

Part I

On the Roles of Ethical Dispositions in the Emergence of Societies and Commerce

If, on the other hand, all men are properly ruled from within, government becomes needless, and all men are perfectly free. Now the chief faculty of self-rule being the moral sense, the degree of freedom in their institutions which any given people can bear, will be proportionate to the diffusion of this moral sense amongst them. (Herbert Spencer, 1851, ch. 10).

Introduction to Part I

Part I focuses on fundamental issues in social science. It develops a series of rational choice models that can be used to analyze how internalized rules of conduct improve life in communities and extend the domain of commerce. To do so, modest extensions of standard rational choice models from game theory and economics are employed. These models allow us to better understand how ethical dispositions affect behavior by abstracting from the myriad of concerns that individuals confront in their lives. The extended models are grounded in the theory of rule-bound choice and basic ethical ideas reviewed in chapter 1.

Rational choice models are used to illustrate and analyze a series of choices in various highly simplified choice settings. The choice settings analyzed produce social dilemmas in cases in which the choosers are all pragmatists. That is to say, narrowly self-interested behavior generates outcomes that are worse than the best possible ones when evaluated in terms of the (pragmatic) interests of the persons involved. Such poor results are not the result of individual errors, but emerge because the outcomes are beyond the control of any single individual. Every individual may adopt strategies that are the best for himself or herself, but the joint result instead of benefits for all are problematic in various ways—some obvious and some not. Such choice settings are surprisingly commonplace in communities and market networks.

The main purpose of part I is to demonstrate how ethical dispositions—which is to say, internalized rules or principles of conduct—can reduce such problems. If life in communities and market transactions are problematic in settings where traders are all amoral pragmatists, they are not necessarily so if individuals have internalized rules that in effect change the payoffs associated with the actions that might be undertaken in particular choice settings. Such rules alter the nature of self interest and may thereby eliminate dilemmas that would otherwise impede or block social and economic development. This is not to say that every rule or system of rules does so, but that at least a subset of possible rules of conduct that might be internalized may do so in a manner that eliminates many social dilemmas.

An individual's interest in acquiring productive ethical dispositions can be also analyzed with rational choice models, if the term “rational” is used in its philosophical sense, as reasoned and reasonable, rather than in its economic sense as utility maximizing behavior by persons with “given” preferences. When ethical rules can be internalized, and subsequently revised or disregarded, preferences are no longer “given.” The ranking of alternatives is affected by the rules and principles internalized.

Chapter 2 uses elementary game theory to analyze how internalized ethical dispositions can solve or reduce the severity of commonplace social dilemmas confronted by all communities. Indeed, it is arguably such dispositions that make communities possible. Given reasonably peaceful and attractive communities, chapters 3 and 4 analyze dilemmas that have to be overcome for markets to emerge and flourish. Part II takes up the role that ethics play in external support for such rules such as provided by governments and religious organizations.

Although some familiarity with elementary tools from game theory and economics is assumed throughout Parts I and II, the arguments and conclusions are developed in a manner that should be clear to those without much knowledge of either. An appendix at the end of chapter 1 provides a short introduction to elementary game theory for interested readers. Of course, similar conclusions can be reached without this analytical device. Elementary game theory was not available to philosophers or social scientists writing before W.W.II, although the general approach was not entirely new. Many philosophers developed ideas that seem to have embodied game theoretic reasoning, but without the aid of game

matrices and other analytical methods worked out during and after War World II. Game theory is used in the text, because it makes many problems clear, sheds light on possible solutions, and does so with far fewer words than possible without them. The classic texts for game theory are Von Neumann and Morgenstern (1944) and Luce and Raiffa (1957).

Many useful contemporary illustrations of rule-based behavior without formal institutions for enforcing rules still exist in contemporary societies, although the reach of governments and other rule enforcing organizations is much greater than it seems to have been in humanity's prehistory. For example, "pick-up" games of basketball and soccer/football are played throughout the world in which the players follow rules, are embarrassed or feel guilty if they violate the rules, and may be informally punished for violating the rules (by fellow players). The rules of these games are not single dimensioned but are followed by most players. Indeed, it is arguably the case that such informal games are as "clean" as games played with formal referees and penalties. Such informal rules tend to largely eliminate violence of the sort that unrestricted competition tends to generate. They also generate intense efforts to "win" the game, but only by the rules. The rules also support their own notions of fairness and duty both with respect to the rules of a particular sport and with respect to the division of tasks and praise among plays and players.

The effects of ethical dispositions on the nature of a community's laws and institutions are examined in part II. It shows that formal institutions may usefully "top up" internalized rules, but also are more likely to be effective and productive if at least a subset of persons in the community and governments of interest have internalized productive ethical dispositions. Institutions are not substitutes for ethical dispositions but complements to them.

Chapter 2: Ethics and the Quality of Life in Communities

I. On the Possibility of Communities: The State of Nature and the Hobbesian Dilemma

Most people live in communities, but it is by no means completely obvious why they do so. There are a number of problems that arise when living in groups, and these can largely be avoided by living alone. To make living in groups sensible, groups must be attractive. In rational choice terms, there must be benefits that are greater than their costs for all group members. Otherwise, groups would simply disintegrate as members leave for more attractive alternatives. There are clearly benefits—as with advantages associated with team production, specialization, and social insurance—but there are also major costs—as with both violent and peaceful conflict, commons problems, free riding, externalities and coordination problems—that can easily eliminate the potential benefits of life in groups. This chapter suggests that the emergence of ethical dispositions that solves or at least ameliorates such problems help explain the emergence of both stable groups and settled communities. These are both relevant for the purposes of this book because extended commercial networks are unlikely to emerge without settled communities where team production, specialization, capital accumulation, and trade are possible and may become commonplace.

Thomas Hobbes (1651) focused on the intense conflict that tends to emerge among narrowly self-interested persons in settings where resources are scarce and in high demand. He demonstrated that in the absence of rules of conduct—whether internally or externally enforced—communities would be unattractive—indeed impossible. Interactions between members of a group that lack conflict reducing dispositions tend

to generate unconstrained conflict over resources and a relatively short and miserable life—a war of every man against every other.

Whatsoever therefore is consequent to a time of War, where every man is Enemy to every man; **the same is consequent to the time, wherein men live without other security, than what their own strength, and their own invention shall furnish them withal. In such condition, there is no place for Industry; because the fruit thereof is uncertain; and consequently no Culture of the Earth; no Navigation, nor use of the commodities that may be imported by Sea; no commodious Building; no Instruments of moving, and removing such things as require much force; no Knowledge of the face of the Earth; no account of Time; no Arts; no Letters; no Society; and which is worst of all, continual Fear, and danger of violent death; And the life of man, solitary, poor, nasty, brutish, and short.** (*Leviathan*, pp. 70-71).

In the absence of ethical or legal constraints, conflict over scarce resources tends to escalate to the point where both a good life and good society are impossible. Everyone would be reduced to bare subsistence, and life would be stressful, dangerous, and short.

In order for life in communities to be viable, the Hobbesian dilemma and other significant dilemmas have to be overcome. Hobbes proposes what would later be called a contractarian solution. He argues that people would recognize their dilemma, and agree to create a strong central government—a Leviathan or commonwealth—to enforce rules that would limit losses from conflict. Such a government, might, for example, create and enforce laws that protected life and property. By changing the rewards associated with war and theft, such a government would improve life for all—even if the government itself could not be easily restrained.¹

¹ Hobbes (1651) also suggests a dozen or so norms that can reduce conflict within a community. Hobbes terms these natural laws. The first three are: “[T]he first, and Fundamental Law of Nature; which is, ‘To seek Peace, and follow it.’ The Second, the sum of the Right of Nature; which is, ‘By all means we can, to defend ourselves.’ ... [And,] from that law of Nature, by which we are

obliged to transfer to another, such Rights, as being retained, hinder the peace of Mankind, there followeth a Third; which is this, ‘That Men Perform Their Covenants’ ...” (1651, pg. 73-80). Individuals have a duty to pursue peace, defend themselves when necessary, and keep their promises. Together these (and others mentioned) tend to help maintain peace in communities.

Ethics and the Commercial Society: Chapter 2

Hobbes was not the first to link prosperity to law and order, but his clear statement of the unrestrained conflict generated in a setting in which resources are scarce, persons are uninhibited by either internally or externally enforced rules of conduct, and his proposed solution to conflict were new and had significant influence on political theory, both during and after the enlightenment.² We will examine contractarian norms and justifications for government in part III. What is most relevant for the purposes of Part I is Hobbes' demonstration that human interests are not inherently harmonious.

Subsequent enlightenment scholars did not all agree with Hobbes' bleak assessment of the "natural state," nor regarding the impossibility of constraining government once created, but most regarded the problem characterized by Hobbes to be serious and fundamental.³ John Locke (1689), for example, also uses a natural state and social contract to explain the emergence of legitimate government, but he regards the natural state to be more pleasant than Hobbes.

This more pleasant original state exists according to Locke, because individuals have internalized ethical ideas (termed natural laws) that reduce the problems confronted in the absence of government.

The state of nature has a law of nature to govern it, which obliges everyone: and reason, which is that law, teaches all mankind, who will but consult it, that being all equal and independent, no one ought to harm another in his life, health, liberty, or possessions ... (*Two Treatises on Government*, KL: 3286).

²The Leviathan was written by Hobbes in the relative security of Paris during the English civil war, a war that may have inspired his idea of the war of every man against every other. The details of Hobbes' social contract and its associated theory of legitimate state action are beyond the scope of this book, although the contractarian approach to social ethics is taken up in Part III.

³Contemporary archeologists have found that the Hobbesian jungle was a reasonably accurate depiction of society from the dawn of agriculture through the iron age. Although the warfare was not literally man against every man, but band against band or tribe against every tribe, life was poor, nasty, and short. Considerable resources were devoted to attack and defense. See, for example:

Locke assumes that such rules have divine origins, but it would matter little whether such laws were products of biological evolution and transmitted genetically or products of social evolution and taught to children by their parents, friends, and other teachers. The important factor is the existence of norms that inhibit violent conflict.

Locke, nonetheless, suggests that some persons will violate natural law, and therefore an external law enforcing organization—a government—can improve life in a community.⁴ This role for the state or other rule enforcing organizations will be taken up in Part II of this book. Part I can be regarded as providing evolutionary support for Locke's claim that people have internalized rules that tend to reduce conflict and overcome other problems associated with life in communities.

