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What can we gain from the analytical power of game theory to advance a positive, empirically- oriented institutional analysis? General equilibrium theory in neo-classical economics is used to predict allocations. Is it possible to use game theory to study institutions in the same way?

Chapter 11 highlights why it is not possible to do so. More generally, game-theoretic insights reveal the limitations of this theory for deductively predicting a unique outcome in, for example, recurrent strategic situations. The implications of the limited ability of game theory to deductively predict a unique outcome in a given situation depends on the issue under consideration.¹ The discussion here concentrates, however, on the implications of this limited ability for institutional analysis. Chapter 12 presents how we can benefit from the analytical strength of game theory to identify, rather than predict, institutions. As part VI elaborates, this identification is necessary for predicting institutions. It argues that institutional dynamics is a historical process in which past institutions influence the rate and direction of institutional change. Hence, predicting institutions and influencing the direction of institutional change necessitates identifying past institutions.

Chapter 12 argues that benefitting from the analytical power of game theory to empirically study institutions that prevailed in a particular situation requires an interactive, context-specific analysis (Greif 1997a). An interactive analysis combines the merit of a case-study approach and quantitative analysis with insights and restrictions on arguments, as well as predictions obtained from context-specific models. Detailed knowledge of the situation under consideration is used to identify the relevant interactions, the context that would be embedded in the rules of the game, and to develop conjectures regarding relevant institutions. Context-specific, game-theoretic models are used to select among various conjectures and substantiate and develop a particular one regarding the relevance of a specific institution.

¹ On these insights and their implications regarding the analysis of various issues, see, for example, Bates et al. 1998 (regarding studying unique historical events); Greif 1997a (regarding institutional analysis); Sutton 1991 (regarding industrial organizations).

Such an interactive, context-specific analysis was utilized in chapters 5 and 6 but these chapters did not elaborate on how to conduct the analysis. Accordingly, chapter 13 presents another empirical analysis while highlighting the essence of the empirical methodology presented here. The chapter examines an issue of importance: the institutional foundations of impersonal exchange. To highlight the merit of the interactive analysis, the chapter presents studies that did and did not use it to examine this issue during the late medieval period.

To simplify the presentation and to concentrate on the strength of game theory, the discussion in this part considers economic transactions and beliefs, organizations, and behavior. Furthermore, it ignores social relationships and social preferences although introducing these considerations would strengthen the merit of the methodology proposed here.

&Chapter 11 Is Game Theory Sufficient for Institutional Analysis?

If it had been possible to use game theory to predict institutions, it could have fulfilled the same role in institutional analysis that the general equilibrium theory (GET) serves in studying allocations in neo-classical economics. GET provides an explicit model of allocation: given the technology and each economic agent's endowment and preference, the model predicts prices and an associated allocation of goods and services. To study prices and allocations in a particular time and place, we just need to supplement this theory with an empirical analysis providing the details of the agents' endowments, preferences, and technology. While the deficiencies of this theory to various positive analyses are well known, it is nevertheless a coherent statement regarding the relationships between the exogenous and endogenous variables. For a given vector of endowment, preferences, and technology, the theory predicts an allocation. Clearly, game theory is not a "theory" in this sense. It is a theory of behavior in strategic situations and hence not a theory of institutions, in particular.

As a theory of behavior, game theory has been extensively used to study outcomes in diverse fields. It has been used to predict outcomes in economics, political science, sociology, evolutionary biology, and anthropology. Its usefulness for advancing positive, empirical analysis is widely accepted in some fields and debated in others. In economics, for example, the positive usefulness of game theory is widely accepted but it is controversial in political science.²

One can object, for example, to the assumptions underlying some game theoretic analysis, such as rationality or game theory's limitations in studying endogenous preferences and hence norms and emotions. Indeed, we have already seen in part III that to study norms and emotions we need to supplement game theory with insights from various disciplines. But even if we accept game theory's underlying assumptions and concentrate on the study of behavior and beliefs regarding others' behavior, is it adequate for predicting institutions? Can we begin an institutional analysis, for example, with a game specifying all the technologically and physically possible actions and predict - based on game theory alone - the cultural beliefs and behavior that will prevail?

² For the debate in political science, see, for example, Green and Shapiro 1994 and Friedman 1996 (political science). For the general position of economists, see Gibbons 1997.

The answer to this question is well known. The insights of game theory itself revealed that it is insufficient even for such an analysis. Game-theoretic analysis indicates that we cannot, in general, use only game theory to advance an argument regarding the prevalence of specific cultural beliefs in a given recurrent strategic interaction. This is the case, in particular, because institutions embody the knowledge of the interacting individuals and the set of self-enforcing beliefs that can prevail in recurrent situations is usually large.

Hence, the particular positions in economics and political science seem to reflect the distinct questions they ask. Economists usually examine situations in which the action sets of the economic agents are arguably known to these agents and the analyst and it is rather restricted. In other words, it is clear that the interacting agents share a common knowledge of the relevant rules of the game, and many institutional elements can be taken as exogenous to the analysis. The economic textbook discussion of oligopoly theory, for example, does not even bother to mention that it is assumed that the rivaling firms cannot resort to violence. Political scientists, however, are often concerned with situations in which what is known is less clear to the decision-makers and the existing institutions must be explained rather than assumed. Institutional analysis is similarly concerned with such situations and game theory is indeed inadequate for predicting institutions in them.

11.1 Cognition and Knowledge

Is it possible to predict an institution by considering a game in which decision-makers' choices of behavior are constrained only by technological and physical possibilities? Specifying such a game constitutes a statement about the relevant knowledge and cognition among decision-makers. It assumes that they know all the technological and physical possibilities, that they are aware of any possible moves, and they all know what the implications of each combination of actions will be. Furthermore, specifying such a game entails making assumptions about the internalized beliefs that these decision-makers hold. Do they believe, for example, in punishment in the afterworld or that the ghost of someone you hurt will haunt you forever?

Such a specification, however, ignores the fact that existing institutions distribute, embody, and reflect the knowledge and beliefs that have been accumulated in a society. In the absence of institutions and because of individuals' limited and distinct cognitive abilities and

experiences, each decision-maker is likely to have a limited and distinct knowledge, awareness of feasible alternatives, and beliefs regarding the various unobservable aspects of a situation. This is the case when existing institutions are unintentionally selected from the set of feasible alternatives, as well as when they are intentionally selected from the known subset of feasible alternatives. Indeed, section 7.1 has elaborated on the role of rules in guiding behavior by distributing knowledge and beliefs among the interacting individuals.

Can learning and evolutionary forces lead individuals to recognize, or act “as if” they recognize, the set of all possible actions and their implications? If this were true, considering a game in which decision-makers’ choices of behavior are constrained only by technological and physical possibilities might be justified. Learning and evolutionary models, however, reveal that this is not the case. Such models assume that there is an objective reality about which each individual learn through past, personal experience by observing others’ actions and performance and adjust their behavior accordingly. It is also often assumed that some individuals randomly “mutate” to play a different strategy than others thereby adding to knowledge regarding the merit of alternative behavior. Such models reveal that even in a stationary environment, evolutionary and learning processes are likely to be very slow in yielding convergence to a particular equilibrium. (Ellison 1993.) The results are even weaker when the environment is not stationary; the learning and evolutionary process may fail to catch up with reality.³

More fundamentally, outcomes of evolutionary and learning processes crucially depend on the details of the process through which mutations are generated and learning occurs. They assume that decision-makers observe such variables as the average actions of others and their average payoffs or that individuals mutate through some random process. If we take these processes as exogenous, as is done in the game theoretic learning and evolutionary models, then we implicitly recognize the limitations of game theory per se. If we consider these processes as endogenous, reflecting actions and information generated by some institution, we are back to asking how convergence on these institutions occurred. (See chapter 14 for further discussion.)

³ Recall also the discussion in chapter 4 regarding results in deductive and subjective game theory. When we consider internalized beliefs and mental models, convergence on a particular belief is even less likely to occur.

Hence, in the absence of institutions, each decision-maker is likely to have limited and distinct knowledge, awareness of feasible alternatives, and beliefs regarding various aspects of the situation. Indeed, it is the role of institutions in distributing knowledge that lends support to the use of game theory to restrict admissible self-enforcing beliefs and behavior. Existing institutions reflect, embody, and structure the sphere that the decision-makers understand.⁴ Hence, institutions reflect the set of actions that the relevant actors envision as possible choices within which they can contemplate and select among their actions. But if institutions provide the knowledge required for the game-theoretic analysis to be useful, we cannot predict these institutions by assuming that a particular game is relevant.

Institutions reflect, embody, and distribute a society's collective knowledge. Furthermore, existing knowledge and its development over time depends on existing institutions. (Chapter 14.) Hence, we can not begin the analysis by postulating that decision-makers' choices of behavior are constrained only by technological and physical possibilities. If we begin the analysis by postulating that the decision-makers in the situation under consideration were aware of all alternatives, we impose our knowledge of the situation on them. We postulate that they knew the set of all technologically and physically possible institutions and share the same beliefs regarding its nature as we do. Instead of learning how the prevailing knowledge in a particular society is reflected and embodied in its institutions, we might end up superimposing our knowledge on the analysis and thus examine or predict irrelevant alternatives.

For example, a society may not have limited liability firms because of the incentives generated by its existing institutions that discourage individuals from establishing them. But it may also be true that members of the society did not recognize a limited liability firm as a possibility: it had not been invented. Knowing which scenario is correct in a particular society requires recognizing the relevant institution. Did the members of a society know about limited liability but the existing institutions were such that no individual was motivated or able to adopt this organizational form? Or were they unaware of this possibility? Initiating the analysis while assuming that the former is the case may lead to examining theoretically possible and

⁴ See, for example, Hayek 1960; March and Olsen 1989; Denzau and North 1994.

empirically irrelevant possibilities. Instead of examining institutions that influence innovation we would examine institutions that influence selection.

The danger of predicting or examining theoretically possible but empirically irrelevant institutions is enhanced by the flexibility of the game-theoretic framework and revealed by its insights. The flexibility of game theory is so extensive that we can construct a game to predict literally every behavior. Furthermore, game theory reveals that the equilibrium set of a given game is very sensitive to its details. (Section 4.4.) Many of these details are regarding parameters that are unobservable to the interacting individuals and the researcher who model their interaction. Among them are others' time-discount factors, wealth, personal attributes, and various options.

The interacting individuals hold particular beliefs regarding the value of such parameters which, in turn, reflect the influence of existing institutions and the real values or magnitudes of these parameters. (Section 4.7.) The existing institution generates the behavior that confirms the beliefs that motivate this behavior. In modeling a situation as a game, we have to assume that the value of these parameters is within a particular range because we cannot directly observe the beliefs. Doing so, however, limits the predictive power of the analysis. The model will only inform us about which beliefs and behavior can be self-enforcing and confirmed for a given parameter, but not which ones will actually prevail.

Consider, for example, an infinitely repeated prisoners' dilemma game in which, as discussed in chapter 4, the set of self-enforcing outcomes critically depends on how patient the players are, that is, on their time discount factors. If the players are sufficiently patient, cooperation can prevail; if they are not sufficiently patient, it cannot prevail. If they are sufficiently patient but each believes that the other is not, they will not cooperate and hence neither will learn that the other's patience is such that cooperation is possible. In modeling the situation, the best we can do is confine the discount factor, for example, to be between zero and one. Hence, we can not predict which of these particular three (or other) outcomes will prevail.

More generally, the mere fact that we can construct a particular game with an equilibrium generating the behavior we are interested in understanding lends very weak support to the claim that this tells us something about the institution that generated this behavior. There may be

many games like this. Clearly, these conclusions would have been strengthened if we were to recognize that institutions also shape individuals' utility functions and internalized beliefs.

11.2 Multiplicity:

Even ignoring the issue of knowledge, game theory reveals the impossibility of using only game theory to identify an institution relevant in a particular time and place. Game theory reveals that a generic property of strategic, particularly recurrent situations is that multiple equilibria exist.⁵ But although game theory reveals the multiplicity of equilibria and hence raises the problem of equilibrium selection, it offers little guidance for resolving it. The "refinement" literature in game theory that has attempted to refine the concept of the Nash equilibrium to yield a unique equilibrium in all games has, by and large, failed to do so.⁶ One cannot identify unique equilibrium beliefs about behavior and the associated behavior based on knowledge of the game.

To illustrate the generality of the multiplicity problem, consider the well-known Prisoners' Dilemma (PD) game. (Figure 4.??.) There are two players who simultaneously choose actions. Each can either cooperate with the other by not admitting that they committed a crime or defect by admitting that they did. If both cooperate, each player's payoff is higher than if they both defected. Specifically, both will serve light prison terms. But if one cooperates and the other defects, the latter's payoff is higher (entailing fewer years in prison) than his payoff would be if they both cooperated. If this game is repeated once, the best each can do is to defect. Playing defect is one's dominant strategy: It is the best one can do independently of what the other is doing. The only equilibrium is thus the one in which both defect. The only behavior and beliefs about behavior that can establish themselves in this case, therefore, are those associated with this unique equilibrium.

⁵ The (original) Folk theorem of repeated games (Friedman 1971) established that any average payoff vector that is better for all players than the (static, one-period game) Nash equilibrium payoff vector can be sustained as the outcome of a subgame-perfect equilibrium of the infinitely repeated game if the players are sufficiently patient. Later analyses established that the equilibrium outcome set is even larger (e.g., Fudenberg and Maskin, 1986).

⁶ Reference and elaboration to be added.???

