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Cultural Beliefs and the Organization of Society: A Historical and Theoretical Reflection on Collectivist and Individualist Societies

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Lacking an appropriate theoretical framework, economists and economic historians have paid little attention to the relations between culture and institutional structure. This limits the ability to address a question that seems to be at the heart of developmental failures: Why do societies fail to adopt the institutional structure of more economically successful ones? This paper integrates game-theoretical and sociological concepts to conduct a comparative historical analysis of the relations between culture and institutional structure. It examines cultural factors that have led two premodern societies—one from the Muslim world and the other from the Latin world—to evolve along distinct trajectories of institutional structure. It indicates the theoretical importance of culture in determining institutional structures, in leading to their path dependence, and in forestalling successful intersociety adoption of institutions. Since the distinct institutional structures found in the late medieval period

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resemble those differentiating contemporary developing and developed economies, the paper suggests the historical importance of distinct cultures in economic development.

I. Introduction

The organization of a society—its economic, legal, political, social, and moral enforcement institutions, together with its social constructs and information transmission and coordination mechanisms—profoundly affects its economic performance and growth. It determines the cost of various feasible actions as well as wealth distribution. Although this theme goes back at least to Adam Smith, it has recently been the focus of historical and theoretical studies. For example, North (1991) attributed the growth performance of nations throughout history to differences in their enforcement mechanisms. North and Weingast (1989) claimed that England's unique political institutions encouraged economic growth. Marimon (1988) examined the growth rate attainable under various enforcement mechanisms, and others (e.g., Banerjee and Newman 1993) explored the relations between wealth distribution and growth due to credit market imperfections and investment in human capital.

Indeed, social psychologists have found societal organization to be highly correlated with per capita income in contemporary societies: most of the developing countries are “collectivist,” whereas the developed West is “individualist.” In collectivist societies the social structure is “segregated” in the sense that each individual socially and economically interacts mainly with members of a specific religious, ethnic, or familial group in which contract enforcement is achieved through “informal” economic and social institutions, and members of collectivist societies feel involved in the lives of other members of their group. At the same time, noncooperation characterizes the relations between members of different groups. In individualist societies the social structure is “integrated” in the sense that economic transactions are conducted among people from different groups and individuals shift frequently from one group to another. Contract enforcement is achieved mainly through specialized organizations such as the court, and self-reliance is highly valued.¹

Economic anthropologists, economic historians, and theorists have long conjectured that cultural variations account for intersociety differences in societal organizations. Yet, little is known about the origins

¹ Clearly, any society has individualistic and collectivist elements, and categorization is a matter of their relative importance. For discussions, see Bellah et al. (1985), Reynolds and Norman (1988), and Triandis (1990).

of various systems of societal organization and the factors that make these systems path dependent.² Thus we cannot address a question that seems to be at the heart of developmental failures: Why do societies fail to adopt the organization of more economically successful ones?

This paper presents a historical and game-theoretical analysis of the relations between culture and societal organization by examining the cultural factors that have led two premodern societies to evolve along distinct trajectories of societal organization. It examines two traders' groups that operated during the late medieval period, an era that had a profound impact on the evolving European (post-Roman) societal organization. The Maghribi traders of the eleventh century were part of the Muslim world, and the Genoese traders of the twelfth century were part of the Latin world. These two historical case studies provide the base for an examination of differences in societal organization.

Analytically, the paper models an economic transaction central to these two trading societies to examine the relations between culture and societal organization in the related multiple equilibria game.³ The theoretical and historical analyses indicate the importance of a specific cultural element—*cultural beliefs*—in being an integral part of institutions and in affecting the evolution and persistence of diverse societal organizations. Differences in the societal organization of the two trading societies can be consistently accounted for as reflecting diverse cultural beliefs. It is interesting to note that the societal organization of traders from the Muslim world resembles modern collectivist societies, whereas that of the traders from the Latin world resembles individualist societies. Hence my findings suggest the theoretical and historical importance of culture in determining societal organizations, in leading to path dependence of institutional frameworks, and in forestalling successful intersociety adoption of institutions.

The rest of the paper is organized as follows: Section II is a general discussion of the notion of cultural beliefs and the relations among cultural beliefs, institutions, and organizations. Sections III–VII present the specific historical and theoretical analytical base on which the concept of cultural beliefs and the related theoretical framework was developed. Section VIII presents conclusions.

² See, e.g., Polanyi (1957), North (1981, 1990), and Cole, Mailath, and Postlewaite (1992). Regarding path dependence, see Arthur (1988) and David (1988). On path dependence and institutions, see North (1990, 1991) and David (1992).

³ Game theory has been employed to examine social norms and status (e.g., Schotter 1981; Okuno-Fujiwara and Postlewaite 1990; Kandori 1992) as well as conventions and focal points (e.g., Schelling 1960; D. Lewis 1969; Sugden 1989; Kreps 1990).

II. Cultural Beliefs and the Organization of Society

Sociologists and anthropologists consider the organization of society to be a reflection of its culture—an important component of which is cultural beliefs. Cultural beliefs are the ideas and thoughts common to several individuals that govern interaction—between these people, and between them, their gods, and other groups—and differ from knowledge in that they are not empirically discovered or analytically proved. In general, cultural beliefs become identical and commonly known through the socialization process by which culture is unified, maintained, and communicated (see, e.g., Davis 1949, pp. 52 ff., 192 ff.; Bandura 1977). That cultural beliefs influence economic outcomes is intuitive, but formal examination of the relations between cultural beliefs and societal organization is subtle. If we arbitrarily define cultural beliefs, a variety of phenomena can be generated. How should cultural beliefs be restricted, and what are their sources? Should they be considered rational?

The historical analysis of this paper indicates the importance of a specific subset of cultural beliefs, namely, rational cultural beliefs that capture individuals' expectations with respect to actions that others will take in various contingencies. Since cultural beliefs are identical and commonly known, when each player plays his best response to these cultural beliefs, the set of permissible cultural beliefs is restricted to those that are self-enforcing. Hence this specific subset of cultural beliefs can be formalized as a set of probability distributions over an equilibrium strategy combination. Each probability distribution reflects the expectation of a player with respect to the actions that would be taken on and off the path of play.

Yet if each player expects others to play a self-enforcing and hence an equilibrium strategy, is there any analytical benefit from distinguishing between strategies and cultural beliefs? Unlike strategies, cultural beliefs are qualities of individuals in the sense that cultural beliefs that were crystallized with respect to a specific game affect decisions in historically subsequent strategic situations. Past cultural beliefs provide focal points and coordinate expectations, thereby influencing equilibrium selection and society's enforcement institutions.

These enforcement institutions are composed of cultural beliefs and the rules of the game. In the long run, the (nontechnologically determined) rules of the game may be changed endogenously as individuals attempt to improve their lot by establishing organizations. These organizations alter the rules of the game by, for example, introducing a new player (the organization itself), by changing the information available to players, or by changing payoffs associated

with certain actions. Examples of organizational innovations of this nature are the court system, the credit bureau, and the firm. The introduction of a new organization reflects an increase in the stock of knowledge, which may be the outcome of an intentional pursuit or unintentional experimentation.

A necessary condition for an organizational change, however, is that those able to initiate it expect to gain from it. Their expectations depend on their cultural beliefs, and hence diverse cultural beliefs lead to a distinct trajectory of organizational development. The distinctiveness of each trajectory is reinforced by the process of modifying and refining “microinventions,” which follows an “organizational macroinvention.”⁴ Diverse paths of organizational development, in turn, further affect the historical process of equilibrium selection. Once a specific organization is introduced, it influences the rules of historically subsequent games and hence the resulting societal organization.

