Economic Origins of the Mafia and Patronage System in Sicily

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Abstract

Organized crime satisfies a demand for necessary social services in the absence of effective government institutions. This paper examines the rise of the Sicilian mafia. Using system dynamics, we model this system and test various policies to determine what factors have the greatest impact on mafia power. Based on the experiments, the most effective policies for reducing mafia power are those that decrease the demand for private protection services by reducing the threat of banditry in society, and not those policies that act against the mafia directly. We also examine historical examples of other mafia-type organizations and discover that our findings apply not just to Sicily, but also to other societies including present-day Iraq and Afghanistan.

Introduction

Organized crime is a pervasive problem in much of today's global economy (Milhaupt & West 2000). Syndicates and cartels control much of the world's global narcotics trade, and also earn significant profits from illegal activities such as gambling, prostitution, smuggling, extortion, and racketeering. Of these global crime syndicates, perhaps the most famous is the Sicilian mafia. Although the modern perception of the mafia is based heavily on media portrayals such as the Godfather movies or The Sopranos television show, it is important to realize that the mafia's roots were not as a normal bandit gang that used the threat of violence and extortion to gain power through entirely illegitimate means. Rather, most organized crime syndicates, including the mafia, initially gained much of their power by acting as parallel or substitute legal system, taking advantage of high demands for services such as private protection during periods or places characterized by an absence of effective government institutions.

In this report, we examine the Sicilian mafia in an effort to better understand the dynamics associated with the formation of mafias. The Sicilian mafia came into existence during a time of transition in Sicily following the abolition of feudalism and the creation of the Italian state. Prior to the Italian revolutions of 1848 and 1860, land ownership in Sicily was based on a feudal system with peasants living on land owned by absentee landlords. To ensure that they maintained control of their property, these landlords would often rent their property to middle-class intermediaries, known as "gabelloti" who managed the estates and often coerced local peasants into working on the lands for low wages. The period following the abolition of feudalism saw not only an increase in the number of landowners with property to protect, but also in banditry and the associated threats to personal property. As a result of this breakdown in social structures and the inability of the absentee landowners to maintain the status quo by controlling the peasants, the influence of the gabelloti increased and they became the de facto agents of law and order in rural Sicily. we n this manner, a system of patronage developed where the gabelloti received payments from the landowners in return for suppression of the peasantry and payments from the peasantry in return for the promise of protection and continued employment. These gabelloti and the soldiers they hired to enforce the system of patronage and control banditry were the genesis of today's modern Sicilian mafia (Blok 1966, Blok 1969, Bandiera 2003).

We take the lessons learned from our numeric simulation experiments specific to the Sicilian mafia and examine the conditions that led to the formation of five other historical mafia-type organizations. We discuss the similarities between these disparate mafias, demonstrating that the policy recommendations associated with our model apply not only to conditions in 19th-century Sicily, but also to almost any condition of lawlessness and lack of effective government institutions that are favorable to the formation of a mafia-type organization. These lessons are particularly relevant today when anticipating the likely results of rapid societal change in such global hotspots as we raq and Afghanistan, as current conditions in both countries suggest the emergence of a market for services that have historically been provided by mafia-like organizations.

Mafia in Sicily: a Historical Perspective

Sicily under Feudalism

Prior to the 19th-century, the structure of society in Sicily was based on feudalism, or serfdom, similar to that of most of medieval Europe. A feudal society is one that is characterized by a dominant stratification between two classes: a small elite minority that owns almost all of the land in rural areas while living in urban areas; and a large peasant population that lives in small villages and works the land for minimal compensation while passively accepting its subservient role (Blok 1966).

In Sicily, the feudal structure consisted of land that was divided into large estates, or *feudo*, owned by barons or other nobility (Blok 1966). These barons were granted their power by the foreign powers that historically ruled the island (e.g., the Spanish, the Austrian Hapsburgs, and the Bourbon kings of Naples), who relied on a few local noble families to manage public affairs. we n return, these families were given control over lands encompassing three-quarters of the villages on the island (Bandiera 2003). Because the land-owning aristocrats tended to live in either Naples or Palermo, many of them leased their property to tenants known as *gabelloti* who managed the lands in their stead. The gabelloti agreed to pay a fixed annual sum to the owner, and acted as "substitute landlords who run the estates, live on them and conclude labour contracts with the peasants" (Blok 1966). Each baron also maintained a standing army that they used to protect their fields and police the peasants (Bandiera 2003).

Under the feudal system, peasants were obligated to work on the land owned by the ruling class in return for a small percentage of the food that they produced and the promise of protection from bandits and the armies of neighboring lords and barons. The landowners also granted certain minimal land rights to the peasants, including the rights to use the land for hunting, pasturing of livestock, and gleaning grain that was leftover from the harvest (Blok 1966). These agreements were arranged through the use of written charters, although encroachments on the rights of peasants "were the rule in this period, during which the lords, and gradually in their wake the great lease-holders (gabelloti), usurped the domanial and communal lands on which the peasants had various rights … fundamental for their livelihood" (Blok 1969).

Landownership Reforms in 19th-Century Sicily

The British gained control of Sicily during the Napoleonic Wars of the early 19th-century and officially abolished feudalism by law on the island in 1812 (Bandiera 2003). The Bourbon kings continued these reforms after regaining control of Sicily in 1816. These land reforms included:

- The abolition of primogeniture (i.e., the tradition of the first-born son inheriting all of his fathers' property to the exclusion of younger siblings) in 1820;
- The seizure of land in settlement of debts in 1824; and,

- An order giving peasants property rights over at least one-fifth of the land where common rights were enjoyed under feudalism (Bandiera 2003).

As a result, the number of large landowners in Sicily increased from 2,000 to 20,000 between 1812 and 1860 (Bandiera 2003). However, Blok notes that this attempt at landownership reform did not have any significant de facto consequences and, if anything, actually reinforced existing structures by weakening the position of the peasant class (Blok 1966, 1969). Specifically, although members of the peasant class were freed from their positions of servitude, the vast majority were still excluded from any forms of landownership while also losing their traditional rights under feudalism.

Instead of empowering the peasants, the land reforms initiated in Sicily during the 19th-century led to the creation of a new class of landowners comprised of the gabelloti. Although many of the large feudal estates were broken into small parcels following the abolition of feudalism, ownership of most of these properties was granted to their former stewards (i.e., gabelloti), rather than to peasants (Blok 1966). Often this occurred because the estate-owners anticipated the expropriation of their lands by the government and were eager to sell them before they lost their ownership to anyone who would be willing to pay (Blok 1969). The gabelloti, in turn, used their new riches and power to acquire a position amongst the elite upper classes. Although reluctant to give up power, the old aristocracy found that they had a common interest with the gabelloti in terms of suppressing the peasantry at any price. Thus, as long as the gabelloti were able to continue the maintenance of a social structure built around quasi-feudalism, the aristocracy was willing to allow them into the system of landownership (Blok 1966).