Now consider the case in which this PD is repeated an infinite number of times and each player discounts future payoffs by a positive amount. In this case, the strategy of playing defect each period is still an equilibrium. If this strategy is played by both players, each of them has nothing to gain by taking any action other than defect. But other equilibria are possible as well. Consider, for example, the following (trigger) strategy. A player begins by cooperating and continues to do so while the other player also cooperates. But if the other ever defects, the player will defect in any subsequent period. This strategy implies that a player has to choose between present and future gains. Defection implies a relatively large immediate gain: the gain from defecting as long as the other player cooperates. But doing so implies losing future gains from cooperation because following defection, both players will defect forever. Hence, if the players' discount rates are sufficiently high - if they value future gains from cooperation enough - each will find it in his best interest to adhere to the above "grim strategy." It is an equilibrium. If each player believes the other will follow this strategy, he will follow it too.

As this example illustrates, many equilibria, indeed, an infinite number of them, are associated with even such a simple game as a repeated PD game.⁷ Given the rules of the game, more than one pattern of behavior can prevail. Defection every period and cooperation every period are both possible patterns of behavior in the repeated PD game. Both the rule of behavior captured by the strategy of perpetual defection and the rule captured by the strategy of conditional cooperation can prevail as equilibrium outcomes. This insight - that there is no one-to-one mapping from structure to outcomes - is not an artifact of some particular feature of the PD game. It is a generic insight because a sufficient (and not even necessary) condition for it is repetition of the same strategic situation over time. But this is exactly the characteristic of the most important interactions among individuals and the domain of institutional analysis, whether they are interactions within the family, in the polity, or in the economic arena.

One response to the problem of multiplicity has been to examine institutions based on the deductive assumption that the equilibrium that prevails is the one that best serves a particular

⁷ This also highlights the difficulty in identifying institutions with rules or the rules of the game. Within the same rules of the game there are many patterns of behavior and beliefs that can be an equilibrium outcome.

function, such as efficiency, fairness, or the gains of those who can influence selection of an institution. While appropriate in some empirical analyses, this assertion is outside the confines of game-theoretic analysis per se. In a game-theoretic analysis all equilibria (however defined) are equally valid, and using criteria that are not part of their definition in selecting a particular equilibrium is a departure from game-theoretic analysis. It implies that game theory, in and of itself, is insufficient for institutional analysis.

In any case, the deficiencies of this functionalist explanation in accounting for the selection of a particular institution out of the many that are possible are well known: accounting for the origin of an institution based only on its function is putting the cart before the horse. Claiming that an efficient institution prevails, for example, requires delineating the mechanism that lets efficiency account for institutional selection. Furthermore, each of the functions proposed as a prime force in institutional selection have been disputed and for good reasons.⁸ Institutions serve more than one function and hence attributing a unique function to institutions cannot resolve the problem of multiplicity. Finally, suppose that an institution corresponds to a particular game-theoretic equilibrium that serves a particular function, say efficiency. But if this institution is an equilibrium in a steady-state situation, how would it be able to change once the underlying parameters of the game changed in a way that rendered the equilibrium inefficient (Sugden 1989)?

The problem of selecting an institution is sometimes referred to as a second-order coordination problem. (E.g., Knight 1995.) Although there are many possible equilibria, members of a society utilize various coordination mechanisms to reach a particular one. Coordination can be provided by culture, leadership, authority, bargaining, negotiation, and collective decision-making organizations such as the legislature. (E.g., Miller 1993.) This observation is valid although it reflects a recognition of the limits of game-theoretic analysis rather than proposing a concrete way to mitigate it.

⁸ For a discussion of various positions and their limitations, see, for example, Ellickson 1991; Sugden 1989; Knight 1992; and chapter 14 below

Another response to the problem of multiplicity has been to enrich game theory with evolutionary imitations and learning dynamics to try to restrict the set of equilibria. Interestingly, these analyses indicate that such institutions would not necessarily be (even) Pareto-efficient since they are an equilibrium reflecting an uncoordinated process.⁹ In any case, even a process that can lead to convergence of a unique equilibrium are likely to take a long period of time. (Ellison 1993.) Ensuring convergence, as we have seen above, and relatively rapid convergence, requires imposing various features on the game that, by themselves, are not aspects of the underlying situation. For example, a common assumption made in evolutionary game-theoretic models is that each individual knows the distribution of past actions of all or enough other individuals. But this knowledge is rarely an attribute of a meta-game devoid of any man-made structures such as organizations that distribute information.

Clearly, the problem of multiplicity is made worse if we abandon the assumption, made in evolutionary and learning models, that there is an objective environment. This assumption ignores the inventive power of humans. Individuals can and do develop “mental models,” which are a set of assumptions about the world around them and causal relationships within it, that they use to understand and guide their behavior. As discussed in section 4.7, deductive and subjective game theory has been recently applied to examine such situations.¹⁰ It revealed that individuals can hold subjective beliefs about the structure of the game which will never be disproved by the behavior they induce. Just consider belief in God and punishment in the afterlife. Hence, so far at least, game theory has failed to provide a guide as to which behavior and beliefs will prevail in a given situation even though it seems objective to us. Indeed, the results suggest that we will never be able to develop such a theory given the possible asymmetry in objective knowledge and the possibility of subjective knowledge

Game theory thus lends support to the claim that one cannot begin an institutional analysis by considering the natural environment within which individuals interact and proceed

⁹ See discussion in Sugden 1989; Kandori, Mailath, and Rob 1993 have examined conditions under which evolution can lead to Pareto-dominant Nash equilibria. See also Young 1998.

¹⁰ See section 4.7 and Kaneko and Matsui 1999; Aoki 2001.

from this base to identifying the relevant institution. Game theory does not inform us about what the relevant actors knew and believed about the game or the factors that influenced equilibrium selection. It cannot, by and large, predict which institutions will prevail in a given environment.

Yet, we can benefit a lot from game theory analytical strength to advance a positive, empirically oriented institutional analysis. This is the topic of the next chapter.

&Chapter 12 Identifying Institutions: Interactive and Context-Specific Analysis

Game theoretic insights thus provides analytical support to the assertion central to the assertion that one can not study institutions deductively without relying on a detailed knowledge of the society under consideration, namely, the historical context. Outcomes depend on the details of the historical context and the particularities of the decision-makers can potentially have large impact on outcomes. Game theory provides institutional analysis with an explicit analytical framework that attests the importance of studying a society's institutions as a unique phenomena. Game theory does not lead to the a-historical conclusion that the same preferences, technologies, and endowments will lead to unique institution in all historical episodes. A society's institutions can be unique to it and can not be deducted using theory alone. The deficiencies of game theory support the inherent historicism of institutional analysis.

This chapter elaborates on a particular way to take advantage of the analytical power of game theory for institutional analysis despite its inability to deductively predict institutions. Rather than predicting institutions, the focus here is not identifying them: revealing the institutions that influence behavior in a particular time and place. The chapter argues that such an analysis necessitates integrating theory and empirical analysis in an approach that can be referred to as interactive analysis using context-specific models (Greif 1997a).¹¹ The point of departure for such an interactive, context-specific analysis is neither an institution nor a game. The point of departure, consistent with the framework presented above, is identifying relevant interactions. Accordingly, the discussion begins by defining more specifically what an interaction or a transaction is. It then presents how game theoretic and empirical analyses can be interactively used to develop and evaluate a thesis regarding the relevant institution. Thick knowledge of the historical context and game theoretic analysis are mutually constitutive in identifying the relevant institution. interactive approach and context-specific analysis draw on the analytical strength and micro-foundations traditionally associated with the agency approach

¹¹ For discussion related to the one advanced here, see, Greif 1996, 1997a, 1998a, 1998b, 2000; Bates et. al. 1998; Sutton 1991; Munck 2001.

with the empirical considerations and sensitivity to context traditionally associated with the structural approach. This chapter elaborates on this way of studying institutions.

12.1 The Transaction as a Basic Unit of Analysis

The above discussion implies that we can not begin the analysis while considering either institution or game as the basic unit of analysis. After all, the institution is the endogenous, man-made factors that we want to identify and understand and hence, can not be the analysis' starting point. Similarly we can not begin the analysis with a game. We can not begin the analysis considering a meta-game because it is clearly not relevant. Neither can we begin the analysis using a very restricted game because, as we have seen while discussing the scope of the analysis, it is the rules of the game relevant to the decision makers and beliefs and norms that established themselves within these rules that we want to identify and understand. But if the analysis needs to identify the game relevant to the interacting individuals and the forces that made it relevant and imply particular pattern of behavior within it - then what is an appropriate basic unit of analysis? This work follows the tradition of the New Institutional Economics in taking the transaction as the basic unit of analysis.

The transaction is only one of the many units of analysis “proposed to study economic organization. Simon has proposed that the *decision premise* is the appropriate unit of analysis.... *Ownership* is the unit of analysis of the economics of property rights. The *industry* is unit of analysis in the structure-conduct-performance approach to industrial organization.... The *individual* has been nominated as the unit of analysis by positive agency theory” (Williamson 1993, p. 127.) Transaction cost economics and the approach taken here follows John R. Commons (1924, 1934) and takes the transaction to be the basic unit of analysis. In studying a society's institutions taking decision premise, ownership, industry, or agency relationship as the basic units of analysis may imply assuming the institutions that have to be examined as endogenous outcomes while taking the transaction as the basic unit of transaction does not exclude examining how decision premise, ownership, industry, or agency relationships come about and/or influence outcomes.

The centrality of the transaction in institutional analysis has already been mentioned in chapter 2 and a detailed discussion of it can be found in Furubotn and Richter (2000). Common suggested this unit of analysis arguing that “the ultimate unit of activity... must contain in itself the three principles of conflict, mutuality, and order. This unit is a transaction” (1932: 2). For him transactions “are the alienation and acquisition between individuals of the *rights* of future ownership of physical things” (Furubotn and Richter 2000: 41-2). This definition of transaction had been superseded in institutional analysis with the one introduced by Williamson: “A transaction "occurs when a good or service is transferred across a technologically separable interface" (Williamson, 1985: 1).

Neither of these definitions is sufficiently encompassing to serve the purpose of this study. In particular, Williamson’s definition does not really defines a transaction but concentrates on the manifestation of transacting. This served his purpose of considering contractual and organizational manifestation of transacting in production processes well. But this definition is too narrow to examine institutions in general which may requires examining also cases in which actual transaction does not occur.

Accordingly, this work defines a transaction as follows. **A transaction exists when something (e.g., a good, a commodity, a feeling, knowledge, etc.) can be transferred among individuals (or other units) or when one can take an action that directly affect someone’s (including that person’s) well-being.** Hence, transactions can be, for example, economic in nature, such as lending; they can be political in nature, such as voting in the Congress; they can be emotional, such as the expression of sympathy; or they can be health-related like the decision whether or not to smoke. Similarly, there is nothing in this definition that assume particular reason to transact. The act of transacting, if it occurs can be voluntary as often assumed in economics but it can also be non-voluntary reflecting the use of force, and it can be legal or not.

To exemplify the relationship between transactions, institutions, and regularities of behavior, consider again the repeated PD game. In PD games, two interrelated transactions are relevant: the transaction between the two prisoners and the transaction between each of them and the “legal system.” The legal system can take actions directly influencing his well-being as well

as that of the other prisoner while each prisoner can take an action influencing the well-being of the other prisoner. In this case, transacting is not voluntary given that each prisoner is held against his will. Given that, the transactions also entails potential mutual gains.

We analyze behavior in these transactions by presenting the situation as a game. The rules of the game relevant to these transactions, as well as the behavior that will prevail in it, reflect various beliefs and organizations. The rules of the game assumes that various technologically feasible organizations and beliefs are either relevant or not. A legal system is implicitly assumed to exist and be able to commit to taking particular actions in response to a prisoner's action, thereby generating particular beliefs. This implicit assumption is reflected in the game's payoff that captures the prisoners' beliefs that cooperation lessens punishment. On the other hand, some potentially relevant organizations like the Mafia were assumed not to exist. Hence, the game assumed away beliefs that a prisoner who defected would be penalized by such an organization. Similarly, the analysis assumed away the possible influence of norms of behavior such as the norm of honor among thieves that the prisoners may have internalized prior to their arrest. Such norms, if they had been internalized by the prisoners, would have affected their willingness to cooperate or

Roughly speaking, considering a transaction as the basic unit of analysis highlights the need and enables considering the relevant rules of the game as partially endogenous. As reflecting, for example, particular knowledge, beliefs, and organizations. Understanding patterns of behavior in a given transaction requires comprehending the organizations and beliefs that generate the relevant rules of the game and behavior within these rules.

In other words, we need to take the transaction rather than an institution or game as the basic unit of analysis because using either institution or games as the basic unit is making an statement regarding man-made factors that influence behavior. But this is exactly what we want to study. It was what the analysis should identify as an endogenous outcome. The question we want to examine is what was the institution that influence behavior of decision makers involved in a particular transaction. Furthermore, by concentrating on a transaction and the beliefs and organizations that influence behavior in it, the scope of the analysis is well defined. We are not interested in all the beliefs and organizations that prevailed in the society under study. All we

care about is the beliefs and organizations directly related to the transaction under consideration. Taking the transaction as the basic unit of analysis also facilitates a comparative study of institutions because we can compare institutions that govern the same transaction in different time and places.

Consider, for example, the above study of the Maghribi traders. The analysis considered as exogenous such man-made features as language, money, and product markets. Taking as given such factors, however, did not imply assuming that a particular institution govern the transaction under consideration. It only provides the context within which we want to examine the man-made factors which influence behavior in the transaction under consideration. In other words, while concentrating on relevant transaction takes into account the historical context, it does not imply that the issue under consideration directly depends on the endogenous institutions we want to examine.

Similarly, taking the transaction as the basic unit of analysis clarifies the scope of the analysis. All we have to understand is the beliefs, norms, and organizations that directly influence behavior of the relevant decision makers. Finally, by concentrating on a transaction rather than on an institution, we avoid presupposing that institutions with particular attributes (such as efficiency) govern that transaction. For example, even if we were to observe that agency relationships were not established during the late medieval period (as they did in some parts of, for example, Europe), an analysis of the institutions - the man-made factors - that generated this behavior would still be warranted. More generally, concentrating on a transaction and associated pattern of behavior prevents the analysis from being functionalist in assuming that we can account for existing institutions based on their function.

