-strengthening effects of increased certainty.

In the discussion that follows, I present case-study evidence for claim (iii). Both gangs *and* state officials have incentives to suppress information on prison-gang strength. Moreover, the idea that crackdowns can help criminals is simply counterintuitive, not obvious to policymakers or the public. The result has been spectacular intelligence failures and a tendency to exacerbate the problem with insufficiently targeted crackdowns. Meanwhile, positive feedback channels such as the surplus rents that accrue to a gang when it establishes itself as 'focal' (Schelling 1960) make the gang-strengthening effects of crackdowns even stronger at high levels of incarceration. This suggests a real limit on the efficacy of punitive power: the state may only be able to establish so much authority using any one technology of punishment. In the Conclusion, I conjecture that this limit can shift over time. In fact, incarceration replaced public torture (often unto death) as the universal form of punishment in the 18th century precisely when the latter's authority-restoring efficacy was compromised by social unrest, protest, and rebellion (Foucault 1977). I argue that two factors have similarly eroded the authority-restoring efficacy of imprisonment, by facilitating prison gang formation and projection of power: an accumulation of technologies of coordination, including but not limited to cell phones; and the expansion of the drug trade and the 'war' against it, creating nearly limitless rents for groups able to control retail markets.

Authority, Crime, and Punishment

From Machiavelli through Weber to Tilly, a durable line of analysis identifies the formation of states with the monopolization of violence and the transformation of this monopoly into legitimate authority. Many of the key contributions of modern political science, in turn, have studied authority as an explanatory factor—often in the guise of state capacity, or the shape and strength of institutions—across a wide range of phenomena, including comparative economic development (Acemoglu, Johnson, and Robinson 2005), civil war (Fearon and Laitin 2003), and democratization (O'Donnell and Schmitter 1986). Given this interest in the variation of state authority over time and space, it is puzzling how little attention the role of

punishment in establishing and restoring—or, as I show here, eroding—authority, has attracted.[3]

Similarly, despite increasing awareness that even for modern, consolidated states, penetration into the periphery of their national territory is imperfect (O'Donnell 1993), there has been little recognition that prisons themselves can become 'stateless' areas. Prison ethnographers have long understood gangs as a 'natural', protective reaction to incarceration, (Jacobs 1974), and documented how guards' authority may atrophy until "inmates have established their own unofficial version of control" (Sykes 1958), but gangs are still widely seen as a purely administrative, 'corrections' problem. Projection of power beyond the prison walls makes it clear that they are not, and forces us to rethink the relationship between punishment and state authority.

I focus on a characteristic common to canonical conceptualizations of authority: the ability to lay down rules which 'subjects' then (more or less) willingly accede to; i.e., to establish a functioning order in a way that will not be systematically challenged. The idea that order produces a social surplus over chaos goes back to Hobbes. Weber describes authority as involving, more than just physical or coercive force, a degree of "voluntary submission" (1947, 325) and internalization of rulers' commands by subjects, which, in modern states, comes about because the rules chosen are 'rational', universal, and efficient. Tilly (1985) emphasizes the monopolization of violence, but also that pseudo-criminal protection rackets only became states when they imposed social orders that protected property rights, permitted accumulation, and ultimately left subjects willing to cooperate with their rulers. Roger Myerson (2004, 2008) highlights this self-reinforcing quality when he identifies authority with Schelling's (1960) notion of 'focality', the ability to get a group of people to focus on and hence select one out of a multiplicity of potential equilibria. It is the very essence of a Nash equilibrium that once one is selected, i.e., once we all believe that everyone else will play according to it, nobody has an incentive to defect—an apt game-theoretic parallel of Weber's 'voluntary submission'. Across conceptions, coercive force may be necessary to establish authority and impose order, but this order, once imposed, is self-sustaining and surplus-producing.

An important distinction can now be drawn between individual and collective challenges to authority. Individuals may simply break the rules and laws of social order, defecting, in Myerson's terms, from the equilibrium strategies selected by the state. A prime empirical referent is atomistic property crime. That these moves are in some sense 'out of equilibrium' is evidenced by the fact that theft usually catches us unaware: if we thought someone was going to mug us, we wouldn't have walked down that street. Of course, as more and more individuals defect, a new equilibrium arises: people begin to expect crime on a street, avoid it, making it more crime-prone, and so on. At the extreme, state-induced social order gives way to chaos.

The aggregate effects of such individual affronts to state authority are conceptually different from collective threats. Of course, non-state actors may directly engage in crime and chaos-causing, just like individuals. But they can also lay down rules, impose their own preferred social order, select their own equilibria—in short, establish their own form of authority over 'subjects' within their ken. Many groups do this within limited spheres, without entirely supplanting the state, leading to regions of intermittent state penetration and overlapping authority. O'Donnell offers a rich characterization of such "brown areas" (1993) and catalogues the damage they do to the state and the rule of law (2004). Of particular importance here is the fact that non-state authority is still self-reinforcing: by solving this "equilibrium-selection problem to solve all other equilibrium-selection problems" (Myerson 2004), the establishment of focality by one gang (or warlord, or charismatic social movement leader) helps all players avoid costly

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[3]The exception is Foucault (1977), discussed at length in the conclusion.

conflict, coordinate strategies, and reap the gains of collective action. This is a source of positive feedback: in the cases studied here, successful imposition of authority both inside prison and in outside criminal markets gives gang leaders a surplus with which to buy off officials and reward members, thus reinforcing their own non-state authority. Tilly's metaphor, it turns out, works in reverse: gangs, like states, that better foster and tax collective gains, ultimately supplant cruder extortion rackets—and the 'subjects' of such a gang's 'rule' are better off for it.

The individual / collective distinction carries over into the role of punishment in restoring authority. Incarceration directly incapacitates individuals who defect, and deters others by making future threats of punishment credible; these 'individual effects of punishment' are authority-restoring to the extent that people who might otherwise break the law no longer can or do. There may be countervailing individual effects as well: recent empirical studies (Gaes and Camp 2009; Lerman 2009) have found that prisoners are made more likely to commit future crimes by their time in prison. In any case, changes in the crime rate offer a rough and ready measure of individual defiance of and restoration of authority. Though there is an empirical debate over their exact size and shape, the marginal effects of punishment on crime are widely thought to be negative and diminishing (Kleiman 2009, 110).

Collective threats to state authority may not directly increase crime or violence; in fact, the establishment of extra-legal authority may end up bringing order to far-flung places the state was having difficulty controlling. The resulting erosion of state authority can be hard to observe, revealed only in sporadic and embarrassing episodes of non-state control or chaotic violence. A sufficient conceptualization of the effects of punishment on state authority must therefore include not only the crime rate but also the strength of non-state sources of authority. For traditional mafias, street gangs, insurgencies, and other non-state actors, increases in punishment may well reduce the ability to impose non-state authority. The main contribution of this paper is to show how this logic becomes inverted when prison gangs are strong: higher incarceration rates and harsher sentences *increase* gangs' coercive power on the street, which gangs use to impose cooperative equilibria in drug markets and non-state authority over peripheral areas. The marginal collective effects of punishment on state authority can thus be negative, hard to observe, and because of the self-reinforcing nature of (non-state) authority, increasing in the level of punishment.

Prison-Gang Dynamics: Consolidation, Propagation, and Projection

The growth of prison-gang power can be usefully analyzed as a sequence of mutually reinforcing dynamics: consolidation of control over prison life; propagation throughout a prison system; and projection of power beyond the prison walls. A prison-born gang is unlikely to begin projecting power before it has consolidated and propagated to some degree, but successful projection is likely to lead to further consolidation. Since it is projection that transforms prison gangs from a "corrections" problem into a broader threat to state authority, I touch only briefly on consolidation and propagation here.

Consolidation and Propagation

Successful gangs consolidate power by eliminating or containing rivals, taking control of certain aspects of prison life (including the flow of contraband), and winning the capacity to mete out rewards and punishments to other inmates. While the early stages of consolidation are often characterized by shocking scenes of violence and brutality among fledgling gangs and groups, once a gang has achieved a degree of

primacy it may impose rules that reduce violence or make it more predictable, in ways that are benefi-
cial to members and non-members alike. Even the guard corps benefits, as its management problem is
reduced to striking deals with gang leaders:

> So we got some advice from—guess where?—the [prison gangs] themselves. Damn if they didn't give
> some good advice. [...] They'd write it all out for us. [...] Some of their ideas were better than ours.
> (California Department of Corrections official, quoted in DiIulio 1987, 134)

In Tillian fashion, gangs extract surplus from their role as providers of order, using the threat of orga-
nized prison violence to win concessions from wardens, and redistributing the benefits back to inmates.
Welfare provision for poor inmates or those whose privileges have been revoked in turn increases a gang's
prestige and the loyalty it commands. An inmate in a PCC-dominated facility explains:

> Thanks to the PCC, the number of deaths fell, the [PCC] controls the inmates. Nobody kills anybody
> without authorization. [...] There's a steady supply of cell phones and drugs, nobody has to get them
> from the outside... and the PCC helps the guys who are hard up. It hands out cesta básica[4], sometimes
> there are buses for visitors coming from far away, they raffle bicycles on Children's Day... Who does all
> this? Just the PCC (Quoted in Barros 2006, 8).