The Italian Revolution of 1860 and the formation of the new Italian state (including Sicily and the former Papal States) had additional ramifications on the societal structure of Sicily. For example, from 1862-1863, the state confiscated a large share of public and church landholdings and redistributed them to the public (Bandiera 2003). This land distribution resulted in the creation of more than 20,000 private landowners (Blok 1969). However, most peasants were again excluded from this redistribution, as the vast majority of these properties were given to their former landlords, the gabelloti (Blok 1966, 1969). Moreover, those lands that were given to peasants tended to be very small (e.g. 4.5 hectares) and of the very lowest quality. As a result, their owners often had to earn their livelihood by continuing to work as share-croppers on their former masters lands (Blok 1966). Other peasants found that the land reform meant that they had lost access to the land for traditional uses granted to them by the church.[1] (Blok 1966)

The post-revolution land reform had additional unintended consequences that helped encourage the growth of the mafia. Notably, the confiscation of church lands led to a feeling of hostility amongst the Popes towards the Italian government, and because Sicily was a stronghold of Catholicism, its citizens were strongly influenced by the

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[1] Blok cites the example of a village in Sicily with 700 ha of wooded land confiscated from a local monastery in the 1860s. When this estate was under control of the church, peasants were allowed to use the land for such purposes as gathering firewood and pasturing livestock, and the monastery provided an important source of employment and alms. When the estate was confiscated, a local Mafioso used his influence to arrange an auction where a merchant from a lower social stratum gained ownership of the property for a very low price. This provided the Mafiosi with a loyal servant while keeping control of the land away from the peasantry. (Blok 1966)

Popes' edicts that Catholics refuse to cooperate with the new state. As a result, the Italian government had very little social control over much of Sicily. For example, there were usually less than 350 policemen stationed in the entire island of Sicily (or one per 28 square miles) (Bandiera 2003).[2] Moreover, bandits exacerbated the sense of lawlessness by arguing that any peasant who sought the help of the police was going against the direct wishes of the Pope. we n some communities, it was even considered a civic duty to keep the police out of local affairs (Brögger 1968). This power vacuum would be instrumental in the rise of the mafia.

The Role of Mafia and Bandits in Sicilian Society

As discussed in the previous section, the societal structure of mid-19th century Sicily was characterized by two major factors: a general sense of lawlessness due to the absence of an effective state police force, and a de facto feudal system where most of the land in rural areas was owned by a relatively small number of absentee landlords. These factors resulted in a peasantry that found itself beset by crime and looking for an organization that could provide a sense of order. The mafia stepped in to fill this role.

Following the Italian revolution, bandits infested large areas of rural Sicily. Part of the increase in crime was directly caused by the confiscation of church estates and the sale of the land to private hands, as peasants who found that they no longer had access to traditional sources of income (i.e., firewood gathering, livestock grazing) turned to a life of banditry instead (Blok 1969). The extent of the lawlessness can be seen in a local report from rural Sicily in 1914: "Thefts of cattle and the killing of men and animals are such common occurrences that the papers do not even report them any more" (Blok 1966). A Sicilian magistrate noted in 1874 that "people in the countryside [are] more afraid of criminals than they are of the Law … [the] public force is completely overcome by the strength of the criminals" (Bandiera 2003). Farmlands and vineyards were particularly vulnerable to theft as local peasants chose to reside in small towns or villages rather than the countryside, both for reasons of safety (Blok 1966) and because farming techniques did not require permanent workers (Bandiera 2003).

Under feudalism, absentee landowners in Sicily used standing armies to protect their property from bandits and to control the peasantry. After the abolition of feudalism, the legal power of enforcement lay in control of the state police force. However, due to the ineffectiveness of the local police in controlling banditry, landowners were forced to obtain private protection. This was accomplished primarily through leasing the property to a gabelloto, who in turn hired a suite of retainers to act as a private police force (Blok 1969). These police forces consisted of two positions: a *soprastante*, or administrator of the estate; and the *campieri*, armed men on horseback who protected the estate from such transgressions as theft or abusive pasturage. Both positions were paid annually, and were peasants who were often recruited from the ranks of bandits or common criminals, as the main criterion for their employment was the quality to make themselves respected by the

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[2] The government also instituted twenty-five "Companies at Arms" or "cavalry," comprised mainly of former bandits and criminals, to police the countryside. These companies would arrive in each town two or three times a year to round up a token number of criminals, followed by periods of months where all crime went unpunished by the state. we n addition, these companies were notoriously susceptible to corruption and often colluded with the same bandits that they were intended to persecute. (Bandiera 2006)

local population (Blok 1969). Landowners "preferred to hire the best and most violent bandits as guardians of their properties, thus using the criminal reputation of one as a defense against the crimes of others …" (Bandiera 2003).

The mafia also played an important part in running the local economy, as many gabelloti acted as landlords for the absentee land owners. They would lease small plots of about five hectares to peasants for one year and provide seed for sowing. we n return the peasants would be allowed to farm their plots, using their own equipment. At harvest time, the gabelloto would take the first sowing-seed from the crop and divided the remainder into three parts: two for the gabelloto and one for the sharecropper. The farmer would also be required to give 14 kg of his share to the campiere, although he would often give more than required in the hope of being considered for another contract in the following year (Blok 1966). This tribute was given in return for a promise by the campiere to guarantee the protection of the peasant's life and property. One report noted that, "Every peasant who wishes to avoid trouble has to pay a tribute to the *mala gente* (lit. 'bad people')" (Blok 1966). we n the end, most sharecroppers were left with only one-quarter to one-fifth of their crops, and in years of drought or poor productivity, often were left in debt to the gabelloto. Such debtors were often forced to steal to make ends meet, thus exacerbating the problem of lawlessness (Blok 1966).

we n this way, the gabelloti, soprastante, and campieri (i.e., the mafia) gained an enormous position of power in rural Sicily. They used the threat of uncontrolled banditry (often committed by the campieri themselves) to force their protection services on the absentee landlords and peasants. At the same time a combination of the promise of rewards (e.g. favorable lands for farming) as well as a threat of violence and intimidation allowed the mafia to exploit the lower class. A positive feedback loop also existed which reinforced the growing strength of the mafia: as more people went to the mafia for ask for protection, the stronger it became with respect to legitimate enforcement, causing its political power to increase even further (Bandiera 2003). Moreover, the mafia recognized the source of their power and would occasionally allow bandits to operate with impunity in exchange for a share of the profits. For example, Blok (1966) noted that cattle-rustling was a common problem faced by peasants in mid-20th-century rural Sicily, although it would have been impossible for local bandits to steal cattle without the assistance of the local mafia who possessed the necessary knowledge of the village. However, once the mafia had become entrenched within the political landscape, it no longer needed to rely as much on the threat of banditry to give it legitimacy as it could retain its power by buying blocks of votes during elections instead. Indeed, the rate of banditry did in fact decline after it lost the protection of the mafia in the 20th-century (Blok 1969).

Model Description

This section discusses the model that we developed to describe the dynamics behind the landownership system in 19th-century Sicily. As described in the previous chapter, Bandiera (2003) presented a model based on a game-theory optimization framework to analyze the system that led to the rise of the mafia in Sicily. In contrast, we use system dynamics theory as the basis for my model.