12.2 Interactive and Context Specific Analysis

A study employing interactive analysis begins by identifying in the episode under study a recurrent and important transaction in which multiple pattern of behavior are technologically and

physically possible.¹² Examples are credit relations, political mobilization, or the intergenerational transfer of resources. Only the next step in the analysis is to examine the related institutions. Evidence, general theoretical insights, and context-specific models are interactively used to form a hypothesis about the relevance of a particular institutions in guiding, motivating, and enabling behavior in that transaction. The hypothesis is about how the inherent features of the transaction (section 2.3.2) in conjunction with the relevant man-made factors generate pattern of behavior among the relevant decision makers. In particular, the hypothesis should articulate on the postulated organizations, beliefs, and norms that influence behavior in the transaction under consideration.

Formulating our hypothesis as a game enables us to express and evaluate this hypothesis formally, using a context-specific model that differentiates between those institutions that should be incorporated in the rules of the game and those that would be examined as emerging within the rules. The details of the context-specific model are based on the historical evidence, and the model should aim to evaluate the robustness of its implications, particularly regarding unobservable aspects of the situation assumed in the rules. The game should be the simplest one possible which makes explicit lines of causation and the mechanisms linking exogenous and endogenous variables.

Since the theoretical analysis is the benchmark of the empirical study, not its mold, the hypothesis regarding the relevance of the particular institution and the game-theoretic formulation must be *empirically substantiated*, mainly by comparing conditions and predictions that the theoretical analysis reveals implies with historical and comparative observations. The basic method is similar to the one used in economics generally: confronting predictions generated by the theory with evidence. This process of substantiation, however, enables us to do more than simply confirm a hypothesis. From it we can also gain further insights into the nature of the institution we are considering.

¹² Two of the measures that can be used to evaluate importance are the number of people involved and the welfare implications of the outcomes. Important and permanent transactions include labor relations, credit relations, and parent-child relations.

Interactive, context-specific analysis takes advantage of the ability of game theory to yield predictions that can be confronted with observable historical evidence given a hypothesis about observable and unobservable institutional elements. Because of the technical difficulties associated with studying dynamic games over long period of time, the analysis mainly utilizes repeated games in which the same basic game is repeated in every period. This analysis, therefore, need to be complemented by examining the long-run processes that an institution entails and which may change the basic stage game. Such analysis also yields predictions that we can compare with the historical evidence. Finally, by comparing institutions at different points in time and in different situations HIA aims at understanding their origin and dynamics.

This empirical methodology *is interactive* entailing continual dialogue between theory and evidence and based on context-specific models which generate context-specific predictions. (Namely, predictions that would necessarily will be true in other situations.) Although presenting the analysis in discrete stages can be misleading, what follows is a short schematic elaboration of the empirical methodology's four interrelated steps. The first step uses historical evidence to identify the relevant transaction and establish the historical context. The second combines historical evidence and theory to generate a hypothesis about the relevance of a particular institution and then to model that institution. The third uses game theory and consistency analysis to substantiate the hypothesis. And the fourth attempts to gain support to the hypothesis and better understanding of the relevant institutions by considering the origin, dynamics, and long-run implications of institutions.

12.3 Step One: Identifying an Issue and the Historical Contest

We begin the analysis by identifying an important and recurrent transaction in the historical episode that we are considering. Alternatively, we begin the analysis by forming, based on the evidence a thesis regarding the transactions relevant to the issue at hand. We then examine the historical context and the technological and non-technological aspects of the situation that can be taken as exogenous.

The starting point of the analysis is a micro-level, empirical examination aimed at identifying the relevant issue by revealing a recurrent and important transaction. In considering

institutions influenced economic outcome, it may be constructive to ask: Which transactions are crucial for achieving particular economic outcomes (such as efficiency or a particular distribution of resources) in that society? And which political transactions are crucial for achieving particular economically relevant objectives (such as political order, resource mobilization, or equity)?

To avoid functionalism, we want to identify a transaction rather than to identify institutions and behavior and assume that they mitigated a problem associated with some transaction. That is, the appropriate transaction should not be identified by assuming that existing institutions reflect such considerations as efficiency or distributional. Rather, it should be identified based on the economic and political structure or potential of the society.

To illustrate this point, consider economies based on long-distance trade. A relevant transaction is the one in which overseas agents supplied the services required for handling merchants' capital abroad. Some societies developed institutions that mitigated the contractual problems associated with this transaction, while others failed to do so. Hence, we would not begin our analysis by identifying institutions and their function, but by identifying relevant transactions. Furthermore, by concentrating on a particular transaction, we reduce the analysis to a manageable size.

This reduction, however, usually comes at the cost of having to take some institutions as exogenous. Thus once we have identified the relevant issue, we turn to an empirical study to further clarify the significant aspects of the situation. It is imperative that we differentiate the technological and institutional aspects of the situation that are exogenous to the analysis as a whole and those that can be held fixed in the short run for the purpose of the game-theoretic analysis but should be considered as endogenous in the long-run. Indeed, given the state of our knowledge, we are not likely to be able to easily analyze some elements of the situation, such as norms using game theory. In addition, we must identify the empirical details of the situation so that we can formulate it as a game, that is, we must identify the relevant decision-makers, the nature of their relationships, their possible actions, and their preferences over possible outcomes. Finally, we need to delineate relevant endogenous aspects of the situation, particularly those like organizations and behavior, that are observable.

The above does not preclude another foray into identifying the object of study. Instead of identifying recurrent and important transaction, the analysis can be initiated by asking a question of interest. For example, how particular property rights were secured, how political order was achieved, or how particular exchange was conducted. Then we can try to identify the transactions relevant to generating these outcomes and proceed as before. To illustrate this complementary way of initiating the analysis, consider the Mu (2001). She observed that the economic and political system implemented under the Qing during the 17th century during enabled economic expansion and political order. The same system, however, was unable to achieve either of these objectives during the 19th century. Her analysis then proceeded to identify the exact transactions that were the components of this system, the institutions that governed them, and what these institutions implied during these distinct historical epochs.

12.4 Step Two. Developing a Hypothesis and Context-Specific Model

Once we have made explicit the endogenous and exogenous institutional and other features of the historical episode, we use historical evidence and theory interactively to form a hypothesis about the relevance of a particular institution.

Once we identified the relevant transactions we proceed using the evidence, theoretical consideration, and context-specific models to develop a hypothesis regarding the institution that influenced behavior in that transaction. Developing a hypothesis based on interactive, theoretical and empirical analysis surmount the problems associated with cognition, knowledge, multiplicity, and complexity. We do not use theory to predict which institution prevailed. We use evidence and theory interactively to form a hypothesis.

This hypothesis should present the organization, beliefs, norms that generated pattern of behavior in the transaction under consideration. In game theoretic terms, the hypothesis should make explicit what game was socially constructed around this transaction, what beliefs and norms prevailed within this game, and to what effect. We present and examine our hypothesis using a context-specific, game-theoretic model. The context-specific game theoretic analysis is used to present and evaluate the plausibility of a hypothesis regarding the nature of a particular

institutions emerging from an empirical analysis regarding the its relevance in the time and place under consideration.

The virtues and pitfalls of such modeling have been extensively discussed in economics and political science (e.g., Kreps 1990; Bates et al 1998; Powell 1998) and hence only a few comments are in order here. The model should be as simple as possible, capturing the exogenous features of the situation and allowing us to investigate the feasibility of, rationale for, and implications of the endogenous features postulated in the hypothesis. The model's assumptions should, to the extent possible, be based on historical evidence. This serves two purposes. First, it constrains the set of possible models, thereby reducing the likelihood of generating a model that has nothing to do with the historical situation, but still can explain its relevant endogenous features. This is an important issue since game theory shows us that the equilibrium set is very sensitive to specification of the rules of the game - if we misspecify the game, the analysis is likely to be irrelevant. Small changes in the rules of the game can have a large impact. Second, selecting assumptions based on historical evidence limits the ability (or, shall I say, temptation) to account for the observed phenomenon with ad-hoc assumptions about unobservable features of the situation.

Choosing assumptions based on interaction between theory and historical evidence is important because HIA considers situations other than pure economic exchange embedded in a anonymous market. With market exchange we could argue that it is appropriate to use deductive criteria in specifying preferences over outcomes: higher profits bring greater utility. Yet such deductive criteria do not apply as well to other social interactions. Directly identifying preferences over outcomes and behavior may be problematic particularly because preference are unobservable and partially endogenous. Hence, we must be careful not to confuse observed behavior with norms or preferences. For example, in the case of the community responsibility system conjecturing that lenders did not cheat because they had internalized the norm of honesty would be misleading. It confuses actual behavior with preferences. Accordingly, HIA relies on the deductive assumptions regarding preferences and norms used in rational choice analysis unless there is compelling evidence to the contrary. Whether we specify preferences deductively

or inductively, we must evaluate their consistency with the resulting institution.¹³ We also must take similar care in determining whether the prevalence of a particular institutional element is due to lack of knowledge or lack of incentive.

The model should be constructed so as to substantiate the hypothesis that a particular institution prevailed, rather than to prove that all other feasible institutions did not.¹⁴ Whenever possible, the analysis should increase our confidence in the hypothesis regarding the relevance of a particular institution by rejecting alternative ones. Yet it would be counterproductive to attempt to identify all technologically feasible institutions, or those that the historical actors could have or believe they could have used. By assuming that the actors were aware of this set, we may be imbuing them with knowledge that they did not have, and will thus be needlessly complicating the analysis by introducing irrelevant alternatives.¹⁵ We must verify, rather than assume a claim that the historical actors were aware of a particular option.

12.5 Step Three: Refining and Substantiating the Hypothesis

Now, we can interactively use the context-specific model together with historical evidence to better understand, refine, and substantiate our hypothesis.

We further refine and substantiate our hypothesis using game theory and evidence interactively. Consider first how we can use game theory. A model amounts to a statement

¹³ The two next parts of this book demonstrate this position. Part II claims that there is sufficient evidence to inductively assume particular norms and preferences and concludes by examining how these norms were reinforced by the ensuing institutions. Part III, however, begins with a deductive specification of norms and concludes by examining the likely impact of the ensuing institutions on norms.

¹⁴ The same is done in econometric analysis as well in which we get a statistical confirmation that we can not reject the hypothesis we test. This, as well known, does not imply that we either should accept it or that every other hypothesis would be rejected.

¹⁵ A deficiency of this approach is that alternative, off-the-path-of-play options may have a profound impact on on-the-equilibrium-path outcomes. That is, omitting a potential organization from the game's specification may have a large impact on the analysis. Thus the empirical analysis should take this possibility into consideration. Similar problems exist in the "discrete institutional analysis" conducted in transaction cost economics (Williamson, 1985), in which the transaction costs associated with governing a transaction under all potential institutions must be compared.

regarding the aspects of the situation that we claim to be important or unimportant - a statement that can be confronted by relevant evidence. Subjecting the model to game-theoretic equilibrium analysis restricts the set of admissible institutions, but it also provides other ways to compare the theoretical insights with historical evidence. It may be the case that there is no equilibrium with which the postulated institution is associated and which generates the behavior or stylized facts associated with the hypothesis. This result may imply that the theoretical framework is inappropriate and thus that the focus of the empirical investigation should be redirected. Alternatively, it may imply that the model is misspecified, having missed important aspects of reality, and should be reevaluated.¹⁶ Modeling and equilibrium analysis thus provide a check on the logic of the hypothesis.

If such an equilibrium exists, we can use the model to further substantiate our hypothesis. Since game theory makes explicit the expectations and behavior that generate a particular outcome, we can further substantiate a hypothesis by using direct evidence. Direct evidence includes explicit statements and documentary references indicating that the actions, expectations, and perceptions of historical agents, as reflected in the historical sources, match the actions, expectations, and perceptions associated with the game-theoretic equilibrium. For example, in studying the community responsibility system, we can examine the associated legal codes, cases, and treaties among communities to identify the expectations and behavior related to inter-community lending.

Equally important is the indirect evidence: the confirmation of predictions generated under the assumption that the hypothesis is correct. In other words, the hypothesis should be such that the predictions it generates can be falsified by the empirical evidence, and the analysis should enable us to learn what we did not know before. Game theory enables us to make predictions since it reveals the relationship between endogenous and exogenous variables. A

¹⁶ I will not present this part of the analysis here, since it concerns evaluating findings rather than the process of reaching them. Yet in carrying out this process, the models' failures led to revisions. For example, part II of the book emphasizes the importance of the threat imposed by Frederic Barbarossa on the ability of the Genoese clans to cooperate. This emphasis, in turn, reflects the failure of a similar model, but without an external threat, to account for the patterns in Genoa's political and economic history.

particularly useful feature of game-theoretic analysis for the study of self-enforcing institutions is its ability to generate predictions, which can be falsified based on hypotheses regarding expectations off the path of play, a crucial but unobservable aspect of self-enforcing institutions.

Clearly, a hypothesis whose predictions concern only the particular observation the analysis is trying to account for to begin with has limited empirical validity. The analysis thus must be able to generate *several* predictions that can be falsified once confronted with the evidence. The more predictions the analysis can account for, the more likely it is that the hypothesis is indeed the relevant one.¹⁷ One merit of conducting a comparative analysis of institutions at different points in history is that it enables us to test predictions against a wealth of evidence. We carry out such tests using econometric techniques. Yet when we examine institutions at the level of society and when the object of the analysis is a strategic situation, econometrics will often be of little use. Clearly, we can still compare predictions and evidence (although without the benefit of a confidence interval).