II. Ethics, Game Theory, and the Hobbesian Dilemma

Game theory was not available to Hobbes and Locke, but their analysis of human behavior in the natural state is entirely consistent with non-cooperative game theory. Elementary game theory implies that narrowly self-interested individuals living in close proximity to one another be expected to make choices that produce lives that are "poor, nasty, brutish, and short." Elementary game theory also implies that communities in which most persons have ethical dispositions that induce them to avoid harming another's life, health, liberty, and possessions tend to be far more attractive than those associated with Hobbes' natural state.

The Hobbesian War of Every Man against Every Other as a Nash Equilibrium

Keeley (1997) for a book length overview of that evidence. Pinker (2011) provides an overview of the general decline in violence from prehistoric to contemporary societies.

⁴All persons according to Locke have a common understanding of natural law, evidently more or less as in Grotius' (1609) theory of natural rights and duties. More or less the same result may also emerge from social evolution as demonstrated in this chapter. Whether social evolution is set in motion by divine causes or not is a topic beyond the scope of this paper and conclusions reached would not significantly affect its argument or implications.

Ethics and the Commercial Society: Chapter 2

The natural place to begin a game-theoretic analysis of the role of ethics in society is with the Hobbesian dilemma, which is to say a world without ethics. Essential features of this choice setting can be characterized with a 2-person, 2-strategy struggle over holdings of some natural resource. The two persons are assumed to have equal abilities and resources, and to be unconstrained by internalized ethics or external legal sanctions.

Each is assumed to initially control their own labor and a small stock of useful items such as food, clothing, water, and firewood. Labor (time) can be used to produce more of those goods from a natural resource freely available in the area, or it can be used to attack the other person and attempt to capture their stocks of goods. Warfare, however, takes time and other resources away from productive activities. In this context, steal, attack, and defend are equivalent strategies. They all require an individual to invest his or her resources in conflict. The alternative strategy (produce) employs one's time and other resources to create useful resources for themselves or their families, rather than taking them from others.

Both persons are assumed to initially control 2 units of the good or bundle of interest and be able to produce up to 10 more during the period of potential conflict. Alternatively, they may devote most of their time and energy to stealing the holdings of the other, but he or she may obtain all of the victim's resources, depending on whether the attack is resisted or not. If it is resisted a standoff occurs, but no new production is undertaken.

The numbers in table 2.1 are the payoffs for John and Thomas in terms of physical wealth, net benefits, or utility for the 4 possible combinations of strategies. They may both produce (upper lefthand cell), both attack (lower righthand cell) or one may attack and the other not (the lower lefthand and upper righthand cells). If the person attacked is not fully engaged in defense (or attack), he or she loses everything, their initial reserve (2) plus that which was produced (10). Poorly defended surprise attacks thus are rewarding for the victor ($14 > 12$). However, if both parties are fully engaged in military efforts, no new production takes

place, with the result that both are poorer than if they had both chosen to produce rather than attack ($2 < 12$), although this outcome is still better than being the undefended victim of a surprise attack ($2 > 0$).

Table 2.1: The Hobbesian Dilemma

		Thomas	
		Produce	Attack
John	Produce	(J, T) (12, 12)	(J, T) (0, 14)
	Attack	(14, 0)	(2, 2)

Consider the thought process that such individuals would undertake if they make their decisions rationally and independently of one another. On the one hand, if Thomas believes that John will not attack, then he can also not attack in which case he engages in peaceful production and get a payoff of 12; however, if John is engaged in peaceful production, Thomas could attack John and get a payoff of 14, which is a better result for him. On the other hand, if Thomas believes that John will attack, then if he engages in peace production Thomas will get a payoff of 0, whereas if he also attacks (or strenuously defends) he gets a payoff of 2. In this choice setting, Thomas is better off if he attacks John regardless of what John does ($14 > 12$ and $2 > 0$). He has a dominant strategy. So, logically, he will always attack.

Since both persons undertake similar narrow interest-based reasoning and face similar circumstances, they reach the same conclusions about the relative merits of the produce and attack strategies, and so both parties attack and the result is the outcome in the bottom right-hand cell, the one that characterizes the Hobbesian dilemma, a war of every man and woman against every other. This combination of strategies is a Nash equilibrium, because no person can increase his or her own payoff by changing their strategy, given the strategy chosen by the other(s).⁵

⁵Only the rank order of the payoffs matter for this and most of the other game matrices used in this and the following chapter. The numbers are used to

illustrate various problems, temptations, and possible solutions.

Note, however, that—although neither can do better by changing their own strategy, given what the other player is doing—both would be better off if they did not to attack one another. The upper lefthand result is better for each than the lower righthand result ($12 > 2$). There are thus potential mutual advantages that can be realized through a social contract between John and Thomas, as noted by Hobbes.

Unfortunately, a simple agreement will not suffice because each can benefit from secretly renegeing on the agreement and launching a surprise attack on the other.⁶ The upper left-hand corner is not a stable outcome, unless both have internalized a promise-keeping or similar oath-reinforcing norm.

Hobbes argues that escape from the dilemma can only be achieved by creating a permanent law-enforcement regime. A governing organization can alter the payoffs of the game by punishing persons for attacking the other. Such an organization may be costly to operate and may cause other problems, but as long as rules against attacking others are well enforced and the overall cost of government is less than 10 units for each, both John and Thomas would be better off with such an organization than without it.⁷

If an agreement to create and maintain such a rule-enforcing organization is reached, it can be said that it is both productive and legitimate. However, it does not imply that such organizations are the only possible solution to the Hobbesian dilemma or that they can be easily created.

Civil Ethics and Moderation of the Hobbesian Dilemma

An alternative method of escape from a Hobbesian Jungle is implied by Locke's characterization of the natural state. A wide variety of ethical systems can reduce conflict among neighbors. Aristotle, Locke, Smith, and Kant disagree about the grounding principles of ethical conduct, but

One-shot games are used to characterize the Hobbesian choice setting, because they are simpler to character and easier for readers to process. However, the matrices can also be considered to represent strategy choice in finite repeated games, with the payoffs representing present-discounted values associated with a finite sequence of play. Repeated contest settings have the same equilibrium, unless the temptations are relatively small and the discount rates are also relatively small. For more general analyses with similar results, see Bush and Mayer (1974), Skaperdas (1992) or Garfinkel and Skaperdas (2008).

all agree that rules that reduce unproductive conflict within communities tend to make communities more attractive.

The process of internalizing such rules changes the subjective (utility) payoffs associated with the two strategies. Persons would feel better off (virtuous) when they follow their rules of conduct and worse off (guilty) whenever they violate the rules. Sufficiently strong ethical dispositions can solve the Hobbesian dilemma when a sufficient number of persons in the region of interest have internalized appropriate codes of conduct.

The effects of internalized rules of conduct can be modeled in several ways. They may be represented (i) as taking some strategies off the schedule of life's possibilities, (ii) as reductions in the perceived payoffs associated with the "attack" choices (because of guilty feelings associated with immoral choices, the failure to abide by universal law, or anticipated disapprobation from others), (iii) as increases in the perceived payoffs of the "virtuous choices" (because of increased self-esteem, the satisfaction of doing one's duty, or anticipated praise from others), or (iv) combinations of all three. This book assumes that they alter the payoffs of preexisting strategies rather than eliminating strategies. To truly eliminate strategies from consideration requires stronger blinders than plausible for rational individuals—although there may well be cases in which "blinders" solve problems. It is more plausible that internalized rule change the payoffs. It is, after all, internalized rules that generate all the assessments of payoffs.

The second characterization is adopted for the Hobbesian dilemma of table 2.2. The third is used in other illustrations. As far as the game matrices are concerned, the last three are equivalent in that they may change the rank order of the payoffs and thereby behavior.

⁶That this property is not immediately obvious to readers who are not familiar with game theory is evidence that you (the reader) have probably internalized a "keep your promises" ethic or norm. Such norms can produce self-enforcing agreements to move from (2,2) to (12,12) for reasons characterized by table 2.2.

⁷ Not all governments would achieve better results. For a good introductory analysis of the effects of alternative government regimes on losses from conflict, see Congleton (1980).

Ethics and the Commercial Society: Chapter 2

The effects of relevant internalized norms are incorporated into the Hobbesian dilemma in table 2.2. The dilemma is solved whenever the “ethical cost” (G) associated with violating the norm is greater than 2 for each person. Note that in that case $14-G < 12$ and $2-G < 0$, making the productive strategy better for both John and Thomas. In such cases, each person chooses the “don’t attack” strategy and the outcome is the upper lefthand cell of the game matrix, a relatively benign Lockean natural state without government. That result is stable as long as ethical dispositions do not change; thus, ethical dispositions can solve the Hobbesian dilemma.

Table 2.2: Solving the Hobbesian Dilemma with Ethical Dispositions

		Thomas	
		Don't	Attack /Steal
John	Don't	(J , T) (12, 12)	(J , T) (0, 14-G)
	Attack /Steal	(14-G, 0)	(2-G, 2-G)

Table 2.2 also demonstrates that both the strength of internalized norms and the magnitude of the temptations both matter. Finite feelings of guilt reduce the subjective payoff of the improper, immoral, or wicked strategy by amount G , rather than eliminating such strategies from the choice set. The magnitude of the guilt varies both with the ethical system characterizing moral action and the strength of one’s disposition to avoid such actions. Modest guilt ($G < 2$) does not solve this dilemma. The greater is the temptation (here, $14-12 = 2$ and $2-0 = 2$) the stronger the feeling of virtue or guilt required to overcome it.

Note that a variety of ethical system and maxims can solve the dilemma without requiring detailed information about the game as a whole or the welfare of others. Examples include various nonaggression principles such as “self-defense is honorable, but never attack first” and reciprocity-based rules such as “tit-for-tat” of the variety that engages in peaceful conduct first and continues doing so as long as the other does as well. Such rules may be narrowly or broadly interpreted. They may apply only to one’s neighbors or to all persons.