As spats and personal vendettas are replaced by less frequent but more lethal 'wars' among rival gangs,
prison administrators have incentives to segregate prison facilities by gang affiliation; some form of seg-
regation can be seen in all the cases considered here. While this may save lives (and officials' prestige) in
the short run, it also hands gangs control over their designated area, facilitating consolidation. Segrega-
tion also implies sorting incoming prisoners by gang affiliation, which has the perverse effect of putting
first-time offenders with only tenuous gang links under the custody of gang leaders, to be schooled, so-
cialized, and definitively inducted.[5] Recognizing these drawbacks, some administrators have attempted
to desegregate prisons, with bad results. Shortly after Rio de Janeiro desegregated its Benfica prison, CV
leaders rioted and brutally murdered some 30 members of rival gangs (Borges 2004). A 2009 US Supreme
Court discrimination ruling forced California to desegregate its prison wings, but inmates have thus far
refused to comply, citing the risk of violence (Thompson 2009).

Propagation—the spread of a gang from one prison to multiple facilities within a prison system—
usually occurs via the transfer of members to new facilities, often as part of a misconceived strategy of
"breaking up the gang" and isolating leaders. Conversely, some gangs deliberately get members trans-
ferred to other facilities through both legal and corrupt channels as part of a propagation strategy. Once a
gang is sufficiently powerful and well-known, local chapters or franchises may arise spontaneously; sim-
ilarly, established gangs in one region may forge alliances with or become franchises of a dominant gang
from another region. In the US and Brazil, whose prisons reflect the countries' federalist structure, prop-
agation occurs quickly within autonomously administered state prison systems, and more slowly and
sporadically across states and through the federal prison systems. In Central America, prison systems are
small and administered at the national level. Gangs there have propagated across countries via a distinct
mechanism: the *mara* gangs were first founded in the US by Salvadoreans, Hondurans and Guatemalans,
who were later deported to their home countries and jailed.

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[4]A standardized basket of food staples designed to satisfy nutritional needs for one month. Commonly provided to the needy by
charities or government agencies.

[5]Author's visit to and interview with the director of Neves Jail, Rio de Janeiro, August 29, 2009. See also Human Rights Watch
2004.

Projection of Power: From Prison Gangs to Prison-based Criminal Networks

Taken together, consolidation and propagation permit a prison gang to credibly promise rewards and punishments to prisoners anywhere in a prison system. Combined with the state-provided threat of incarceration, this also allows them to project power onto the streets. The mechanism is explored at length in the formal model to follow, but is succinctly captured in the following testimony of LA Sheriff's Department Sergeant Richard Valdemar at the murder trial of a Mexican Mafia ('Eme') gang member:

> [A]sked why Hispanic street gangs obey the Eme even though it is primarily a prison gang[,] Valdemar explained that "the Eme controls the prisons and the [street] gangsters know that eventually they'll end up in prison[6] and be subject to sanctions and retribution if they don't obey the Eme while they're on the street." (Rafael 2007, 326)

Prison gangs use this coercive power to coordinate the actions of outside actors, leading to three key outcomes that directly threaten state authority: 1) organization of local criminal activity, particularly the drug trade; 2) orchestrated attacks and campaigns of violence, and 3) establishment of 'parallel power', i.e. territorial control and state-like authority over peripheral areas and populations.

Organization of local gangs / drug markets.   In all the cases studied, prison gangs have used their projection of power to organize a diffuse panorama of local street gangs and drug trafficking outfits into affiliates of a cohesive, prison-based criminal network. Brazil's prison gangs provide the starkest example. In the 1980s, the CV employed a mutual aid scheme to systematically oust or subdue—using militarized force—incumbent drug dealers from a majority of the city's *favelas*, then hold that territory in the face of decades of extreme police repression.[7] Nowhere else have prison gangs developed this level of military capacity and territorial dominion. Yet at a more general level of analysis, US, Central American and Brazilian prison gangs' outside activities look strikingly similar. Local gangs are brought into a system where they pay taxes, receive a set commission or margin on drug sales, and abide by rules and edicts laid down by an imprisoned gang leadership. The result is an enormous surplus of criminal rents—often with minimal increases or even decreases in the observed level of violence.

Empirically, prison gangs seem to bring a greater level of organization to local criminal markets than pure street gangs or traditional mafias. Field visits in 2005 to retail drug markets in four Brazilian cities revealed that only Rio's had stable local monopolies; in other cities, rising drug lords could amass turf for a time, but would inevitably get caught or killed, and the market would fracture again. Lessing (2008) attributes this difference to the historical presence of prison-based criminal networks in Rio, which counteract the centrifugal forces that bring down larger retail drug operations in other cities. In 2005, the PCC had yet to show its strength on the streets of São Paulo, which continued to have highly fractured local drug markets. Six years later, the PCC dominates São Paulo's drug markets, operating as sole distributor, arbiter of disputes and enforcer of rules among myriad small-scale drug retailers throughout the urban periphery (Caramante 2008; Feltran 2010). The domination of Rio and São Paulo's drug markets by prison-based criminal networks took place decades apart, but at quite similar moments in 'analytic time' (Collier 1993): 10-15 years after their founding inside prison.

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[6]Probably an accurate assessment on their part: 52% of inmates released from US state prisons in 1994 were back in prison within three years (Langan and Levin 2002).

[7]Rio police, by their own account, have killed over 10,000 civilians in armed confrontations in the last decade alone. Monthly reports available at http://www.isp.rj.gov.br/.

In Central America, the arrival of deported *mara* members from the US transformed a vast collection of local, turf-based gangs into *clikas* ('cliques') of the MS and 18 *mara* franchises (Miguel Cruz 2010). This affiliation was entrenched in the early 2000s in the wake of region-wide 'Mano Dura' incarceration policies that put tens of thousands of gang members behind bars. Bloody prison clashes led officials to segregate facilitates, giving each *mara* a safe base of operations. Soon, formal hierarchies emerged, stricter and savvier codes of outside behavior came into force (e.g. prohibiting the ubiquitous gang tattoos that were making members an easy target for anti-gang enforcement) and prison was established as the nerve center of territorially extensive organizations (Miguel Cruz 2010). Street gangs, now operating as local affiliates of region-wide criminal networks, put in place a regularized system of extortion of businesses and public transportation known as '*la renta*' (the rent), involving the complicity of corrupt police and company officials (Aguilar and Carranza 2008). According to law enforcement officials, the *maras* are also increasing their participation in local retail drug markets, and angling to control wholesale, within-country distribution (Dudley 2010).

Similarly, US prison gangs have brought the street gangs of entire cities and regions under an umbrella of control and affiliation. In 1993, released Eme members held mass gatherings of southern California's 'Sureño' street-gang leaders in which the new system of "complete vertical integration" was announced (Rafael 2007, 39): a restriction on inter-gang violence, loyalty to the Eme, and a tax on drug profits. The Eme's primary rival, La Nuestra Familia (NF), soon imposed a similar system, controlling, "through top-down leadership... most of the Norteños gangs who operate in central California from Yuba City to Bakersfield and from Salinas to the Sierra foothills" (California Department of Justice 2010), setting the stage for organized gang warfare in regions where the two groups overlap (Reynolds and Sácnchez 2003). In Texas, the Barrio Azteca has successfully imposed a system of turf, prices and taxes on the street gangs of the El Paso region (Burton and West 2008). According to the US Department of Justice (2010, 13), Hispanic prison gangs are now buying drugs wholesale from Mexican cartels, and "controlling most street gangs in areas along the Southwest Border."

In all these cases, the driving motivation has been to organize local illicit markets and increase profits by delimiting turf, fixing prices and commissions, moving into wholesale distribution, and reducing clashes that waste resources and draw the attention of law enforcement. These new arrangements have remained relatively stable; street gangs usually declare their prison-gang affiliation proudly, and continue to recruit new members. This suggests that prison gangs are acting like Tillian proto-states: not maximally predating on street gangs, but rather fostering and taxing mutual gains from criminal cooperation, making all members at least weakly better off, and feeding the surplus back into a process of growth and consolidation.

Coordinated attacks. Prison gangs can use their coercive capacity to orchestrate mass violence both within and beyond the prison system, sometimes simultaneously. A prime example is deliberate prison riots, which gangs often incite in order to pressure or punish wardens, or provide cover for criminal acts, including murder and escape. Propagated prison gangs can use their increased capacity for coordination to instigate simultaneous riots in multiple facilities. While multiple riots are not, strictly speaking, a form of projection, their saliency for public officials can make a promise to start or end them an effective political bargaining chip. In Guatemala, *maras* organized simultaneous riots in 2005 that led to the segregation of prisons there. In Georgia, inmates from seven prisons, including members of various gangs, recently used cell phones to coordinate simultaneous non-violent protests demanding better living con-

ditions (Wheaton 2010). In Brazil, this technique was pioneered by the CV but perfected by the PCC, first in 2001's 'mega-rebellion' involving 29 prisons, then in the 2006 attacks.

Prison gangs with the capacity to project also orchestrate violent attacks outside prison, often against rivals. The Eme, for example, has a long-standing rivalry with Black Guerrilla Family prison gang, which led to a prison-orchestrated campaign of "ethnic cleansing" against African-Americans living in mixed Latino neighborhoods in the early 2000s (Mock 2006). At the same time, the Eme and its enemy the NF have unleashed waves of street-level gang violence on one another over the years, often punctuated with prison-negotiated truces (Rafael 2007). In Brazil, CV bosses each run their own autonomous drug operation, but regularly lend each other man- and fire-power in order to carry out invasions of rival territory. Sometimes attacks are directed at civilians or even state forces: the CV has used its foot soldiers in the *favelas* to carry out city-wide shutdowns of businesses, burn busses, and machine-gun public buildings and police stations (e.g. Penglase 2005). The PCC has gone even further, integrating the synchronized riots into a larger, coordinated battle plan. The 2006 attacks began with simultaneous riots at over 90 prisons, drawing São Paulo's police forces out to far-flung facilities, before street-level cells launched hundreds of attacks on civilian and police targets in the unguarded capital.[8] The attacks proved to be, more than just a destructive affront to state authority, an effective political cudgel: they not only forced concessions, but helped defeat PCC antagonist Gerardo Alckmin, Governor of São Paulo from 2001-2006 and architect of its mass incarceration policies, in the 2006 presidential elections.