In the case of the community responsibility system we can use a game-theoretic model to generate predictions regarding observables such as the relationship between the size of communities and their participation in inter-community lending, the incentives of lenders and their actions designed to verify the creditworthiness of borrowers, whether a trader abroad would be subject to the legal system of the local community or his own community, the process through which new traders began to establish credit relations, and the relationship between the expected value of future trades and the actions taken following accusation of default. Some of these predictions derive directly from the equilibrium analysis, and they are robust to variations in the underlying parameters. Others are generated through comparative statics, that is, by examining the equilibrium implications of variations in the underlying parameters. In other words, while assuming that the same institutional constraints governed the relations between lenders and

¹⁷ A partial ordering between analyses is thus possible.

borrowers, we derive observable implications about the behavior of lenders, borrowers, and communities with distinct characteristics.¹⁸

The complexity of the model and the proposed equilibrium provides additional means of evaluating the hypothesis. We can ask: If the expectations associated with the equilibrium are very complex, can we reasonably assume that they prevailed in that particular episode? Can we identify empirically plausible evolutionary or learning processes that could have led to the emergence of that equilibrium? Similarly, we can use game theory's sensitivity to specifications to examine the robustness of the analysis, particularly with respect to those aspects of the situation that are not well reflected in the historical records.

We can use several criteria to substantiate the hypothesis and, *ceteris paribus*, the more means that can be used, the better. The hypothesis gains support to the extent that the associated game-theoretic analysis:

- Is based on the simplest possible assumptions that can be supported by the historical evidence.
- Indicates the existence of an equilibrium that captures the essence of the hypothesis about an institution, particularly with respect to its unobservable elements such as beliefs.
- Is confirmed by direct evidence.
- Is confirmed by indirect evidence, that is, it produces predictions that can be falsified either by evidence from the historical episode under consideration or through a comparative study over time and space.
- Indicates that the expectations and behavior associated with the equilibrium are reasonable for the particular historical episode and/or there is an empirically plausible evolutionary and learning process that could have led to their emergence.

¹⁸ Conducting a comparative statics analysis while using game theory presents certain problems. In particular, a change in the exogenous variables implies that a new game is being played. Any equilibrium in the equilibrium set of the new game is feasible, and hence there is no a priori reason to assume that the equilibrium that prevailed in the previous game will hold, thus enabling comparative statics analysis. As reflected in the details of the analysis below, to address this problem we can, for example, conduct monotone comparative statics (Milgrom and Shannon 1994) on the equilibrium set, examine the relationship between the change in the parameter and the parameter set required for a particular equilibrium to hold, and concentrate on an equilibrium with particular attributes.

- Is robust to different specifications, particularly with respect to aspects of the situation that are not well reflected in the historical evidence.

So far we have discussed how game theory can refine and substantiate a hypothesis. This analysis can be enriched by recognizing the limitation of the game theoretic formulation. Game theoretic analysis takes as given such (at least partially) factors as preference, norms, and knowledge. These however, can and are being shaped by existing institutions directly and indirectly and hence can be referred to as quasi-parameters (a concept which chapter 13 further develops). They can be taken as exogenous in the short run but are endogenous in the long run. For example, organizations contribute to the socialization process and the behavior implied by existing institutions provide new members of a society with role models. A conjecture regarding the relevance of a particular institution in a particular time and place can thus gain further support by indicating that this institution implies changes in quasi-parameters that do not undermine it. The institution's implications regarding factors assumed as exogenous in the game theoretic analysis contribute to its perpetuation.

Ideally, we would employ such analysis at least at the same level of rigor that we would game theory. But because this line of analysis is less well defined than game theory, its application is more context specific and hence it is difficult to discuss in the abstract. In general, examining quasi-parameters can further empirical evaluation in three related ways. First, it lends support to the claim that a particular institution prevail by pointing to mechanisms leading to a positive feedback from an institution's behavioral implications and the institutional and other factors assumed as given in the model. Second, considering quasi-parameters can reveal the relationships between institutions and gradual changes in factors assumed exogenous in the game-theoretic analysis. A claim about the relevance of particular institutions would be further substantiated by observing such changes.

Third, such changes in the quasi-parameters can amount to changes in parameters in the rules of the game. Hence, we can explore the implied changes in the equilibrium outcome. We can use, for example, comparative statics to evaluate responses to the changes assuming that the prevailing institution still influence behavior. We can consider the extent to which changes in

quasi-parameters are likely to lead to new pattern of behavior and beliefs. But we can also consider other changes such as the introduction of organizations aimed at . To illustrate this last point, consider the community responsibility system. The success of the system was one of the factors that contributed to the gradual increase in the size of communities. This change - in a quasi-parameter - diminished the extent to which one's communal identification had been public information. Hence, if indeed the system prevailed, we would see over time attempts to enhance its ability to support lending despite such changes in quasi-parameters. Hence, we can see the introduction of rules in the form, for example, of custom and regulations, and organizations in the form, for example, of a formal representative of a community living abroad who would enable a lender to verify ex-ante a borrower's community affiliation.

However we attempt to substantiate a hypothesis, the critical point is the interaction of theory and history. Indeed, it is only this interaction that enables us to understand which institution functioned and how. Theory can indicate conditions required for a particular institution to prevail, but, by and large, does not fully reveal the nature or the details of that institution. Theory can reveal the conditions that had to be fulfilled for the community responsibility system to induce lending, but only when combined with empirical analysis can it reveal how these conditions were fulfilled. Theory can reveal, for example, that sanctions had to be used, that courts and communities had to have particular information and the motivation to sanction cheaters, that officials in charge had to be induced not to shirk their duty, and that offenders had to be unable to flee to avoid sanctions. When we combine this theory with historical study, we can then learn, for example, which sanctions were actually used, how courts and communities decided which sanctions to use, why courts and communities were motivated to apply sanctions, why the officials in charge did not shirk their duty, and why offenders could not flee.

Theory does not tells us what did or did not happen. Theory tells what to look for in substantiating that some institution prevailed and understanding why and how it influence behavior. In the above study of the Maghribi traders, for example, theory has led us to ask questions that otherwise we would have been led to consider. Among these questions were the following

- How was the unraveling problem resolved? In other words, why if the long-hand of the future induced honesty were old age agents trustworthy?
- Why were members of the coalition in a position to learn about an agent's cheating despite the fact that cheating was not expected to happen regularly?
- How were agents deterred from cheating despite their ability to sever their relationships with the coalition.
- Why was the threat of collective punishment credible?

12.6 Step Four: Wandering in the Woods - The Origin, Dynamics, and Implications of Institutions

Once we have understood the nature and established the relevance of particular institutions, we can gain further support and insight to the institution by examining its origin and long-run implications and dynamics.

While the general issue of the origin and dynamics of institutions is examined later in this book, empirically considering the origin and long-run implications of an institutions can be used to further advance and substantiate a hypothesis regarding its relevance and nature. We can gain support to the hypothesis and better understanding of the relevant institutions by considering the origin, dynamics, and long-run implications of institutions.

The idea is to consider the historical context and examine whether we can identify a plausible process through which that particular institution was likely to emerge. Where did the knowledge required for that institution to be established come from? Is there a reasonable evolutionary or learning process through which this institutions could have emerged given existing institutions and the economic, political, and social environment. What may have led to the emergence of that institution in this particular time and place? Was there any change that made it possible where it was not before? Finding that we can identify the origin of an institution or a plausible process through which it could have emerged clearly lend further support to the hypothesis that this institution was relevant.

Similarly, we can ask what are the likely long-run implications of the conjectured institution. To the extent that they are observed in the data, it lends further support to the hypothesis.

&Chapter 13 Applying Context-Specific Analysis: Institutions and Impersonal Exchange

Interactive, context-specific analysis has already been utilized in this study to examine the Maghribi traders coalition. This examination began with considering the historical context, identifying an important and recurrent transaction, and using evidence, general theoretical insights, and context-specific model to generate a hypothesis regarding the relevant institution and substantiate it. This chapter makes similarly presents a context-specific analysis in a manner that comes to illustrates its distinctive characteristics. It does so by comparing studies which differ in the extent to which they employ context-specific analysis.

The substantive issue that this chapter examines is of importance for its own sake. A basic assertion in economics since at least the days of Adam Smith is that exchange facilitates specialization and hence economic efficiency. Yet, until recently, little attention has been devoted to examine the institutional foundations of such exchange. What enable individuals living in different areas to exchange. In particular, how can they conduct exchange characterized by separation between the *quid* and the *quo* over time and space? This question is of particular interest in situations such as those that prevailed in many historical episode and still characterized many developing countries in which a centralized, impartial legal authority does not exist.¹⁹ How in such situations people can benefit from impersonal exchange, namely, exchange which is impersonal in the sense that in deciding whether to exchange or not, one does not rely on knowledge of the past actions of his partner in the exchange or rely on the expectations that his partner would refrain from cheating based on the fear of losing future gains from exchange with him or others.

This chapter examines this issue in the context of the late medieval Commercial Revolution. In this developmental epoch stretching from the eleventh to the fourteenth centuries, Mediterranean and European long-distance trade reemerged after an extended period of decline (e.g., Pirenne 1956; Lopez 1976). It was during this period that Western Europe witnessed trade expansion and market integration as well as a widespread reliance on exchange

¹⁹ This is not to say that such legal system is the only institution that facilitates impersonal exchange in developed economies. Even in developed economies impersonal exchange is and can be supported by other means. See Platteau 1994, Greif 1997e.

characterized by separation between the *quid* and the *quo* such as credit, contracts for future delivery, negotiable securities, and maritime insurance.

A context-specific examination of the institutions that governed impersonal exchange during this period indicates the role of communities in establishing an institution facilitating inter-community impersonal exchange characterized by separation between the *quid* and the *quo* over time and space.²⁰ More importantly, the paper presents evidence indicating that such an institution - the Community Responsibility System (CRS) - indeed functioned throughout Europe - in England, Flanders, France, Germany, and Italy - from as early as the eleventh century.²¹

The essence of the CRS was simple. If a member of community A had defaulted on a contract with a member of community B, each and every member of community A was held legally liable for the damage. So if community A refused to compensate for the damage, any member of community A who wandered into the territory of community B had his property confiscated as a compensation for the damage and he was sent to settle the account with his community member who defaulted. Clearly, members of community A could have refrained from trading outside their community thereby avoiding confiscation of their property. While possible, this course of action implies the high cost of losing the gains from future trade with members of other communities. Hence, a member of community A, when considering whether to default on a contract with a member of community B, took into account that members of his own community would be motivated to seek compensation from him and would hold him liable for the cost his actions imposed upon them. This increase in the expected cost of not fulfilling one's contractual obligations with members of other communities deterred one from doing this.

²⁰ Works on games with overlapping generations of players are surveyed in Fudenberg and Tirole 1991: 168-72. They also survey works on games between a long-lived player and sequence of short-lived players, an issue discussed below.

²¹ An earlier generation of scholars have noted the operation of this system. E.g., Santini 1886; Arias 1901; Maitland and Bateson, 1901; Patourel, 1937. I extensively rely on these important contributions. By and large, these scholars did not analyze the system and concentrated on the inter-community disputes that this system entailed. Hence they viewed it as an archaic and barbaric system - a relic of the past that hindered, rather than advanced, trade. For a more recent presentation of some of the system's elements, see Moore 1985.

Recognizing that this was the case, a member of one community, could, for example, lend money to a member of another community in impersonal exchange.

Hence, the CRS built on individual traders' affiliations with particular communities, the large extent to which these affiliations were common knowledge, the appropriate strategies, and the existence of intra-community contract enforcement institutions. Inter-community impersonal exchange was possible despite the fact that each merchant could avoid interacting with the one he cheated and one's past actions were unknown to future potential trade partners. The CRS thereby enabled exchange that was impersonal up to one's community affiliation. Inter-community impersonal exchanges was possible long before the rise of the state with effective authority over the whole scope of the transaction and the ability and incentive to discipline the courts to dispense impartial justice.

The following discussion neither presents the origin of the CRS nor the reason for its demise. This latter issue is examined in chapter 13.

13.1 Exchange Characterized by Separation Between the Quid and the Quo During the Late Medieval Period?

The historical records indicate that exchange characterized by a separation between the *quid* and the *quo* over time and space was common in Western Europe during the late medieval Commercial Revolution, perhaps for the first time since the fall of the Roman Empire. In towns, fairs, and marketplaces, merchants provided and received credit, bought and sold through contracts for future delivery, and insured the cargo they shipped over the sea.²² While we cannot qualitatively measure the efficiency contribution of such exchange relations, their contributions were arguably great. Lopez (1976: 72), the eminent historian of the Commercial Revolution, has viewed credit as a necessity for the occurrence of commercial expansion in a period with a monetary system based upon a limited supply of precious metal. The "take-off [of the

²² For a description of these developments, see, for example, Lopez and Raymond 1955: 157-238; de Roover 1963: 42-118; and Postan 1973.

Commercial Revolution] was fueled not by a massive input of cash, but by a closer collaboration of people using [commercial] credit."