Other reputation and trust-based rules such as “promise keeping” might emerge among community members and that norm might be used to support agreements to rules of conduct that solve the dilemma. For example, a group may agree to share all resources or the subset of resources that tend to generate the most conflict. Of course, this is not the only rule that might reduce proclivities to attack one another. Other rules that call for accepting each other’s holdings and production as “yours” and “mine,” which is to say as “personal property” that should not be fought over can also solve the dilemma.

There is no uniquely “best” norm for escape from this dilemma—many rules of conduct and ideas about justice, fairness, or right and wrong can alter the subjective payoffs of the Hobbesian dilemma in a manner that that make the attack strategy less personally rewarding or the don’t attack strategy more personally rewarding.

However, it bears noting that it is not simply the fact that rules of conduct are agreed to and internalized, or simply internalized because such rules were taught to individuals when they were children that solves the dilemma. Not all ethical systems reduce the likelihood of a Hobbesian dilemma.

For example, “militant” and “to the victor goes the spoils” principles tend to increase the subjective payoffs from attacking and reduce those associated with attacking. Such normative theories tend to perpetuate the Hobbesian Dilemma, rather than curtail it—although they may contribute to solving a village’s free-rider problems with respect to self-defense, a topic taken up in section III of this chapter. They do so by increasing the rewards associated with the attack strategy, rather than reducing them.⁸

norms apply only to attacks on persons outside the tribe or village. Such groups

⁸Such militant norms may for example be valuable to communities if the

Ethics and the Commercial Society: Chapter 2

For example, if V is the additional payoff associated with the attack strategy for those that have internalized militaristic norms, the payoffs of the aggressive choices become $2+V$ and $14+V$. Both these are clearly larger than the payoffs associated with the productive choices, 0 and 12. Norms that tend to perpetuate the Hobbesian dilemma yield societies where lives are closer to the margin of survival than communities in which norms reduce counterproductive conflict. Nonetheless, militants might be sufficiently proud of their Spartan virtues (bravery, toughness, guile, resilience) that they prefer their own society to more prosperous but to them less virtuous decadent alternatives.⁹

In cases in which internalized dispositions are not sufficiently strong for all persons and all temptations, a law-enforcing organization can improve life in community, as argued by Locke. In effect, the governmental sanctions top up the internal ones, but these external sanctions can be milder than would have been required in the absence of norms supporting production over attack or theft. Contrariwise, in the case in which ethical theories support the attack or taking choice, formal penalties would have been stronger than those in a community of narrowly self-interested persons.

may defend themselves from other communities with similar norms and/or conquer pacifist ones and take their wealth. Such militaristic norms create Hobbesian dilemmas among communities. They also tend to undermine a subset of the norms that can solve the Hobbesian dilemma within communities. For example, pacifist norms would not long survive in an environment where a subset of groups internalize militant tribal norms. They would be attacked and reduce to poverty, or perhaps enslaved. To survive in such an environment, pacifist ethical systems would have to be refined in some way. For example, they might rank pacifism higher than attacking, both within a community and among communities, but support self-defense when attacked. Keeley (1997) notes that pre-literate communities evidently lacked a strong government, nonetheless, often undertook a variety of defensive measures, including the construction of defensive walls and ditches and attempting to repel invaders when under attack.

⁹Montesquieu (1748) argues that communities and states emerge as methods for escaping from Hobbes' war of every man against every other, and that such communities each have their own formal and informal codes of conduct. Inter-community relations remain problematic, however, except insofar as international law (which tends to be a collection of informal rules rather than formally enforced ones) tends to promote peaceful relations among communities. Keeler

Locke suggests that ethical dispositions are not generally strong enough to eliminate all risks to life and property and so government is necessary. However, Herbert Spencer (1851, ch. 4) argues that the evolution of norms can potentially solve all the problems associated with life in a community without the need for government and its associated police and court systems.¹⁰

A Short Digression on Ethics and Law as Substitutes

It bears noting that differences in the dispositions within a community can be problematic, as when John has internalized a strong norm against attacking ($G>2$) and Thomas has internalized a militant norm ($V>0$ or $G<0$). In such cases, John may resist defending himself even if Thomas attacks, generating a stable (O, $14-G$) outcome. In a community in which most persons have internalized norms similar to John, but a few Thomas-types are also members, the Thomas types may rule, or a government of some kind might be formed by the John-types to produce a peaceful, non-Hobbesian equilibrium, by discouraging Thomas-types from attacking others in the community.¹¹ Note, however, that in both cases, ethical dispositions (internalized rules of conduct) would precede

(1997) provides an overview of archeological evidence that implies that pre-literate tribal norms solved a variety of problems within their communities, but also supported both aggressive and defensive warfare between communities.

¹⁰ For the purposes of this chapter, evolutionary pressures favoring one or another ethical system are neglected to gain some understanding about how differences in ethical dispositions can produce different kinds of societies. For some insights into how a community's rules of conduct with respect to social dilemmas similar to the Hobbesian one may evolve, see Vanberg and Congleton (1992) or Congleton and Vanberg (2001).

¹¹Norms are often more context specific and conditional than a simple game matrix can capture, as for example reciprocity norms may be applied within a community and different norms (or none) to persons outside the community. The latter can be referred to as tribal norms and contrasts with most of the general or universal ethical theories discussed in part III. Both tribal and universal norms can solve problems associated with life within communities, but tribal norms arguably create problems among communities or nations. Differentiating between a community's membership and that of other communities may, for example, be useful in war. Treating all trading partners equally may reduce conflict among nations.

law.

If a governing organization is established, both the rules to be enforced and the manner in which they are enforced are obviously important. Rules can ameliorate or exacerbate the Hobbesian dilemma. However, establishing well-functioning (non-extractive) governments is not easy. As developed in part II, extractive regimes are easier to establish than “productive” ones. It turns out that the internalized norms of rulers and persons employed in government all affect the kinds of laws adopted and the manner in which they are enforced.

Most theories of good governance begin with rules of conduct similar to those which can solve the Hobbesian dilemma explored above. Hobbes argues that what a community needs most are rules that reduce conflict among its membership. With that in mind, Hobbes suggests ten natural laws grounded in reciprocity, including promise keeping, civility, and equal liberties. A Hobbesian government must assure that such laws are followed to prevent society from reverting to the natural state (1651, ch. 14-15). In a somewhat more optimistic vein, Locke argues that natural law is essentially self-evident and most people on most occasions are inclined to abide by natural law. In the Lockean case, a government need only help assure that natural law is respected by those who lack such dispositions and in settings of great temptation. It also should intervene to settle disputes about the nature of the law in a given instance. Both Hobbes and Locke emphasize natural law as the foundation for the laws that governments should enforce, but both also suggest that governments should not determine personal religious beliefs or virtuous dispositions. Rules of conduct grounded in religion rather than civil ethics should not be included in law.

Most of the philosophers surveyed in part III explicitly or implicitly agree with Hobbes and Locke that most laws have (and should have) ethical foundations, and that not all moral rules of conduct should be codified and enforced through governing organizations. Theists such as Baxter often supported a very high degree of overlap between divine rules of conduct and formal laws. Montesquieu believed that ideas of fairness predated man-made law, but argued that ideal laws varied with governments and circumstances. Smith favored a system of natural liberty with relatively few formal laws, because the pursuit of praise and praise worthiness tends to induce virtuous behavior, which reduces the need for government enforcement. Kant favored both behavior and legislation

compatible with universal law, but believed that legislation and moral actions should be based on different principles. Utilitarians support laws that increase aggregate happiness for their communities, and oppose ones that do not, including ones that cost more to enforce than they generate in benefits. Aristotle regards virtue to be largely a private matter produced by moral choices, but he also supported laws that encouraged virtuous actions and penalized vice.

Most of these theories imply that the purpose of law and law enforcement is to supplement ethical dispositions.

There is clearly some merit in this line of argument. A legal system that enforces moral or ethical law makes particular actions criminal in addition to being immoral. Criminal actions are supposed to result in external penalties (fines, jail time, death) and these encourage lawful behavior by changing the payoffs individuals face in social dilemmas (and other circumstances). Thus, in addition to the guilt (G) or reduced sense of virtue (V) associated with such acts, a law enforcing organization imposes an additional penalty (P). The new higher combined internal and external penalty (G+P) clearly discourages unethical acts in more circumstances than internal guilt (G) alone whenever guilt is finite.

To completely eliminate crime in communities with various internalized norms and temptations can, in principle, be accomplished with sufficiently high expected penalties. Stringent penalties, however, often conflict with widely held ethical principles. For example, appropriate penalties may be limited by ethical theories of just deserts. Thus, imposing the death penalty for “minor” transgressions might be deemed improper or immoral by persons who believe that punishments should be proportional to the harm done by a crime. Similarly, persons that believe that the aim of law is to increase the overall happiness and wellbeing of a community (including those violating its norms) would also limit penalties. The penalties (reduced welfare of those bearing them) should be more than offset by the advantage(s) of better adherence to community norms. Also, the possibility of error implies that innocent persons may be unjustly penalized for crimes that they did not undertake. The guilt or

loss of esteem associated with punishing the wrong person further limits the punishments that a government can justly impose.¹²

Although legal systems clearly matter insofar as the extent of immoral activity is concerned, there is a strong pragmatic case for relying on internalized ethical dispositions to the greatest extent consistent with achieving a tolerable crime rate. Formal systems of punishment tend to be more costly and less certain than ones associated with ethical dispositions. An individual knows what he or she has done and if he or she has internalized supportive rules of conduct, more or less automatically self-imposes guilt. In contrast, a law enforcement system must both detect crimes and determine the identity of criminals in order to impose penalties. Each step in the law enforcing process is costly and prone to error and also various forms of shirking and corruption.

Law enforcement itself is subject to a variety of dilemmas that are difficult to address unless at least a subset of persons in law-enforcing organizations have internalized productive ethical principles and maxims, as discussed in Part II of this book. Such problems and others associated with governance itself imply that Hobbes' hypothetical solution in which an unpleasant anarchic society becomes orderly as a consequence of a single social contract that creates a productive governing organization in one great step is essentially impossible. The imagination required for such a contract to be signed and implemented is beyond that normally attributed to mankind—especially in the circumstances anticipated by Hobbes. There are many problems that have to be addressed, and many have yet to be fully solved.

The Lockean account of the emergence of a commonwealth is thus more plausible. It is the evolution of norms that allows a group or community to escape from the Hobbesian dilemma and the existence of such norms that ultimately motivates government officials to top up a community's norms with dutiful and effective law enforcement.