Cultural beliefs also influence societal organization since strategic interactions occur within a specific social and historical context. Diverse cultural beliefs can lead to differential economic behavior toward individuals with diverse social characteristics such as wealth or “membership” in a specific social group. For example, different cultural beliefs may imply diverse social constructs—diverse social patterns of economic interactions—each of which entails different dynamics of wealth distribution. Different cultural beliefs may also imply different relations between efficiency and profitability in intra-society and intersociety economic interactions. Some cultural beliefs can render efficient intersociety relations unprofitable, leading to an economically inefficient social structure.

Various social patterns of economic interactions further affect societal organization by, for example, the process examined by the eminent sociologist George Homans (1950). Frequent economic interactions among the same individuals give rise to “friendliness,” and satisfaction from friendliness motivates them to interact further, socially as well as economically. These repeated interactions and the resulting social networks for information transmission facilitate informal collective economic and social punishments for deviant behavior (see also Dawes and Thaler 1988).

Finally, social and economic patterns of interactions also affect moral enforcement mechanisms, that is, enforcement based on the tendency of humans to derive utility from acting according to their values. Although this tendency seems to be universal, different patterns of social and economic interactions lead to the development of

⁴ Mokyr (1990) introduced this terminology with respect to technological change.

distinctive value systems as individuals attempt to find moral justification for their behavior through cognitive dissonance (Davis 1949, p. 52; Homans 1950).⁵ Different values, in turn, entail the moral enforcement mechanism that reinforces distinct behavior.

III. Agency Relations and Cultural Beliefs

The Italian city-states of the late medieval period were the forerunners of the emerging post-Roman, European economy. Among these cities, Genoa stands out for its commercial importance and excellent historical records from as early as the late eleventh century, when the city was incorporated. These records enable examining the emergence of its societal organization. The examination is facilitated by the fact, reflected in the saying *genuensis ergo mercator* (Genoese, therefore merchant), that long-distance overseas trade was central to Genoa's economy. Similarly, trade was central to a group of eleventh-century traders from the Muslim world known as the Maghribi traders. These Jewish merchants were involved in large-scale, long-distance trade all over the Muslim Mediterranean.⁶

The Maghribis and the Genoese faced a similar environment, employed comparable naval technology, and traded in similar goods. The efficiency of their trade depended, to a large extent, on their ability to mitigate an organizational problem related to a specific transaction, namely, the provision of the services required for handling a merchant's goods abroad.⁷ A merchant could either provide these services himself by traveling between trade centers or hire *overseas* agents in trade centers abroad to handle his merchandise. Employing agents was efficient, since it saved the time and risk of traveling, allowed diversifying sales across trade centers, and so forth.⁸ Yet without supporting institutions, agency relations could not be established since an agent could embezzle the merchant's goods. Anticipating this behavior, a merchant would not hire an agent to begin with.

For agents to be employed, the organization of society had to enable them to commit themselves *ex ante* to be honest *ex post*, after

⁵ This view of culture as a "legitimizing" mechanism is fundamental in Karl Marx and Emile Durkheim. For recent economic analyses, see Sugden (1989) and Rabin (in press).

⁶ For a general introduction to Genoa's history, see Vitale (1955). For a general introduction to the Maghribis' history, see Goitein (1967), Gil (1983*b*, vol. 1), and Greif (1989, 1993*a*).

⁷ Williamson (1985) calls attention to the importance of using transaction as a unit of analysis.

⁸ For the superiority of trading systems that employ agents, see, e.g., De Roover (1965).

receiving the merchant's goods. The societal organization of the Maghribis and the Genoese enabled them to mitigate this commitment problem, and in both groups trade was based on agency relations among nonfamily members. For example, the first Genoese historical source reflecting agency relations, the cartulary of Giovanni Scriba (1155–64), indicates that in its approximately 612 contracts reflecting trade, only 5.3 percent did not entail agency relations, and only 6.45 percent of the sum sent abroad through agents was entrusted to family members.

To examine how each group mitigated the merchant-agent commitment problem, consider the following perfect and complete information One-Side Prisoner's Dilemma (OSPD) game, which captures the essence of the problem. (Extensions are discussed below.) There are M merchants and A agents in the economy, and (in accordance with the historical evidence) it is assumed that $M < A$. Players live an infinite number of periods, agents have a time discount factor β , and an unemployed agent receives a reservation utility per period of $\phi_u \geq 0$. In each period, an agent can be hired by only one merchant, and a merchant can employ only one agent. Matching is random, but a merchant can restrict the matching to a subset of the unemployed agents that contains the agents who, according to the information available to the merchant, have previously taken particular sequences of actions. A merchant who does not hire an agent receives a payoff of $\kappa > 0$. A merchant who hires an agent decides what wage ($W \geq 0$) to offer the agent. An employed agent can decide whether to be honest or to cheat. If he is honest, the merchant's payoff is $\gamma - W$, and the agent's payoff is W . Hence the gross gain from cooperation is γ , and it is assumed that cooperation is efficient, $\gamma > \kappa + \phi_u$. The merchant's wage offer is assumed credible, since in reality the agent held the goods and could determine the ex post allocation of gains. For that reason, if the agent cheats, the merchant's payoff is zero and the agent's payoff is $\alpha > \phi_u$. Finally, a merchant prefers receiving κ over being cheated or paying $W = \alpha$, that is, $\kappa > \gamma - \alpha$.

After the allocation of the payoffs, each merchant can decide whether to terminate his relations with his agent or not. There is a probability σ , however, that a merchant is forced to terminate agency relations, and this assumption captures merchants' limited ability to commit to future employment because of the need to shift commercial operations over places and goods and the high uncertainty of commerce and life during that period. For similar reasons, the merchants are assumed to be unable to condition wage on past conduct (indeed, merchants in neither group did so). Finally, in neither group was wage a function of political or legal considerations. Wages were not determined by the court or politically supported guild. Accord-

ingly, and as is customary in similar efficiency wage models (e.g., Shapiro and Stiglitz 1984), the analysis assumes that no subgroup is organized in a manner that affects wage determination. Furthermore, attention is restricted to equilibria in which wages are constant over time.⁹

Suppose for the moment that the history of the game is common knowledge. What is the minimum (symmetric) wage for which, if it is offered by all merchants, an agent's best response is to be honest under the threat of firing if he cheats and the promise of being rehired if he is honest (unless forced separation occurs)? To find this wage, one has to fully specify the merchants' strategies. Yet to analyze the impact of different strategies in the same framework, the analysis initially concentrates on probabilities that are a function of the strategies. Denote as an *honest agent* an unemployed agent who was honest in the last period he was employed, and by h_h the probability that he will be hired in that period. Denote as a *cheater* an agent who cheated in the last period he was employed, and by h_c the probability that he will be hired. Proposition 1, which is proved in the Appendix, specifies the minimum wage that supports cooperation.

PROPOSITION 1. Assume that $\beta \in (0, 1)$, and $h_c < 1$. The *optimal wage*, the lowest wage for which an agent's best response is to play honest, is $W^* = w(\beta, h_h, h_c, \sigma, \phi_u, \alpha) > \phi_u$, and w is monotonically decreasing in β and h_h and monotonically increasing in h_c , σ , ϕ_u , and α .

A merchant induces honesty by the carrot of a wage higher than the agent's reservation utility and the stick of terminating their relations. For a wage high enough, the difference between the present value of the lifetime expected utility of an unemployed and employed agent is higher than what an agent can gain by one-period play of cheating, and hence the agent's best response is to be honest. The minimum wage that ensures honesty decreases in the factors that increase the lifetime expected utility of an honest agent relative to that of a cheater (i.e., β and h_h) and increases in the factors that increase the relative lifetime expected utility of a cheater (i.e., h_c , σ , ϕ_u , and α).