While law enforcement and judicial agents have occasionally been targets of this prison-coordinated violence even in the US, until recently it was only the Brazilian prison gangs that systematically confronted state forces. In early 2011, however, Salvadoran *mara* leaders handed down orders for street-level 'cliques' to target police, army and corrections officers, going so far as to establish monthly quotas; in the following months, murders of state agents spiked (Flores and Perez 2011).

Parallel Power Intimately related to gangs' consolidation of local drug and criminal markets is their often militarized control of peripheral or low-income areas and their role as parallel or alternate sources of state-like power over residents. Parallel power is of enormous substantive and normative importance both in terms of its impact on citizens and its implications for the state. To take the most striking example, in Rio de Janeiro, as many as one million residents have, for the past 25 years, lived under the armed dominion of prison-based drug syndicates (Leeds 1996). An entire generation has been born and raised in *favelas* in which the enforcement of social order and the provision of public goods rested primarily with illegal armed groups, while the state's presence was largely limited to intermittent, brutal, corrupt, and highly lethal police invasions. While such overt territorial control remains unique to Rio, in São Paulo's urban periphery the PCC has, since the 2006 attacks, established parallel power within certain spheres of life, regulating extra-legal violence and providing residents with an alternative justice system, including 'trials', via cell-phone, before a jury of jailed PCC elders (Feltran 2010). In the US, the state's reach tends to be greater, but street gangs have long played an important role in structuring social order in low-income communities. As street gangs get incorporated into larger, often warring prison-based networks, the consequences for residents as well as the state can be deleterious. Examples include the shrinking of Los Angeles's black community, possibly in response to the Eme's campaign of ethnic cleansing, and the war between Norteños and Sureños that has engulfed and severely damaged communities across central California (Reynolds and Sánchez 2003).

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[8] Author's interview with Guaracy Minguardi, Head Researcher, São Paulo Office of the Public Prosecutor, August 2006.

The causes and effects of parallel power are the subject of a rich ethnographic and analytic literature (e.g. Arias 2006; Lins 1997) and go far beyond the scope of this paper. The relevant point is that parallel power is generally established by gangs as part of a larger strategy to control and maximize the profitability of retail drug markets or other criminal activity (Akerlof and Yellen 1994). As such, it is likely to become more thoroughgoing and entrenched wherever prison gangs begin to project power and organize local criminal activity. This is a key mechanism by which prison gang growth and expansion threatens and undoes state authority, even when not immediately or directly contributing to a higher crime rate. The model that follows is concerned with imprisoned gang leaders inducing compliance in outside criminal actors, not law-abiding residents; but it should be borne in mind that prison gangs can use their power over outside members to establish coercive control over residents as well.

A Model of Prison Gang Coercion and Recruitment

It is the ability of an imprisoned leadership to induce compliance in its non-imprisoned members, recruits and affiliates that allows prison gangs to expand beyond the prison walls and ultimately, threaten state authority. How do prison gangs manage it? Why do criminals on the streets obey the orders of men who are likely to spend the rest of their lives in prison?

Part of the answer is that it can be in their interest to do so. Just as there are gains from cooperation within prison (all prisoners benefit when gang members establish social order), there are gains to collective criminal action on the outside. But coercive force may be needed to establish a gang's authority, i.e. its ability to make a new cooperative equilibrium focal among outside actors (Myerson 2008, 134), and many such cooperative equilibria require credible threats off the equilibrium path to be sustainable.[9] This points to the ability to mete out punishment and reward loyalty, i.e. to affect outside members' payoffs to cooperation vs. defection, as key determinants of prison gangs' capacity to coordinate outside members' actions. Street gangs punish defection severely, and many require members to lower their outside options through tattoos and non-attendance of school; as a result, they induce members to commit great acts of self-sacrifice for the organization (Berman 2000). But the rise of prison gangs has reconfigured street gangs and other criminal groups into larger networks in places as diverse as Texas, Honduras, and São Paulo, suggesting that street-level organizations alone were not capturing all the potential collective gains. Consolidation and propagation, which qualitative evidence suggests are pre-conditions for projection of power, simply give prison gangs more "reach" than street gangs: a credible promise to punish defection and reward loyalty across whole states and regions.

The model formalizes the logic of projection of power, asking how much disutility a prison gang can impose on local gang leaders or drug lords without provoking disobedience, and takes this 'coercive power' as an implicit measure of its ability to resolve collective action problems and induce criminal cooperation. It analyzes the effects of crackdowns (increases in the 'certainty' or likelihood of incarceration) and harsher sentences (increases in the 'severity' of punishment). When gangs are sufficiently consolidated within prison (i.e. can mitigate the pain of incarceration felt by members), increases in severity increase coercive power. The effect of crackdowns depends on how well they target gang members versus defectors. The model identifies a critical level of targeting below which crackdowns increase gang coer-

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[9]More formally, to the extent that the ongoing interaction among players resembles a repeated prisoner's dilemm with discounting, a basic folk theorem result applies: the worse the potential punishment for defection in relation to the rewards of cooperation, the larger the set of cooperative equilibria that can be supported.

cive power. If crackdowns necessarily lead to overcrowding and worsening prison conditions, an even higher level of targeting is needed to avoid inadvertently strengthening the gang. Conversely, the model shows that the suggestion of Kleiman (2009) and others to move to a 'high certainty, low severity' paradigm can avoid strengthening gangs if the reduction in severity is sufficiently large.

An extension of the model examines the gang's ability to get outside actors (usually new recruits and low-level foot soldiers) to carry out actions such as hit jobs or civilian attacks that significantly increase their chance of going to prison. Here the focus is not on sustaining cooperation but rather on recruiting the most skilled individuals as possible to carry out orders. The extension also incorporates elements of Becker's (1968) classic model of crime by giving potential recruits a non-criminal outside option. In this setting, increases in the likelihood and severity of punishment can increase the gang's ability to recruit, even while lowering the expected utility of criminals relative to law-abiding citizens, thus reducing the overall crime rate.

Coercion of Outside Members

Setup and Parameter Conditions   The players are the imprisoned gang leadership and a single outside member M. The gang leadership moves first, setting a membership tax of τ. Then, M chooses whether to cooperate (C) and pay τ or defect (D) and "go it alone". M is caught and goes to jail with a probability of π if he has defected and $\tilde{\pi}$ if he has cooperated. Finally, the gang rewards or punishes M depending on whether he has cooperated or not, and payoffs are realized.

FIGURE 3. Game Tree for the Coercion Model
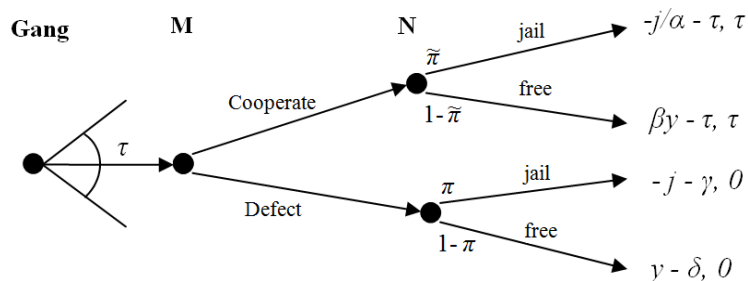
If jailed, M forfeits his earnings and receives negative utility from imprisonment equal to $-j$, where $j > 0$ measures the severity of punishment, including sentence length and prison conditions. Defectors suffer the full pain of imprisonment $-j$, but if M has cooperated, the gang leadership uses its power within the prison system to ameliorate this pain. Let $\alpha > 1$ measure this aspect of the gang's power, such that a jailed member suffers only $-\frac{j}{\alpha}$. This formalization captures the intuition that gang membership is more important to welfare when sentences are long and prison conditions are bad.[10]

Let y represent the baseline level of profits from illicit activity that M can earn by "going it alone". To capture the idea that gang membership may permit long-term gains from criminal cooperation among outside members, a paying member receives βy where $\beta \geq 1$. Finally, assume that the gang punishes

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[10]Modeling α as additive, so that jailed member suffer $-(j - \alpha)$, implies that imates serving short and long sentences get, implausibly, the same total relief from gang membership. Moreover, many gang services seem especially welfare-improving when conditions are bad, e.g., providing food and medicine when the administration does not, or passing messages to and from prisoners in solitary.

defectors, and that it is capable of exacting a punishment of $\gamma \geq 0$ within prison and $\delta \geq 0$ on the outside. To simplify analysis, assume the gang leadership's costs from rewarding or punishing M are negligible, so that its utility is given by τ. The outside option of "going straight" is not modeled here, since the kind of criminal actor represented by M—ranking gang members and local drug dealers—would face a non-zero probability of incarceration even if they ceased further criminal behavior.[11]

The model has a number of parameters whose relative value has been left unspecified, to increase generality. Assigning different values to these parameters sheds light on different forms of projection of power. The motivating example of the basic model is a prison gang organizing and imposing a tax on outside street gangs and drug dealers. If the locus of power is still firmly within the prison system, it is reasonable to assume that $\gamma > \delta$, or even $\delta \cong 0$. I also assume that $\tilde{\pi} - \pi$ is close to zero, since the criminal actions of members and defectors may be very similar (e.g. drug dealing) and the payment of τ may not be observable to police.[12] In the next section, where the price of membership involves carrying out violent actions on behalf of the leadership, the natural assumption is that $\tilde{\pi} - \pi$ is substantial.