The historical records also reflect the identity of the individuals who entered into exchange characterized by a separation between the *quid* and the *quo* over time and space during the Commercial Revolution. This exchange was often conducted among people who lived near each other. (E.g, Herman Van der Vee 1977: 300). It is more intriguing to note, however, that exchange characterized by a separation between the *quid* and the *quo* was also established from as early as the twelfth century among merchants who did not live near each other. For example, around the middle of the century traders from Asti regularly sold Northern textiles imported from the Champagne fairs on credit to Genoese traders (Reynolds 1929, 1930, 1931; Face 1958). Credit arrangements among individuals from other localities are frequently mentioned in Genoa's historical records. In 1190, for example, two Genoese traders, Bonifacius della Volta and Nicola Mallonus, bought goods from a Piacenzan merchant for 120 lira with one year to pay. On the 28th of March, 1210, Rubeus de Campo of Genoa paid a debt of one hundred marks sterling in London on behalf of Vivianus Jordanus from Lucca.²³ Credit transactions among individuals from distant localities were not confined to Italy during this time. Such transactions were common in England during the twelfth and thirteenth centuries among English merchants from different localities and among English merchants and French, Flemish, and German traders.²⁴

Similarly, contracts for future delivery among individuals from distant localities were common in Italy, England and France. For example, in 1191 a Genoese merchant named Ugo Mallonus bought from a Pavian and a Roman 5 bales of fustian of Pavia at 40 pieces per bale, including 13 vermilion, 6 green, the rest brown, and contracted to buy 3 more bales at mid-Lent and another 2 at Easter. At the Fairs of Champagne, where much of the trade between northern

²³ Obertus Scriba 1190, No. 669 and see also Nos. 138, 139. Lanfranco Scriba 1952, vol. 1, No. 524: 234.

²⁴ E.g., *Calendar of the Patent Rolls Preserved in the Public Record Office*. 1266-1272: 20. *English Historical Documents*, vol. II: 1012-3. Postan 1973.

and southern Europe was conducted during the twelfth and the thirteenth centuries, merchants from different localities frequently entered into contracts for future delivery.²⁵

Contract enforceability is necessary for any exchange but enforcement is particularly important in exchange characterized by separation between the *quid* and the *quo*. In the absence of appropriate institutions, a borrower, for example, can enrich himself after obtaining a loan by not repaying his debt. Expecting such behavior *ex post*, a borrower would not lend *ex ante*. Similarly, a merchant who is paid to deliver goods in the future will find it optimal to retain possession of these goods, implying that the buyer would not be willing to pay *ex ante*. Hence, exchange characterized by separation over time and space between the *quid* and the *quo* requires contract enforcement institutions that enable the transacting parties to *ex ante* commit to carry out their contractual obligations *ex post*.

13.2 Theory in the Absence of History

What were the institutions that enabled exchange characterized by separation between the *quid* and the *quo* during the Commercial Revolution? How could a twelfth-century borrower from Lucca, for example, commit himself *ex ante* to repay *ex post* a debt to a lender from London? Did late medieval Europe develop contract enforcement institutions that enabled impersonal exchange? Or was exchange confined to personal exchange in which repeated interactions or family relationships mitigated the commitment problem?

Given the available historical evidence, we cannot address this question by tracing the exchange relations of individual merchants over time. Even if we find that particular traders exchange only once, it does not mean that the exchange was not personal and based on, for example, bilateral reputation. Hence, to examine the extent to which impersonal exchange was feasible in pre-modern Europe one has to determine whether an institution that enabled it functioned during this time.

²⁵ Ugo: Guglielmo Cassinese (1190-2), no. 250. With respect to England and France, see Moore 1985, and Verlinden 1979.

Institution based on the legal system clearly did not function during this period to enable impersonal exchange between members of different communities. In the early days of the period under consideration there was no legal system in Europe that could have effectively supported impersonal exchange among individuals from distant localities. Even within a relatively well-organized political unit (such as England), there was no legal system that could support at a low cost the enforcement required for such exchange.²⁶ Local courts that could supervise and enforce contracts executed in the areas under their authority existed throughout Europe. They had the ability to provide the contract enforcement required for exchange among individuals present in the (limited) territorial area over which they had legal jurisdiction. Yet, such local courts were not, by and large, unbiased agents of a central legal authority. Rather, they were the embodiment of local interests and are known to have been prejudiced in their judgments against foreigners. (E.g., Hanawalt 1974.) Similarly, late medieval communities probably had informal contract enforcement institutions of the kind that often emerge among individuals who live in close proximity.²⁷ Such local formal and informal contract enforcement institutions, however, could not govern impersonal exchange characterized by separation between the *quid* and the *quo* among individuals who lived far away from each other.

The absence of legal contract enforcement provided scholars who did not conduct a context-specific analysis a large latitude in arguing whether impersonal exchange as conducted or not. Those who view legal contract enforceability provided by the state as the glue that enables economic activity in general concluded that impersonal exchange was not conducted.²⁸ It is often argued that impersonal exchange was not feasible during this period because the

²⁶ Plucknett 1949: 142; Ashburner 1909; Postan 1973; and the information contained in *Select Cases Concerning the Law Merchant, A.D. 1239-1633. 2: Central Courts*.

²⁷ Ellickson 1991 has argued, and provided some empirical support, that communities develop welfare-maximizing norms supported by informal contract enforcement institutions. For analysis of such informal contract enforcement institutions among merchants, see Greif 1989, 1993; Bernstein 1992; Clay 1997.

²⁸ See Williamson 1985: 20-1 and Ellickson 1991 for a discussion of the legal centralism tradition in economics.

“personal ties, voluntaristic constraints, and ostracism” that supported an exchange during this period were not “effective” in supporting impersonal exchange (North 1991, p. 100). The rise of impersonal exchange in pre-modern Europe was constrained by the lack of impartial and comprehensive contract enforcement institutions. A necessary condition for impersonal exchange and the emergence of market economies in Europe was the rise of relatively impartial legal systems provided by the European states. This conclusion, however, is not based on historical evidence but only on theoretical premise. Its validity, therefore is open to question.

Other scholars, indeed, reached an opposite conclusion. As a matter of fact, the claim that impersonal exchange prevailed during the late medieval period despite the lack of central legal authority has been used by those who maintain that state intervention in economic affairs hinders the natural evolution of the economy. Benson (1989) argued that impersonal exchange prevailed during the Commercial Revolution. During the eleventh century and on, of a "Law Merchant" which served to coordinate “thousands of traders [who] traveled to fairs and markets all over Europe exchanging goods which they knew little about with people they knew little about.” (p. 648). This “voluntarily produced, voluntarily adjudicated and voluntarily enforced mercantile law” (p. 647) was a necessary condition for the late medieval Commercial Revolution. "Merchants formed their own courts to adjudicate disputes in accordance with their own laws. These courts' decisions were accepted by winners and losers alike because they were backed by the threat of ostracism by the merchant community at large - a very effective boycott sanction" (p. 469).

But the validity of this assertion is also in doubt for the lack of any empirical support and internal logical contradictions. The only reference to a historical support is to the wonderful study of Trackman (1983, 10) whose focus is only on the content of law during that time rather than how it was enforced. Furthermore, how could the fear of ostracism influence behavior if the interaction was among individuals trading with those about whom “they knew little about?” (P. 648.) As we have already seen in discussing the Maghribi traders coalition, for an argument about ostracism to hold water, how information about past behavior is diffused among traders and how they are motivated to participate in a collective punishment has to be articulated.

13.3 Spicing Theory with History: Private Judges and the Champagne Fairs

Recognition of the need to account for information flows and enforcement as emerging endogenously is at the heart of the paper on this issue by Milgrom, North, and Weingast (1990). (Henceforth, MNW) Their analysis focuses, in particular, on contract enforcement in the Champagne Fairs. During the twelfth and the thirteenth centuries much of the trade between Northern and Southern Europe was conducted at the Fairs of Champagne, where merchants from different localities entered into contracts that required enforcement through time, such as contracts for future delivery. (Verlinden 1967). How could a merchant from one community commit to honor contractual obligations toward a member of another?

MNW argue that in the large merchants' community that frequented the fairs, personal exchange could not have surmounted this commitment problem. A reputation mechanism based on personal familiarity could not surmount this commitment problem because large communities lack the social networks required to make past actions known to all. Noting the operation of judges in the fairs, MNW's analysis came to address the following question: "What prevents a merchant from cheating by supplying lower quality goods than promised, and then leaving the [Champagne] Fairs before being detected? In these circumstances the cheated merchant might be able to get a judgement against his supplier, but what good would it do if the supplier never returned to the Fairs? Perhaps ostracism by the other merchants might be an effective way to enforce the payment of judgements. However, if that is so, why was a legal system needed at all?" (pp. 5-6).

13.3.1 The analysis

To address this question, MNW presented a formal model whose essence is as follows. Suppose that each pair of traders is matched only once and each trader knows only his own experience. Since the fairs' court lacked the ability to enforce judgment once a trader left the fairs, assume that the court is capable only of verifying past actions and keeping records of traders who cheated in the past. Acquiring information and appealing to the court is costly for each merchant. Despite these costs, there exists an (symmetric sequential) equilibrium - the Law Merchant equilibrium - in which cheating does not occur and merchants are induced to provide

the court with the information required to support cooperation. It is the court's ability to activate a multilateral reputation mechanism by controlling information that provides the appropriate incentives. Hence, a local court can ensure contract enforcement through time even if it can not use coercive power against cheaters. MNW suggest that the role of the Champagne Fairs' court was similar to that described in their theoretical analysis. The Law Merchant system (LMS) provided contract enforcement in the Fairs.

In advancing this line of argument MNW were among the first analyses to recognize the central role of the lack of information in hindering the operation of a reputation mechanism based on the long hand of the future. Furthermore, their analysis highlights the complementary relationships between reputation based institutions and organizations that change the relevant rules of the game. In the absence of a court, the information required for the operation of a reputation mechanism was not available. The introduction of a particular organization - the court - changed the rules of the game relevant to the traders and made enforcement based on reputation mechanism possible. The court is “introduced” in the sense that it is an equilibrium outcome in a larger game (Calvert 1995).

13.3.2 An interactive, context-specific analysis?

The analysis is theoretically insightful but is it empirically relevant? Was the LMS central to late medieval trade in general and the Fairs in particular?

MNW bring two evidence to support the claim regarding the historical relevance of their findings. First, it explains exchange characterized by separation between the quid and the quo among traders from distinct parts of Europe at the Fairs. The second argument MNW advance to support the historical relevance of their analysis is that “key characteristics” of the “model correspond to practices found at the Champagne Fairs. While merchants at the Fairs were not required to query prior to any contract, the institutions of the Fair provided this information in another manner. As noted above, the Fairs closely controlled entry and exit. A merchant could not enter the Fair without being in good standing with those who controlled entry, and any merchant caught cheating at the Fair would be incarcerated and brought to justice under the rules

of the Fair. So anyone a merchant met at the Fair could be presumed to have a “good reputation” in precisely the sense of our model” (p. 20).

Are these evidence convincing? I would argue that it is not and highlight its limitation by elaborating how it diverged from the interactive, context-specific analysis suggested above. Interactive, context-specific analysis has been described as following four steps. First, identifying an Issue and the historical Contest. Second, developing a hypothesis and context-specific model. Third, refining and substantiating the hypothesis. Fourth, wandering in the woods - The origin, dynamics, and implications of institutions.

In MNW, the historical context is basically ignored and there is not attempt to incorporate it in formulating the issue. For example, the analysis is built on the assumption that there is a group of players: the traders. But traders during the late medieval period operated within a larger population. This is a relevant aspect of the historical context because it raises the issue of how “fly by night” problem was mitigated. What prevented a peasant near the fair from coming to it once, take a loan, and never to be seen again? A good beginning in life. As we have seen while discussing the Maghribi traders, the closeness of the players’ group is an aspect of the historical context that has to be contend with. Similarly, other potentially important information is ignored. For example, what is the internal organization of the Fair? Does it have any relevance to the model relevant to consider the problem? As we will see in the next chapter, considering both these issue is critical and developing and evaluating the institution that foster impersonal exchange during this period.

Consider now the step of developing a hypothesis and context-specific model. The LMS model ignores relevant theoretical insights. For example, critical to the operation of reputation mechanism is the assumption that the game is infinitely repeated. In finitely repeated games, unraveling implies that cooperation can not be sustained. Claiming that the LMS was the institution that governed impersonal exchange ignores the need to address the issue: how was the infinite horizon problem resolved? Without addressing this question, the analysis must be partial and hence open to doubt.

Similarly, the hypothesis and the model incorporate assumptions that are questionable given the historical context. In particular they assume that identities of traders could have been

verified by the court and that one was trading with his own capital. How did the authorities of the Fairs verify that one was in a good standing? After all, driver licences were unknown during this period. So were ID cards, passports, and any other form of identification. As a matter of fact, unlike nobles, commoners did not even have last names. In any case, no form of identification with a reliable picture was available and forgeries were common. Similarly, we know that during this period, merchants throughout Europe traded using agents. Hence, one could have cheated in the Fairs and send an agent to trade on his behalf without the court ever knowing whose money the agent was carrying. Developing a hypothesis and a relevant model have to take such considerations into account.

Very little attention is devoted in the paper to substantiate its hypothesis. Essentially one main argument is advanced: that the model can explain the behavior that motivated it to begin with. But as elaborated above, many models can generate this pattern of behavior. The paper also argue that making traders pay toll at the entrance was the practical equivalence of checking one's past record. But the distinction between the two is large exactly because of the difficulty, mentioned above, of verifying one's identity at the gate. Indeed, the assertion that the authorities at the game has the ability to capture one who would then be "incarcerated and brought to justice at the Fair" if needed reveals the need to examine the role of coercive power rather than commercial sanctions in the operation of the fairs. Indeed, if one accept the paper's assertion that the fairs' court could have verify one's identity and knew about his past transgression, then a cheater would not have returned to the fair fearing coercive retribution rather than commercial sanctions.

As for the origin and dynamics of the postulated institution, the paper does not attempt to gain further support to its postulate based on examining either its origin or its dynamic implications or evolution. It argues that this institution was efficient but this does not account for its origin. Furthermore, no attempt is made to reconcile the model's implication that the existence of the Fairs should have made the emergence of other trading centers very difficult. There are, as the paper noted economies of scale in the operation of the LMS postulated in the paper. How can we then account for the large scale expansion of trading places during this time

in which members of different political units exchange based on contracts characterized by separation between the *quid* and the *quo*.

In short, because the analysis in the paper is not an interactive, context specific analysis it fails to substantiate the relevance of its argument. Theory and empirical evidence are not interactively used to form and evaluate a thesis.