How can differences between collectivist and individualist societies manifest themselves in agency relations? Intuitively, in collectivist societies everyone is expected to respond to whatever has transpired between any specific merchant and agent, whereas the opposite holds for individualist societies. Two strategy combinations formalize this difference: the *individualist* and the *collectivist* strategies. In each strat-

⁹ For an efficiency wage model in which this result is derived endogenously, see MacLeod and Malcolmson (1989).

egy a merchant hires, for a wage W^* , an unemployed agent whom he rehires as long as cheating or forced separation does not occur. Under the individualist strategy, however, a merchant randomly hires an unemployed agent, whereas under the collectivist strategy a merchant randomly hires only from among the unemployed agents who have never cheated. An agent's strategy is to play honest if and only if he is offered at least the W^* relevant to him given the history of the game. Note that W^* is lower under the collectivist strategy. Each of these strategies is a subgame perfect equilibrium as established in proposition 2 (proved in the Appendix).

PROPOSITION 2. Assume that under both the *individualist* and the *collectivist* strategy combinations $\gamma - \kappa \geq W^*$; then each strategy combination is a subgame perfect equilibrium of the OSPD game.

The individualist strategy is a subgame perfect equilibrium because merchants are not expected to take into account the agent's past behavior when making hiring decisions. Hence each merchant perceives the probability that an unemployed agent who cheated in the past will be hired to equal that of an unemployed honest agent. According to proposition 1, this implies that each merchant is indifferent whether to hire a cheater or an honest agent. (As discussed below, when the decision to acquire information is endogenous, under individual equilibrium the merchant would not have the related information.)

Under the collectivist equilibrium, because each merchant expects others not to employ a cheater, the perceived probability that a cheater will be hired is lower than that of an honest agent. According to proposition 1, this implies that a higher wage is required to keep him honest, and hence the merchant strictly prefers to hire an honest agent. The merchant's expectations are self-enforcing, although cheating does not convey any information about future behavior; the agent's strategy does not call for cheating any merchant who violates the collective punishment; and merchants do not "punish" any merchant who hires a cheater.

The analysis above assumed that the history of the game is common knowledge. Acquiring and transmitting information during the late medieval period were costly, and hence the model should incorporate a merchant's decisions to acquire costly information. Since merchants gathered information by being a part of an informal information-sharing network, suppose that each merchant can either "invest" or "not invest" in "getting attached" to a network before the game begins, and his action is common knowledge. Investing requires paying Λ each period, in return for which the merchant learns the private histories of all the merchants who also invested. Otherwise, he knows only his own history. Intuitively, under the individualist equilibrium,

history has no value, since an agent's wage does not depend on it. Hence no merchant will invest in information. In contrast, under the collectivist equilibrium, history has value since the optimal wage is a function of an agent's history. Merchants will invest since an agent who cheated in the past will cheat if hired and paid the equilibrium wage. Although on the equilibrium path cheating never occurs, merchants are motivated to invest, since this action is common knowledge and hence one who does not invest is cheated if he pays the equilibrium W^* . This intuition is verified in proposition 3, which is proved by inspection.

PROPOSITION 3. W_{-i}^* is the minimum wage that merchant i has to pay his agent if only he does not invest; W_c^* is the equilibrium wage under the collectivist strategy in the full information game. Invest and the collectivist strategy is an equilibrium iff $W_{-i}^* - W_c^* \geq \Lambda$. Not to invest and the individualist strategy is an equilibrium whereas invest and the individualist strategy is not an equilibrium.

Reality may also be characterized by incomplete information; that is, some agents may have an unobservable "bad" attribute and thus be more likely to cheat. The analysis above holds when the proportion of the bad type is "high" or "low." Under a collectivist equilibrium, incomplete information reinforces investment in information. Under an individualist equilibrium, the value of information may still be zero (if the proportion of the bad type is high) or may not be high enough to induce investment in information (if the proportion of the bad type is low). Hence this paper uses the complete information model, which highlights the role of expectations with respect to actions and abstracts away from expectations with respect to types (see the discussion in Greif [1989, 1993a]).

This section relates two societal organizations and different cultural beliefs, that is, different expectations with respect to actions that will be taken off the path of play. In an individualist equilibrium, players are expected to be indifferent, and in a collectivist equilibrium players are expected to respond to whatever transpires between others. Since these cultural beliefs correspond to an equilibrium, they are self-enforcing, and each entails a different wage, enforcement institution (second- vs. third-party enforcement), and investment in information.

On the equilibrium path, the individualist and collectivist cultural beliefs entail the same *actions* with respect to agents: merchants randomly hire unemployed agents and agents never cheat. By assuming complete information, the discussion above and the next section's analysis enable concentration on cultural beliefs concerning actions that never actually transpire, thereby emphasizing the implications for societal organization of diverse expectations regarding actions rather than the actions themselves. Hence the following analysis iden-

tifies cultural beliefs with probability distributions over the off-the-path-of-play portion of a strategy combination generating an observed path of play.¹⁰ Historically, imperfect monitoring is a likely cause of the observed punishment phases, and thus, historically, it is not feasible to distinguish between cultural beliefs relating to on and off the path of play, and no attempt to do so is made.¹¹

IV. The Maghribis and Genoese: Origin and Manifestations of Diverse Cultural Beliefs

Are there historical reasons to believe that the Maghribis and the Genoese held diverse cultural beliefs? The historical records do not provide any reason to believe that a particular theory of equilibrium selection is relevant in this case. They indicate, however, that cultural “focal points” as well as social and political events in the early development of these societies were likely to be instrumental in shaping diverse cultural beliefs and the related equilibria in these groups. When the Maghribis began trading in the Mediterranean early in the eleventh century and when the Genoese began trading toward the end of that century, they had already internalized different cultures and were in the midst of different social and political processes. Their cultural heritage and the nature of these processes suggest that among the Maghribis a collectivist equilibrium was a natural focal point, whereas among the Genoese an individualist equilibrium was the natural focal point.

The Maghribis were *musta‘ribun*, that is, non-Muslims who adopted the values of the Muslim society. Among these values is the view that they were members of the same *umma*. This term, although translated as “nation,” is derived from the word *umm*, meaning “mother,” reflecting the basic value of mutual responsibility among

¹⁰ In Greif (in press) this subset is referred to as “behavioral beliefs.” In a perfect information extensive form game, denote by P a path of play, and define $S(P)$ to be the set of all strategy combinations for which the path of play is P . Denote the cultural beliefs of player i by $CB_i(S(P))$ defined as a probability distribution over $S(P)$. Note that diverse cultural beliefs differ only in terms of expectations concerning behavior off the path of play. When it is common knowledge that

$$CB_i(P(S)) = \{\text{prob}(s^*(P) = 1)\} \quad \forall i \text{ for some } s^*(P)$$

and

$$U_i(s_i^*, CB_i(S(P))) \geq U_i(s_i, CB_i(P(S))) \quad \forall i \text{ and } s_i \in S_i,$$

then s^* is a Nash equilibrium. Hence $s^*(P)$ is an equilibrium and the associated cultural beliefs are self-enforcing.

¹¹ For a discussion of imperfect monitoring models, see Pearce (1992). Under imperfect monitoring, agents will be punished on the equilibrium path. This does not qualitatively alter the results of this paper.

the members of that society (see, e.g., Cahen 1970). Further, members of the *umma* share the fundamental duty not only to practice good but also to ensure that others do not practice sin (B. Lewis 1988). In addition, the Maghribis were part of the Jewish community, within which it is a prominent idea that "All Israel is responsible for every member." Furthermore, as is common among immigrant groups, the Maghribis, who migrated from Iraq to Tunisia, retained social ties that enabled them to transmit the information required to support a collectivist equilibrium. The associated collectivist cultural beliefs in turn encouraged retaining an affiliation with this information network.