Analysis[13]   The leadership will charge the highest positive tax rate that does not induce defection:

Lemma 1. *There is a unique sub-game perfect equilibrium whenever*

$$\tau^* \equiv j\left(\pi - \tilde{\pi}/\alpha\right) + y\left[\beta(1 - \tilde{\pi}) - (1 - \pi)\right] + \gamma\pi + \delta(1 - \pi) > 0 \tag{1}$$

in which the gang demands, and M pays, τ^*.[14]

Corollary. *For any set of parameter values $\{\alpha, \beta, \gamma, \delta, \pi, j, y\}$, there exists $\tilde{\pi}$ sufficiently close to π such that τ^* is positive.*

Given the expectation that $\tilde{\pi} - \pi$ is close to zero and the fact that actual taxation of outside actors by prison gangs is observed, I focus on parameter values such that τ^* is positive. τ^* is a measure of the gang's coercive ability, so by taking comparative statics, we can see how changes in aspects of gang strength as well as law enforcement policy affect gang power over outside members.

Differentiating Equation 1, it is clear that increases in α, β, γ and δ will all raise τ^*. This is a source of positive feedback: if the gang uses τ^* to increase any of these strength parameters, its future coercive power will be even greater. Exogenous increases in outside profits (y) will also raise τ^* whenever there is sufficient surplus from collective criminal activity relative to the increase in the likelihood of imprisonment it entails ($\beta > \frac{1-\pi}{1-\tilde{\pi}}$). Again, if $\tilde{\pi} - \pi$ is very small, this is easily satisfied, since $\beta \geq 1$.

Policymakers may not directly and independently choose the values of π, $\tilde{\pi}$, and j; rather, they may be restricted to policy changes which affect multiple parameters jointly. I thus examine the effects of a set of policy vectors $\{\rho_\theta\}$, indexed by θ, each of which differentially affects the incarceration rates for criminal activities π and $\tilde{\pi}$, as well as the severity of punishment j. Formally, let π, $\tilde{\pi}$, and j all be functions of the

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[11]In practice, this kind of criminal actor generally only goes straight when offered amnesty (lowering π) and/or protection (lowering δ). The case of low-level criminal participation in gangs, where going straight is a real option, is considered below.

[12]Indeed, a more organized drug operation might be more effective at systematically bribing the police or politicians, such that $\tilde{\pi} < \pi$.

[13]Proofs are given in the Appendix.

[14]Real-world gangs frequently punish defectors. An information asymmetry, say a distribution over types of M, can generate this kind of result, with the leadership choosing a τ^* which M rejects with positive probability. None of the substantive findings would be affected by such a modification.

form $f(\cdot, \{\rho_\theta\}^{\theta \in \Theta})$; then the total effect of any change in ρ_θ on τ^* is given by:

$$\frac{\partial \tau^*}{\partial \rho_\theta} = \frac{\partial \pi}{\partial \rho_\theta} [j + y + \gamma - \delta] - \frac{\partial \tilde{\pi}}{\partial \rho_\theta} \left[\frac{j}{\alpha} + \beta y \right] + \frac{\partial j}{\partial \rho_\theta} \left[\pi - \frac{\tilde{\pi}}{\alpha} \right] \tag{2}$$

Comparative statics for each ρ_θ are presented as parts of Proposition 1. First, I focus on 'harsher sentences', policies that increase the severity of punishment (such as longer sentences, solitary confinement, reduced privileges, or simply neglect and overcrowding) but have no affect on the incarceration rate.

Proposition 1a (**Harsher sentences increase gangs' coercive power**). *The effect of any policy $\{\rho_s : \frac{\partial \pi}{\partial \rho_s} = \frac{\partial \tilde{\pi}}{\partial \rho_s} = 0, \frac{\partial j}{\partial \rho_s} > 0\}$ on τ^* is positive whenever:*

$$\alpha > \frac{\tilde{\pi}}{\pi} \tag{C_S}$$

In words, whenever a gang can ameliorate the pain of prison enough, harsher sentences will, *ceteris paribus*, increase its coercive power over outside actors. "Enough" here means condition C_S, which has a natural interpretation. Cooperating with the gang makes a player $\frac{\tilde{\pi}}{\pi}$ more likely to go to jail; call this the *risk differential*. C_S holds whenever the gang can reduce the pain of imprisonment by a factor larger than the risk differential. In this model, member and non-member activities are observationally similar, so $\frac{\tilde{\pi}}{\pi} \approx 1$ and is C_S easily satisfied; I assume it holds throughout this section.

What are the effects of stricter law enforcement and higher incarceration rates on gang coercive power? For the moment, assume such 'crackdowns' are independent of changes in the severity of punishment. A crucial question about crackdowns is how *targeted* they are, i.e. to what degree they distinguish between gang members and non-members. Define the *degree of targeting* φ of a policy ρ_θ as the ratio of the increases in the probability of imprisonment for a gang member to that of a non-member: $\varphi(\rho_\theta) \equiv \frac{\partial \tilde{\pi}}{\partial \rho_\theta} / \frac{\partial \pi}{\partial \rho_\theta}$. For the same reasons that we expect $\tilde{\pi}$ to be close to π, targeting may be difficult: 'paying' τ may not correspond to an observable or actionable offense. With that in mind, consider first an *untargeted crackdown* with $\varphi(\rho_u) = 1$:

Proposition 1b (**Untargeted crackdowns increase prison gangs' coercive power**). *For any policy $\{\rho_u : \varphi(\rho_u) = 1, \frac{\partial j}{\partial \rho_u} = 0\}$, the effect on τ^* is positive whenever*

$$j - \frac{j}{\alpha} - y(\beta - 1) + \gamma - \delta > 0. \tag{3}$$

In words, untargeted crackdowns will increase a gang's coercive power whenever it is stronger within prison than on the street. To see this, note that $\gamma - \delta$ just represents the differential between the gang's ability to punish inside versus outside prison. Similarly, $j - \frac{j}{\alpha} - y(\beta - 1)$ represents the "inside / outside differential" in terms of the benefits of membership. When the sum of these two differentials is positive, so is the effect of untargeted crackdowns on gang coercive power, $\frac{\partial \tau^*}{\partial \rho_u}$. Intuitively, if the benefits of membership to outside actors have more to do with 'prison insurance' than outside profits, and if they are more afraid of retribution inside prison than outside, then a higher chance of imprisonment will make membership more valuable.

For a prison gang beginning to project power and organize outside actors, β and δ are likely to be small relative to α and γ, so that $\frac{\partial \tau^*}{\partial \rho_u} > 0$ and more effective policing will actually strengthen the gang's ability to induce cooperation. More generally, Equation 3 suggests a useful analytic guideline when thinking about street- versus prison gangs. Empirically, the distinction between the two can become quite blurred, as members of the former are incarcerated and those of the latter are released but remain loyal to the

imprisoned leadership. One way to define 'prison-based' is simply as a group whose total power to punish and reward is greater inside than outside prison, such that $\frac{\partial \tau^*}{\partial \rho_u}$ is positive. In other words, a prison-based criminal network can be *defined* as one that is strengthened by an untargeted crackdown.

How targeted does a crackdown need to be in order to avoid increasing a gang's coercive power? First, define the *critical level of targeting* of a policy ρ_θ, as the value φ_θ^* such that $\varphi(\rho_\theta) < \varphi_\theta^* \implies \frac{\partial \tau^*}{\partial \rho_\theta} > 0$. For a targeted crackdown with no effect on j, this yields:

Proposition 1c (**Better-consolidated gangs require more targeting**). *For any policy* $\{\rho_t : \varphi(\rho_t) > 1, \frac{\partial j}{\partial \rho_t} = 0\}$, *the critical level of targeting is* $\varphi_t^* = \frac{j+y+\gamma-\delta}{j/\alpha+\beta y}$, *which is increasing in the "inside" parameters* α *and* γ, *and decreasing in the "outside" parameters* β, δ *and* y.

The model's main finding is that insufficiently targeted crackdowns increase a gang's coercive power. Proposition 1c pins down what is meant by 'insufficiently targeted', and says that the larger a gang's capacity to reward and punish inside relative to outside prison, the more targeted a crackdown must be to avoid strengthening the gang.

Thus far, the analysis has implicitly assumed that changes in severity (j) can move independently from changes in 'certainty' (π and $\tilde{\pi}$). Now consider relaxing the assumption. For concreteness, imagine that the state implements what it takes to be a sufficiently targeted crackdown (with $\varphi(\rho_t) = \varphi_t^*$), but does not realize that this will lead to effectively harsher punishment, because of (say) overcrowding or the introduction of violent individuals into the prison system. Then the total effect will be to increase the gang's coercive power, in spite of the targeted nature of the crackdown. Formally:

Proposition 1d (**Overcrowding increases the critical level of targeting**). *For any* ρ_t *such that* $\frac{\partial \tilde{\pi}}{\partial \rho_t} \geq \frac{\partial \pi}{\partial \rho_t} > 0, \frac{\partial j}{\partial \rho_t} = 0$ *and* $\varphi(\rho_t) = \varphi_t^*$, *take* $\rho_{t'}$ *such that* $\frac{\partial \pi}{\partial \rho_t} = \frac{\partial \pi}{\partial \rho_{t'}}, \frac{\partial \tilde{\pi}}{\partial \rho_t} = \frac{\partial \tilde{\pi}}{\partial \rho_{t'}}$, *and* $\frac{\partial j}{\partial \rho_{t'}} > 0$. *Then* $\frac{\partial \tau^*}{\partial \rho_{t'}} > 0$, *and* $\varphi_{t'}^* > \varphi_t^* = \varphi(\rho_{t'})$.