Commons Problems

In the previous section, the problem focused on was conflict over scarce natural or human made resources. The resources were ones that

were potentially excludable and the conflict was a consequence of rival desires to control and/or retain control over those resources. We now assume that rules of conduct have been internalized that solve the most serious Hobbesian problems within communities, although it is possible that lesser forms of conflict remain within communities. Internalized norms and ethical dispositions that solve the Hobbesian dilemma allow people to live together, more or less in peace, and is a necessary first step in the emergence of viable communities.

Many of the ethical dispositions that reduce conflict over the control of resources indirectly and informally make some resources into personal property—property over which existing users exercise a “right” to exclude others from using the property. Others may create sharing rights of various kinds, as with the community pastures and woodlots. Others may simply rule out attacking except in cases of self-defense without addressing the manner in which resources are ultimately controlled.

For the purposes of this section, it will be assumed that an open sharing system has emerged for at least a subset of resource in the community of interest. This may be because exclusion of the resource of interest is very difficult or because sharing is consistent with other preexisting norms—such as those common in families in which many resources are shared among family members. Sharing “rights” may be applied to potentially excludable resources such as pastures, orchards, or woodlot, as well as to resources from which exclusion is difficult or impossible as with access to large forests, great open plains, large bodies of water, or the air. Other resources in the same community may be subject to “mine and thine” norms regarding the control of food gathered by hand, as with homemade articles of clothing or dwellings, and as agriculture emerges, particular animals and gardens. Such communities may be said to have particularized solutions that address a series of problems in which conflict may potentially escalate to all encompassing levels.

Sharing norms limit the conflict over resources, by forbidding any user from excluding others, generating a sense of communities among those sharing, but possibly generating other problems as the use of com-

¹² If f is the probability of being caught and captured and P is the penalty, the expected penalty is $P^e = fP < P$. The probability of arrest and punishment is

partly a function of the ethos of the law enforcing agency, a topic that will be taken up in part III.

Ethics and the Commercial Society: Chapter 2

mon property intensifies. As a resource is used by more and more people, its productivity tends to fall and that effect can be catastrophic for an otherwise successful community.

The tragedy of the commons develops in this way. Picture a pasture open to all. It is to be expected that each herdsman will try to keep as many cattle as possible on the commons. Such an arrangement may work reasonably satisfactorily for centuries because tribal wars, poaching, and disease keep the numbers of both man and beast well below the carrying capacity of the land. Finally, however, comes the day of reckoning, that is, the day when the long-desired goal of social stability becomes a reality. At this point, the inherent logic of the commons remorselessly generates tragedy. (Hardin, 1968, p. 1245)

Table 2.3 illustrates the commons problem for two persons, which as in the previous cases can be easily generalized to a group or community of any size and to finitely repeated settings. The problem is subtle and does not always exist for modest usage of the commons, as noted in the excerpt from Hardin's classic piece. A commons problem arises when usage reaches the point where every person's use of the common resource, reduces the (net) benefits received by other users. This effect is normally assumed to be a result of reductions in the "output" available to others, but the output need not be an ordinary agricultural product, as with the pleasures of a public park or the waste waste dissipating abilities of a body of water.

In the choice setting characterized by table 2.3, grazing one's herd on the common reduces the amount of grass left for other herd owners. In small groups, this effect is often trivial, but it increases in importance as resources is used more and more intensively. The end may be a rather barren common pasture as implied by the tragedy of the commons or simply a pasture that produces less agricultural output than it could have.

In the game matrix, the effect is relatively large to more clearly illustrate the effect and need for regulating access to the resource of interest (a field, forest, pond, stream, etcetera) to maximize the (net) productivity of the communal resource. The numbers in the cells are payoffs, which in this case may be pounds of meat or fur generated, or the net benefits or utility associated with those agricultural outputs. It is again the relative order of the payoffs that is important rather than the magnitude.

In this case, there are some restrictions on the cell payoff totals. For example, unless there is an obvious difference among the cattle, the totals have to be the same when the same total number of animals (heads) are on the commons.

Table 2.3: The Tragedy of the Commons

		Garrett		
Elinor		One Head	Two Head	Three Head
		(A, B)	(A,B)	(A,B)
One Head		5, 5	4, 9	2, 12
Two Head		9, 4	7, 7	4, 8
Three Head		12, 2	8, 4	5, 5

In the case illustrated, the output or net benefit from the commons is maximized when a total of 4 heads are on the commons. This generates 14 units of net benefits, which can be thought of as 14kg of net weight gained by grazing on the pasture for a given period of time, a week or a month. As in the Hobbesian dilemma, there are pure dominant strategies for each player. Each herdsman's net benefits are maximized if he or she place 3 heads of cattle on the pasture. This is the maximum herd size represented in the table, although it is not necessarily the case that each herdsman or shepherd maximizes their herd size. The result is a total of six head of cattle on the pasture at the Nash equilibrium, and a total output of 10 rather than 14 units. The commons is over used.

The tragedy illustrated is not as grave as the Hobbesian dilemma, nor as described by Hardin, but it can be life-threatening when food supplies are scarce. The productivity of the pasture is not entirely exhausted in the illustration; it is simple less than it could be.

In many cases, as true of the Hobbesian dilemma, the nature of the problem may be obvious to the participants (over grazing) and so may the nature of the solution—graze less. However, it bears noting that for large common pastures used many herdsman and shepherds, the nature of the problem may be less clear—is it over grazing, bad weather, insects,

excess manure, a grass disease, or divine intervention?

In small groups, one can imagine a variety of informal solutions. One possibility is that the group would simply move on to another site and take up life there. This migratory solution was evidently used by early humans for thousands or millions of years before stationary communities emerged. The migratory solution to both the Hardin and Hobbesian problems is easy to implement as long as unclaimed empty relatively peaceful places exist. When a hunting ground, natural orchard, or pasture becomes overused—or is threatened by neighboring tribes—a tribe can simply move on to another more fertile (and peaceful) area.

When this is to not relatively easy do—possibly because of scarcity, the well-defended claims of other tribes, or because a group has more or less permanently settled in a particular place—the community must solve the Hardin problem if it is to thrive in the long run.¹³

If the nature of the commons problem of table 2.3 is understood, the group may simply agree to place at most two head of cattle on the commons. If a promise-keeping norm has been internalized, such an agreement might be sufficient to solve the problem. However, notice that such an agreement among pure pragmatists would not be kept, since each herdsman benefits from grazing more than three head of cattle on the commons. The middle cell is not a Nash equilibrium and so is not stable unless supported by internalized norms or external law enforcers.

Other norms that may solve the commons dilemma include norms of “fair use” that are adjusted so that pasture output is maximized, and a property-type of norm under which herdsmen keep their cattle in particular non-overlapping parts of the common. For the problem illustrated, norms do not have to be very strong to solve the problem. The central [7,7] cell can be sustained with a guilt level greater than 1. As with the Hobbesian dilemma, the necessary strength of the norm varies with the extent of the commons problem.

Notice that some norms solve or help to solve both the Hobbesian

problem and the Hardin problem. Both a promise keeping norm and a “partitioning” or “property mine/thine norm can solve both problems if the norms are sufficiently internalized. Promise-keeping norms allow a variety of literally self-enforcing agreements to be reached to address social dilemmas. Property norms both tend to reduce conflict and eliminate incentives to overuse a pasture.

Other norms tend to be narrower and address only a particular problem or particular class of problems. For example, pacifism and tit-for-tat rules may help to reduce Hobbesian problems, but contribute little or nothing to solving the Hardin problem. Similarly, a quota system for the commons (at most two head) may solve a particular commons problem without solving the Hobbesian battle for control over the pasture.

Communities that have internalized norms that help reduce a variety of problems are more likely to flourish than ones that have a different norm or ethical principle for addressing every problem that emerges, because they have fewer social dilemmas and new social dilemmas are often easier to solve because preexisting norms suggest or help support “obvious” solutions.

It also bears noting that some norms are more complex and so more difficult to learn and internalize than others. For example, property norms are somewhat more complex than sharing norms, because they include several commitments. Persons deemed to be “owners” are conceded the “right” to do more or less as they please with “their” property, and each “owner” has the “right” to exclude others from using his or her property. This requires the notions of “owner” and “right” to be understood and similar among community members, and these are not entirely obvious ideas. Moreover, as noted above, the property solution is not always possible—some resources are difficult to partition and others are arguably too important for exclusion to work well (as with a rare natural spring or well in a desert). Moreover, property norms may conflict with other sharing norms and notions of just desserts already internalized by the persons involved.¹⁴

also discusses a few success stories in which relatively complex systems of rules were able to solve such ecological dilemmas in places, such as South Pacific Islands where many resources were very scarce.

¹⁴ Note that partitioning land can undermine the “sharing” solution

¹³ Diamond (2005) analyzes several cases in which communities disappeared because of failures to solve commons problems that emerged as they began to thrive or as weather changes altered the nature of commons problems previously overcome. One need not completely accept his analysis of particular cases to accept his general line of argument, that failures to solve such problems can be catastrophic for communities. He

Note that some solutions to the Hobbesian and Hardin are more likely to create circumstances in which commerce emerges than others. Division of the tribal herd into family or personal herds and the commons into family or personal parcels creates numerous exchange possibilities—for example, the exchange of one’s land for cattle or other goods—whereas general sharing rules tend not to do so. When claims to a particular piece of fruit, head of cattle, or piece of land can be transferred to others, trade will tend to emerge.

After the Hobbesian and Hardin problems are solved or significantly ameliorated, stationary communities can emerge and be self-sustaining. However, these are not the only dilemmas that need to be overcome for communities to flourish as they increase in size, prosper, and become attractive targets for roving bandits and conquerors.

III. Ethics and the Provision of Public Services

Both migratory and stationary groups can benefit from a variety of services that provide benefits for essentially everyone in their communities, but only if essentially everyone contributes to the production of those services. Norms for addressing free-rider problems thus are likely to have emerged before settled communities emerged. However, a stationary community confronts problems that migratory groups do not, and it is likely that norms that solved free-rider problems for migratory groups did not always generalize to the problems faced by stationary communities.