In contrast, Christianity during that period placed the individual rather than his social group at the center of its theology. It advanced the creation of "a new society based not on the family but on the individual, whose salvation, like his original loss of innocence, was personal and private" (Hughes 1974, p. 61). Indeed, the contract through which the Genoese established their city shortly before 1099 was a contract between individuals, not between families or other social groups. Furthermore, for political reasons the number of Genoese active in trade rose dramatically toward the end of the twelfth century. Instead of a few dozen traders who had previously been active in each trade center abroad, hundreds of Genoese began trading. At the same time, Genoa experienced a high level of immigration. For instance, Genoa's population increased from 30,000 to 100,000 between 1200 and 1300. In the absence of appropriate social networks for information transmission, the individualist equilibrium was likely to be selected. Once it was selected, individualist cultural beliefs discouraged investment in information. In the absence of a coordinating mechanism, a switch to a collectivist equilibrium was not likely to occur.

Collectivist cultural beliefs were a focal point among the Maghribis, and individualist cultural beliefs were a focal point among the Genoese. Does the historical evidence indicate the existence of the related societal organizations? That is, was there high investment in information and collective punishment among the Maghribis and low investment in information and individualist punishment among the Genoese?

The historical evidence indicates that the Maghribis invested in sharing information and the Genoese did not. Each Maghribi corresponded with many other Maghribi traders by sending informative letters to them with the latest available commercial information and "gossip," including whatever transpired in agency relations among other Maghribis. Important business dealings were conducted in public, and the names of the witnesses were widely publicized (Goitein

1967, 1973; Greif 1989). Information transmission was probably facilitated by the relatively small size of the Maghribi traders' group (although, as discussed below, this size was endogenously determined). In 175 documents, for example, 330 different names are mentioned.¹² Although, most likely, not every Maghribi trader was familiar with all the others, belonging to the Maghribis was easily verifiable through common acquaintances, an extensive network of communication, a common religion, and a common language (Judaeo-Arabic).

The historical records indicate the use of collective punishment among the Maghribis, although it was rarely used.¹³ For example, in the first decade of the eleventh century, Samhun ben Da'ud, a prominent trader from Tunisia, sent a long letter to his business associate, Joseph ben 'Awkal of Fustat. The letter says that Joseph made his future dealings with Samhun conditional on his record: "If your handling of my business is correct, then I shall send you goods." It happened, however, that Samhun did not handle Joseph's business to his satisfaction: Joseph believed that Samhun had intentionally not remitted his revenues on time. Joseph's response was to ignore Samhun's request to pay two of Samhun's creditors in Fustat. By the time Samhun found out about it, "their letters filled with condemnation had reached everyone." The contents of these letters caused Samhun to complain that "my reputation (or honor) is being ruined" (David Kaufmann Collection, Hungarian Academy of Science, Budapest [document 13, side a, lines 26 ff., 41]; Stillman 1970, p. 267 ff.; Goitein 1973, p. 26 ff.).¹⁴

In contrast, the Genoese seem to have held an opposite attitude regarding information sharing. Lopez (1943) noted the efforts of the Genoese to conceal information and conjectured that the "individualistic, taciturn, and reserved Genoese" were not "talkative" about their businesses and were even "jealous of their business secrets" (p. 168). For example, when the Vivaldi brothers attempted in 1291 to sail from Genoa to the Far East through the Atlantic, their commercial agreements were drawn for trade in "Majorca, even for the Byzantine Empire" (p. 169). Genoa's historical records are not explicit about the nature of punishment. Yet they suggest the lack of collective punishment and informal communication. For example, despite the fact that it was known that a Genoese merchant, Daniel Fontanella, gained at least 50 percent on the capital entrusted to him as an agent,

¹² These letters are those available regarding the trade with Sicily and Israel during the mid-eleventh century and the trade of Naharay ben Nissim (see Michael 1965; Gil 1983*b*; Ben-Sasson 1991).

¹³ In the 175 contracts mentioned above that reflect at least 652 business ventures, only three cases of alleged cheating are mentioned.

¹⁴ For other examples and a discussion, see Greif (1989, 1993*a*).

he declared a loss of 20 percent (Lopez 1943, p. 180; De Roover 1965, pp. 88–89).

Cultural factors that coordinated expectations and social and political factors that slightly altered the relevant games in the formative period seem to have directed the Maghribis and the Genoese toward different cultural beliefs. As these various cultural beliefs were a part of the institutional framework of each group, they determined the costs and benefits of various actions and hence efficiency. For example, since collectivist cultural beliefs reduce the optimal wage, they can sustain cooperation in situations in which it cannot be sustained by individualist cultural beliefs (Greif 1993*a*). Even if each member of the society recognizes the inefficiency caused by individualist cultural beliefs, a unilateral move by an individual or a (relatively) small group would not induce a change. Expectations about expectations are difficult to alter, and thus cultural beliefs can make Pareto-inferior institutions and outcomes self-enforcing. (Responding to this constraint, however, individuals may strive to change the rules of the game, as discussed in Sec. VII.)

V. Within the Boundaries of the Game: Cultural Beliefs, Social Patterns of Agency Relations, and Wealth Distribution

What are the implications of different cultural beliefs on social patterns of economic relations and the dynamics of wealth distribution? Can different cultural beliefs manifest themselves in distinct social structures? Examining this issue requires extending the theoretical analysis to allow each merchant to serve as an agent for another merchant.¹⁵ Accordingly, the collectivist cultural beliefs should be redefined to include the expectations that merchants will not retaliate against someone who cheats a merchant who has cheated any other merchant. That is, whoever is hired by a merchant who cheated in the past is not expected to be subjected to collective punishment if he cheats that merchant. Indeed, the historical evidence indicates that Maghribis shared such expectations. For example, a Maghribi merchant who was accused in 1041–42 of cheating complains that when it became known, “people became agitated and hostile and whoever owed [me money] conspired to keep it from [me]” (Bodleian Library, Oxford, MS Hebrew, a 2 f. 17, sec. D; Goitein 1973, p. 104).¹⁶

¹⁵ To shorten the presentation, this extension is not made explicit here.

¹⁶ See also Greif (1989, 1993*a*). Regarding the Italian merchants who did not hold such beliefs, see, e.g., De Roover (1965, pp. 88–89).

In this extended game, two social patterns of agency relations and associated dynamic patterns of wealth distribution can emerge. The first is a vertical social structure in which merchants find it optimal and therefore employ only agents, and hence an individual functions as either a merchant or an agent. The second is a horizontal social structure in which merchants employ only other merchants, and thus an individual functions as an agent *and* a merchant, providing and receiving agency services. What are the relations between cultural beliefs and these social patterns of agency relations?