In a recent contribution to an old debate over how to optimally balance 'certainty' versus 'severity' of punishment, Kleiman (2009) offers important 'behavioral' and game-theoretic arguments why 'sure and swift' punishment is a better deterrent than the status quo of long sentences for a small fraction of offenders. The present model suggests another advantage of this approach: Proposition 1a says that whenever C_S holds, the imprisoned leadership is strengthened by increases in j; by the same token, a decrease in severity *weakens* the gang. For example, if players know they face shorter sentences, the value of gang membership conditional on incarceration is lower.[15] This can be used to offset the gang-strengthening effects of an insufficiently targeted crackdown:

Proposition 1e (**Offsetting 'more certainty' with 'less severity'**). *Take any insufficiently targeted* ρ_t *such that* $\frac{\partial j}{\partial \rho_t} = 0, \varphi(\rho_t) < \varphi_t^*$, *and (therefore)* $\frac{\partial \tau^*}{\partial \rho_t} > 0$. *There exists* $k \in \mathbb{R}^+$ *such that any* $\rho_{t'}$ *with* $\frac{\partial \pi}{\partial \rho_t} = \frac{\partial \pi}{\partial \rho_{t'}}, \frac{\partial \tilde{\pi}}{\partial \rho_t} = \frac{\partial \tilde{\pi}}{\partial \rho_{t'}}$, *and* $\frac{\partial j}{\partial \rho_{t'}} \leq -k$ *will have a non-positive effect on* τ^*, *i.e.* $\frac{\partial \tau^*}{\partial \rho_{t'}} \leq 0$. k *is positive and decreasing in* $\varphi(\rho_t)$. *It is decreasing in* α *whenever*

$$\varphi(\rho_t) > \frac{j+y+\gamma-\delta}{j\frac{\pi}{\tilde{\pi}}+\beta y} \qquad (C_K)$$

The term k tells us how much the severity of punishment must be reduced in order to avoid inadvertently strengthening the prison gang through an insufficiently targeted crackdown. Naturally, the better

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[15]In this model, a decrease in sentence length (captured by a reduction in j) reduces gang coercive power because it reduces the size of the in-prison benefits it can offer. Shorter sentences could also weaken gangs by giving them less time to learn incoming inmates' type, or to socialize new recruits, channels beyond the scope of this model.

targeted the crackdown ($\varphi(\rho_t)$), the smaller the necessary reduction in severity. An increase in α has countervailing effects: it raises the critical level of targeting φ_t^*, which increases the 'targeting gap' and raises k. Counterintuitively, though, the stronger the gang is within prison, the more effective a reduction in j is in reducing coercive power, lowering k. Condition C_K tells us which of these effects predominates. Overall, the result is promising: it suggests that Kleiman's approach is particularly apt in situations when gangs have consolidated within prison.

Recruitment

The model thus far focused on τ^*, a utility tax, as a measure of the gang's ability to induce cooperative behavior among outside members. A related aspect of gang strength is the ability to recruit outside actors to carry out actions that raise their probability of imprisonment. A key example is the PCC's reliance on unaffiliated, marginal youth as 'foot soldiers' to carry out the 2006 attacks. Specialists believe that these youth received little or no money, acting out of a desire to acquire "prison insurance" (Phillips 2006).

To clarify when such a recruiting strategy is viable, this model abstracts away from direct payments to recruits and retaliation for non-compliance, focusing entirely on the prison-insurance channel. It also adds an outside option: unlike the street-gang leaders and local drug dealers who are the players in the model above, this extension deals with low-level criminals with little or no criminal history who might realistically "go straight". The setup adapts Becker's classic (1968) formalization of individuals' decisions to commit crimes, allowing us to consider the effects of policies on both prison gang strength and the overall crime rate. Many policies are found to simultaneously reduce crime and lower the expected utility of all criminal actors, but strengthen prison gangs.

Setup and Parameter Conditions   The players are the imprisoned gang leadership and a continuum of potential recruits, indexed by $y \in [\underline{y}, \overline{y}]$ where y is an individual's expected income from non-gang, "go it alone" criminal activity (D). Rather than charge a membership tax τ, the leadership requires potential recruits to carry out a violent action as part of some coordinated attack. Cooperating (C) raises y's chances of imprisonment from π to $\widetilde{\pi}$, where $\widetilde{\pi} - \pi$ is now significant. In exchange, the leadership offers cooperators in-prison membership benefits, captured by α. To focus on the prison-insurance channel, assume that non-imprisoned recruits receive no cash or expected criminal rents: $\beta = 1$. Moreover, since there are many potential recruits, the gang cannot be bothered to track down and punish those who refuse to participate : $\gamma = \delta = 0$. Finally, assuming that potential recruits are sufficiently anonymous to police that by "going straight" they are sure to avoid jail, players now have an outside option (O) worth y_o, with $\pi_o = 0$. The choice between non-gang crime and legal activity is thus equivalent to the simplified version of Becker's model presented by Glaeser (1999).[16]

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[16]Glaeser simplifies Becker's (1968) 'intensive' choice (how many crimes to commit) to a binary choice (crime or legal activity). Glaeser has a distribution over individuals' legal wages and a constant criminal wage; I reverse the formalization, allowing the model to say something about the quality of criminals the gang can recruit; comparative statics are unaffected. The model also retains the quintessentially Beckerian assumption that "Some persons become 'criminals'... not because their basic motivation differs from that of other persons, but because their benefits and costs differ." (1968, 176)

FIGURE 4. Game Tree for the Recruitment Model
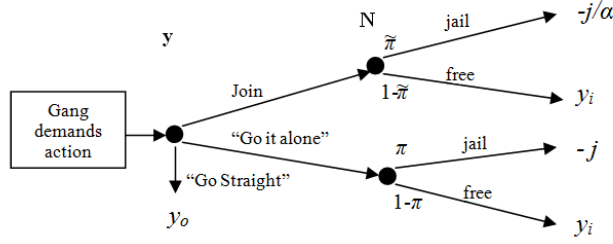
An individual y is *recruitable* if his payoff to joining the gang is higher than either the payoff to going it alone or going straight. The three actions generate three cutpoints:

If $y =$	then indifferent between:	Given by:	If y below cutpoint
y^*	joining (C) and going alone (D)	$y^* = j\frac{\pi - \widetilde{\pi}/\alpha}{\widetilde{\pi} - \pi}$	$y < y^* \Leftrightarrow C \succ D$
y^C	joining (C) and going straight (O)	$y^C = \frac{y_o + j\widetilde{\pi}/\alpha}{1 - \widetilde{\pi}}$	$y > y^C \Leftrightarrow C \succ O$
y^D	going straight (O) and going alone (D)	$y^D = \frac{y_o + j\pi}{1 - \pi}$	$y > y^D \Leftrightarrow D \succ O$

I make three simplifying assumptions. First, since all three actions are observed empirically, I focus on regions of the parameter space where all three actions are taken along some portion of the interval $(\underline{y}, \overline{y})$. Algebra reveals that $y^* > y^C \iff y^* > y^D$, so a sufficient and necessary condition for all three actions being taken is $\underline{y} < y^D < y^* < \overline{y}$. Thus all $y \in [y^C, y^*]$ are recruitable, and y^* represents the highest recruitable type. Second, I assume that the gang recruits only a small number of individuals relative to the density of criminal actors, such that it is not constrained at the low end of the criminal tail. Formally, let R be the total number of actors the gang seeks to recruit; then assume:

$$R < \int_{y^D}^{y^*} F(\cdot) dy \tag{C_R}$$

Among other things, this says that at the lower margin, we have criminals (of low quality) who do not get recruited.[17] Finally, I assume that y measures some kind of "criminal talent", such that the leadership is better off recruiting higher types, and that, as per Becker/Glaeser, comparative statics on y^D tell us about the total participation of the population in criminal activity (i.e. the overall crime rate).

Analysis First note that increases in gangs' control over prison life (α) increase outside recruiting strength (y^*) but have no effect on overall crime (y^D), while increases in the outside option y_o reduce the crime rate but have no effect on gang strength, a consequence of C_R. As for state policies, we again consider a series of policy vectors ρ_θ, where the total effects on our two variables of interest are now given

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[17]This assumption is more sound empirically and theoretically than the alternatives C_R' : $\int_{y^D}^{y^*} F(\cdot)dy < R < \int_{y^C}^{y^*} F(\cdot)dy$ or C_R'' : $\int_{y^C}^{y^*} F(\cdot)dy < R$. If either of these held, the gang would be recruiting people who would not otherwise be involved in crime. Empirically, this does not appear to be the case; theoretically, it is not clear how the gang could observe y_i for an individual who (absent recruitment) would take the outside option. In any case, most of the results hold under these alternative assumptions, though their interpretation becomes less clear.

by:

$$\frac{\partial y^*}{\partial \rho_\theta} = \frac{\partial \pi}{\partial \rho_\theta}\left[\frac{\widetilde{\pi}j(1-\frac{1}{\alpha})}{(\pi-\widetilde{\pi})^2}\right] + \frac{\partial \widetilde{\pi}}{\partial \rho_\theta}\left[-\frac{\pi j(1-\frac{1}{\alpha})}{(\pi-\widetilde{\pi})^2}\right] + \frac{\partial j}{\partial \rho_\theta}\left[\frac{\pi - \frac{\widetilde{\pi}}{\alpha}}{\widetilde{\pi}-\pi}\right] \tag{4}$$

$$\frac{\partial y^D}{\partial \rho_\theta} = \frac{\partial \pi}{\partial \rho_\theta}\left[\frac{y_o + j}{(1-\pi)^2}\right] + \frac{\partial \widetilde{\pi}}{\partial \rho_\theta}[0] + \frac{\partial j}{\partial \rho_\theta}\left[\frac{\pi}{1-\pi}\right] \tag{5}$$

As before, I first assume that changes in severity (harsher sentences) are independent of changes in 'certainty' (crackdowns), then relax the assumption.