For example, a settlement tends to be a more attractive target for roving bandits than migratory tribes because migratory tribes may simply flee to safety. Everything they have is portable, and there tends to be less wealth to protect than in settled communities where more specialized production often takes place. Village defense is thus likely to be a greater concern for stationary communities than migratory ones. A settlement also tends to benefit more from investments in transport networks, housing, and farm fields and buildings. These are not at risk from roving bandits, but do require coordinated efforts to produce and maintain, and

to the Hobbesian problem. If some regard such exclusion to be unjust or unfair, they may violate their neighbor’s property, which can renew conflict over resources and regenerate the Hobbesian problem. Thus

they may be of interest to conquerors.

The exact timing of the emergence of norms that reduce free riding is not crucial for the norm-assisted emergence of settled communities developed—although it does help align the analytical history and narrative with anthropological research on the gradual emergence of settled communities, agriculture, and commerce at the dawn of human history.

Free Riding and the Public Goods Dilemma

When the large-number dilemma summarized above exists, ... Gains from n -person trade or agreement are clearly present, and these potentialities may be universally recognized. ... In such situations, individuals [may] suggest n -person “rules” or “arrangements” aimed explicitly at reducing or eliminating the inefficiencies generated by independent behavior. ... It may prove almost impossible, however, to secure agreement among a large number of persons, and to enforce such agreements as are made. **The reason for this lies in the “free-rider” position in which each individual finds himself.**

While he [or she] may recognize that similar independent behavior on the part of everyone produces undesirable results, it is not to his [or her] own interest to enter voluntarily into an agreement, since **[personally] optimal results can be attained by allowing others to supply the public good to the maximum extent while he [or she] enjoys a “free ride”; that is, secures the benefits without contributing toward the costs.** Even if an individual should enter into such a cost-sharing agreement, he will have a strong incentive to break his own contract, to chisel on the agreed terms. (J.M. Buchanan, 1968)

After a community has solved its most critical Hobbesian and Hardin problems, they become viable in the sense that conflict is controlled and local sources of food, water, and fuel are not over used.

some norms may solve one problem but reduce prospects for solving other problems that emerge later.

Ethics and the Commercial Society: Chapter 2

Groups that have norms solve these problems without a formal governing organization, although they may have an informal process for making collective decisions. They have rules, but the enforcement of rules remains informal, unorganized and unspecialized. There is no law making class, no law-enforcer elite, but there is to be a highly productive system of norms.

Although viable, such communities still face a number of risks and other problems. For example, they often confront a variety of free-riding problems with respect to services that can potentially benefit everyone in their community. Such services include the informal enforcement of norms through praise and criticism, the teaching of norms to children, and community services such as the maintenance of passage ways and dikes, village defense, social insurance, and participation in group decision making procedures.

Some of these services are critical to a community's survival while others simply make life in the community more attractive to its residents and to potential residents. The advantages of these services may be recognized by everyone, but each might rather free ride than contribute to their production. In this manner, he or she may expect to gain the benefits of those services without contributing to them or at least not to be the only one that undertake such costly efforts.

Table 2.4 characterizes this choice setting. The individuals represented decide whether to contribute to the production of community serviced or not. In this case, it is assumed that the service can be produced by a single individual (or subgroup) living in the village, albeit at a high cost for that individual or subgroup. Or, it can be produced by essentially all members of the community, who share equally in both the costs and benefits of its production. A two-person game is again used to illustrate problems that are likely to be even more severe in larger groups. Paul and Alfred may serve on a posse or not, turn out to defend the village or not, spend time servicing the local transport network or not, contribute to a community insurance fund or not, and so on.

Production of the service is assumed to consume scarce time and energy (labor) of the person or persons engaged in producing the service. The cost of such efforts is simply the use of that time and energy for other personal purposes such as tending to one's family, garden, or cattle. The payoffs are individual net benefits from the service (benefit from the

service less the value of the time spent producing the service) for various combinations of his or her own efforts to producing the community service.

The payoff, however, are not arbitrarily assigned to the cells, although there is a pattern in the relative payoffs that must exist have if a free-rider problem exists. This particular example assumes that the public service can be produced with resources that would otherwise have been used to produce 10 units of benefits if used in an alternative activity. Producing the public service can thus be said to cost 10 units of benefits. The public service, if produced, provides 8 units of benefits to each person in the community. If one person provides the public service, he or she pays the full cost and realizes net benefits of -2. ($8 - 10 = -2$). If two persons contribute, each bears half the required cost and realizes a net benefit of 3. ($3 = 8 - 10/2$). If the good is not produced, no new net benefits are provided, so the payoff for each is 0.

Table 2.4: The Public Goods Dilemma

		Paul	
		Contribute	Free Ride
Alfred	Contribute	(A, P) (3, 3)	(A, P) (-2, 8)
	Free Ride	(8, -2)	(0, 0)

Note that free riding is the dominant strategy for both Paul and Alfred. If Alfred believes that Paul will contribute, then he is better off free riding ($8 > 3$). If Alfred believes that Paul will free ride, Alfred is again better off free riding ($0 > -2$). No matter what Paul does, free riding is Al-

fred’s best choice. The same logic applies to Paul’s decision. As a consequence, the Nash equilibrium is the (0,0) outcome associated with mutual free riding and the public good is not produced.¹⁵

The result is said to be a dilemma because all community members would all be better off if the service were provided and the costs shared ($3 > 0$). Nonetheless, in a community without norms that counter the free-rider problem, self-interest induces each to free ride, because at it is advantageous for each to do so. Note that this may be true even if residents of the community have internalized norms that solve the Hobbesian and Hardin problems, and so are not true pragmatists.

The free rider problem is not inevitable—the cost in some cases may be lower than private benefits associated with individual supply and a single individual may voluntarily provide it—but for relatively expensive and time-intensive public services the free rider problem can be a serious one.

For public services such as community defense, potable water, and law enforcement, the free rider outcome can be as important to solve as the original Hobbesian dilemma. A community may not be viable unless it is able to defend itself from roving bandits and resist the annexation efforts of neighboring communities, nor is likely to be attractive if it cannot assure safe drinkable water and a tolerable system of village passageways and paths into and out of the village.

Whenever free rider problems exist, both Alfred and Paul would favor low cost steps to move from the (0,0) cell to the (3,3) cell where the service is provided and the cost is shared among all members of the community. However, a “solution” that costs more than 6 units would not be undertaken because it costs more than it produces in benefits (3+3).

Civil Virtues as Solutions to Public Goods Problems

Table 2.5 modifies table 2.4 to analyze the effects of internalized codes of conduct that affect propensities to free ride. As in the Hobbesian and Hardin illustrations, the effects of civil virtue can be represented as an internal loss associated with not performing one’s duty (G) or as an

¹⁵As in the Hobbesian game, this game can also be represented in continuous and infinitely repeated forms. In the former case, some of the public service will be provided, but far less than maximizes member welfare. In the latter cases, the relative payoffs in the matrix should be considered present discounted

internal benefit from feelings of virtue associated with performing one’s civic duty (V). Table 2.5 illustrates the case in which contributing to the community service of interest is regarded by Paul and Alfred to be virtuous, praiseworthy, civic duty.

In the case illustrated, the benefits from the public service are nearly sufficient to justify private provision, so the “virtue payoff” does not have to be very large to solve the problem. Note that $V > 2$ is sufficient to assure that the public service is provided, although it is not sufficient to assure that the costs are shared, which in this case requires a stronger disposition, $V > 5$.

Table 2.5: Solving the Public Goods Dilemma through Civic Norms

		Paul	
		Contribute	Free Ride
Alfred	Contribute	(A , P) (3+V, 3+V)	(A , P) (-2+V, 8)
	Free Ride	(8, -2+V)	(0, 0)

The game matrix also demonstrates that the extent to which norms can be relied upon to solve a public good problem varies with the cost of the service. If the strength of civic duty is modest, as with $V=2$, public services costing up to 10 can be overcome via civic ethics in the two-person case, but not ones costing more than 10—other things being equal.

It also demonstrates that internalized ethical dispositions need not be universal within a community to solve problems. In the case in which $V=3$ for either Alfred or Paul, the free riding problem (lack of provision)

values of the pure strategy choices, and the equilibrium depicted as a sub-game perfect Nash equilibrium. (The payoffs are normalized so that if the service under consideration is not produced, the payoffs for both Paul and Alfred are both zero.)

Ethics and the Commercial Society: Chapter 2

is solved, although there may still be free riders. For example, if $V=3$ for Alfred but $V=0$ for Paul, Alfred provides the service and Paul free rides.

It bears noting that contributions to public services do not necessarily require the nature of the problem to be fully understood. Bravery, for example, tends to reduce the problem of village defense by reducing its cost for those who have that virtue. The virtue of bravery may have been developed for private rather than civil reasons. Aristotle, for example, argued that bravery enables one to live a more satisfying less fearful life.

As in the previous cases, some norms may be narrow rules that address only a subcategory of the problems faced, as bravery helps with village defense but would not play a role in solving the village passageway maintenance problems. Other norms, may contribute to solutions to a variety of problems such as a promise keeping norm. The latter would reinforce oaths made with respect to defending the village, even if the persons making the promises were not especially brave and did not regard defense or road maintenance to be inherently virtuous activities.¹⁶

It bears noting that among the most important free-rider problem to be solved is the transmission of norms that solve the Hobbesian, Commons, and free-rider problems. In communities without formal governments, such norms are also transmitted informally by families, friends and village wise men and women. This teaching of norms is normally supplemented with encouragement, approbations, public esteem and other rewards for acts of “public service.” Together the internal and external rewards for virtuous behavior can induce families to engage in moral training, friends and families to encourage more or less the same norms through praise and other supporting stories and theories of the good life, dutiful conduct, and praiseworthy behavior. Thus norms promote the transmission of norms as well as encouraging minutemen to

grab their bows and arrows or guns and rush to the defense of their community at a moment’s notice, volunteer firemen to grab a bucket and put out a fire down the street, or in contemporary times to induce folks to sort through and separate their trash into designated recycle bins.

Sustaining useful civic norms is itself a public good, without which solutions to the Hobbes and Hardin problems would be only temporary. In relatively successful communities—and these are generally the only ones observed—parents, friends, and neighbors all devote considerable time and attention to the moral training of children. Children are taught both maxims and ethical principles, and their ethical conduct is rewarded with praise and gifts.¹⁷

Civil Virtue and Public Goods Dilemmas in Large Communities

Decentralized solutions to public goods problems are not limited to small communities in which the performance of civil duties are clear and can be closely monitored and encouraged by fellow community members. The logic of the above free-rider problem can be easily extended to communities with large numbers of members in which the internalized codes of conduct vary among members.