Intuitively, under collectivist cultural beliefs, a merchant's capital functions as a bond that reduces the optimal wage required to keep him honest. If a merchant cheats while functioning as an agent, he is no longer able to hire agents under the threat of collective punishment. Hence, cheating by a merchant while he functions as an agent reduces the future rate of return on his capital. This implies that a merchant who had cheated while functioning as an agent had to bear a cost that an agent (who cannot function as a merchant) would not have to bear. Hence a lower wage is required to keep a merchant honest, and each merchant is motivated to hire another merchant as his agent, leading to a horizontal social structure. This is not the case, however, under individualist cultural beliefs. Past cheating does not reduce the rate of return on a merchant's capital. But having capital to invest *de facto* increases a merchant's reservation utility relative to that of an agent, thereby increasing the wage required to keep him honest. Merchants are discouraged from hiring other merchants as their agents, leading to a vertical social structure.¹⁷

More formally, consider the optimal wage required to ensure the honesty of a merchant who functions as an agent (under the assumption that each merchant is risk neutral and has the discount factor β). The present value of the lifetime expected utility of the merchant if he is always honest is the sum of the present value of his expected utility from being an agent, V_h^a , and the present value of his expected utility from being a merchant, $(\gamma - W^*)/(1 - \beta)$, that is, $V_h^a + [(\gamma - W^*)/(1 - \beta)]$. If this merchant cheats while providing agency services, the present value of his expected utility from being an agent is the sum of his current gain from cheating, α , plus the lifetime expected utility of a cheater, V_c^a . In addition, he receives from being a merchant in the current period $\gamma - W^*$ plus the present value of the future periods' expected utility from being a merchant who had cheated, V_c^m . Hence the present value of his lifetime expected utility is $\alpha + \gamma - W^* + V_c^m + V_c^a$. For a merchant to be honest when providing

¹⁷ The basic logic of this argument resembles that of Bernheim and Whinston (1990).

agency services, he should not be able to gain from one period of cheating; that is,

$$V_h^a + \frac{\gamma - W^*}{1 - \beta} \geq \alpha + \gamma - W^* + V_c^m + V_c^a.$$

For a person who can act only as an agent, that is, who is not a merchant, the equivalent honesty condition is $V_h^a \geq \alpha + V_c^a$.

These honesty conditions enable examination of the relations between diverse cultural beliefs and hiring decisions. Under collectivist cultural beliefs, a merchant who cheated in the past can no longer rely on collective punishment to deter his agent from cheating him and therefore has to pay a higher wage to keep him honest. This implies that under a collectivist strategy a merchant's lifetime expected utility obtained from being a merchant decreases if he cheats when functioning as an agent. That is, $(\gamma - W^*)/(1 - \beta) > \gamma - W^* + V_c^m$. Since, *ceteris paribus*, an agent's honesty condition is $V_h^a \geq \alpha + V_c^a$, a merchant strictly prefers to employ another merchant as his agent. In contrast, under individualist cultural beliefs, a merchant who cheats while providing agency services does not have to pay more to his agents in the future. That is, $(\gamma - W^*)/(1 - \beta) = \gamma - W^* + V_c^m$, and hence, *ceteris paribus*, a merchant is not motivated to employ another merchant. Yet it is likely that a merchant's reservation utility is higher than that of an agent. If the higher reservation utility is merely a reflection of the merchant's investment in trade, it further encourages the employment of merchants under collectivist cultural beliefs but discourages their employment under individualist cultural beliefs. If merchants' higher reservation utility is unrelated to investment in trade, it increases the optimal wage required to keep them honest independent of any cultural beliefs.

It can be concluded that merchants' capital serves as a bond that encourages their employment under collectivist cultural beliefs. Merchants' higher reservation utilities, however, discourage their employment under individualist cultural beliefs (and possibly collectivist cultural beliefs). Hence under individualist cultural beliefs, a society reaches a vertical social structure for a larger set of initial conditions than under collectivist cultural beliefs, whereas under collectivist cultural beliefs, a society reaches a horizontal social structure for a larger set of initial conditions than under individualist cultural beliefs.

Differences in social structure are indeed observed among the Maghribis and the Genoese. The Maghribi traders were, by and large, merchants who invested in trade through horizontal agency relations. Each trader served as an agent for several merchants while receiving agency services from them or other traders. Sedentary traders served as agents for those who traveled, and vice versa. Wealthy merchants

served as agents for poorer ones, and vice versa. Among the Maghribis there was not a “merchants’ class” and an “agents’ class.” The extent to which the Maghribis’ social structure was horizontal can be quantified by examining the related distribution of “agency measure.” Agency measure is defined as the number of times a trader operated as an agent divided by the number of times a trader operated as either a merchant or an agent. It equals one if the trader was only an agent, zero if he was only a merchant, and some intermediate value in between if he was both a merchant and an agent. In 175 letters written by Maghribi traders and in which 652 agency relations are reflected, 119 traders appear more than once, and almost 70 percent of them have an agency measure between zero and one. Furthermore, the more a trader appears in the documents, the more likely he is to have such an agency measure.¹⁸

The horizontal social structure of the Maghribis is also reflected in the forms of business associations through which agency relations were established among them. They used mainly partnership and “formal friendship.” In a partnership, two or more traders invested capital and labor in a joint venture and shared the profit in proportion to their capital investment. In a “formal friendship,” two traders who operated in different trade centers provided each other with agency services without receiving pecuniary compensation (Goitein 1967, p. 214 ff.; Stillman 1970; Gil 1983*b*, 1:200 ff.).¹⁹

In contrast, agency relations among the Genoese traders were vertical. Wealthy merchants who rarely, if ever, functioned as agents hired relatively poor agents who rarely, if ever, functioned as merchants (De Roover 1965, p. 51 ff.). Byrne (1916, p. 159) concluded that during the late twelfth century, “as a rule” the Genoese agents were “not men of great wealth or of high position.” Agency measures calculated from specific cartularies reflect this assertion. For example, only 21 percent of the 190 trader families mentioned more than once in the cartulary of Giovanni Scriba (1155–64) have an agency measure between zero and one, and in value terms only 11 percent have this agency measure.²⁰ The vertical character of the Genoese social structure is also reflected in the forms of business associations through which agency relations were established. They mainly used *commenda* contracts, which were, by and large, established between two parties,

¹⁸ This data set is defined in n. 11. The nature of the sources precludes calculating a value-based agency measure for the Maghribis.

¹⁹ For a discussion of business associations, see Goitein (1973, p. 11 ff.) and Gil (1983*b*, 1:216 ff.). Goitein (1964, p. 316) concluded that about half of the business dealings reflected in the Geniza are formal friendships.

²⁰ Krueger (1957) concluded that only 6 percent (36 traders) of those mentioned in Giovanni Scriba’s cartulary functioned as both agents and merchants.

one providing capital and the other providing work in the form of traveling and transacting overseas. The difference in forms of business associations between the two merchant groups does not reflect diverse knowledge.²¹

Diverse cultural beliefs not only affect social patterns of economic interactions but also lead to diverse dynamics of wealth distribution. *Ceteris paribus*, a vertical society provides better opportunity for “upward” mobility to wealthless individuals (in a partial equilibrium framework). Since under individualist cultural beliefs an agent’s ability to commit is negatively related to his wealth, wealthless individuals are better able to capture the rent (above the reservation utility) available to agents. In a horizontal society, wealthless individuals are not able to capture the rent available to agents, since under collectivist cultural beliefs one’s commitment ability is positively related to one’s wealth.

The historical sources are mute with respect to the dynamics of wealth distribution among the Maghribis, but the Genoese sources reflect a dynamics of wealth distribution that conforms to the theoretical prediction. Wealth transfer is reflected in a declining concentration of trade investment and the increase, over time, of trade investment made by commoners (i.e., nonnobles). In the cartulary of Giovanni Scriba (1155–64), trade was concentrated, by and large, in the hands of a few noble families, and less than 10 percent of the merchants invested 70 percent of the total. In the cartulary of Oberto Scriba (1186), 10 percent of the families invested less than 60 percent. In 1376, the only year for which, to the best of my knowledge, data are available in the secondary literature, commoners who paid customs in Genoa exceeded nobles (295 vs. 279), and the share of the latter amounted to only 64 percent of the total (Kedar 1976, pp. 51–52).²² That agency relations shifted wealth distribution is reflected, for example, in the affairs of Ansaldo Baialardo, who was hired in 1156 by the noble Genoese merchant Ingo do Volta. From 1156 to 1158, Ansaldo sailed abroad as Ingo’s agent, and by investing only his retained earnings he accumulated the sum of 142 lire (De Roover 1965, pp. 51–52). (A house in Genoa cost about 40 lire [see *Giovanni di Guiberto, 1200–1211*, nos. 260, 261].)