Proposition 2a (**Harsher sentences reduce crime but aid gang recruitment**). *For any policy $\{\rho_s : \frac{\partial j}{\partial \rho_s} > 0, \frac{\partial \pi}{\partial \rho_s} = \frac{\partial \widetilde{\pi}}{\partial \rho_s} = 0\}$, $\frac{\partial y^D}{\partial \rho_s} > 0$. If C_S holds (i.e. $\alpha > \frac{\widetilde{\pi}}{\pi}$) then $\frac{\partial y^*}{\partial \rho_s} > 0$.*

In words, harsher sentences unambiguously make criminals worse off with respect to non-criminals, lowering the overall crime rate; at the same time, they increase the gang's ability to recruit as long as it is sufficiently consolidated within prison.[18] I now turn to crackdowns, assuming for the moment that they have no impact on severity.

Proposition 2b (**Crackdowns reduce crime**). *For any $\{\rho_t : \frac{\partial \pi}{\partial \rho_t} > 0, \frac{\partial j}{\partial \rho_t} = 0\}$, $\frac{\partial y^D}{\partial \rho_t} > 0$*

This says that as long as crackdowns are not exclusively targeted at gang members, they will always reduce the overall crime rate. However, they will also increase gang recruiting strength if not sufficiently targeted. As before, define the degree of targeting as $\varphi(\rho) = \frac{\partial \widetilde{\pi}}{\partial \rho} / \frac{\partial \pi}{\partial \rho}$ and φ^* as the critical level of targeting needed to avoid strengthening the gang ($\varphi^* : \varphi(\rho) < \varphi^* \iff \frac{\partial y^*}{\partial \rho} > 0$).

Proposition 2c (**Untargeted crackdowns always aid gang recruitment**). *For any policy ρ_t that has no effect on severity ($\frac{\partial j}{\partial \rho_t} = 0$), the critical level of targeting is given by:*

$$\varphi_t^* = \frac{\widetilde{\pi}}{\pi} \tag{6}$$

Since $\frac{\widetilde{\pi}}{\pi} > 1$, it is immediately clear that *any* untargeted policy increases recruiting strength. Moreover, a crackdown that affects the risk differential by a factor less than the differential itself will increase the gang's ability to recruit. This suggests rapidly diminishing returns to the targeting approach: the effect of such policies is to raise the risk differential, which in turn makes further improvements in law enforcement more likely to be counterproductive.

As for overcrowding, if condition C_S holds, then the result from above holds here as well: a seemingly sufficiently targeted policy, with $\varphi(\rho_{t'}) = \varphi_t^*$, will end up strengthening gangs if it leads inadvertently to a worsening of prison conditions ($\frac{\partial j}{\partial \rho_{t'}} > 0$). However, overcrowding will also intensify the policy's positive effect on deterrence, since $\frac{\partial y^D}{\partial j} > 0$. Thus letting criminals "rot" in jail both reduces crime and strengthens gang recruiting.

What about increasing certainty and reducing severity? As above, it is possible to reduce j enough to offset the positive effect of increased incarceration on gang strength:

Proposition 2d (**Offsetting 'more certainty' with 'less severity'**). *For any insufficiently targeted ρ_t, such that $\varphi(\rho_t) < \varphi_t^*$, there exists $k > 0$ such that any policy $\rho_{t'}$ with $\frac{\partial \pi}{\partial \rho_{t'}} = \frac{\partial \pi}{\partial \rho_t}, \frac{\partial \widetilde{\pi}}{\partial \rho_{t'}} = \frac{\partial \widetilde{\pi}}{\partial \rho_t}$, and $\frac{\partial j}{\partial \rho_{t'}} \leq -k$ will have $\frac{\partial y^*}{\partial \rho_{t'}} \leq 0$. k is decreasing in both $\varphi(\rho_t)$ and α.*

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[18]Since the risk differential $\frac{\widetilde{\pi}}{\pi}$ is now substantial, C_S is now more restrictive.

A more targeted crackdown requires a smaller reduction in severity. In this case, increases in α do not affect the size of the 'targeting gap', and so unambiguously make a reduction in severity more effective at offsetting an insufficiently targeted crackdown.

Corollary (**Offsetting reduces deterrence**). $\frac{\partial y^D}{\partial \rho_{t'}} < \frac{\partial y^D}{\partial \rho_t}$, *but* $\frac{\partial y^D}{\partial \rho_{t'}} > 0$ *whenever* $k < k^* \equiv \frac{\partial \pi}{\partial \rho_{t'}} \frac{y_o + j}{\pi(1-\pi)}$.

In words, reducing severity necessarily produces less deterrence (and hence a smaller reduction in crime) than the original policy ρ_t. However, if the targeting gap is small enough, or, ironically, if α is high enough, the net effect on deterrence will still be non-negative. This suggests that when prison gangs are very strong, taking a 'sure and swift' approach to punishment is a particularly appropriate strategy.

Discussion: Counterproductive Punishment

The model highlights the paradoxical nature of law enforcement in the face of prison gangs: the same policies that incapacitate, hurt and deter individuals may simultaneously strengthen anti-state groups by increasing their coercive and recruiting power on the street. This finding bears a family resemblance to a growing body of empirical work documenting significant, negative impacts of incarceration on economic activity (Western 2002) and political participation (Weaver and Lerman 2010). But unlike these broad social costs and unintended consequences of incarceration, prison gangs' ability to induce outside compliance, organize criminal activity and orchestrate violence cuts directly against incarceration's supposed benefits: the restoration of state authority.

The dilemma is further exacerbated by two key asymmetries between the individual and collective effects of punishment, summarized in the table below. First, the individual-level effects are more visible than prison-gang consolidation and projection, which are slow, difficult to observe, and poorly understood processes. The second asymmetry is one of 'returns to scale', i.e. diminishing vs. increasing marginal effects. As the level of incarceration rises, the positive effects of incapacitation and deterrence are thought to decrease; the gang-strengthening effects modeled here, on the other hand, can become larger. I first discuss the reasons behind these asymmetries, then draw out the implications for the efficacy of incarceration in restoring the state's legitimate authority.

		Individual Effects (Incapacitation, Deterrence)			**Collective Effects** (Gang coercive power)	
Impact on State Authority		Authority-restoring			Authority-eroding	
Visibility	Timing	High	Short-term	Low		Long-term	
	Measurability		Easy, public			Difficult, hidden	
	Causal Pathway		Clear, well-theorized			Counterintuitive	
'Returns to scale'		Diminishing returns			Increasing returns	

Visibility Incarceration immediately and directly incapacitates criminals: the causal pathway is crystal clear and effect is estimated via the criminological concept of a personal crime rate, λ. Deterrence is somewhat more opaque: it acts at a distance, and there is a real question as to how well a purely rational model captures potential criminals' decisions to commit crimes (Kleiman 2009). But the very existence of an empirical debate underlines the relative visibility of these individual effects: well-specified causal theories that point to observable outcomes, which can be measured with ample, publicly available data on arrests, inmate profiles, recidivism, and so on.

The gang-strengthening effects of incarceration are far less visible. The causal pathway is not obvious or immediate (and is formally modeled herein for the first time, to the best of my knowledge). Prison gang projection occurs, by definition, outside prison, at a distance, and many observers, including law enforcement officials, are reluctant to believe that imprisoned criminals can really be controlling outside actors. Moreover, both consolidation of power within prison and projection of that power onto the street occur over years or decades. The organization of street gangs into prison-based networks can even reduce visible crimes—particularly in the short-run—sometimes as a direct result of prison-gang dictums against ostentatious violence (such as the Eme's prohibition of drive-by shootings in LA or the PCC's regulation of revenge killing is São Paulo). And when gangs do engage in organized outside violence, few understand that high incarceration rates may have *helped* make such violence possible.

Even when the causal pathway is understood, the components of gang strength and their resulting actions are not easily measured: prison gangs are usually secretive about their membership, internal codes, plans, and activities (which often constitute crimes). Authorities everywhere struggle to obtain accurate information about criminal entities; Macauley (2007), for example, details the obstacles to knowledge production within Latin American criminal justice systems that contribute to intelligence failures like the one that preceded the PCC's attacks. But prison-gang growth itself exacerbates this lack of information in three key ways: first, by producing illicit rents that can be used to (further) corrupt the guard corps and administration. Second, gang power within prison is a 'black eye' for both administrators and elected officials, creating incentives to distort, over-classify, or simply prevent the collection of accurate information, whether by their own agencies or prison ethnographers. Finally, even well-meaning officials and researchers may simply be unable to gain access to increasingly prisoner-run prisons. In São Paulo, prior to the PCC's 2006 attacks, these dynamics led to the disastrous combination of an official policy of denial of the gang's existence and a lack of academic research to counter it (Salla 2007).

This asymmetry in visibility adds a political dimension to the 'overcrowding' results above. The public may see no reason not to let criminals "rot" in jail, even though it is precisely these execrable conditions that give gangs leverage over members. Conversely, the reduction in severity required to avoid strengthening prison gangs may reduce total deterrence, leave criminals better off, and make policymakers appear "soft on crime". This political issue is aggravated by states' resource constraints and opportunity costs: in contexts where many law-abiding citizens live at or below subsistence levels, prison conditions any better than sub-human may be viewed as "paying people to go to jail".