For example, if the assumptions of the illustration are kept, the net benefits of sharing costs tend to increase as the number of persons in the community increases, because the costs of the service can be shared among more members of the community. The payoffs of the upper lefthand cell become $(8-10/N)$, which rises toward 8 as N increases.

It bears noting that large communities are likely to have a wider distribution of values for “ G ” and “ V ” than small communities and so are more likely to have a few extremely virtuous persons than an otherwise

¹⁶ Buchanan (1965) for example emphasizes agreements as a potential source of moral rules and principles that might solve social dilemmas in the small groups typical of emergent communities.

¹⁷Such multi-level normative systems doubtless emerged gradually, because a hierarchy of supporting norms and sequence of moral choices is required. (i) There are community norms for parental duties to teach their children particular norms, (ii) there are the actions taken by parents to do so or not, and (iii) there are the actions by the children to follow the norms or not. (iv) There are duties

to all to encourage parents and children to undertake their duties—e.g. behave in accord with community norms. All four choices require community support, which is most likely to be of the Smithian variety—which is to say praise for performing one’s duties and disapprobation for failing to do so. Most likely, some parents began inducing their children to do the “right” thing, because the “right” thing benefited them directly, as with deference to parents and undertaking personal hygiene and household chores. Other civic norms were gradually added to those taught, and this elicited praise from others in the community who benefited from the “right actions” of dutiful children.

similar small community. The strongest norms tend to be stronger and the weakest weaker. This increase in variation, perhaps surprisingly, tends to reduce free-rider problems in large communities, although it also tends to increase crime.

In the above example, it is sufficient for at least one person to have a virtue payoff greater than 2 for the public good or service to be provided.

If the strength of ethical dispositions in a given society has a normal distribution, the probability that at least one person in a community has a virtue benefit greater than 2 increases with population.¹⁸ Individuals with higher than average civil virtue or propensities to resist free riding will be likely to team up to provide public services, even if all others free ride.

For services that increase in average cost as community size increases, the fraction of persons who have to contribute and the magnitude of contributions required to solve the associated free-rider problems increase. Whether such services are provided will depend on the rate of increase in average cost and the distribution of community norms. With favorable a distributional characteristics, a minority of persons will often have sufficiently strong ethical dispositions to contribute to those services. For example, in large communities, charitable contributions have often funded churches, town meeting halls, residences for the poor, public education, libraries, museums, opera halls, medical research, and many other community services.

From a utilitarian perspective, civil society solutions are often superior to tax-financed solutions, because collecting tax revenues and organizing the provision of public services consumers resources takes resources from other net-benefit generating activities. Moreover, coercion itself may be regarded as cost of the tax system that reduces the net benefits of community life. Even if the problems of good governance are

solved, the cost of tax systems tend to rise with the revenues raised (including both administrative costs and deadweight loss). For utilitarians, all such costs must be charged against the net benefits of service provision.¹⁹

In cases in which ethical dispositions are not strong enough to solve a particular free rider problem, internalized ethical dispositions can reduce the overall cost of governmental solutions. In the above game, the higher the direct and indirect benefits of virtue, the smaller subsidies need be to induce the provision of the service of interest (and the smaller are tax payments required to fund those subsidies). Thus, a community with relatively strong civic virtues requires a less burdensome government than one with weaker or no ethical sanctions against free riding, other things being equal.²⁰

Solutions to Social Dilemmas as Public Goods

The notion of public good is inclusive enough that all solutions to social dilemmas can be regarded to be public goods. Each dilemma's solution provides benefits for essentially everyone in a community. Thus solutions are not likely to emerge from the collective efforts of a group—until after a group has developed norms that address free-riding. This may require a meeting of the the minds and a method—possibly a voting method—to recognize when that is achieved. However, organizing a group is itself a public goods in many cases, and it is likely that organizing steps are not taken until norms that reduce free riding have emerged. Prior to that step, there is no collective action and no voluntary process for making group decisions.

It is therefore likely that the first solutions to community public goods problems emerged without central administration, which is to say they were accomplished through the emergence of civic duties of various

effects of coercion within utilitarian and contractarian frameworks.

²⁰It bears noting that relatively low expected penalties are sufficient to induce very high levels of tax compliance in the US and much of Western Europe. Although the penalties are not trivial, the probability of being punished is very low. That trustworthiness plays a role in tax payments has been demonstrated by Feld and Frey (2002) and by Feld and Tyran (2002). We return to these and other related issues in Part III.

¹⁸This is a property of sample size for normal distributions. If the distribution sampled has a maximum value, as in a uniform distribution, there are limits to this sampling effect. However, it is also possible that small groups of relatively virtuous persons may form clubs, and share costs in a manner that provide the service for themselves and their communities. Public service clubs often undertake such projects.

¹⁹See Martinez-Vazquez and Winer (2014) for a recent analysis of the welfare

kinds that ameliorated a subset of the problems faced.

IV. Ethics and Conventional Behavior: Solutions to Coordination Problems

Beyond peace and security, essential public services, management of access to natural resources, and public amenities, there are a variety of other problems that can be overcome to make life in a community easier, more pleasant, and productive. Among the simplest of these are norms (conventions) that solve coordination problems. Examples include, language, alphabets, measures and weights, calendars, and many simple customs of day-to-day life such as rules for using public passageways and greetings.

Coordination games have the property that all participants are better off when everyone chooses the same strategy, although no particular choice is better than another. This makes coordination problems quite different from most other social dilemmas. The desirable outcomes of coordination games are stable when they emerge, in contrast to the desirable outcomes of most other social dilemmas.

Table 2.6 illustrates the payoff structure of a coordination game for the case of passing people on the left or right on a path or sidewalk. Note that in this case, a pattern of community behavior is likely to emerge that is stable and requires neither ethical nor legal support. Narrow self-interest is sufficient to sustain it when an equilibrium emerges.

Table 2.6: Coordination Games: Walking on Community Pathways

		Harold	
		Pass on Left	Pass on Right
Duncan	Pass on Left	(D, H) (1, 1)	(D, H) (-1, -1)
	Pass on Right	(-1,-1)	(1, 1)

The above matrix and its associated solutions can be used to think about a wide variety of coordination problems. Persons in a given community may pass on the right when driving, walking, horseback riding, sailing, and so on. Random choices would slow traffic and increase accidents. Persons in a given community may say: good morning, buenas dias, bonjour, guten tag, sabah alkhayr, ohayo gozaimusu, zaoshang hao, etc.. A random choice among such phrases would not be understood very often in most places.

Coordinating maxims are often generalized to cover a variety of similar settings.

Although one could have a different convention for each pairing or place, a general rule will minimize the chance of the undesirable lower left-hand and upper-right hand cells being realized. In relatively infrequent cases, coordination is improved by internalized norms such as one should always pass on the right (or left). One should always shake hands with the right (or left), or say hello rather than buongiorno (or vice versa).

When rules for solving a coordination problem become internalized, one of the strategies increases in value relative to the other. It becomes the “right thing to do” and the others become the “wrong thing to do.” In a society where there is an internalized disposition to drive on the right, driving on the left is uncomfortable, feels wrong, and is disorienting for its drivers. Similarly, a native speaker might feel uncomfortable with violations of his or her community’s rules for greetings, pronunciation, grammar, and expression. Not only would they tend to be unwilling to use slang, pronunciation, or spellings from another region or dialect, they may be uncomfortable when they are used by others. An unconventional speaker may be dismissed as incoherent, an idiot, a barbarian.

As norms and habits of thought and behavior emerge, one of the possible equilibria that might emerge in new circumstances becomes more likely to emerge than others. Normative conventions emerge regarding actions that one should take to be a responsible member of a community. Table 2.7. illustrates the effects of such conventions.

Table 2.7: Internalization of a Convention for Walking on Community Paths and Sidewalks

		Harold	
		Pass on Left	Pass on Right
Duncan	Pass on Left	(D, H) (1+V, 1+V)	(D, H) (-1+V, -1-G)
	Pass on Right	(-1-G, -1+V)	(1-G, 1-G)

The role of conventions and supporting norms in coordination games is to shorten the period of disequilibrium by reducing incentives to “be unconventional.” Even a small nudge provided by an internalized normative principle is often sufficient to induce the “right” strategy choice in unfamiliar circumstances within a given community. The combination of “pull” toward a community’s conventions (sense of civil virtue, V) and risk of losses from deviation (sense of guilt from failure to behave conventionally, G) only have to be sufficient to dominate the other possible equilibrium, as with $(V+G) > 2$. As conventions emerge, the unfavorable off-diagonal results occur with less frequency.²¹

The simplest conventions may be taught in a moment, as children may be taught to stay to their right someone approaching them from the front and thereby the passerby will be to their left. They may also have rules that call for passing persons by moving to the left of any person they approach from the rear. Other conventions are so complex that it takes a lifetime (or more) of practice to master, as true of English grammar, the Chinese character set, etiquette, and mainstream religious interpretations.

Although conventions are often supported by strong norms, conventions are not always regarded to be matters of ethics. This is partly because many conventions are entirely arbitrary.

However, some conventions involve moral acts or have moral consequences. These can be analyzed with ethical principles. For example, con-

ventions of the variety illustrated in tables 2.5 and 2.6 satisfy the Kantian imperative and can be regarded as moral duties under Kant’s theory or moral action. Similarly, insofar as following conventions benefit all members of a community, they are moral acts from the utilitarian perspective. However, neither Kantian nor utilitarian theory provide any guidance about which of the above two conventions should be followed, because the results are identical in terms of universality and aggregate utility or net benefits. They simply rule out rules that might have generated the lower lefthand or upper righthand outcomes. Conventions that do not contribute to character development or elicit praise are beyond the domain of moral conduct from the perspectives of Aristotle’s and Smith’s theories. (Short overviews of these theories are provided in part III.)