An indirect indication of the growing wealth of the commoners is reflected in the political history of Genoa. A relative increase in the wealth possessed by a subgroup within a society is likely to lead them to demand a greater say in political matters. Hence as wealth distribu-

²¹ See Krueger (1962). For a general discussion, see De Roover (1965). For a discussion of knowledge, see Lieber (1968).

²² De Roover (1965) argued that agency relations in Italy facilitated wealth transfer.

tion changes, one is likely to observe an attempt to change the political organization of the society. Indeed, the *popoli* of Genoa revolted during the thirteenth century against the nobility and changed the political organization of Genoa to reflect and protect their growing wealth (e.g., Vitale 1955).

VI. Transcending the Boundaries of the Game: Segregated and Integrated Societies

The Maghribis and the Genoese experienced over time a specific alteration in the merchant-agent game. Following various military and political changes in the Mediterranean, both groups had the opportunity to expand their trade to areas previously inaccessible to them (see, e.g., A. Lewis 1951).²³ Commercially, both groups responded similarly and expanded their trade from Spain to Constantinople. From the perspective of societal organization, however, their responses differed. The Genoese responded in an “integrated” manner, but the Maghribis responded in a “segregated” manner.

The Maghribis expanded their trade employing other Maghribis as agents. They emigrated from North Africa to other trade centers, and for generations the descendants of Maghribis continued to cooperate with the descendants of other Maghribis (Goitein 1967, pp. 156–59, 186–92; Gil 1983*b*, 1:200 ff.). For example, in the letters of Naharay ben Nissim, the most important Maghribi trader in Fustat around the midcentury, 97 different traders are mentioned but only two were Muslims (Al Qasim and Muhammad).²⁴ This segregated response was not a result of the Maghribis’ being a religious minority, since they did not establish agency relations with other Jewish traders even when these relations were perceived by the Maghribis as very profitable (ignoring agency costs). This was true, in particular, with respect to Italian Jewish merchants (Greif 1989, 1993*a*; Goitein 1973, pp. 44, 211). That this segregation is endogenous is reflected in the Maghribis’ later history, when, toward the end of the twelfth century, they were forced by the ruler of Egypt to cease trading. At this point they integrated with the Jewish communities and vanished from the stage of history.

The Genoese also responded to the new opportunities by emigrating abroad, and their cartularies indicate that agency relations between Genoese prevailed. Yet although the cartularies were written in Genoa and hence are biased toward reflecting agency relations

²³ Among these changes were the disintegration of the Muslim caliphate in Spain, the rise of the Fatimids in North Africa, and the decline of the Byzantine naval power.

²⁴ This information is based on the 37 documents published by Michael (1965).

among Genoese, they nevertheless clearly indicate the establishment of agency relations between Genoese and non-Genoese. For example, in the cartulary of the Genoese Giovanni Scriba (1155–64), at least 18.3 percent of the total sent abroad through agents was sent or carried by a non-Genoese.²⁵

The rationale behind the different responses of the Maghribis and the Genoese to the same exogenous change in the rules of the game is clear once one considers the impact of cultural beliefs on equilibrium selection. The change altered the OSPD game in a specific manner. As trade with more remote trade centers became possible, a merchant could either hire an agent from his own economy who would sail or emigrate abroad, or hire an agent native to the other trade center. Such intereconomy agency relations are likely to be more efficient than intraeconomy agency relations since they enhance commercial flexibility, and a native agent does not need to immigrate and is likely to possess a better knowledge of local conditions.

In deciding whether to establish intereconomy agency relations, however, a merchant is concerned with profitability and not efficiency. The relations between efficiency and profitability are influenced by cultural beliefs that had crystallized before intereconomy agency relations became possible. Individualist cultural beliefs lead to an “integrated” society in which intereconomy agency relations are established if they are efficient. Collectivist cultural beliefs create a wedge between efficient and profitable agency relations, leading to a “segregated” society in which efficient intereconomy agency relations are not established. Whenever there is uncertainty whether collectivist cultural beliefs or individualist cultural beliefs will be practiced in intereconomy agency relations, these more efficient agency relations are less profitable to collectivist merchants since they increase the agents’ wages.

To see why this is the case, suppose that two *identical* economies, within which either individualist cultural beliefs or collectivist cultural beliefs prevail, become a *joint economy* in which players can identify members of their previous economy but intereconomy agency relations are possible. What will the patterns of hiring agents in the joint economy be as a function of the players’ cultural beliefs? (For ease of presentation, assume that past actions are common knowledge. Letting players invest in information greatly strengthens the results presented below.)

²⁵ For non-Genoese in other cartularies, see, e.g., *Oberto Scriba de Mercato, 1186*, nos. 9, 38; *Oberto Scriba de Mercato, 1190*, nos. 138, 139; *Guglielmo Cassinese (1190–1192)*, nos. 418, 1325; and *Lanfranco (1202–1226)*, no. 524. The ease of hiring non-Genoese is reflected in their use when a politically unfavorable situation prevented the Genoese from trading in Sicily (see Abulafia 1977, p. 201 ff.).

Intuitively, when players project their cultural beliefs on the new game—that is, when their expectations concerning others' actions in the postchange game are the prechange expectations—these prechange cultural beliefs constitute the initial conditions for a dynamic adjustment process.²⁶ For example, if the prechange economies were collectivist, players expect each merchant to hire agents from his own economy and expect that merchants of the same economy will retaliate against an agent who has cheated one of them. Yet the prechange cultural beliefs are insufficient to calculate best responses in the postchange game. They do not stipulate a complete strategy for a player, since the same prechange behavior implies off-the-path-of-play situations in the postchange game that did not exist before. For example, the prechange cultural beliefs do not specify how merchants from one economy would react to actions taken by an agent from their economy in intereconomy agency relations. As the others' strategies are not specified, a player cannot find his best response.

To find his best response, a merchant has to form expectations about the response of the merchants from the other economy to actions taken in intereconomy agency relations. Although the merchants from the agent's economy can be expected to respond in various ways, two responses predominate. For any agent's action in intereconomy agency relations, the merchants from the agent's economy can regard him either as one who cheated one of them or as one who did not cheat one of them. For example, in a collectivist economy the merchants can consider an agent who cheated in intereconomy agency relations as a cheater subject to collective retaliation, or they can ignore his cheating. There is nothing in the prechange cultural beliefs, however, that indicates which of these responses will be selected for each action. Accordingly, the best that can be done analytically is to assume that in intereconomy agency relations any probability distribution over these two responses is possible.²⁷ Considering the prechange cultural beliefs and any such probability distributions as initial conditions enables examination of the merchants' best response (while not imposing any differences between the prechange economies apart from their cultural beliefs).

What would the merchants' best response be as a function of their cultural beliefs? It is easier to present the related analysis, assuming

²⁶ For references and results regarding this type of convergence, see Milgrom and Roberts (1990). For a sociological discussion regarding the tendency of human beings to feel that cultural patterns of behavior *ought* to be followed and the tension between this feeling and the actual behavior, see Davis (1949, pp. 52–53). For a recent economic analysis, see Geanakoplos, Pearce, and Stacchetti (1989).