The theoretical framework of the computer model used in this project is based heavily on one developed by Saeed and Pavlov (2008) to simulate the historical rise and fall of political dynasties in the history of China. As with the Dynastic Cycle Framework described by Saeed and Pavlov (2008), a basic relationship between peasants and bandits lies at the heart of the current simplified model of the societal structure in 19th-century Sicily. This relationship assumes that peasants earn all of their income from sharecropping, a portion of which is lost to bandits (per Blok 1966). Bandits, in turn, consist of a disorganized group of criminals who derive a portion of their income from the loot they appropriate from peasants, as well as a portion from illegal activities (e.g., prostitution, smuggling, gambling) that do not directly impact the economic well being of the peasants. Because we assume that bandits and peasants are comprised of rational people who seek to maximize their total utility, we assume that peasants will choose to become bandits if they believe that their expected disposable income from crime is greater than the disposable income they can expect to earn from farming. This behavior is demonstrated by historical example, as periods of high unemployment led to six major increases in banditry in Sicily during the 19th-century (Bandiera 2003). Similarly, bandits will take up farming if they believe that it is more profitable than banditry. Because neither the bandits nor the peasants have perfect knowledge, this simplified cost-benefit analysis is based on their perceptions of disposable income as influenced by the historical income earned by members of the two population classes during previous years.

In feudal Sicily, the number of bandits was kept in check by the standing armies owned by the feudal lords. Following the abolition of feudalism and the creation of the Italian state, Sicily fell into a state of disarray, with almost no police presence and a prevailing system of anarchy. Such a system can lead to societal collapse if banditry is considerably more profitable than farming. In this situation, peasants will turn to a life of crime because they will believe that it offers an opportunity to earn more disposable income than they would as farmers. This will increase the number of bandits in the system, as well as the total amount of crops looted from the peasants. With a greater threat of crime from bandits, peasants can therefore expect their income to decrease. (These feedback loops are illustrated in Figure 3.1.) Depending on the circumstances of the system, this decrease may be partly or wholly offset by an increase in per-capita disposable income caused by the decreased competition amongst peasants.[3] we n contrast, if the increase in disposable income from reduced competition is less than the decrease in disposable income from increased banditry, then the ratio of disposable income per bandit to disposable income per peasant will increase and even more peasants will choose to become bandits. This feedback may continue until the number of bandits has grown so large that they loot 100 percent of the crops produced by the peasants, at which point all of the remaining peasants will give up farming and choose to earn income from illegal activities such as smuggling or robbing passing merchants. we n this worst-case scenario, everyone in the system is worse off than they would be if banditry was regulated: bandits are no longer are able to earn disposable income from looting peasants

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[3] Given a fixed amount of farmland, fewer peasants working as farmers leads to a situation where each peasant will be allotted a greater area of land to farm. This, in turn, results in an increase in farming output per peasant.

as no peasant is willing to farm if he knows that he will be robbed of all of his potential income.
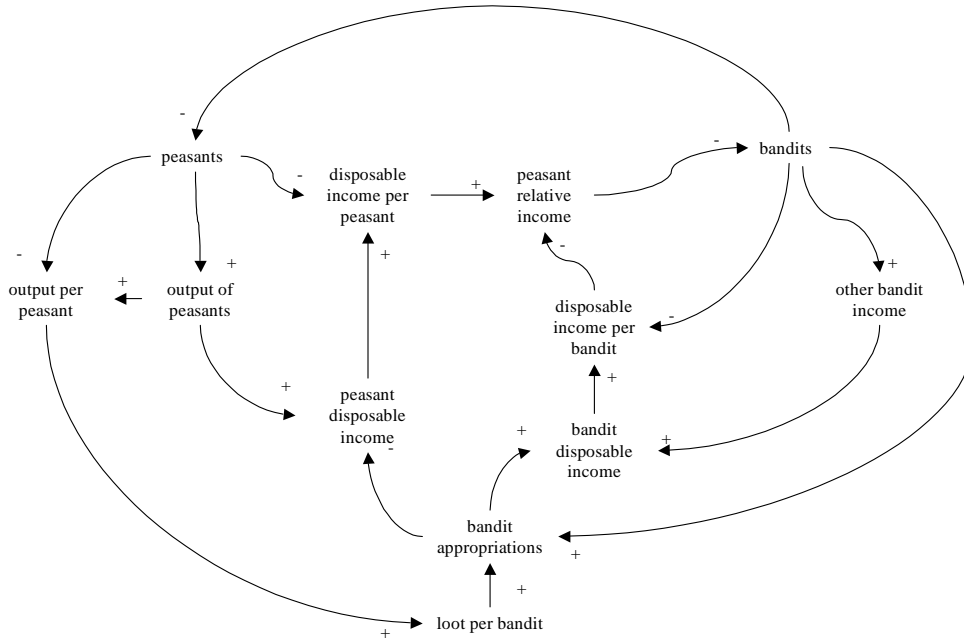

Figure 3.1: Simplified Feedback Structure of Model with No Mafia

Peasants have two incentives that cause them to be willing to pay for services that give them protection from bandits. On an individual level, peasants are willing to pay to reduce the likelihood that they will be looted of their income, as long as the reduction in risk outweighs the value of the tax or fees that they must pay. In addition, on a societal level, the peasant class as a whole can be better off by supporting a system that offers protection services, as the introduction of enforcement can prevent a systematic collapse of the social structure. In many societies, this enforcement comes from police services offered by a government that is supported through taxes. However, the lack of an effective police presence in 19th-century Sicily, combined with the distrust that many Sicilians held towards the Italian government based in Rome, led to an opportunity for the emergence of an alternative legal system in lieu of a legitimate one. This void was filled by the mafia, which offered landowners and farmers protection from crime in exchange for high levels of tribute.

The mafia was an organization comprised of gabelloti who either were middle-class villagers appointed by absentee landowners to manage their lands or former land-managers who gained control of their own estates following the landownership reforms enacted in Sicily during the 19th-century. These gabelloti exercised political control over the peasants by deciding which farmers would be allowed to work on each plot of land and the terms that they would have to pay to do so. This relationship is shown in Figure 3.2 below. In order to gain the support of the mafia, a peasant would be expected to give them a large percentage of their income as tribute. This quasi-feudal system was built

around exploitation of the peasants, and as such, it was critical for the gabelloti to suppress any desires for social change amongst the peasant class.
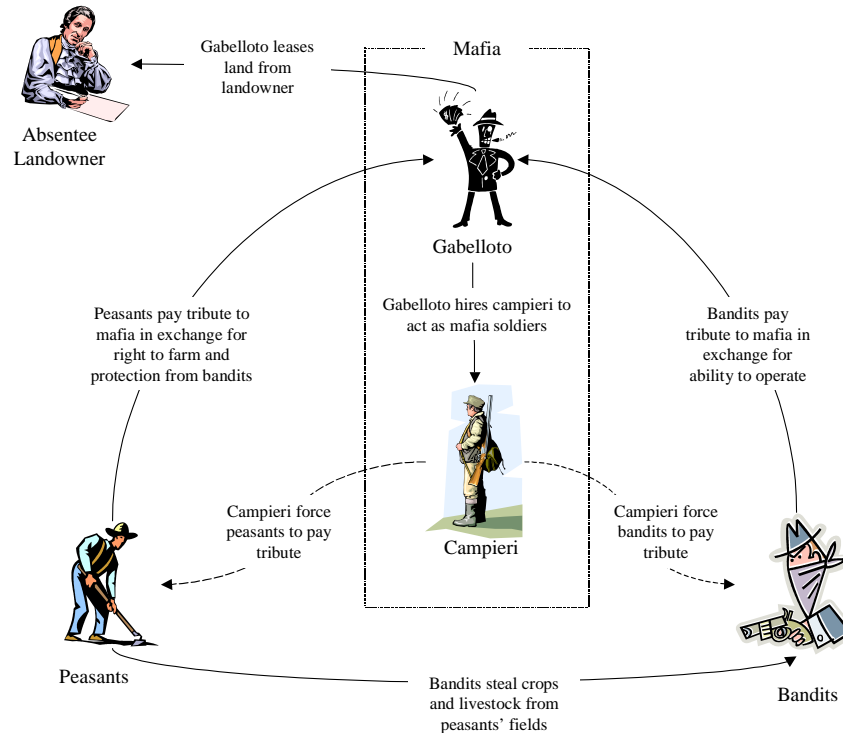