Nonetheless, internalized conventions elicit the same sort of psychological and social reactions as associated with Aristotelian and Smithian theories. Violating conventions, as with a boy named Sue or poor spelling, generate guilty reactions and disapprobation from fellow community members in much the same manner as other actions regarded to be unethical. It is this sense of guilt or virtue that allows the effects of internalized conventions to be represented in the same manner previously used for ethical decisions. Once established, following community norms may be supported by other higher-level virtues that are unrelated to specific conventions such as prudence or a sense of duty to the law or one’s community.²²

Conventions enrich community’s life by increasing the likelihood that one of the more rewarding equilibria emerges and is sustained, which tend to reduce conflict and transactions costs. A normative principle that extends easily to new circumstances helps assure that a mutually beneficial equilibrium emerges quickly as minor changes in circumstances occur. Although, one could imagine different rules for coordinating on sidewalks, roads, stairs, and hallways, a uniform rule is easier to remember and easier to generalize to new situations.²³

²¹ That frequency tends to be larger in large communities than in small ones, other things being equal, because of mistakes made by their more numerous visitors (who may use different conventions at home) and because of the intentional choices of their more numerous nonconformists.

²²See Brennan and Pettit (2004) for an analysis of markets for esteem.

²³ It bears noting that there are usually more social conventions and uniformity norms than there are coordination problems to be solved. Examples

Table 2.8: The Externality Problem

V. Ethics and the Internalization of Externalities

Rules that facilitate escape from the Hobbesian dilemma, avoid the Hardin problem, assure community services, and solve coordination problems allow attractive communities to emerge and sustain themselves. Nonetheless, there are many other sources of potential conflict within a community. Normative dispositions can address these as well.

Among these are what economists refer to as externalities, actions by an individual or group that impose costs or benefits on others. For example, a community member’s behavior may endanger others, may engage in activities that propagate diseases, or may create smells and noises that annoy others in their neighborhood. A house may be heated or trash disposed of in a manner that creates a risk of fire, diseases, or simply produces unpleasant smells for its neighbors. A resident may enjoy loud music or target practicing at 3:00 AM.

Table 2.8 illustrates the nature of externality problems. The choice setting illustrated is one that might emerge as settled communities and husbandry emerge—although is also one that some towns and cities are concerned about today. Suppose there are externalities associated with raising chickens in a village in the form of noise, smells, and pests. Suppose that urban farming is beneficial for the persons of interest, but that each person’s satisfaction is diminished by the noises and smells associated with their neighbor’s fowl farms.

Three farm sizes are used below to illustrate the case in which an externality problem is not of the all-or-nothing variety.

		James		
		1 Chicken	10 Chickens	50 Chickens
Craig	1 Chicken	(C , J) (4, 4)	(C, J) (3,6)	(C , J) (1, 8)
	10 Chickens	(6,3)	(5,5)	(2, 6)
	50 Chickens	(8,1)	(6,2)	(3, 3)

In the case illustrated, the Nash equilibrium is one with relatively large household poultry farms throughout the village. These provide benefits to the chicken owners but impose significant costs on their neighbors. A problem exists because there is another outcome that is in principle feasible and generates additional net benefits for each poultry farmer (5>3).

A variety of ethical theories and other norms can potentially ameliorate externality problems such as this one altering the net benefits associated with different sized flocks. In some cases, this might cause individuals to take account of the effects of their actions on others. Utilitarians do this explicitly, when they attempt to evaluate the consequences of alternative actions by adding up the net utility effects on all others in a community. Indeed, a utilitarian would conclude that the result is the worst possible one. The sum of the payoffs at the Nash equilibrium is the smallest on the table.

Another possibility is that individuals may have adopted a “do no harm” norm in which case, the notion of harm has to be worked out. Such a norm may associate guilt with any and all externalities. Note that external costs are imposed on others for any expansion beyond a single chicken in the table. If both farmers initially have just a single chicken, a move to a flock of size 10 by either of them reduces the net benefits

from ancient and more recent history include dress codes, dietary restrictions, and state-sanctioned religious beliefs. In these cases, the benefits from eliminating uniformity norms and formal penalties for violating them were evidently larger than their long run costs, because they were not solutions to coordination

problems. They were unproductive restrictions on choice and occasionally generated Hobbesian conflict over which convention should be imposed. Tolerance for a bit of non-conformity may help weed-out conventions that do not address coordination or free-rider problems.

from chicken farming for the other. Another possibility is a solution analogous to the rationing solution of the commons problem. It may gradually emerge that a flock owner's fair or just right to poultry farming involves no more than a flock of 10 and that consequently as that norm became widespread among poultry farmers, that a feeling of guilt would be associated with larger flock sizes and of virtue for the proper or fair size of flock. The same result may be generated by reciprocity norms such as the "golden rule" (do unto others as you would have others do unto you).

The point here, once again, is that a variety of norms can potentially solve this particular problems, some of which may generalize across problems more easily than others. And some of which may provide better foundations or support for poultry farming as vocation than others.

An internalized norm that associates guilt with activities that generate negative externalities (external costs) or virtue with activities that reduce or eliminate externalities reduces associated problems. Table 2.9 illustrates how a do no harm norm might operate, when guilt rises as the external costs generated by chicken farming increase. Note that in such cases, the norm is not simply "right or wrong," but "righter" and "wronger"—a rank ordering of states with respect to their moralness. Also note that such systems may generate small or large flocks depending on the degree guilt generated. Combinations of "graduated guilt" such as $G_{50} > 2$ and $G_{10} < 1$ generate the middle cell as an equilibrium. However, other versions of the do no harm rule would not settle on the middle outcome that utilitarians would aim for.²⁴

Table 2.9: Solving the Externality Problem

		James		
		1 Chicken	10 Chickens	50 Chickens
Craig	1 Chicken	(C, J) (4, 4)	(C, J) (3, 6-G ₁₀)	(C, J) (1, 8-G ₅₀)
	10 Chickens	(6-G ₁₀ , 3)	(5-G ₁₀ , 5-G ₁₀)	(2-G ₁₀ , 6-G ₅₀)
	50 Chickens	(8-G ₅₀ , 1)	(6-G ₅₀ , 2-G ₁₀)	(3-G ₅₀ , 3-G ₅₀)

In this case, not only to the rationales for guilt (or virtue) differ, but the ideal outcome also differs. Some norms would place the community closer to the edge of survival than others, by in this case reducing food production. Others may do so by increasing the risk of disease.

Such cases also illustrate a challenge associated with general moral maxims and formal regulations. In this case, the many resembling it, the solution is not simply avoiding a particular behavior. Eliminating poultry farming would avoid the externality problem, but produce an output that is worse (0,0) than the problem (3,3) under many ethical principles. When multiple intermediate cases exist and the best outcome is not obvious, simple general rules of conduct may provide little guidance. Ethical limits exist in such cases, but vary with the ethical principles in the minds of the persons in the community of interest and with the externality problem of interest—many of which may be deemed morally irrelevant under some ethical principles but not others.

Another point illustrated by the externality problem is that some characteristics of problems are general. All the previous problems can be regarded as one's associated with externalities—namely choice settings in which some or all choices impose costs (or benefits) on others who affect the outcome generated by that setting (game matrix). If the concept of externality is recognized and appreciated for its generality, then ethical principles may be invented that can both help identify problems and solve or mitigate them. However, without such a recognition, every exter-

and guilt serves as a subjective Pigovian tax for the activities in question.

²⁴ An ideal utilitarian ethical disposition with its associated feelings of virtue

nality problem may be dealt with as a separate dilemma. Ethical progress—at least insofar as solving social dilemmas is concerned—is clearly possible both as individual problems are overcome and as more general principles are deduced that make new problems both easier to recognize and ameliorate.²⁵

VI. Conclusions: Ethics and Life in Communities

This chapter shows several ways in which life in communities is made more attractive by a subset of ethical theories. Ethical dispositions can reduce conflict, address common problems, help assure that public services are provided, solve coordination problems, and reduce externality problems. The results need not be perfect to provide the foundations for a flourishing community. It is sufficient that the combination of internally enforced rules reduce the losses from critical social dilemmas to the point where the communities are sufficiently attractive to be viable in the long run.

From a social evolutionary perspective, ethical dispositions exist because they “work,” which is to say because they solve problems that make both individuals and communities more viable in both the short and long run. From this perspective, ethical dispositions, communities and norms coevolve. However, ethical and other normative dispositions do not all generalize in the sense that they are equally able to be used to recognize and solve new problems as they emerge. Indeed, some ethical dispositions arguably create as many or more problems as they solve.

In the limit, as Spencer noted in 1851, normative dispositions could in principle “do it all,” and eliminate all the unnecessary conflicts and coordination problems associated with living in the community. In such cases, there would be no need for the centralized authority, no need for a government.

²⁵ It bears noting that the concept of an externality is a late 19th century invention attributed to Alfred Marshall, it was further elaborated by Arthur Pigou and many others in the 20th century. The extent to which this concept is recognized outside of welfare economics is likely to be fairly limited (except as special cases). Fitzgerald et al (2016) suggest that relatively few individuals have internalized the concept of externalities.

²⁶See Eldredge and Gould (1972) or Bak and Sneppen (1993) for overviews

However, social evolution, although faster than biological evolution, is sufficiently slow and haphazard that it can take place without reaching such an ideal system of ethical dispositions and community norms. There may be pauses in social evolution of the punctuated variety associated with biological evolution, rather than a steady series of improvements. Thus what we observe is less akin to Spencer’s perfected society than to Locke’s original state in which various “natural laws” (moral maxims, principles, and their associated duties) have been internalized to varying degrees by persons within a community. These allow communities to be viable without solving the even more difficult problems associated with productive as opposed to extractive governance—an issue taken up in part II of the book.²⁶

With respect to the purposes of this book, ethical solutions for the problems of life in community are important because towns and cities are the places where commerce is most often central to life. As Hobbes pointed out, without security of life and property, industry and the arts would be unlikely to emerge. The analysis of this chapter supports that contention, although it suggests a different solution than the creation of an all-powerful government that imposes law and order on a population of pragmatists. A variety of normative systems can support viable communities. However, not all of these are as supportive of the emergence of commerce and commercial networks—a topic taken up in the next two chapters.

and models of punctuated equilibrium. See Congleton and Vanberg (1992, 2001) or Boyd and Richardson (1988, 2002) for evolutionary models of the emergence of norms. Remarks in Spencer’s autobiography (1904) suggest that at some point after 1851, he changed his mind about the feasibility of an evolutionary cultural equilibria, partly because he came to believe that society and human nature change more slowly than new problems emerge.