'Returns to Scale'   Individual effects are widely thought to have diminishing marginal returns (Kleiman 2009, Useem and Piehl 2006). Because criminal justice systems usually direct time and resources to the most serious crimes, they tend to incarcerate the most dangerous criminals first, so that the incapacitation of each additional criminal is of lower social value. Similarly, most citizens are deterred from crime by even low levels of punishment, while hardened and professional criminals may not be deterred even by very high levels. The result is that the marginal deterrent effect of more punishment is decreasing, and may even become negative (Liedka, Piehl, and Useem 2006).

In contrast, the gang-strengthening effects of increased punishment are likely to be of an increasing-returns nature. This is a reduced-form way of summing up a number of phenomena that may come into play over the relevant range. First, as the model shows, the gang-strengthening effects of crackdowns are directly increasing in gangs' power within prison; there will be positive feedback if gangs use increased coercive and recruiting power to further consolidate. Second, if, as I have argued, prison gangs use co-

ercive force to become 'focal' and induce cooperative equilibria on outside actors, then an increase in punishment could have a decisive, tipping-point effect. Corruption also seems to be an equilibrium phenomenon (Fisman and Miguel 2007); if true, small increases in punishment, raising the gang's coercive power and hence its illicit surplus, could help 'tip' a guard corps or police force from honest to corrupt. Finally, as prison becomes an increasingly common part of the life course for targeted demographic groups (Pettit and Western 2004), going to prison and joining a prison gang may come to be seen as a rite of passage, and obtaining 'prison insurance' a widespread community norm.

Putting together the foregoing claims, Figure 5 offers a schematic and conjectural portrait of the situation:

FIGURE 5. Individual vs. Collective Effects of Incarceration on State Authority
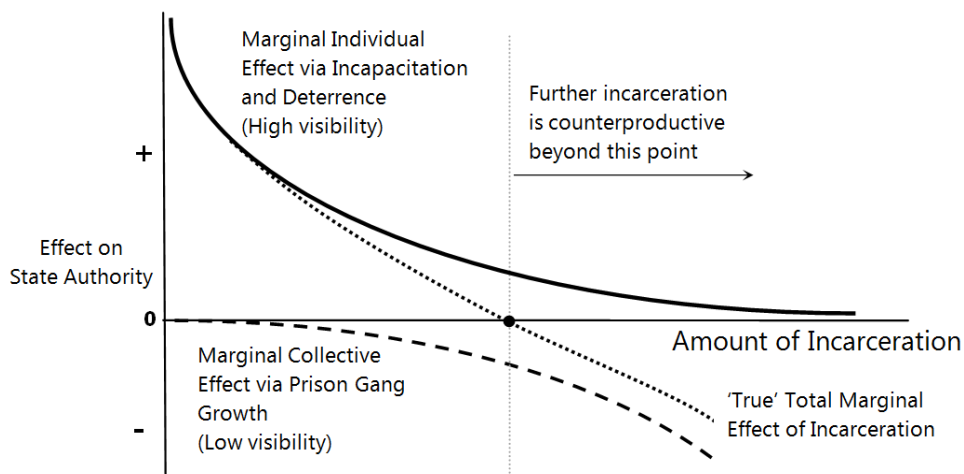
The marginal effect from incapacitation and deterrence on state authority is positive and quite high at low levels of incarceration, since it is in this region that basic social order is established. At higher levels of incarceration, the marginal benefit is lower because most people have already been deterred or incapacitated. These effects are salient and (roughly) measurable via the crime rate. The marginal effect from prison gang growth on state authority is negative, small at low levels of incarceration, but larger at higher levels, once gangs have consolidated and begun to project. The curve is downward-sloping to show these 'increasing returns' and dashed because the effects are not immediately or easily observed. The 'true' total marginal effect of incarceration on state authority is shown by the vertical sum of these two curves. Unlike the observed, 'individual effects' curve, total marginal benefits become negative at some inflection point. Beyond this point, increases in incarceration continue to have observable benefits in terms of a lower crime rate, but in reality undermine overall state authority.

In this view, the dynamics of prison gangs do not merely represent a hidden cost or externality that lead policymakers to set the level of incarceration higher than socially optimal. Rather, they suggest a fundamental limit to the amount of 'restoration of authority' that the state can accomplish *at any price*. This may sound fanciful, but consider the radical (and expensive) experiments in mass incarceration that have been carried out in California, Texas, El Salvador, and São Paulo. How much legitimate authority have these experiments really produced? Crime may be 'under control', but the drug trade (and in Central America, organized extortion) continues unabated, prison riots are frequent and lethal, and in the low-income neighborhoods where many inmates come from, social order is structured more by gangs and prison-based criminal networks than by the state. In the short-run view of elected officials, this may be an

attractive trade-off, in effect subcontracting the fundamental state function of establishing order to illegal groups, who work 'cheap'. Surely, though, in the long run, such abdication by the state of its defining role erodes authority and signifies a net loss for society. And while there may be no way to quantify these losses, and a great deal left to learn about how prison gangs behave as they grow more powerful, the little comparative evidence there is suggests that we may be near, or even beyond, the inflection point.

Conclusion: Punishment Technologies and Historical Change

Wherever our societies lie along Figure 5, it is surely due in part to rapidly expanding inmate populations (i.e., an unprecedented movement rightward along the Incarceration axis). But important too are historical developments that have exacerbated the collective effects of incarceration (making the 'prison gangs' curve steeper, and hence shifting the inflection point leftward). Ironically, it was a similar shift that drove western societies to adopt incarceration as their primary form of punishment in the 18th century. Foucault's (1977) account of this transition to the modern penal system can, I argue, be generalized into a useful model for how any punishment technology can become counter-productive.

Foucault shows that public execution and torture, then the primary forms of punishment, became problematic for the state because they were increasingly generating civic unrest and disorder. The underlying logic of the punishment technology had not changed: public torture or execution of a wrongdoer at the hands of the state still (literally) incapacitated the culprit while terrifying onlookers. Nor had punishment become more expensive *per se*. Rather, shifting class and political relations meant that this terror no longer translated directly into the restoration of the king's authority (63). Instead, certain contradictions latent in the punishment technology (e.g., a public spectacle requires a crowd, which generates rowdiness) were amplified by changes in the wider social context (ideological ferment and agitation). These changes shifted the inflection point beyond which the individual effects of punishment (incapacitating criminals and terrorizing onlookers) were outweighed by negative, collective effects (inciting violent mobs), so that further punishment actually eroded overall state authority. In retrospect, this seems fairly obvious: publicly brutalizing citizens in the hopes of cowing the masses into submission strikes most modern observers as a self-defeating strategy. And yet to leaders at the time, this self-defeating quality of the prevailing punishment technology was far from obvious, and in any case to *not* publicly torture criminals might well have seemed like "going soft on crime".

Eventually, though, faced with a punishment technology that had become counterproductive, states adopted incarceration (along with the regime of discipline and constant observation that Foucault dissects) as the primary form of punishment. Incarceration has many qualities that makes it attractive to the modern state (e.g., it simultaneously recasts punishment as 'rehabilitation' and hides it from public view). Yet it has its own latent contradictions: it brings criminals together under virtually identical conditions, thus aligning their interests; it provides them with opportunities and incentives to network and share information; it makes the state responsible for their physical well-being, often at significant expense; and it generates situations in which outnumbered guards must ultimately win the cooperation of inmates through semi-corrupt concessions (Sykes 1958). Historically, these unintended consequences have been manageable as "corrections" problems, never seriously threatening the efficacy of incarceration as a means of restoring state authority.

This has changed, as I have argued throughout. In 18th century Europe, agitation over class roles and civil rights transformed public executions into rowdy citizen-state confrontations. In the contemporary

globalized economy, prison gangs, once a mere headache for prison officials, have been "potentialized" by two key factors. First, technological changes have facilitated communication and cooperation. Cell phones have proven both transformational in impact–as with the PCC's synchronized attacks and multi-juror 'trials'–and impossible to control, even in maximum-security US prisons (California Department of Justice, 2010). Equally important, however, is the steady accumulation and diffusion of organizational know-how. Techniques of collective action and protest were transferred (probably unintentionally) by jailed leftist groups to the founders of the CV (Lima 1991, 45-9), and were then deliberately copied and improved upon by the PCC (Jozino 2004, 31). Statutes and constitutions, facilitating cooperation and organizational survival, have been promulgated by Californian (Skarbek 2010), Texan (Fong 1990) and Brazilian prison gangs (Amorim 2003, 166-7, 388-90). While this accumulation of know-how was facilitated by mass incarceration, its technological nature means that simply reducing the inmate population would not reverse the trend.[19]

The other key factor is the illicit drug trade and states' repression of it, both of which have expanded rapidly over the last 40 years, becoming a source of enormous rents to organizations that can control significant market shares.[20] At the same time, local retail drug markets tended toward fragmentation, with small gangs and outfits battling for modest pieces of turf. Prison gangs' capacity to project power is only as valuable as the uses to which it can be put; the drug trade has massively increased the potential returns to the kind of collective criminal activity that prison gangs are uniquely positioned to organize. The history of the CV illustrates the point: when it first began projecting power, its members were mostly thieves with no experience in the drug trade. Its first collective criminal actions were armed robberies, but the net profits from these very risky activities were meager, and the CV stagnated. It was only when leaders switched to a strategy of cornering retail drug markets that the CV grew into the citywide criminal network it is today (Amorim 2003). The PCC also moved from property crime into the drug trade in the last decade, and it appears that the Central American *maras* are pursuing a similar strategy.