²⁷ This probability distribution can also be thought of as reflecting a merchant's uncertainty regarding the agent's expectations concerning the responses of the merchants from the agents' economy.

initially that there is no efficiency gain from intereconomy agency relations. Intuitively, when intereconomy agency relations become possible between two collectivist economies, the initial cultural beliefs specify collective punishment in intraeconomy agency relations. But if there is some doubt whether collective punishment also governs intereconomy agency relations, the optimal wage in intereconomy agency relations is higher than in intraeconomy relations. It is higher because the uncertainty about collective punishment in intereconomy relations reduces the probability that an agent who cheats in such relations will be punished, and, as established in proposition 1, this increases the optimal wage. As the merchants' cost of establishing intereconomy agency relations is higher than the cost of establishing intraeconomy agency relations, only the latter will be initiated, and segregation is the end result. If intereconomy agency relations are more efficient, the analysis implies that merchants will initiate them only if the efficiency gains are sufficiently large.

The foregoing analysis does not hold when intereconomy agency relations become possible between two individualistic economies. Although similar uncertainty is likely to exist, the intereconomy and intraeconomy optimal wages are the same. Individualist cultural beliefs make this uncertainty irrelevant for the determination of the optimal wage. Hence any efficiency gains from intereconomy agency relations will motivate merchants to establish them. Proposition 4 (which is proved in the Appendix) makes the intuitive discussion above precise. For this proposition, however, some definitions are required.

A joint economy is *segregated* if, given the initial conditions, merchants from each economy strictly prefer to hire agents from their own economy. A joint economy is *integrated* if, given the initial conditions, merchants from at least one economy are indifferent about the original economy of their agents. Denote a merchant from economy s by M^s and an agent from economy t by A^t , where $s, t \in \{K, J\}$. Denote by μ the perceived probability that merchants from economy s will consider an A^s last employed by M^t as a cheater if he cheated when employed by M^t . Denote by η the perceived probability that merchants from economy s will consider an A^s , last employed by M^t , as a cheater if he was honest when employed by M^t .

PROPOSITION 4. Suppose that intereconomy agency relations do not entail efficiency gain and that the two economies are identical in their parameters. If the prechange economies are collectivist, the joint economy is segregated for any $\mu \in [0, 1)$ and $\eta \in (0, 1]$, and integrated only if $\mu = 1$ and $\eta = 0$. If the prechange economies are individualist, the joint economy is integrated for $\mu \in [0, 1]$ and $\eta \in [0, 1]$.

When intereconomy agency relations become possible between a collectivist and an individualist economy, a collectivist merchant would not initiate intereconomy agency relations regardless of the uncertainty regarding the individualist merchants' responses.²⁸ The wage he has to pay to keep the agent honest is higher than the wage in the collectivist economy, since the collectivist economy's wage is lower than the individualist economy's wage. Hence collectivist cultural beliefs create a wedge between efficient and profitable agency relations and will be initiated by collectivist merchants only if efficiency gains from interagency relations are high enough.

In contrast, because the collectivist economy's wage is lower, individualist merchants *may* find it optimal to establish intereconomy relations even if such relations *do not* imply efficiency gains, thereby inducing (asymmetric) integration. To see why, consider the uncertainty regarding the collectivist merchants' responses that decreases the profitability of intereconomy relations the most. Hence suppose that the collectivist merchant would not impose a collective punishment on a cheater ($\mu = 0$) but would impose punishment on an agent who was honest in intereconomy relations ($\eta = 1$). The expectations that collectivist merchants would not collectively punish a cheater in intereconomy relations cannot by themselves (i.e., when $\eta = \mu = 0$) decrease the profitability of intereconomy relations enough to prevent integration. They imply that if a collectivist agent who was employed by an individualist merchant becomes unemployed, his lifetime expected utility equals that of any unemployed collectivist agent. Hence the individualist economy wage is more than required to keep the agent honest, since the lifetime expected utility of an unemployed collectivist agent is lower than that of an individualist agent. Hence it is profitable for an individualist merchant to hire a collectivist agent.

If collectivist merchants are also expected to consider an agent who was *honest* in intereconomy agency relations to be a *cheater* ($\eta > 0$), the wage that has to be paid to a collectivist agent by an individualist merchant increases further. An unemployed collectivist agent who was honest in intereconomy agency relations has a lower lifetime expected utility than other unemployed collectivist agents. Hence a higher wage (than when $\eta = 0$) is required to induce honesty. Nevertheless, integration may still follow, since an honest agent will become unemployed only in the future. Thus only if the agent's time discount factor, β , is high enough or the probability of forced separation, σ ,

²⁸ To concentrate on the asymmetry in responses due to diverse cultural beliefs, the following discussion ignores possible implications of vertical and horizontal social structures on agents' reservation utility.

low enough would these expected responses by the collectivist merchants forestall intereconomy agency relations.

Individualist (but not collectivist) merchants are likely to induce integration, and they may find it profitable to initiate intereconomy agency relations even if they do not imply efficiency gains and no matter what the uncertainty is regarding the collectivist merchants' responses. Segregation can result, however, if the expected response of the collectivist merchants erects "barriers to exit" for collectivist agents.²⁹ Furthermore, since integration increases the wage in the collectivist economy, collectivist merchants may strive to prevent intereconomy agency relations through social or political actions. Proposition 5 establishes the necessary and sufficient conditions for integration and segregation (it is proved, under the same assumptions as in proposition 4, in the Appendix).

PROPOSITION 5.

- a) For any $\mu \in [0, 1]$ and $\eta \in [0, 1]$, a collectivist merchant will not initiate intereconomy agency relations.
- b) A sufficient condition for integration is $\mu \geq \eta$. A necessary condition is

$$\mu + \frac{(1 - \beta)[V_h^{u,I} - \mu V_c^{u,c} - (1 - \mu)V_h^{u,c}]}{\beta\sigma(V_h^{u,c} - V_c^{u,c})} \geq \eta$$

(superscript c [or I] means collectivist [individualist] economy).

- c) A necessary condition for segregation is $\mu < \eta$. If μ is close enough to zero and η close enough to one, then there exists $\beta \in (0, 1)$, such that, for all $\beta \geq \beta$, the economy is segregated.

This section examines the relations between different cultural beliefs, the endogenous emergence of segregation and integration, and economic efficiency. Pareto-inferior segregation may prevail because of the structure of expectations and the absence of a mechanism able to alter them in a manner that makes this alteration common knowledge. Thus the extent of trade expansion of a collectivist society is limited by the initial expectations regarding the boundaries of the society. Different cultural beliefs determine directions of trade expansion since individualist merchants are likely to penetrate collectivist societies but not the other way around. Indeed, during the period under consideration, trade expansion was based on Latin merchants' penetration into the Muslim world. Finally, as discussed in

²⁹ Note that if integration is sequential and a collectivist agent who had been hired by an individualist "joins" the pool of individualist agents, then these expectations and the decrease in the number of collectivist agents may lead to a new equilibrium in which the size of the two economies differs.

the next section, segregation and integration influence the relations between individuals and their society and hence affect the evolution of organizations that govern collective actions and facilitate exchange.

VII. Transcending the Boundaries of the Game: Organizational Evolution

Among the Maghribis, collectivist cultural beliefs led to a collectivist society with an economic self-enforcing collective punishment, horizontal agency relations, segregation, and an in-group social communication network. In a collectivist society, individuals can be induced to forgo “improper” behavior through a credible threat of informal collective economic punishment. Suppose, for example, that every Maghribi expects everyone else to consider a specific behavior as “improper” and punishable in the same manner as cheating in agency relations. This punishment is self-enforcing for the same reasons as the self-enforcing collective punishment in agency relations and is feasible because there is a network for information transmission. Furthermore, this punishment is likely to be reinforced by social and moral enforcement mechanisms that, as discussed in Section II, emerge as a result of frequent economic interactions within a small segregated group. Clearly, to make the threat of collective punishment credible, there is a need to coordinate expectations by defining what constitutes “improper” behavior. In a collectivist society, this coordination is likely to be based on informal mechanisms such as customs and oral tradition.