VII. References

- Bak, P., & Sneppen, K. (1993). Punctuated equilibrium and criticality in a simple model of evolution. *Physical review letters*, 71(24), 4083.
- Boyd, R., & Richerson, P. J. (1988). *Culture and the evolutionary process*. University of Chicago press.
- Boyd, R., & Richerson, P. J. (2002). Group beneficial norms can spread rapidly in a structured population. *Journal of theoretical biology*, 215(3), 287-296.
- Brennan, G. and Pettit, P. (2004). *The Economy of Esteem: An Essay on Civil and Political Society*. Oxford: Oxford University Press.
- Buchanan, J. M. (1968). *The Demand and Supply of Public Goods* (Vol. 5). Chicago: Rand McNally.
- Buchanan, J. M. (1965). Ethical rules, expected values, and large numbers. *Ethics*, 76(1), 1-13.
- Bush, W. C., & Mayer, L. S. (1974). Some implications of anarchy for the distribution of property. *Journal of Economic Theory*, 8(4), 401–12.
- Congleton, R. D. (1980). Competitive process, competitive waste, and institutions. *Toward a theory of the rent-seeking society*, 153–79.
- Congleton, R. D., & Vanberg, V. J. (2001). Help, harm or avoid? On the personal advantage of dispositions to cooperate and punish in multilateral PD games with exit. *Journal of Economic Behavior and Organization*, 44(2), 145-167.
- Diamond, J. (2005). *Collapse: How societies choose to fail or succeed*. NY: Penguin.
- Eldredge, N. and Gould, S. J. (1972). Punctuated equilibria: an alternative to phyletic gradualism. In Ayala, F. J. & Avise, J. C. (Eds.) *Essential Readings in Evolutionary Biology*. Baltimore: JHU Press.
- Eldredge, N. and Gould, S. J. (1972). Punctuated equilibria: an alternative to phyletic gradualism. In Ayala, F. J. & Avise, J. C. (Eds.) *Essential Readings in Evolutionary Biology*. Baltimore: JHU Press.
- Feld, L. P. and Frey, B. S. (2002). Trust Breeds Trust: How Taxpayers Are Treated, *Economics of Governance* 3: 87-99.
- Feld, L. P. and Tyran, J. R. (2002). Tax evasion and voting: An experimental analysis," *Kyklos* 55: 197–221.
- Fitzgerald, M. P., Lamberton, C. P., & Walsh, M. F. (2016). Will I Pay for Your Pleasure? Consumers' Perceptions of Negative Externalities and Responses to Pigovian Taxes. *Journal of the Association for Consumer Research*, 1(3), 355-377.
- Garfinkel, M. R. and Skaperdas, S. (2008). *The Political Economy of Conflict and Appropriation*. Cambridge: Cambridge University Press.
- Grotius (1609/2009) *The Free Sea*. Digitized and distributed by Evergreen Review, Inc.
- Hardin, G. (1968). The Tragedy of the Commons. *Science* 162 (3859): 1243-48.
- Hobbes, T. (1651/2004) *Leviathan*. Digitized and distributed by Digireads.com.
- Keeley, L. H. (1997). *War Before Civilization*. Oxford: Oxford University Press.
- Locke, J. (1689/2009). *Two Treatises of Government*. Digitized and distributed by MacMay at Amazon.
- Luce, D. and Raiffa, H. (1957). *Games and Decisions, Introduction and Critical Survey*. New York: John Wiley and Sons.

- Martinez-Vazquez, J. and Winer, S. (2014). *Coercion and Social Welfare in Public Finance: Economic and Political Perspectives*. Cambridge: Cambridge University Press.
- Montesquieu, C. (1748/1989). *The Spirit of the Laws*. (Cambridge Texts in the History of Political Thought). Cambridge: Cambridge University Press.
- Neumann J. v. and Morgenstern, O. (1944). *Theory of Games and Economic Behavior*. Princeton NJ: Princeton University Press.
- Ostrom, E. (1990) *Governing the Commons*. Cambridge: Cambridge University Press.
- Paine, T. (1776/2014). *Common Sense*. distributed by Amazon.com.
- Pinker, S. (2011). *The Better Angels of Our Nature, Why Violence Has Declined*. New York: Penguin Books.
- Skaperdas, S. (1992). Cooperation, conflict, and power in the absence of property rights. *The American Economic Review*, 720-739.
- Spencer, H. (1851/2011). *Social Statics, or The Conditions Essential to Human Happiness Specified and the First of Them Developed*. Digitized and distributed by Amazon.com.
- Spencer, H. (1904/2014). *An Autobiography: Volume 1 and 2*. New York: D. Appleton and Co. Digitized and distributed by Amazon.com.
- Tullock, G. (1972) *Explorations in the Theory of Anarchy*. Blacksburg: University Publications.
- Vanberg, V. J., & Congleton, R. D. (1992). Rationality, morality, and exit. *American Political Science Review*, 86(2), 418-431.

VIII. Appendix to Chapter 2: Some Introductory Notes on Non-Cooperative Games Theory

The use of game theory to study politics began in the eighteenth century and to study economics in the nineteenth century. For example, the Cournot duopoly model was worked out in 1838, and provides an example of a non-cooperative game with a Nash equilibrium. Other game-theoretic forms of duopoly and models of monopolistic competition developed in the 1930s as with Stackelberg's model.

It was not until shortly after W.W.II. that game theory emerged as a separate field. The book that brought the field to the attention of persons outside the small group of applied mathematicians initially working on game theory is the *Theory of Games and Economic Behavior* by von Neumann and Morgenstern (1944). A second more accessible classic work was published a decade later, *Games and Decisions* by Luce and Raiffa (1957).

Game theory can be used to model a wide variety of human behavior in small number and large number economic, political, and social settings. The choice settings in which economists most frequently apply game theory, however, are small number settings in which outcomes are obviously jointly determined by the decisions of independent decision makers.

In "non-cooperative game theory" individuals are normally assumed to maximize their own utility without taking account of the effects of their choices on other persons in the game. The game players are implicitly assumed to be pragmatists without internalized ethical dispositions.

The outcomes of the game are usually jointly determined by the strategies independently chosen by all players in the game.

Consequently, each person's welfare depends, in part, on the decisions of other individuals "in the game."

For example, in **Cournot duopoly**, each firm's profits depend upon its own output decision and that of the other firm in the market. In a setting where pure public goods are consumed, one's own consumption of the public good depends in part on one's own production level of the good, and, in part, on that of all others. After a snow fall, the amount of snow on neighborhood sidewalks depends partly on your own efforts at

shoveling and partly that of all others in the neighborhood. In an election, each candidate's vote maximizing policy position depends in part on the positions of the other candidate(s).

The simplest game that allows one to model social interdependence is a two person game each of whom can independently choose between two strategies, S_1 and S_2 . There are four possible outcomes to the game:

- (1) Both players may choose S_1 ,
- (2) Both may choose S_2
- (3) Player A may choose S_1 and player B may choose S_2 ,
- or (4) Player A may choose S_2 and player B may choose S_1 .

The combination of strategies that emerges is the result of the independent decisions of the two players, A and B (Al and Bob).

Such games allow a variety of interdependencies to be thought about systematically and, perhaps surprisingly, also shed light on settings in which many strategies exist and many players, which normally generate very similar behavior.

A game is said to have a **Nash Equilibrium** when a strategy combination is “stable” in the sense that no player can change his strategy and increase his or her own payoff by doing so. There may be more than one Nash equilibrium. For example, coordination games **have two equilibria**. Neither person can make themselves better off by changing their strategy (alone) given that of the other player(s) in the game.

A state of the world or game outcome is said to be **Pareto Optimal** or Pareto Efficient, if it is impossible to reach another state where at least one person is better off and no one is worse off. Note that the (Trade, Trade), equilibrium is Pareto optimal, but not of the other outcomes are.

The **Prisoners' Dilemma game** is probably the most widely used game in social science. PD game represents the case in which “cooperate, cooperate” solution is preferred by each player to the “defect, defect” equilibrium, $[v(S_1), v(S_1)] > [v(S_2), v(S_2)]$. It also requires the value generated by defecting is a bit higher than the cooperative solution regardless of whether the other player cooperates or not. Often the payoffs are represented ordinally with (3, 3) for the mutual cooperative solution and (2,

2) for the mutual defection result. The other payoffs are then (1,4) and (4,1) with the defector receiving 4 and the cooperator 1.

The PD payoffs can be represented algebraically with (abstract) payoffs. (C, C) and (D, D) are the payoffs of the mutual cooperation and mutual defection outcomes. And (S, T) and (T, S) for the “temptation” and “sucker's” payoffs when one person defects and the other is “played for a sucker.” In a PD game, $T > C > D > S$.

The PD game's main limitations as a model of social dilemmas are its assumptions about the number of players (2), the number of strategies (2), the period of play (a 1-shot game), and the interests of the players (self-centered). However, most of these assumptions can be dropped without changing the basic conclusions of the analysis. Essentially the same conclusions follow for N-person games in which the players have an infinite number of strategies (along a continuum) and play for any *finite* number of rounds, as we will see later in the book. However, if the players have internalized ethical dispositions many of the settings thought to have payoffs consistent with prisoner's dilemmas (as many lab experiments in which players have money-based payoffs) will not actually have a PD payoff structure in utility terms, as demonstrated in this chapter.

The **mathematical requirements for completely specifying a game** are met in the Prisoner's Dilemma game. The possible strategies are completely enumerated. The payoffs for each player are completely described for all possible combinations of strategies. The information set is (implicitly) characterized. (A player is said to have perfect information if he knows all details of the game. A perfectly informed player knows the payoffs for each party, the range of strategies possible, and whether the other players are fully informed or not.)

The application of game theory to economic problems continues to be among the most active areas of theory in contemporary economics and philosophy. A quick look at any economics journal published and many philosophy journals in the past three decades will find a large number of articles that rely upon elementary game theory to analyze economic behavior of theoretical and policy interest. Modern work on: the self-enforcing properties of contracts, credible commitments, the private production of public goods, externalities, time inconsistency problems, models of negotiation, and models of political and social activity have all used game theoretic models as their engines of analysis.