13.4 Context-specific Analysis: The Community Responsibility System

The lack of a legal system that could have supported impersonal exchange characterized by separation between the *quid* and the *quo* among merchants from distant localities led to the perception common within economic history that, prior to the rise of the state, such exchange was not feasible. Yet, this assertion ignores the observation that late medieval trade actually occurred in a particular social context, namely, that of communities. Trade was not conducted among individuals without any social affiliation. On the contrary, it transpired among individuals with particular community affiliations.

Evidence of the fact that long-distance traders were identified as members of a particular community can be found in the many commercial contracts that survived from the late medieval period. Since during this period last names were not yet common among non-nobles, individuals often had surnames or nicknames indicating their profession, place of origin, particular features, etc. In contracts related to long-distance trade it is common to find merchants whose surnames or nicknames reflect their places of origin (Emery [1952] and Lopez [1954]). Furthermore, such contracts were signed in the presence of witnesses whose names were registered on the contract. It is common to find that merchants from one community witnessed a contract that a member of their community entered into when they were abroad, indicating the close association among them.

Individual merchants were identified with particular communities and these assumed various forms. The most common ones were a hometown, a borough, and a merchant guild. In any case, all these communities seem to have shared a particular feature, namely, that the nature of their members' (social, economic, or legal) relations were such that the community had the ability to impose punishment on each of them. This ability, in and by itself, reflects the broader

social and legal environment of the period. The economic and social costs of leaving one's community were relatively high.

Individual merchants were identified with communities and these communities had intra-community contract enforcement mechanisms. Is it theoretically possible that this provided the foundation for an institution supporting the inter-community contract enforcement required for inter-community exchange characterized by distance between the *quid* and the *quo*? And if possible, did such an institution prevail in late medieval Europe? To address the first question and to facilitate addressing the second, the next sub-section builds on game theory to explore the factors constraining impersonal exchange and the possible role of communities in overcoming these constraints.

13.4.1 A theory of the community responsibility system

Theoretically, communities with partial enforcement institutions with jurisdiction within a limited territory could have supported inter-community impersonal exchange. To highlight the function of the community, the analysis begins by examining the necessary and sufficient conditions for impersonal exchange without communities or a legal system. It proceeds by elaborating on how communities and their intra-community, partial enforcement mechanisms could have supported impersonal exchange. For ease of exposition, technical details are suppressed.

Consider an economy in which there are N_L lenders and N_B borrowers who are engaged (WLOG) in credit transactions. Such exchange, as is generally the case, is best modeled as a one-sided prisoners' dilemma game (Greif 2000). Each borrower can decide whether to initiate exchange with a lender (travel to trade) or not. Every borrower who initiates an exchange is matched with a lender ($N_L > N_B$). A lender who was matched with a borrower can decide whether to lend (a finite amount) or not. The payoffs of a borrower who did not travel and a lender who did not lend are zero. A borrower who receives a loan can decide whether to repay it or not. Repaying yields the payoffs of $i > 0$ to the lender and $g > 0$ to the borrower. Not repaying, however, yields the payoffs of $l \leq 0$ to the lender and $G > g$ to the borrower where $l +$

$G \leq i + g$. The above implies that lending is efficient and profitable to both parties, conditional on the borrower paying his debt, but the borrower is better off by not repaying than repaying.

To complete the above description of the game, we need to specify the number of periods each lender and borrower play, the matching process, and the information available to players. Not much should be said about the appropriate assumption regarding the number of periods. After all, if there is one thing we know for sure about medieval traders it is that their lives were finite and their probability of (naturally) dying increased with age. Hence, it seems correct to assume an overlapping generation model. Each period the old cohort of borrowers and lenders die and new ones replace them. Specifically, a borrower plays the above stage game for $T - 1$ periods. He “retires” and does not trade in period T .²⁹ The time discount factor is δ . To examine if individuals can enter into impersonal exchange, assume for the moment that matching is random and all information is private, that is, a lender knows who cheated him in the past but can not transmit this information to others.

In this game, there is no sub-game perfect equilibrium with lending on the equilibrium path.³⁰ As is well known, the assumption of a finite life span is sufficient for this to be the case.³¹ A borrower’s best response in period $T - 1$ is to not repay implying that the lender will find it best not to lend to begin with, and so the game unravels to the first period.

To highlight the distinct hindrance of exchange implied by the finite horizon and private information considerations, however, consider the above game but assume that players have infinite life spans (and hence there is only one cohort of players). In this case, even under private information a lender who was cheated can impose a cost on a cheater by refusing to trade with him in the future. If the probability of future matching and the borrower’s time discount

²⁹ Works on games with overlapping generations of players are surveyed in Fudenberg and Tirole (1991) pp. 168-72.

³⁰ Because the game is OSPD, contagious equilibria (Kandori 1992, Ellison 1994) do not exist.

³¹ Telser (1980) established that the equilibrium set in finite games with an uncertain date of termination is qualitatively equivalent to the equilibrium set in infinite horizon games only if the probability of termination is non-declining each period. This is clearly not the case among individuals.

factor is sufficiently high, there is a sub-game perfect equilibrium (SGPE) with lending on the equilibrium path. In other words, it is assumed that $\delta \leq \frac{(G - g)N_B}{g + (G - g)N_B}$.

The possibility of such personal retaliation will be ignored here for both theoretical and historical considerations. The focus of interest here is the ability to conduct impersonal exchange and hence we want to exclude personal retaliation. Furthermore, historically, the number of medieval traders was very large implying that the cost that one could have imposed on another by refusing to trade with him in the future was arguably minor.³²

If past conduct is public information, however, there can nevertheless be a SGPE with lending on the equilibrium path. Specifically, it is straightforward to show that if borrowers' identities and past actions are common knowledge, for $\delta \geq \frac{G - g}{G}$, the following strategies constitute such a SGNE: a borrower chooses to travel, but repays if and only if he has never defaulted before; a lender lends only to a borrower who has never cheated before. In this case, a multilateral reputation mechanism can support impersonal exchange.

But how could a large group of merchants be informed about actions taken in bilateral exchange? The technological and strategic difficulties associated with transmitting information about cheaters without supporting institutions in medieval trade are rather obvious. To have this information be known would require transmitting the identity of a cheater in an age prior to last names, passports, driver's licences, and photographs. It would require motivating a cheated lender to inform enough other lenders about the transgression despite the high cost of information transmission in an age prior to printing, phones, faxes, and e-mail. And what would motivate a lender to bear this cost? If the above game captures the essence of the situation, a lender who was cheated would have no incentive to inform others about transgressions.

For a contract enforcement institution to enable impersonal exchange, it has to simultaneously mitigate the problems of merchants' finite life spans and information asymmetries. It must enable a borrower to commit to repay, although cheating is his best

³² In the twelfth century, there were several thousand Genoese long-distance traders (Krueger 1957, 1962). Thousands of individuals crowded every major fair in England (Moore, 1985). It has been conjectured that the merchant class in Western Europe numbered in the hundreds of thousands by 1200 (Berman, 1983).

response in his old age. It has to help a lender verify the identity of a borrower he never met before so that a punishment can be inflicted if necessary. And, the institution has to provide the appropriate incentives for acquiring information and punishing cheaters.

To see how communities can underpin an institution that achieves the above, consider the following alteration of the basic model. There are two communities.³³ All borrowers are members of community B, and all lenders are members of community L. Denote a generic lender and buyer, by A_L and A_B respectively. Because a community is composed of overlapping generations of individuals, they exist forever. (Having a fix probability that a community will cease to exist each period does not change the results.) A community is conceptualized as having two features: a territory and an enforcement institution effective within this territory. All lending and payment of loans are made in the lenders' territory. Denote the lenders' enforcement institution LC and the borrowers' enforcement institutions BC. Before considering the courts' action sets, consider their objective function and payoffs.

Following the historical evidence, it seems inappropriate to consider these courts as dispensers of impartial justice. Furthermore, it also seems inappropriate to consider them independent decision-makers with their own interests. With the exception of fairs (as discussed below), the structure of courts and the incentives faced by decision-makers within them were such that they aggregated the interests of a community's living members. They resembled bodies for collective decision-making whose leading members did not gain private benefits from inter-community exchange in a way that was different from that of other members of their community.

In Florence, for example, prior to 1250, initiating actions over disputes in inter-community exchange was the responsibility of the city administrator and his council. By 1325 to take such actions the city administrator had to make two requests to the Commune to get approval. In 1415 the statute detailing the rules for such actions specifies that they were under the authority of consuls responsible for crafts and trade and no longer under the authority of the

³³ The analysis is robust to multiple borrowers' communities but is sensitive to assuming multiple lenders' communities. See below.

city's administrator. Yet, for these consuls to initiate actions in inter-community disputes the actions had to be approved by two additional bodies, the Consuls of the Popolo and the Consuls of the Commune. (Santini 1886, 168-72.)

The social and political context of medieval trade was such that communities controlled their enforcement institutions. Decisions over disputes in inter-community exchange were made by a community's representatives and involved many decision-makers. Accordingly, assume that a community court's payoff is the sum of the payoffs of its living members, and assume away the possibility of bribes. This implicitly assumes, as a bench mark case, that each community member's payoff has equal weight in the court's payoff function. As before, assume that past actions are private information but they can be ex-post verified by the courts. The cost of verification for LC is C_L and it is C_B for BC. Assume for the moment that courts' actions are publicly observable and that lenders' and borrowers' identities are known. Below I will return to examine the appropriateness of these assumptions. It is easiest to present the players' actions and their sequences using the following time line.

either of these conditions fails, then the game is in **Conflict State**.³⁵ Consider the following strategies: A borrower travels if and only if the two communities are in cooperation state. He borrows if he is given a loan, and returns to pay his debt. If he defaults, he pays compensation whenever it is demanded by BC. If he ever travels to L during conflict and obtains a loan, he defaults. A lender lends if he is matched with a borrower during cooperation, and does not lend during conflict. He complains if and only if he is cheated.

LC never demands compensation when there is no complaint. LC verifies every complaint only in cooperation state, and if the complaint is valid, it impounds the goods of borrowers present in its territory and demands from BC compensation equal to the total cost of default, complaining, and verifying to the lenders ($x = i - l + c + C_L$). If BC provides compensation, LC compensates the lender who was cheated, and returns the impounded goods. If BC does not provide compensation, LC continues to impound goods from members of B who are in L territory. LC impounds the goods of all borrowers in its territory if it ever impounded goods without complaint. BC verifies any complaint and if the complaint is found valid, BC imposes a fine of $f = x + C_B$ on the defaulter and pays x to LC.³⁶ If LC furnished a complaint that BC finds invalid, it does not furnish compensation.

Under what conditions is the above strategy SGPE and how exactly does it mitigate the various problems that hinder impersonal exchange in the absence of a community?

Given the strategies of the lenders, the LC, and the BC, it is a borrower's best response to travel, return, and repay if and only if the state is that of cooperation. In a state of cooperation, borrowing and paying implies the payoff of $g > 0$, and cheating implies the net penalty of paying for complaints and verification ($-c - C_L - C_B$). Furthermore, in a more realistic model of the situation (discussed below) with imperfect monitoring, and hence impounding on the equilibrium

³⁵ Because we assume, so far, that all complaints are perfectly verifiable. The probability of disagreement between LC and BC is zero.

³⁶ For simplicity, it is assumed that borrowers can pay f . In reality, when this was not the case, members of his community paid. Arguably, it was difficult for a LC to verify if indeed a borrower was really bankrupt or not.

path, it is clear why a borrower would be willing to acquire the information about whether the state is cooperation or conflict as long as the cost of doing so is less than d .

Given the strategies of the borrowers, the LC, and the BC, it is a lender's best response to lend if and only if the state is cooperation (and similar to borrowers, lenders have an incentive to learn what the state is). Because a lender has to bear the cost of an invalid complaint (c) but is rewarded for presenting a valid one ($x > C_L$), a lender's best response is to complain only if cheated. BC's best response is to verify any complaint, impose the above fine, and compensate the LC if condition 1 holds: $g \sum_{t=0}^{T-1} (N_B - t) \delta^{t+1} + I_B(t) (g - d) \geq x + C_B$. This condition is that if the value of future lending and that of the impounded goods to the living members of the borrowers' community are more than the value of the amount demanded by the LC ($x = G - g + c + C_L$) and the cost of verification.³⁷

It is clear that LC's best response is to verify a complaint and demand compensation. It is also motivated to return the impounded goods and not to impound without a valid complaint if condition 2 holds: $i \sum_{t=0}^{T-1} (N_B - t) \delta^{t+1} \geq (g - d)N_B$. That is, the value of future trade to the living members of the lenders' community is higher than what they can gain from impounding all the goods and foregoing future trade. The linchpin in making this strategy an equilibrium is the incentive provided to the borrowers' community. The BC's best response is to verify a complaint, impose a fine on a cheater, and compensate.

Theoretically, a CRS can support impersonal exchange in the absence of impartial contract enforcement provided by a non-strategic player.³⁸ The CRS is a self-enforcing institution: all behavior and expected behavior, including that of courts, is generated by each decision-makers' best response to the behavior and expected behavior of others. Its linchpins are the affiliation of individuals with communities that have contract enforcement institutions. Although communities are self-interested and their courts represent only the interests of their

³⁷ If we were to allow coordinated cheating by all the borrowers, the condition would have been:

$$g \sum_{t=0}^{T-1} (N_B - t) \cdot \delta^{t+1} g \geq N_B(x + C_B)$$

³⁸ Fearon and Laitin (1996) explored how communities can be motivated to discipline their members to achieve interethnic political cooperation.

living members, they enable overcoming the commitment problem inherent in exchange despite the finite life span of each of these members. The community constitutes an on-going organization that internalizes the cost inflicted by the default of one borrower on others. In particular, if a borrower's cheats in his T-1 period, the lenders' credible threat not to lend again implies that the borrowers' community is worse off. The younger borrowers thus find it optimal to punish a cheater. A borrower, even a T-1 borrower, finds it optimal to repay his debt. Anticipating that this will be the case, lenders can lend despite the borrowers' finite life spans. Although the community aggregates the payoffs of only its living members, each of whom has a finite life span, it becomes, de facto, a substitute for a single infinite horizon player. At the same time, the strategies of the players imply that a lender does not benefit from furnishing false claims and courts are motivated to examine the validity of claims.