Figure 3.2: Structure of Society in 19th-Century Sicily

As discussed in Acemoglu and Robinson (2006), undemocratic societies tend to be sustainable in two general cases: when the status quo is maintained through the use of violent suppression of rebellion, or when the non-elite class perceives the status quo as legitimate and/or beneficial to their overall well-being by virtue of concessions granted to them by the elite. The former option means that the gabelloti could maintain the societal structure by hiring a relatively large number of campieri to use the threat of violence to enforce the obedience of the peasants. However, this option tends to be relatively costly, as it requires the gabelloti to pay their soldiers and also leaves them vulnerable to a potential coup. we n contrast, if the peasant class perceives the mafia as a legitimate social agency, then they will be much more willing to pay tribute and will have less desire to change the social structure. we n other words, as the importance of the services (e.g., protection from bandits) that the mafia provides to the peasants increases, the costs to the peasants of changing the social structure to eliminate the mafia become greater (Acemoglu and Robinson 2006). As a result, the peasants will be more willing to accept the status quo without revolting or seeking social change. This option may be more attractive for the gabelloti as it allows him to hire fewer campieri to control the peasants, thereby decreasing his total costs and increasing his net profit.

In general, each village in Sicily had its own mafia group, which did not associate with the groups from neighboring villages (Bandiera 2003). Furthermore, the mafia fiercely protected its territory (Blok 1969). As such, we assume that the village in our model is governed by a single gabelloto (roughly equivalent to today's mafia dons). This

gabelloto, in turn, hires campieri (e.g., mafia soldiers) to patrol his land and protect it from bandits while enforcing the system of tribute amongst the peasants. Although the campieri were sometimes recruited from the peasantry in Sicily (Blok 1969), the gabelloti most often chose to employ former bandits, especially ones who had a proven record of success and violence, as their reputation made them particularly suited to the requirements of the job (Bandiera 2003). The campieri receive fixed salaries from the gabelloto and also keep a portion of any tribute paid by the peasants to the mafia. Although data regarding the relative income of campieri is not available, the fact that the most successful bandits were willing to join the mafia suggests that they viewed it as a more profitable career, or at least a more stable one.

Unlike the flow between bandits and peasants, where individuals are essentially free to move between job classes based on their relative profitability, the flow of bandits to the mafia is tightly controlled by the gabelloti. A gabelloto's main desire is to maximize his income (Bandiera 2003). As such, his decisions to increase and decrease the number of campieri he employs are based on the impact that he believes such decisions will have on his profits. Increasing the number of campieri has two effects on the power of the gabelloto: first it makes him more powerful with respect to peasants, allowing him to use intimidation to pressure them for tribute. Secondly, the size of the mafia relative to the number of bandits is important in determining the mafia's effectiveness in controlling its territory. Without campieri acting as guards, a gabelloto could expect a decrease in his overall profits due to theft. However, instead of putting bandits out of business, the history of Sicily shows that the mafia often assisted bandits in crime such as cattle-rustling (Blok 1966). we n this way, the mafia also earns additional income from illegal activities, seen as a tribute paid to the gabelloto and campieri by bandits. Increasing the number of campieri with respect to the number of bandits increases the ability of the mafia to control its territory, catch bandits, and enforce the payment of tribute.

Although hiring campieri allows a gabelloto to increase the income he receives from tribute, he also faces direct and indirect costs associated with the hire. For example, the gabelloto must pay a fixed annual salary to every campiere in his employ, thereby decreasing his total profits. More indirectly, any tribute paid by bandits causes the income per bandit to decrease, possibly to the point where bandits will abandon crime and begin farming instead. The net result is a decrease in the amount of tribute the mafia receives from bandits (although this may be partly or wholly offset by an increase in the amount of tribute received from peasants).

Because they are profit-maximizing individuals, peasants would prefer not to pay any tribute to the mafia. However, the structure of the landownership system in Sicily forced peasants to pay for the privilege of being able to farm lands owned or managed by the gabelloto. If the peasants saw this system as illegitimate, they had the ability and numbers to revolt against the gabelloto. As such, it was in the gabelloto's favor to earn legitimacy amongst the peasants by offering them services such as protection from the threat of banditry. An increase in the relative abundance of bandits corresponds to an increase in the percent of the peasant's income that is lost to bandits. When the percent of income lost to bandits increases, more peasants are willing to pay for protection, and those that receive protection are willing to pay more in return. In such a case, a gabelloto can increase his income from tribute while at the same time maintaining the perceived

"legitimacy" of his role in society. Increasing the amount of tribute paid by peasants increases the inequality in the system, leading to a greater risk of revolution and social change per the theories of Acemoglu and Robinson (2006). However, this increase in the desire amongst the peasants for the elimination of the mafia system will be partly or wholly offset by the increases in the value of the protection services that the mafia provides to the peasants and the corresponding increases in the costs to the peasants of any social change. In contrast, a gabelloto can also increase the amount of tribute paid to him by using the threat of violence from campieri to intimidate the peasants. However, doing so greatly reduces his perceived legitimacy and increases the desire for societal change amongst the peasantry.

In our model, we assume that the mafia wishes to maintain a minimum standard of legitimacy among the general population as a decrease in the perceived legitimacy of the social system increases the risk of societal change (Acemoglu and Robinson 2006). A change in the quasi-feudal land ownership structure in Sicily would have been catastrophic to the gabelloti's ability to earn income and maintain his power (Blok 1969). If the desire for social change (i.e., the net benefits of eliminating the mafia system) became so great that the collective action problem against revolution was overcome and the peasants decided to eliminate the mafia either by using violence to seize the gabelloti's lands or by seeking the help of the Italian government, then the mafia would have lost all of its political and economic power. In addition, being perceived as a legitimate social construct by the average citizen was instrumental to the mafia's later ability to gain political power, expand its influence, and maintain its power in the face of efforts by the Italian government to eliminate the role of the mafia (Blok 1969, Brögger 1968). One proxy of legitimacy in the system is a ratio of the peasants' willingness to pay for protection to the tribute they are forced to pay to the mafia. When the tribute paid exceeds the peasants' willingness to pay, they will perceive the system as being unfair and the benefits of social change as being high, and the mafia will have to reduce its tribute demands in order to maintain the same level of legitimacy and decrease the risk of revolution. Similarly, when the peasants' willingness to pay increases due to an increase in the threat of crime, then the perceived benefits of the status quo increases and the mafia will be able to increase the amount of tribute it collects without having a negative impact on its perceived legitimacy. Tribute is paid based on a fixed percent of the total output of the peasants. Thus, if total output decreases, the income earned by the gabelloto also decreases.