The drug trade, or rather its prohibition, has potentialized prison gangs in another important way: it has criminalized a set of behaviors—production, sale, purchase and consumption—that are extremely widespread and inelastic to disincentives. This gives states two bad options: turn a blind eye to the very activities they have demonized, or fill their prisons with drug offenders. Following the latter approach has given prison gangs an enormous pool of "talent" from which to recruit, both among those already incarcerated and those who, realistically assessing their odds, expect to be at some point.

Accumulating over time and reinforcing one another, these changes have transformed mass imprisonment into a key organizational asset for criminal networks. The logic of incarceration has not changed: it protects society by removing dangerous criminals from its midst, and imposes the pain of imprisonment on the guilty, deterring future crimes. But when prison gangs come to control the prisons and transform them into recruitment and training centers, incarceration, rather than restore the state's legitimate authority, merely draws attention to its absence. And when prison gangs use that control to coordinate the actions of outside criminal agents, further increases in incarceration rates may only strengthen criminal networks at the expense of the state.

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[19]Technologies are often path-dependent because their adoption generates increasing costs to switching or reverting (Boas 2007). When belligerents master a technology of conflict, the strategic interaction may be permanently altered since the cost to the state of returning to the *status quo ante* is now far higher. The point was made eloquently by Mr. Dryden, speaking of nationalist insurgents, in *Lawrence of Arabia*: "You give them artillery and you've made them independent."

[20]Miron's very conservative econometric estimate (2003) finds that prohibition makes cocaine and heroin 2.5-5 and 8-19 times more expensive than it would be under a legal regulatory scheme, far *lower* than commonly cited estimates. The US market for cocaine is estimated at $50 billion annually (Reuter et al. 2009).

The problem is not principally one of low state capacity as commonly understood: US prison gangs, even while subject to some of strictest and costliest custodial regimes in the world, have built extensive outside criminal networks and struck operational agreements with international drug cartels. In fact, some aspects of state capacity and rule of law, such as an efficient, non-corrupt criminal justice system that respects the rights of prisoners (O'Donnell 2004), can be a boon to incarcerated criminal groups. Nor is the problem limited to prison gangs *per se*: groups like Peru's Shining Path (Rénique 2003), Colombia's paramilitaries (BBC 2007), and the Irish Resistance Army (English 2005, 187-205) have all found ways to use incarceration to their advantage, transforming prisons into tactical headquarters and recruiting/training facilities. The mechanisms that allow prison gangs to win control over prison life and project power beyond the prison walls are, to a large extent, generic features of incarceration. And since incarceration has become, in the modern era, the sole form of punishment upon which all state coercion ultimately rests, what these cases expose is a fundamental limit to state power.

Appendix: Proofs

Lemma 1 Existence: Assume Equation 1 holds. M's strategy is to play C whenever it leaves him weakly better off than D, and D otherwise; the gang sets $\tau = \tau^*$. At τ^*, $C \succeq_M D$, so M plays C and cannot profitably deviate. The gang's payoff is increasing in τ, but if $\tau > \tau^*$ the gang gets 0, so it cannot profitably deviate. **Uniqueness**: Assume an equilibrium exists in which the gang plays $\hat{\tau} \neq \tau^*$. Sub-game perfection requires M to accept any $\tau \in (0, \tau^*)$ and reject any $\tau > \tau^*$. If $\hat{\tau} > \tau^*$, the gang gets 0 and could profitably defect to $\tau \in (0, \tau^*)$. If $\hat{\tau} < \tau^*$, the gang could profitably defect by offering $\hat{\tau} + \varepsilon$. Contradiction. **Corollary:** Note that $\lim_{\tilde{\pi} \to \pi} \tau^* = j\pi(1 - 1/\alpha) + y(\beta - 1)(1 - \pi) + \gamma\pi + \delta(1 - \pi)$. By assumption, the first term is strictly positive, and the others weakly so.

 Proposition 1 1a: Follows from Equation 2. **1b:** By assumption, $\frac{\partial \pi}{\partial \rho} = \frac{\partial \tilde{\pi}}{\partial \rho} > 0$; substituting into Equation 2 and rearranging gives $\frac{\partial \tau^*}{\partial \rho_u} = \frac{\partial \pi}{\partial \rho}[j - j/\alpha - y(\beta - 1) + \gamma - \delta]$. This is positive if the expression in brackets is positive. **1c:** $\frac{\partial \tau^*}{\partial \rho_t} = \frac{\partial \pi}{\partial \rho_t}[j + y + \gamma - \delta] - \frac{\partial \tilde{\pi}}{\partial \rho_t}[j/\alpha + \beta y]$, which is positive whenever $\frac{\partial \tilde{\pi}}{\partial \rho_t} / \frac{\partial \pi}{\partial \rho_t} > \frac{j+y+\gamma-\delta}{j/\alpha+\beta y}$. Comparative statics for α, β, γ, and δ are obvious; $\frac{\partial \varphi_t^*}{\partial y} = \alpha \frac{j(1-\alpha\beta) - \alpha\beta(\gamma-\delta)}{(j+\alpha\beta y)^2}$, which is certain to be negative if $\gamma > \delta$. **1d:** $\frac{\partial \tau^*}{\partial \rho_t} = 0$, so $\frac{\partial \tau^*}{\partial \rho_{t'}} = 0 + \frac{\partial j}{\partial \rho_{t'}}[\pi - \frac{\tilde{\pi}}{\alpha}]$. Since $\alpha > \frac{\tilde{\pi}}{\pi}$, $\frac{\partial \tau^*}{\partial \rho_{t'}} > 0$. **1e:** By assumption, $\frac{\partial \tau^*}{\partial \rho_t} = \frac{\partial \pi}{\partial \rho_t}[j + y + \gamma - \delta] - \frac{\partial \tilde{\pi}}{\partial \rho_t}[j/\alpha + \beta y] > 0$, and $\frac{\partial \tau^*}{\partial j} = \pi - \frac{\tilde{\pi}}{\alpha} > 0$, so by continuity, there exists $k \in \mathbb{R}^+$ such that $k = \frac{\frac{\partial \pi}{\partial \rho_t}[j+y+\gamma-\delta] - \frac{\partial \tilde{\pi}}{\partial \rho_t}[j/\alpha+\beta y]}{\pi - \tilde{\pi}/\alpha}$. For any $\hat{\varphi}(\rho_t) > \varphi(\rho_t)$, we can write $\hat{\varphi}(\rho_t) \equiv \widehat{\frac{\partial \tilde{\pi}}{\partial \rho_t}} / \widehat{\frac{\partial \pi}{\partial \rho_t}}$ as $x\frac{\partial \tilde{\pi}}{\partial \rho_t} / y\frac{\partial \pi}{\partial \rho_t}$ where $x, y \in \mathbb{R}$ and $x > y$. Then $k(\cdot, \hat{\varphi}(\rho_t)) - k(\cdot, \varphi(\rho_t)) = y - x < 0$. $\frac{\partial k}{\partial \alpha} = \frac{\tilde{\pi}}{(a\pi - \tilde{\pi})^2}[\frac{\partial \tilde{\pi}}{\partial \rho_t}(j\frac{\pi}{\tilde{\pi}} + \beta y) - \frac{\partial \pi}{\partial \rho_t}(j + y + \gamma - \delta)]$; the first term is positive, the term in brackets is positive whenever condition C_K holds.

 Proposition 2 2a-2c: These follow from differentiation of Equations 4 and 5. **2d:** By assumption, $\frac{\partial y^*}{\partial \rho_t} = \frac{j(1-1/\alpha)}{(\pi-\tilde{\pi})^2}\left[\tilde{\pi}\frac{\partial \pi}{\partial \rho_t} - \pi\frac{\partial \tilde{\pi}}{\partial \rho_t}\right] > 0$, and $\frac{\pi - \tilde{\pi}/\alpha}{\tilde{\pi}-\pi} > 0$, so by continuity, there exists $k > 0$ such that $k = \frac{\tilde{\pi}-\pi}{\pi-\tilde{\pi}/\alpha}\frac{j(1-1/\alpha)}{(\pi-\tilde{\pi})^2}\left[\tilde{\pi}\frac{\partial \pi}{\partial \rho_t} - \pi\frac{\partial \tilde{\pi}}{\partial \rho_t}\right]$. As per the proof of Proposition 1e, $\hat{\varphi}(\rho_t) > \varphi(\rho_t) \implies k(\cdot, \hat{\varphi}(\rho_t)) - k(\cdot, \varphi(\rho_t)) = y - x < 0$. $\frac{\partial k}{\partial \alpha} = \frac{j\left[\tilde{\pi}\frac{\partial \pi}{\partial \rho_t} - \pi\frac{\partial \tilde{\pi}}{\partial \rho_t}\right]}{(\tilde{\pi}-\alpha\pi)^2}$ which is positive since $\varphi_t^* > \varphi(\rho_t)$. **Corollary:** $\frac{\partial y^D}{\partial \rho_{t'}} = \frac{\partial \pi}{\partial \rho_{t'}}\left[\frac{y_o+j}{(1-\pi)^2}\right] + \frac{\partial j}{\partial \rho_{t'}}\left[\frac{\pi}{1-\pi}\right]$, which is less than $\frac{\partial y^D}{\partial \rho_t}$ for any $\frac{\partial j}{\partial \rho_{t'}} < 0$. $\frac{\partial y^D}{\partial \rho_{t'}} > 0$ implies $-\frac{\partial j}{\partial \rho_{t'}} = k < \frac{\partial \pi}{\partial \rho_{t'}}\left[\frac{y_o+j}{(1-\pi)^2}\right]\frac{1-\pi}{\pi} = \frac{\partial \pi}{\partial \rho_{t'}}\frac{y_o+j}{\pi(1-\pi)}$.

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