In addition, the CRS reduces the information required to conduct exchange thereby enabling impersonal exchange and motivating individuals to provide and acquire the needed information. One does not need to know the past history of his current partner to enter into exchange. Rather, all one needs to know is his partner's community affiliation and whether there is a state of cooperation or conflict. Relative to the multilateral reputation mechanism, for example, the CRS requires much less information which, in the historical episode under consideration, was much easier to obtain (as further discussed in the next section). Furthermore, the CRS provides lenders and borrowers with incentives to provide and acquire the information required for the functioning of the system. A lender is motivated to furnish a valid complaint because doing so is profitable while furnishing an invalid complaint leaves him worse off. Lenders and borrowers alike are motivated to acquire information regarding whether the state is conflict or cooperation because this knowledge is valuable. Traveling to borrow in a conflict state costs one d while lending costs one l .

The CRS could theoretically have foster impersonal exchange during the late medieval period. But did it? The historical evidence indicates that it did.

13.4.2 The community responsibility system: a history

A systematic examination of the extent to which a Community Responsibility System functioned in pre-modern Europe has not been undertaken. In particular, we don't know when it was initially practiced although it may have emerged during the ninth and tenth centuries when merchants from the same locality traveled together in armed bands to trade abroad. In any case, by the mid 13th century, the CRS was widespread. It prevailed in the most populated and commercial areas of the period, that is, Italy and Flanders, in the largest political unit, that is, France, and in the best organized country, that is, England. Basically the CRS prevailed in any economic unit I have examined. Comprehensive quantitative measures of the scope of the CRS are few but the existing ones reflect that the CRS was wide spread. In England, by 1256, cities with 65 percent of the known urban population were covered by the CRS. In Italy, all the major cities - Venice, Genoa, Florence, Milan, and Pisa - and numerous smaller ones had the CRS.³⁹ The following discussion draws particularly on evidence from England and Florence.

Direct and indirect evidence supports the claim that the CRS prevailed. Direct evidence is explicit statements on rules, regulations, court cases, etc., reflecting the strategies and actions associated with the CRS. In addition, a rational and consistent explanation can be advanced for trade-related phenomena, either as providing the organizational framework required for the functioning of the CRS, reflecting its operation, or reflecting the process of its declining operation. This indirect evidence further suggests that the CRS indeed governed inter-community exchange.

Part of the strategy associated with the CRS called for holding a person's community members liable for his default in inter-community exchange. This part of the strategy is well reflected even in documents related to inter-community exchange among members of communities within the same political unit. Consider some of the evidence contained in twelfth-century English documents. In a charter given to London sometime between 1130 and 1133, the King, Henry I, announced that "all debtors to the citizens of London discharge these debts, or

³⁹ Cities' population is taken from Bairoch etl. al. 1988. I considered only cities with population of at least 5000 people by 1300. A city was considered to have a CRS if its charter allowed for that. For the charters, see Ballard and Tait 1913, 1923). For Italy, see for example, Vecchio (1975).

prove in London that they do not owe them; and if they refuse either to pay or to come and make such proof, then the citizens to whom the debts are due may take pledges within the city either from the borough or from the village or from the county in which the debtor lives."⁴⁰ Such community responsibility could have even been invoked in response to illegal taxation imposed on Londoners. "If anyone has taken toll or custom from the citizens of London, then the citizens of London may take from the borough or village where toll or custom has been levied as much as the man of London gave for toll, and more also may be taken for a penalty."⁴¹

The above charter focuses on the relations among members of different communities within the same political unit, namely, England. It explicitly defines one's relevant community as either his borough, village, or county. A distinct definition of one's community is found in the English legal documents presented in the *Select Pleas in Manorial and Other Seigniorial Courts* [1889]. They indicate that at times one's guild was considered to be the relevant community for the operation of the CRS. He noted that in England, in general, the ruling was that members of the same merchant guild, rather than residents of a particular borough, were held responsible for each other.⁴² "Every member of the guild ... guaranteed the debts contracted by every member in the way of his trade – is subsidiary liable for those debts. You are a member of the commonality of X: – it is a course of action for me against you that A, who is your 'peer and parcener,' your 'fellow commoner,' [or] 'at scot and lot' with you, has contracted a trading debt with me and has not paid it" (p. 134).

The same strategy is mentioned in agreements regarding exchange between merchants from England and other political units. Consider, for example, a statement made by King Henry III in 1266. The king granted "to his burgesses and merchants of Lubeck, that during the king's

⁴⁰ *English Historical Documents*, vol. II: 1012-3, and see discussion by Stubbs in *Selected Charters and Other Illustrations of English Institutional History from the Earliest Times to the Reign of Edward the First: 128-30*. In this charter Henry exempted the Londoners from the Community Responsibility System, an issue which is discussed below.

⁴¹ *English Historical Documents*, vol. II: 1012-3.

⁴² Notwithstanding the fact that in many towns the mercantile and municipal organizations were identical, since the merchant guild was the governing body of the borough.

life, they or their goods within the king's power shall not be arrested for any debt whereof they are not sureties or principal debtors; unless the debtors are of their commune and power and have failed to pay in whole or part and the said burgesses of Lubeck, by whom the said town is governed fail in justice to the men of the king's land and power, and this can reasonably be proved."⁴³

Similar strategy is reflected in a 1252 document from Flanders. This is a statute drawn up by Countess Margaret regarding the operation of foreign merchants visiting the Flanders fairs. Foreign merchants were held liable for debts assumed by their peers. Yet, consistent with the interpretation that such liability was utilized to ensure punishing those who defaulted, only a principal debtor or his guarantor could be imprisoned for debt. Other members of the defaulter's community could be punished only by impounding their goods. (Verlinden [1979], p.135).

The above rules reflect a particular part of the strategy associated with the CRS: holding a member of one's community responsible for his contractual obligations in inter-community exchange. But evidence also reflects the complementary part of strategy: holding one liable for the cost that his actions abroad imposed on other members of his community. Intra-community punishment is reflected in the thirteenth century "*Discorso intorno al governo di Firenze dal 1280 al 1292*" which states that in response to accusations of cheating a member of another community, the Commune of Firenze was to press on the culprits to pay the damages himself (Santini [1886], p. 166). Similarly, some English boroughs went so far as to have the policy that once a foreign creditor could establish that a member of the borough had failed to repay his debt, the authorities would pay him out of the borough's funds and later they would seek double indemnity from the debtor (Plucknett [1949], p. 137).

The nature of the transactions to which these rules were applied is also consistent with the operation of the CRS. For the CRS to function, courts had to have a way to verify complaints about cheating. The ability to ex-post verify, however, depended on the nature of the transaction under consideration. It is easier in transactions - such as credit and contracts for future delivery - in which the obligations of each party are relatively clear. Ex post verification

⁴³ *Calendar of the Patent Rolls Preserved in the Public Record Office*, 20, pp. 1266-1272:.

is much harder, however, in transactions - such as agency relationships - in which the obligations of the parties are not that well defined. Indeed, rules regarding the CRS restrict the applicability of the system to transactions of the latter kind rather than the former. Agency relations during the Commercial Revolution, for example, were governed by institutions other than the CRS. (Greif, [1989, 1993, 1994].)

Apart from rules corresponding to the CRS strategies, the organization of medieval trade exhibits various peculiar features that can be consistently and rationally explained as reflecting the needs of the CRS. Consider, for example, the Champagne Fairs. They were not organized as a meeting place in which individual merchants from different localities interacted. On the contrary. They were organized as a meeting place for individuals from different communities, each one having its own place of residence, permanent representation, and scribes. Communities even had legal authority over their members. Safety considerations would have accounted for a communal place of residence but cannot account for other aspects of these arrangements.

But the rationale beyond these arrangements is clear once one recognizes that they were part of the organizational foundations of the CRS. If a community is held liable for the actions of its members, it has to have the representation required to verify who its members are, and the ability to discipline them when needed. Similarly, the fairs' authorities must have had the ability to identify members of a particular community and its representatives in order to approach them when necessary. Indeed, in 1260 the wardens of the Champagne fairs had the right to pronounce a sentence of exclusion from the fairs following a default, and this exclusion was extended to the compatriots of the defaulters if the judicial authorities of their own town or principality did not compel them to fulfill their obligations. (Verlinden [1979], p. 131.) The contractual problems that developed because one's identity was not common knowledge were resolved through such organizational arrangements.

If the CRS indeed governed inter-community exchange, we would expect organizational details and rules to change to facilitate it in a manner consistent with the functioning of this institution. We would expect, in particular, that it would respond to opportunities to achieve the same level of enforcement while avoiding the cost of confiscating goods and imprisonment. This opportunity emerged once trade expanded. To see why this occurred, note that if the value

of future trade in the borrower's community is sufficiently high, confiscation or impounding goods is not required to support exchange. To demonstrate this point, suppose for the moment that the LC cannot impound goods. In this case, for the CRS to support exchange, the present value for the BC from future trade must be more than the gain from not compensating and retaining the amount defaulted upon. (Since otherwise the BC would prefer that trade cease and hence forgo compensation.) This condition is more likely to hold if the number of borrowers is large or the value of trade is high, since then the present value of future trade will be higher as well, *ceteris paribus*. Conversely, this condition is not likely to hold when communities are small and the trade value low. When this is the case, impounding goods is required to support exchange since it increases the cost to the BC of not compensating. In deciding whether to compensate or not, the BC takes into account that a failure to do so will also imply the loss of the impounded goods. Hence impounding goods enables exchange at a relatively low level of trade.

Thus, theory implies that in the early stages of the Commercial Revolution when communities and their trade were relatively small and growing, the CRS was likely to require actual confiscation. As time passed and trade increased, however, the value of future trade was likely to eliminate the need for actual confiscations. Consistent with this theoretical prediction, thirteenth-century historical records from Italy and England reflect this transition. While the evidence regarding the operation of the CRS in Italy during the twelfth century mentioned above reflects the threat of impounding goods, by the thirteenth century this was no longer the case. A treaty signed between Pisa and Florence in 1214, for example, contains the provision that if one community refused to compensate the other, members of the latter would be allowed 40 days to leave town. More than a century later, in 1325, a similar clause appears in a Florentine statute. It required the *podestà* to wait one month between declaring and acting upon any impounding of goods under the CRS. (Santini [1886], 165, pp.168-72.)

Rules, their evolution, and organizational features during the late medieval period indicate that the CRS could and did govern inter-community exchange. But did it really? In particular, were the rules reflecting the CRS effective in influencing behavior or were they only agreements that did not achieve this? In other words, is there evidence that the CRS actually functioned? Do we see, for example, a court following the above rules? This kind of evidence is

not predicted by the above model in which disputes leading to court cases are not supposed to occur on the equilibrium path.

This result, however, reflects an unrealistic assumption. The model assumed perfect ability to monitor past actions: parties to the exchange observed each other's actions and the courts could verify their actions. Reality, however, is characterized by commercial disputes in which both parties disagreed about whether contractual obligations were fulfilled or not. Furthermore, different courts (and even judges and juries in the same trial) can reach different conclusions based on the same evidence. Further evaluating the extent to which the CRS prevailed, therefore, requires extending the model to capture this aspect of reality.

Accordingly, consider the following alteration of the model. Assume that lender-borrower relations are characterized by imperfect monitoring – the lender receives a signal which is a random variable that depends on the action taken by the borrower. Particularly, even if cheating has not occurred, the lender's signal may indicate that he was cheated.⁴⁴ Further assume that each court also has an independent imperfect monitoring ability – if a dispute occurs each court receives a signal indicating whether cheating has occurred. Each court's signal is private, non-verifiable information and the signals are not perfectly correlated.⁴⁵ In other words, courts can sincerely disagree about whether cheating took place.

The first observable implication of the above formulation is that we should observe court cases based on the CRS. A more intriguing implication is that any equilibrium implying exchange will be characterized by cases in which individuals will sue each other based on the CRS. Furthermore, we should observe periods of inefficient inter-community "retaliations"

⁴⁴ The historical records suggest that disputes were more likely to occur when one of the contracting parties passed away, the debt was old, the contract was not clearly defined, or the contracting obligations were allegedly fulfilled by the agents of one of the parties rather than one of the parties themselves.

⁴⁵ It is assumed, for simplicity, that if there is no dispute, the courts have perfect monitoring ability.

followed by their “suspension.”⁴⁶ During retaliation, impounding would occur and exchange would cease, imposing costs on both communities. Such retaliations, however, would last for a finite number of periods following which retaliation would be suspended and exchange would resume.

Despite the fact that no cheating occurred (in the sense that a borrower chose not to pay), these costly periods of inefficient retaliations are required to provide the communities and the contracting individuals with the appropriate incentives. Specifically, the only possible equilibrium strategies (that enable exchange) specify confiscation and period(s) during which inter-community exchange ceases when the LC concludes that cheating occurred and the BC concludes that it did not. Such periods of retaliation are required since if the BC’s strategy calls for compensating the lender although it concludes that cheating did not occur, the LC’s best response is to claim that a dispute occurred even if it did not. Similarly, if the LC’s strategy calls for not confiscating when it maintains that cheating occurred, the BC’s best response is not to furnish compensation even if its signal indicates that cheating occurred, thereby motivating borrowers’ to cheat. Thus, for inter-community impersonal exchange to be feasible despite imperfect monitoring, inefficiencies (in the form of forgone exchange) must be incurred by the communities.⁴⁷

These two theoretical predictions - observing court cases based on the CRS and periods of retaliations following disputes and disagreements among courts - are well reflected in the historical records. Cartularies, chronicles, and court cases reflect disputes that were handled according to the rules of the CRS. I will mention here some of the earliest evidence from Italy.