Each year, we assume that a gabelloto must decide how many campieri he wishes to employ. A minimum number of campieri are necessary to enforce tribute and obedience amongst the peasants. This number is based on the total peasant population, as well as the desire for social change amongst the peasants (i.e., the perceived legitimacy of the system). In addition, the gabelloto must also hire campieri to police his lands and protect peasants from bandits. The number of campieri assigned to this task is based on the threat of crime. It is important to note that the campieri do not act as a normal police force and actively eliminate the bandits. Instead, they force the bandits to pay a portion of their income to the mafia as tribute. As the relative power of the mafia increases, the fraction of each bandit's income that he pays as tribute increases. This increase causes relative bandit income to decrease and drives some bandits to become peasants, thus
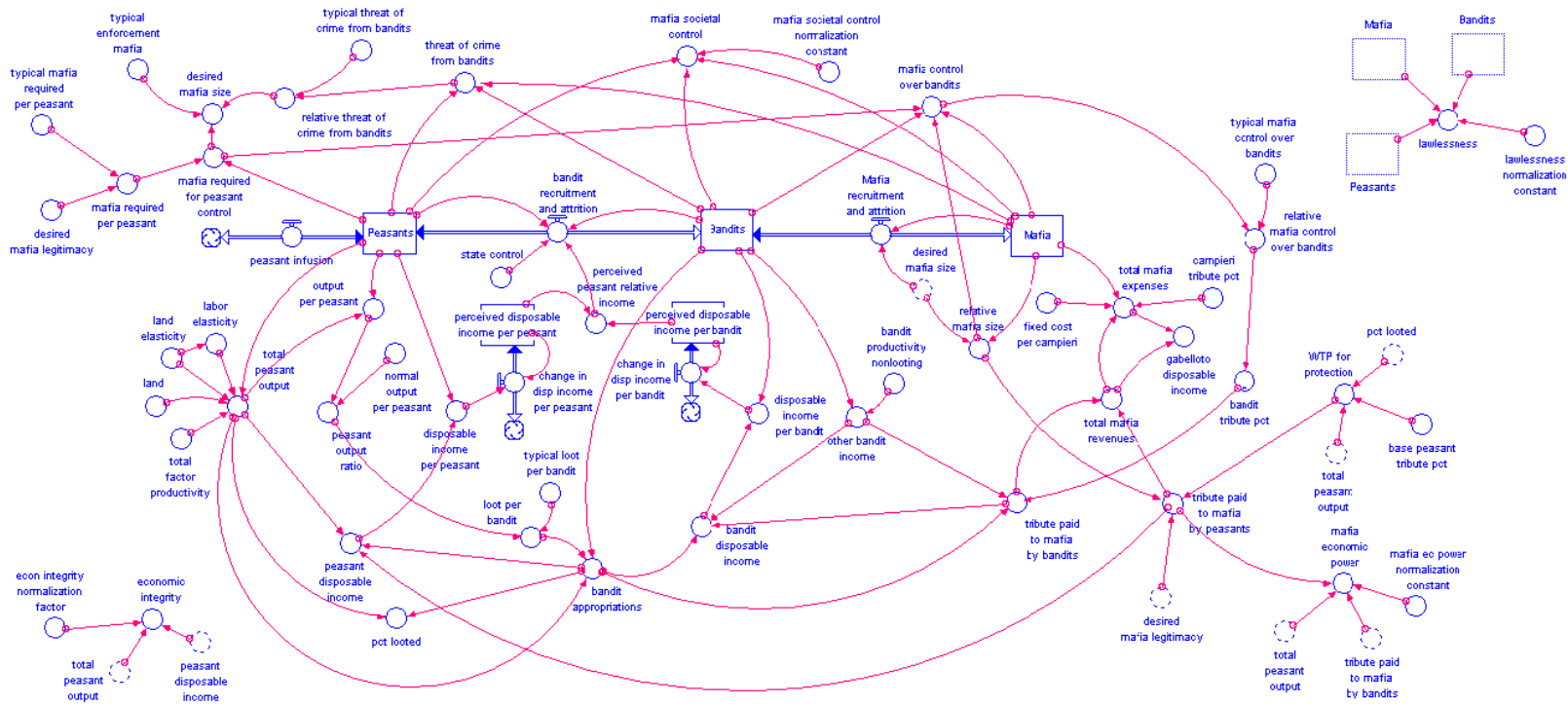
indirectly resulting in the same type of dynamics as if the campieri had acted as a more conventional police force (see Saeed and Pavlov 2008).

The relationships between model parameters in the model with mafia are shown in the causal loop diagram in Figure 3.3 below.

Figure 3.3: Simplified Feedback Structure of Model with Mafia
(Additions to model shown in darker font)

The stock and flow diagram of the model is shown in Figure 3.4. We omit a detailed description of the model equations to satisfy the page limitation for the submission. The model itself is submitted with this paper.

Figure 3.4: Stock and Flow Diagram for Mafia Model

Numeric Simulation Experiments

In this section we discuss the dynamics associated with the model of mafia in Sicily. We begin by setting the parameters of the model so that it is in equilibrium. We then perform several numeric simulation experiments by changing certain parameters and looking at the net impact of those changes on the system. These experiments are intended to either simulate actual historical events in the history of Sicily or to test policies that could have been enacted to limit the influence of the mafia. They include:

- Adding government control to the model to test whether the state of lawlessness in Sicily was important to the establishment of the mafia;
- Setting the population of Mafiosi to zero to test whether the formation of mafia was inevitable given the conditions in Sicily during the 19th-century;
- Increasing and decreasing the population of peasants to simulate the effects of population growth and emigration on the behavior of the system;
- Simulating the effects of increased productivity from capital and technological investment on the relative influence of the mafia; and,
- Examining the effects of changes in the desired level of mafia legitimacy on the system.

Due to page limitations, only the first experiment is shown in detail. Results of all experiments are summarized in the last subsection.

Definition of Model Indices

Throughout this chapter, we use four parameters to describe the state of the system. The first two of these indices are used to model the economic and political health of the peasants. "Lawlessness" is used to denote the relative power of mafia and bandits compared to the peasants.[4] This parameter is based on the assumption that peasants are better off in a system where they are not looted by bandits and do not have to pay tribute to the mafia. It is defined as: $\phi = b_\phi \cdot (M + B)/P$, where b_ϕ is a normalization constant that ensures that $\phi = 1$ in the steady state. "Economic integrity" is used to denote the percentage of peasant output that is kept by the peasants as income and not lost to bandits or the mafia. It is defined as: $\eta = b_\eta \cdot I_P / Y_p$, where b_η is a constant that ensures that the index equals one in the steady state.

The second two indices are used to model the economic and political health of the mafia. The index "mafia societal control" is an indicator of the relative power of the mafia, based on the relative size of the mafia population compared to the populations they control: $\chi = b_\chi \cdot M /(B + P)$, where b_χ is a normalization constant that ensures that

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[4] Note that there is a fundamental difference between the indices of "lawlessness" and "threat of crime from bandits" in this model. The latter represents the relative impact of banditry on the population, and the peasants in particular. In contrast, "lawlessness" represents the view of the Italian government who are concerned not only about banditry, but also about the mafia, as they view the latter as an organization outside of the law.

the index equals one in the steady state. The final index, "mafia economic power" represents the relative size of mafia income compared to total peasant productivity. It is calculated as $v = b_v \cdot I_M / Y_P$, with b_v being a normalization constant that sets the value of mafia economic power to one when the model is in equilibrium. A system with large values for the mafia control and mafia economic power indices represents a society where the mafia is a dominant political and economic force.

Equilibrium Conditions

The first step of the experiments is to initialize the model so that it is in equilibrium. These equilibrium values are summarized in Table 4.1 below. We assume an initial population of peasants (100) that is much greater than the population of bandits (10), which is in turn greater than the population of Mafiosi (5).

Table 4.1 – Equilibrium Values

Parameter	Definition	Value
P	Peasants	100
B	Bandits	10
M	Mafia (Campieri)	5
K	Land	100
α	Land elasticity	0.7
A_P	Total factor productivity	2.5
$\tilde{y}_P$	Normal output per peasant	2.5
a_B	Bandit productivity (non-looting)	0.5
$\tilde{l}$	Typical loot per bandit	2.5
WTP_0	Base peasant tribute percentage	4/9
σ	Government control	0
$\overline{i_P}$	Perceived disposable income per peasant	1
$\overline{i_B}$	Perceived disposable income per bandit	1
a_P^{out}	Normalization constant – peasant to bandit flow	0.01
a_P^{in}	Normalization constant – bandit to peasant flow	0.1
$\tilde{m}_{pc}$	Typical mafia required per peasant	1/50
$\tilde{m}_{bc}$	Typical enforcement mafia	3
τ_D	Desired mafia legitimacy	1
i_c	Fixed cost per campieri	10
λ_c	Campieri tribute percentage	0.02
b_γ	Normalization constant – threat of crime from bandits -- $(P_0 + M_0)/B_0$	105/10
b_ψ	Normalization constant – mafia control over bandits -- M_0/B_0	10/3
b_ϕ	Normalization constant – lawlessness -- $P_0/(M_0 + B_0)$	100/15
b_η	Normalization constant – economic integrity -- $(\tilde{y}_P \cdot P_0)/i_{P_0}$	250/100
b_χ	Normalization constant – mafia societal control -- $(P_0 + B_0)/M_0$	110/5

b_v Normalization constant – mafia economic power -- $(\tilde{y}_P \cdot P_0) / i_{M_0}$

Experiment 1: Adding Government Control

As discussed in a previous chapter, the state of lawlessness in 19$^{\text{th}}$-century Sicily is believed to be one of the major factors that enabled the mafia to become established. A high crime rate and an absence of state enforcement agencies led to a willingness amongst the general populace to accept the mafia's role as a substitute legal system. we n this model, the mafia helps reduce crime by imposing a "tax" on the bandits and reducing their expected income. As a result, fewer peasants are willing to become bandits than they would in absence of the mafia.

We hypothesize that modifying the system to include the presence of state enforcement will lead to conditions that are less favorable for the mafia. State enforcement agencies will act to control the level of banditry, decreasing the benefits to the peasants of the substitute legal system offered by the mafia. This in turn will cause a decrease in the amount of tribute that the mafia can demand without losing legitimacy. With less demand for its services, the gabelloto will react by hiring fewer campieri, thereby reducing the relative size of the mafia. Figure 4.1 below show the effects on class populations after adding low ($\sigma = 0.1$), medium ($\sigma = 0.4$), and high ($\sigma = 0.7$) level of government control to the model.
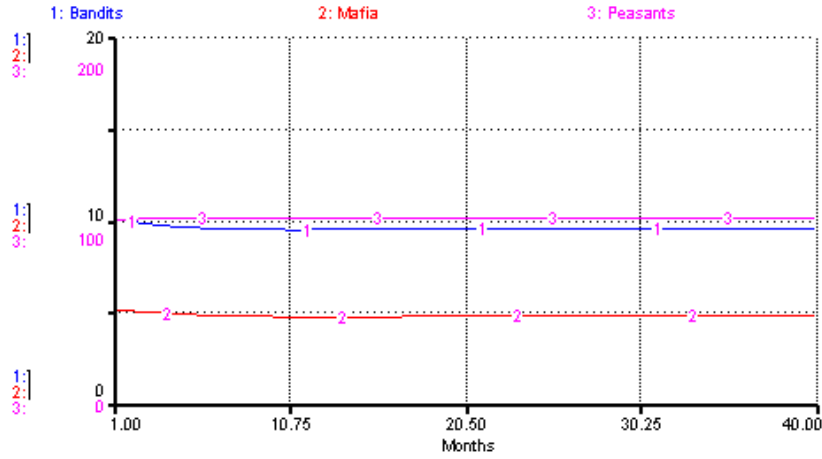
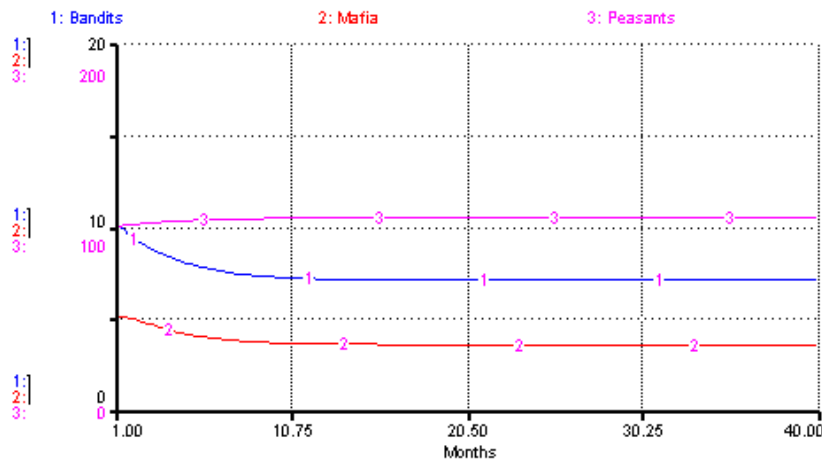Figure 4.1a: Relative Populations with Government Control = 0.1

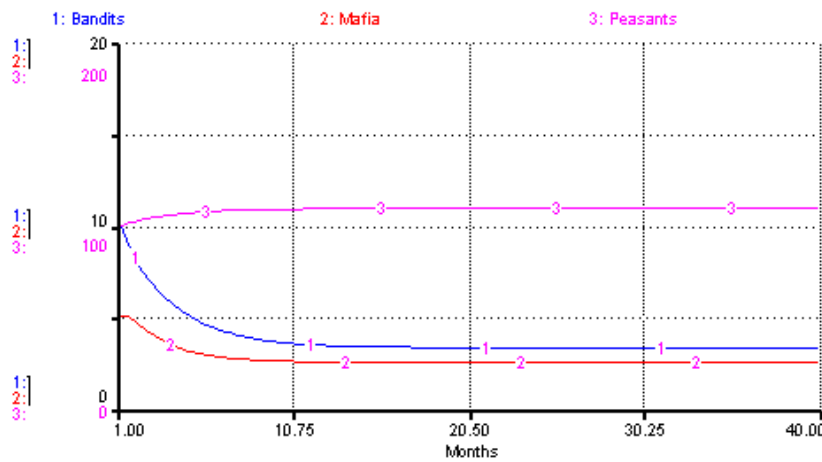Figure 4.1b: Relative Populations with Government Control = 0.4

Figure 4.1c: Relative Populations with Government Control = 0.7

Figure 4.1: Relative Populations with Varying Degrees of Government Control (σ)

Increasing the effectiveness of government actions to fight banditry causes both the populations of bandits and mafia to decrease, even if the government takes no direct action against the mafia itself.