⁴⁶ This conclusion qualitatively holds even if one complains of cheating although a dispute did not occur and the courts have imperfect monitoring ability in the sense that in positive probability each court would reach a distinct conclusion following the complaint.

⁴⁷ If retaliations reflect the inability of two communities to objectively verify the conflicting claims made by their citizens, rather than the communities’ desire to gain compensation or to get revenge, costly retaliations are unavoidable. Even arbitration will not resolve the dispute. If arbitration is cheap, it will not provide the appropriate incentives. The LC, for example, would be induced to submit claims regarding disputes even if it was aware that they were groundless.

Ample cases from England are presented in Moore [1985], Plucknett [1949] and some other English cases are presented later in this section.

The earliest comprehensive cartulary available from late medieval Italy is that of a Genoese scribe named Giovanni Scriba. One of its entries, registered on July 22, 1164, reveals the operation of a CRS. This entry indicates that shortly before 1164 a Genoese trader, Amicus Zostro, received a loan from Xecha Bohadie, a Muslim trader from Tripoli. While Amicus had evidently already arranged to pay Xecha's brother or son in Sicily, Xecha claimed that no such payment had been made. In July, 1164, following Xecha's assertion that payment had not been made, Amicus sent an agent named Baldezonus from Genoa to Tripoli carrying six cantras of copper. Baldezonus was instructed to sell the copper and pay Xecha if the latter would swear in the presence of reliable witnesses that he would hold neither Amicus nor any other Genoese merchant for ransom.⁴⁸

Another mention of actions based on the CRS in Italian sources of the twelfth century, however, indicates that its operation was confined neither to the relations between Christian and Muslim traders nor to Genoa at that time. According to the chronicler of the Emperor of the Holy Roman Empire, Frederick Barbarossa, when the Emperor visited Bologna in 1155, the students of Bologna's famous law school expressed their dissatisfaction with the CRS to him because the city of Bologna was holding them liable for debts incurred by members of their original communities. (Munz [1969], 77)

Retaliation and its termination, as predicted by the theory, are also mentioned in the historical records. For example, in 1238, Beatrice, wife of Marcovaldo of Florence, requested a retaliation against the properties of the people and the Commune of Pisa, for a sum of 2,000 and interest of 750 dinar piccoli of Genoa, to be paid by the heirs of Ubaldo Viscount and Torritano, the son of the late Lamberto, and by two Pisans who had posted a guarantee for them. The retaliation was granted by the podestà after the Commune of Pisa, which had been asked for

⁴⁸ Giovanni Scriba, no. 1245. By the fifteenth century this procedure was institutionalized. As an Arabic writer noted, "the consuls are the chiefs of the Franks and are hostages for each community. If anything happens in any community dishonoring to Islam, the consul is answerable" (Lewis 1988: 76). Any sin, including cheating in a business matter was considered as dishonoring to Islam.

restitution (according to the Statute), denied cooperation. Such denial, according to the above model, would occur when the two courts differed in their assessment of the situation. Various commercial treaties reflect that contemporaries indeed considered retaliation to be unavoidable in cases of disagreement among courts. A treaty between Pisa and Florence signed in 1214, specifies that retaliations would follow if the judges were unable to settle the dispute. (Santini [1886], pp.165-8.)

Disputes were not unique to Italy. A dispute in 1270 may have been the reason that "Gottschalk of Almain, burgher of Lynn, complains [in the court of St. Ives fair in England] of the communities of Ghent, Ppoeringen, Douai, Ypres, and Lisle as subjects of the countess of Flanders, for that whereas the said Gottschalk caused 14 sacks of wool worth seven score marks to be brought from the realm of England to Flanders to trade with it there and hosted this wool at the house of a certain Henry Thuroid on Sunday." The wool, however, was detained in Flanders and the loss amounted to about 200 marks. Yet, the countess of Flanders refused to provide justice. Accordingly, Gottschalk requested that the court impound the goods of members of the above communities present at the fair.⁴⁹

Retaliations were a calculated response aimed at fostering exchange rather than acts of revenge. This is suggested by attempts to confine them only to inter-community commercial matters. A 1325 statute from Florence, for example, explicitly enumerated the cases in which it was appropriate to grant retaliation. It could be granted in cases in which there were losses in currency or goods, damage to property, tax extortion, or personal detention. No retaliation was allowed in cases involving personal bodily offenses. (Santini [1886].) Further evidence that retaliations were a means to ensure proper incentives rather than compensation per-se is suggested by the observation that they indeed lasted for a finite number of periods, and communities terminated a retaliation period by announcing a "suspension" without making it conditional on full compensation. Retaliations were not necessarily carried out until full

⁴⁹ Pro SC 2/178/93: 14 May 1270 published in *Select Cases Concerning the Law Merchant: A.D. 1270-1638*, 1: *Local Courts*: 9-10.

compensation was achieved, but lasted long enough to inflict the appropriate cost to the other side exactly as predicted by the theory.⁵⁰

The above theoretical and historical discussion emphasizes the association between communities and courts. Yet, fair courts that were not affiliated with a particular community also applied the principal of community responsibility during the late medieval period. An examination of their cases indicates that fair courts acted like the LC, holding one member of a community responsible for contractual obligations assumed by another member.⁵¹ As mentioned above, the Champagne fairs held a community responsible for the contractual obligations of each of its member. English fairs acted similarly. For example, sometime in the thirteenth century at the fair of S. Botulph in England, a certain James complained that several merchants of Brussels had cheated him. After verifying his complaint, the fair bailiff impounded wool belonging to the merchants from Brussels who were present at the fair.⁵²

How were fair courts motivated to apply the LC strategy and demand compensation, or the BC strategy and punish a person who defaulted on his obligations? The way that the court case from S. Botulph evolved indicates that motivation was provided by the fair courts' legal obligations to the king or another lord. James believed that the bailiff of the fair neglected to adhere to the CRS so he entered a plea against the bailiff before the "lord king" of England. In the plea he complained that the "bailiff of the fair aforesaid, had wrongfully delivered sacks of the wool aforesaid to the aforesaid merchants [of Brussels] to the grave damage and manifest loss of James himself, inasmuch as the same commune has not yet satisfied him in respect to the debt aforesaid."

An interesting feature of late medieval trade is that its main centers did not have an affiliated community. This is true, at least for the Champagne fairs, the important trade center of Bruges which replaced the Champagne fair as northern Europe's trade center, and one of

⁵⁰ For a discussion of suspension, see Arias [1901], pp. 177-88. See also Santini [1886], p. 165.

⁵¹ For many examples of using the CRS in the courts of English fairs, see Moore [1985].

⁵² *Selected Cases Concerning the Law Merchant*, vol, II, no. 7: 11-12.

England's most important fairs, that of St. Ives. These trade centers were places where merchants from various communities met and there were probably many reasons for their prominence. But one of their unexplained and peculiar features is that their own merchants only traded locally and did not travel to other trade centers. Why was this the case? Recognizing the importance of the CRS in governing inter-community exchange provides a consistent and rational explanation for this observation.

Running a successful fair or international trade center was a profitable business. Hence, those who held the rights to the fair and its court stood to gain from the increasing the volume of trade at the fair under their jurisdiction. Providing inter-community impersonal contract enforcement increased the fair's attractiveness to alien merchants. In providing this, trade centers without an affiliated trading community had an advantage over those that did have one. The incentives to provide inter-community enforcement are diluted if the trade center's court was also a community court since, in that case, the community's own merchants might have to bear the cost of retaliation in cases of dispute.⁵³ Fairs which did not have an affiliated merchant community might have been better able to promote impersonal exchange.

During the Commercial Revolution, the CRS enabled inter-community exchange that was impersonal up to one's community affiliation. One did not have to know the personal history of another community member to exchange. Its novelty is that it took advantage of the existing communal structure and its intra-community enforcement mechanisms to support inter-community impersonal exchange. Information was limited and each community member had a finite life span. Impersonal exchange was nevertheless possible based on one's identification as a member of a particular community and a strategy that motivated communities to punish a member who defaulted on his obligation toward non-members. It was this institution that facilitated the Commercial Revolution by enabling contracts for future delivery and credit arrangements between individuals from various corners of Europe.

⁵³ These concerns are explicit in Florentine legal documents that explicitly restricted the right to demand reprisals from its own citizens. See Vecchio [1975], pp. 14-5.

13.5 The Dynamics of the CRS and Conclusions

The discussion of the CRS focused on the nature of the system rather than on its origin or decline. As such, the analysis demonstrates that the ability of the equilibrium approach to institutional analysis to address the first question does not depend on its ability to address the latter questions. But these issues are important as well. I will not, however, elaborate here on the origin of the CRS but I will briefly describe here the decline of the CRS and will return to elaborate on this issue in chapter 13 as an example of a self-enforcing institution that led to its own demise.

Was inter-community, impersonal exchange possible during the late medieval commercial revolution? The above interactive, context-specific analysis indicates that the Community Responsibility System enabled exchange that was impersonal up to one's community affiliation. It enabled exchange that was impersonal in the sense that the decision whether or not to transact among individuals who did not expect to transact again was independent of knowledge of one's past actions or the ability to transmit his identity to future exchange partners. The CRS enabled impersonal exchange despite the absence of centralized legal contract enforcement provided by a state, the finite life times of humans, the difficulties in communicating one's identity, or verifying past actions.

The CRS was a self-enforcing institution in the sense that all relevant incentives - to individual traders and their communities - were provided endogenously. Initially, it was also a self-reinforcing institution, in that it led to processes that increased the range of parameters within which it was self-enforcing. While the CRS was based on the existing, community-based social structure, it reinforced this structure by motivating the community members to clearly define their communal membership, to establish the organizations required to indicate who their members were to the rest of the society, and to strengthen their intra-community contract enforcement institutions. Similarly, the CRS was reinforced by the introduction of other supporting organizations, structures, rules, and regulations.

But in the long run, the CRS was a self-undermining institution.⁵⁴ Its own implications bred processes leading to its destruction. The CRS contributed to the growth of long-distance trade and the size, number, and heterogeneity of communities and these changes undermined its self-enforceability. It reduced the system's effectiveness, economic efficiency, and its intra-community political support. Such processes made it easier, for example, to falsify one's community affiliation, hindered verification of this affiliation, reduced the cost of inter-community mobility, increased the severity of the moral hazard problem, and made some members of the community worse off under the system than they otherwise would have been. By the late thirteenth century, certain members of communities sought exemptions from the CRS and communities were laboring to abolish it. Where possible, the state stepped in to provide an alternative. The European economic institutions moved closer to their current situation in which individual legal responsibility is a norm.

This study of the nature and dynamics of impersonal contract enforcement institutions in pre-modern Europe reveals the importance of understanding the inter-relationships between social, economic, and political factors in determining the set of feasible and actual economic institutions. It indicates that economic institutions supporting market exchange can be based on and positively reinforce a particular social structure. At the same time, the dependency of an economic institution on its social and political foundations implies that the inter-relationships between social, political, and economic processes influence their effectiveness and political viability.

In recent years there has been a growing interest in the extent to which communities or, more broadly, groups that assume joint liability for each others' actions, facilitate market exchange with non-group members. Much of this research has been either theoretical (e.g., Varian [1990], Tirole [1996], Kranton [1996], Ball [2001]) or dealt with business associations and brand names (e.g., Bernstein [1992],). Its main focus had been on the ability to foster

⁵⁴ See Greif (forthcoming) on the relationships between self-enforcing, self-reinforcing, and self-undermining institutions.

micro-credit in developing countries based on communities and associations (e.g., Besley and Coate [1995], Bouman [1995].)

Little attention, however, had been paid to the broader role of institutions facilitating inter-community impersonal exchange based on intra-community contract enforcement mechanisms in contemporary developed economies. In these economies bodies, such as nations and firms, discipline their members for misconduct vis-a-vis non-members, thereby contributing to impersonal exchange. Their exact nature and the historical process through which they have emerged has not been examined. Yet, it is often argued that the ability to enter into impersonal exchange is a key to the division of labor and the rise of market economies. If this is the case, comparative study of the dynamic evolution of such contract enforcement institutions is likely to greatly enhance our understanding of the historical process of economic development in various societies.

Concluding comments

Although arguably game theory is best theory we have, at this point, to study behavior in strategic, recurrent situations it has many limitations for the study of institutional analysis. We can not use game theory to deductively study institutions. But we can not rely only on studying evidence to study institutions. This is particularly the case because a central aspect of institutions are beliefs that can not be directly observed. Moreover, an institution can often lead to pattern of behavior that would not reveal its importance. As Greif, Milgrom, and Weingast (1994: 746) have noted with respect to contract enforcement institutions: “The effectiveness of institutions for punishing contract violations is sometimes best judged like that of peacetime armies – by how little they must be used. Thus, in reading the historical record to determine whether a major role of merchant institutions was to ensure contract compliance, the numbers of instances of enforcement is not a useful indicator.”

We can, however, interactive combine game theory and evidence to identify and substantiate hypothesis regarding the relevance of a particular institutions. Theory and empirics are complementary in institutional analysis. Concentrating on the transaction as a unit of analysis surmount the problem of the relevant scope of the analysis and does not initiate the

analysis by postulating that a particular institution or game is relevant to the analysis. Concentrating on identification and substantiation mitigates the problem of knowledge, multiplicity, and complexity. One has to study the historical context and its details to produce a mode that can facilitate studying relevant institutions.