16

As shown in these graphs, adding government control to the system results in a steady-state equilibrium with a higher population of peasants and lower populations of bandits and mafia than the equilibrium for a system without government control. Furthermore, an increase in government control results in a decrease in the equilibrium populations of both bandits and mafia. This relationship can also be seen in the phase diagrams in Figure 4.2 below.
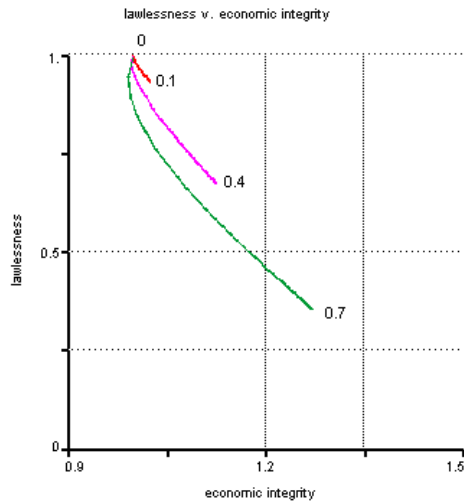

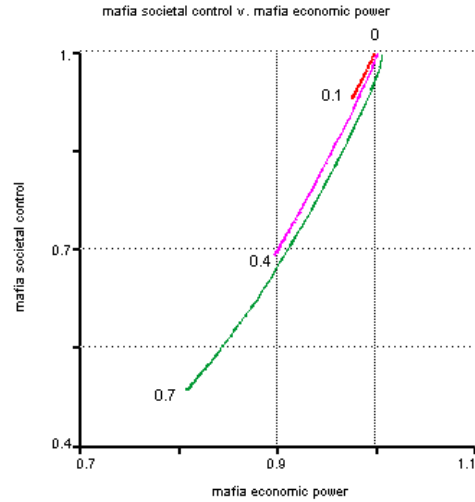Figure 4.2a - Characteristics of Society Under Varying Degrees of Government Control   Figure 4.2b - Mafia Power Under Varying Degree of Government Control

Figure 4.2: Effects of Government Control (σ) on a Mafia-based Society

Increasing the effectiveness of government control of bandits is an effective tool for decreasing the lawlessness of society, increasing the amount of output retained by the peasants (i.e., economic integrity) and reducing the economic and social power of the mafia

As shown above, increasing the effectiveness of government police forces is a very effective tool for decreasing the influence of the mafia in our model, even though the police focus all of their efforts on reducing banditry rather than taking direct action against the gabelloto. This occurs because the high threat of banditry is what allows the mafia to maintain its power. When peasants do not need to rely on the mafia for protection services, the peasants' willingness to pay for protection and the costs to the peasants of eliminating the mafia decrease. As a result, the gabelloto must decrease the amount of tribute he demands, or risk increasing the demand for social change in the system. This results in a net decrease in the mafia's political and economic influence, although it is still preferable to a change in the social structure where the peasants gain control of the gabelloto's land. Furthermore, we note that an increase in the presence of government police could have a negative effect on the gabelloto's ability to use the threat of violence to keep the peasants in line, especially if the government wishes to reduce the influence of the mafia. The increased costs of using repression gives the gabelloto even more incentive to use concessions such as lowering tribute percentages as a means of preventing social change, although this latter relationship is not reflected in our model.

The results of this experiment suggest that a government that wishes to eliminate the influence of a mafia-like organization should take steps to reduce the level of banditry in society. Furthermore, these steps should have relatively quick impacts on the system:

in the experiments above, the system reached its new equilibrium in less than 20 months. History shows that the influence of the mafia in Sicily did indeed decrease under strong governments. For example, during the 1920s and 1930s, the advent of Fascism in Italy under Mussolini saw a marked decrease in the power of the existing mafia. Blok (1969) notes that under Fascism "the rural mafia as a parallel-structure which functioned alongside and intermingled with the formal framework of economic and political power in the interests of the large landowners, became substituted by individuals who represented the Fascist party." Because the mafia did little to change the underlying land ownership system, once the Fascists were overthrown during World War we we , the mafia was quickly able to reassume its former role in society (Blok 1969).

Summary of Experiment Results

The results of the experiments are summarized in Table 4.2. As hypothesized, the most important factor determining the relative power of the mafia is the extent of government control. A mafia-like organization is much more likely to persist in a society with a weak government that is not able to provide stability or safety to its citizens. As such, a government that wishes to reduce the power of the mafia should seek to change the factors that led to the formation of the mafia in the first place (e.g., high levels of banditry and an absence of effective government institutions).

Table 4.2 – Summary of Experiment Results								
	Effect on Equilibrium Values for:							
Experiment	**Peasants (P)**	**Bandits (B)**	**Mafia (M)**	**Lawlessness (ϕ)**	**Economic we ntegrity (η)**	**Mafia Societal Control (χ)**	**Mafia Economic Power (ν)**	**Notes**
1 Increasing government control (σ)	+	-	-	-	+	-	-	
2 Temporary elimination of mafia (P=100, M=0, B=15)	stable	stable	stable	stable	stable	stable	stable	Mafia reforms and system returns to previous equilibrium
Removing mafia from model	-	+	n/a	+	+	n/a	n/a	Disposable income per peasant is greater than in system with mafia
Removing mafia and reducing peasant productivity (A_P = 1.875)	-	+	n/a	+	-	n/a	n/a	System crashes as all peasants become bandits
3 One-time increase in peasant population (P)	+	+	+	+	-	+	+	Immediate decreases in ϕ, χ, and ν and increase in η following initial population infusion
One-time decrease in peasant population (P)	-	-	-	-	+	-	-	Immediate increases in ϕ, χ, and ν and decrease in η following initial population decrease
4 Increasing total factor productivity (A_P)	+	-	-	-	+	-	-	Impacts are minimal
5 Increasing desired mafia legitimacy (τ_D)	+	-	-	-	+	-	-	Gabelloto income less than when $\tau_D = 1$
Decreasing desired mafia legitimacy (τ_D)	-	+	+	+	-	+	+	Gabelloto income less than when $\tau_D = 1$

Otherwise, as shown in experiment two, taking action to eliminate the mafia is not a viable solution, as a mafia will inevitably reform unless effective government institutions are able to assume the mafia's role in society. This also may partly explain why peasants never acted in concert to eliminate the mafia system despite the high level of tribute they had to pay. Revolutions are costly, so a revolution to overthrow one mafia may not be productive if it merely results in the formation of a new mafia. Furthermore, as shown in the second part of experiment two, even though peasants may be economically better off without a mafia, a violent revolution to overthrow the mafia may result in reduced productivity that makes them worse off than before. we n fact, under some conditions, absence of a mafia can even lead to systematic collapse if banditry becomes too prevalent.

The size of the population can also affect the relative power of the mafia. we n general, an increase in peasant population has the effect of decreasing the relative power of the mafia in the short-term. As such, a government may be tempted to institute policies that encourage immigration to areas controlled by the mafia. However, as shown in Experiment 3, these policies will be counter-productive, as an increase in population will lead to a more powerful mafia in the long-term. Instead, a government that wishes to reduce the power of a mafia should encourage emigration away from the area controlled by the mafia even though these policies would lead to a stronger mafia in the short-term. We also note that programs designed to improve the productivity of peasants by encouraging investment in new farming technology or land improvements have only a minimal effect when it comes to reducing mafia power, and as such, are not a cost-effective tool for combating the influence of the mafia.

Finally, we showed in Experiment 5 that even though the mafia can increase its power by demanding higher levels of tribute, doing so may not be economically optimal for the gabelloto, as the costs associated with increased discontentment among the peasants may not be offset by the increased revenues.

Examples of Other Mafia-Like Organizations

In this report, we have examined a model built around the nominate mafia – the Sicilian mafia. However, throughout history there are numerous examples of mafia-like organizations that built their power by exploiting a need for protection services during times of lawlessness. Some of these organizations later became influential organized major global crime syndicates as happened with the Sicilian mafia. Others remained relatively local and little known. Table 5.5 below lists some examples of other mafia-like organizations. Like the Sicilian mafia, each of these organizations came to power during times of extensive social change characterized by a lack of effective government controls and high levels of crime or other threats to personal property. we n addition, each offered important services to the typical citizens of the society, with most demanding tribute in exchange for these services, sometimes voluntarily, sometimes through the use of extortion. Analysis of each of these organizations (omitted due to the page limitation) demonstrates that lessons of our model apply not just to 19th-century Sicily but also to any conditions that lead to the formation of a mafia.

Table 5.1 – Historical Examples of Mafia-type Organizations								
Mafia-like Organization	Approx. Date of Formation	Social Change Leading to Formation of Organization	Early Mafia Constituents	Lack of Effective State Control?	High Threat of Crime?	we ncome Through Tribute / Extortion?	Services Offered by Organization	Main Sources
Sicilian Mafia	Mid 19th-century	End of feudalism	Gabelloti and feudal guards	Yes	Yes	Yes	> Protection from bandits > Dispute mediation > Enforcement of status quo for landowners	Bandiera (2003), Blok (1966, 1969)
Japanese Yakuza	Late 19th-century	Industrialization and end of feudalism	Unemployed samurais	Yes	No	Yes	> Property protection > Dispute mediation > Real estate foreclosure > Debt collection	Milhaupt & West (2000)
Hong Kong Triads	1840s	English acquisition of Hong Kong	Criminals from mainland China	Yes	Yes	Yes	> Labor security > Protecting monopolies > Property protection	Chu (2000)
Russian Mob	1990s	Collapse of the U.S.S.R. and end of communism	Ex-KGB officers and unemployed soldiers	Yes	Yes	Yes	> Property protection > Enforcement of contracts	Varese (1997) Bandiera (2003)
Karbala Shiite gangs in Ottoman we raq	Early 19th-century	Expulsion of Sunni elites and end of Mamluk rule	Local toughs, fugitives and military deserters	Yes	Yes	Yes	> Property protection > Protection of pilgrims > Collection of religious taxes > Regional autonomy from Sunni control	Cole & Momen (1986)
Ugandan drinking companies and vigilante groups	Mid-1960s	Ugandan independence and abolition of district autonomy	Local tribesmen and former soldiers	Yes	Yes	No	> Maintaining discipline in social situations > Property protection > Prosecution of thieves and witches	Heald (1986)

Discussion and Conclusions

As can be shown from the case studies in the preceding section, most mafias have much in common with the Sicilian mafia. All are formed in societies that lack key government institutions governing the enforcement of property rights and/or ensuring personal safety. Many of these situations arose during a rapid change in society, including major shifts in political or economic structures. Moreover, most mafias recognize a demand for services not provided by governments and are able to establish a quasi-legitimate role in society by fulfilling this demand. Sometimes, these services are necessary because the government is weak or ineffective (e.g., Russia), or because of political upheaval (e.g., Sicily). Other times, ethnic or cultural differences may lead to a government that neglects certain areas or people (e.g., Uganda, Hong Kong). Finally, mafias often arise to protect property-rights in markets that are outside the law. For example, many organized crime syndicates in the United States offer market protection services to traders of illegal drugs, prostitution, and gambling, as people who earn their living in these areas cannot rely on the government or legal system to protect their property or enforce their business contracts (Anderson & Bandiera 2006).

Given the similarity between mafias, the lessons of our model will apply to most cases where mafias exist, as long as the mafias earn their income by charging tribute from the people or organizations that they protect. we n general, the most effective method for combating mafias is to try to remedy the institutional flaws that led people to seek an alternate enforcement mechanism in the first place. This usually means creating and maintaining strong government structures that provide adequate protection of property rights and personal safety.

We can also use the lessons of our model to predict when mafias will form. Two examples of such societies are modern-day Iraq and Afghanistan. Both countries have seen political upheaval following wars that ended the rule of their powerful leaders (e.g., Saddam Hussein and the Taliban, respectively). Because an effective leader or government was not able to immediately assume control of society, each country fell into a state of anarchy characterized by high crime, violence, and a lack of order: conditions that have often led to the growth of mafias in the past. Indeed, recent years have seen the emergence of criminal gangs in Iraq (Farrell 2007, Mite 2007) and mafia-syndicates in Afghanistan (Laughlin 2009, Irvine 2007), many of which have ended up funding terrorists or fighting against the United States and its allies. However, the rise of these mafias was not necessarily inevitable. For example, after deposing Saddam Hussein, the United States and its allies chose to disband the army and government of Iraq, which directly contributed to the state of lawlessness in the country, as no alternative government existed that could quickly assume power and maintain order (Kaplan 2007). Had the United States and its allies chosen a different policy or if they had stationed a substantially greater number of ground troops in the country, then they may have been able to prevent lawlessness, maintain order, and avoid the types of conditions favorable to the growth of mafias. Furthermore, now that Iraq relies to a great extent on U.S. and British soldiers to maintain order in many parts of the country, we could expect that the Iraqi mafias will gain significant power after the U.S. withdraws its troops, unless the

new Iraqi government exhibits the stability, legitimacy, and effective police force that are necessary to protect its citizens and discourage lawlessness.

Based on our model and case studies, we could predict similar situations to occur if the United States were to act to overthrow other world leaders in troublesome areas of the world, such as Kim Jong-il in North Korea, Robert Mugabe in Zimbabwe, or the Sudanese government in Khartoum. Without providing an alternative government that has the legitimacy and strength to assume power upon the overthrow of the old, or committing U.S. soldiers to stay in the country to act as agents of order, we should expect the rapid formation of mafias offering alternative sources of protection. Because these mafias would then wield enormous amounts of political and economic power, we could also predict that when a government does form, it will likely be comprised of the leaders of the strongest mafias. Given these realities, models and studies that examine the dynamics of mafias and mafia formations will have important future ramifications not only on the field of law enforcement, but on foreign policy as well.

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