Among the Genoese, individualist cultural beliefs led to an individualist society with a vertical and integrated social structure, a relatively low level of communication, and no economic self-enforcing collective punishment. In such a society a relatively low level of informal economic enforcement can be achieved because of the absence of economic self-enforcing collective punishment and networks for information transmission. Furthermore, the integrated social structure and the low level of communication hinder social and moral enforcement mechanisms. To support collective actions and to facilitate exchange, an individualist society needs to develop formal legal and political enforcement organizations. Further, a formal legal code is likely to be required to facilitate exchange by coordinating expectations and enhancing the deterrence effect of formal organizations.

During the period under consideration, both the Genoese and the Maghribis were establishing a governmental system. Genoa had just been incorporated into a city and liberated de facto from the rule of the Holy Roman Empire (see, e.g., *Annali Genovesi*, 1:1162; Vitale 1955; Airaldi 1986). The Maghribis immigrated to and operated

within the Fatimid caliphate, in which “the administration of their own affairs was left to themselves” (Goitein 1971, p. 1). Hence both groups were in a position to devise their own form of authority and jurisdiction. Yet it was the Genoese who developed formal organizations to support collective actions and exchange; the Maghribis did not develop such organizations and seem not to have used the ones available to them.

During the twelfth century the Genoese ceased to use the ancient custom of entering contracts by a handshake and developed an extensive legal system for registration and enforcement of contracts. Furthermore, the customary contract law that governed the relations between Genoese traders was codified as permanent courts were established (Vitale 1955). In contrast, despite the existence of a well-developed Jewish communal court system, the Maghribis entered contracts informally, adopted an informal code of conduct, and attempted to resolve disputes informally (Goitein 1967; Greif 1989, 1993a).

The relations between cultural beliefs and organizational development are reflected not only in these general processes but also in organizations that served specific economic aims. For example, in medieval trade, the need for enforcement organizations to support collective action was likely to manifest itself in relations between traders and rulers. The medieval ruler could abuse the property rights of *alien* traders visiting his territory. As long as the number of traders was low, the relatively high value for the ruler of each trader’s future trade was sufficient to motivate the ruler to respect their rights. When the number of traders was large, however, this was no longer the case. A mechanism that might provide protection to traders at the higher volume of trade is for (sufficiently many) traders to respond—in the form of a trade embargo—to transgressions by the ruler against any trader. Once an embargo is declared, however, some traders can benefit from ignoring it and selling their goods in the prohibited area in times of shortage. Hence, some enforcement mechanism is required to assure that each trader will indeed respect a collective decision to impose an embargo.³⁰ In collectivist societies, one would expect that informal enforcement mechanisms would be sufficient to ensure traders’ compliance with embargo decisions. In individualist societies, however, one would expect organizations specializing in embargo enforcement to emerge.

Indeed, the historical evidence concerning the Maghribis and the

³⁰ For a theoretical exposition of the traders-ruler relations, the associated commitment problem, and the role of the European merchant guild in assuring collective action, see Greif, Milgrom, and Weingast (1994).

Genoese is consistent with this prediction. Among the Maghribis, compliance was assured through informal means. After the Muslim ruler of Sicily abused the rights of some Maghribi traders, the Maghribis responded by imposing, circa 1050, an embargo on Sicily. It was organized informally. Maymun ben Khalpha wrote a letter to Naharay ben Nissim of Fustat (old Cairo) from Palermo (Sicily), in which he informed Naharay about the abuse and asked him to “hold the hands of our friends [i.e., Maghribi traders] not to send to Sicily even one dirham [a low-value coin].” Indeed, the Maghribis sailed that year to Tunisia and not to Sicily, and a year later the abuse was remedied (David Kaufmann Collection, Hungarian Academy of Science, Budapest [no. 22, side a, lines 29–31; side b, lines 3–5]; Taylor-Schechter Collection, University Library, Cambridge [no. S 10 J 12, f. 26, side a, lines 18–20]; Michael 1965, 2:85; Gil 1983a, pp. 97–106). There is no evidence that compliance was supported by any formal enforcement organization, although the Maghribis could have used the Jewish court system or a communal organization to this end.

In sharp contrast, the city of Genoa functioned as a formal enforcement organization to make the threat of collective retaliation credible. After the authorities had declared that a certain area was a *devetum*, any merchant found there was subject to legal prosecution. For example, in 1340 the ruler of Tabriz (an important trade center between the Black Sea and the Persian Gulf) abused many Genoese traders, and Genoa responded by declaring a *devetum* against the city. In 1343, during the *devetum*, a Genoese merchant named Tommaso Gentile was on his way from Hormuz to China. Somewhere in the Pamir plateau he fell sick and had to entrust his goods to his companions and head back to Genoa by the shortest route. His way, however, passed through Tabriz. When this became known in Genoa, Tommaso’s father had to justify the transgression before the court, which accepted the claim of an act of God and acquitted Tommaso without penalty (Lopez 1943, pp. 181–83).

The history of the modern bill of lading provides another example of a development of formal organizations among the Genoese but not among the Maghribis. This bill combines an earlier version of the bill of lading with a so-called bill of advice. The former was the ship’s scribe’s receipt for the goods the merchant deposited on the ship. This receipt was sent by the merchant to his overseas agent, who then claimed the goods on the basis of the scribe’s own signature. The letter of advice was sent after the ship arrived at its destination by the ship’s scribe to the consignee, who did not come to claim the goods. The bill of lading and the letter of advice surmounted an organizational problem related to the shipping of goods abroad.

The earliest known European bill of lading and letter of advice date from the 1390s and relate to the trade of Genoa, whereas the Maghribi traders hardly ever used the bill of lading even though it was known to them.³¹ Why did the Genoese advance the use of the bill and the Maghribis abandon it? The Maghribis rejected the bill because they had solved the related organizational problem by using their informal collective enforcement mechanism. Maghribis entrusted their goods to other Maghribis traveling on board the ship that carried their merchandise. For example, in a letter sent early in the eleventh century by Ephraim, son of Isma‘il from Alexandria, to Ibn ‘Awkal, a prominent merchant who lived in Fustat, Isma‘il mentions the names of the men in four different ships entrusted “to watch carefully the 70 bales and one barqalu [containing the goods] until they will deliver them safely into the hands of Khalaf son of Ya ‘qub” (Taylor-Schechter Collection, University Library, Cambridge [no. 13 J 17, f. 3]; Goitein 1973, p. 313).³²

Instead of solving the organizational problem between the merchant and the ship’s operator, the Maghribis circumvented it. This fact is forcefully illustrated in a letter sent from Sicily in 1057 that describes what happened to loads of merchandise whose covers were torn during a voyage. The ship arrived in port, and the owner (operator?) of the ship started to steal merchandise. The writer of the letter remarked that “unless my brother had been there to collect [the goods], nothing that belonged to our friends [i.e., the Maghribi traders] would have been collected” (Bodleian Library, Oxford, MS Hebrew [no. c28, f. 61, side a, lines 12–14]; Gil 1983a, pp. 126–33). The fact that the ship’s owner did not consider himself, and was not considered by the traders, responsible for protecting the goods is clear from this letter. Similarly, if goods of unknown ownership were unloaded from the ship or if the ship did not reach its destination, it was not the captain but the Maghribi traders who took care of the goods of their fellow traders (Bodleian Library, Oxford, MS Hebrew [no. c28, f. 61, side a, lines 9–17]; Gil 1983a, pp. 126–33). The Genoese traders, lacking an equivalent informal enforcement mechanism, could not rely on fellow traders to protect their goods and solved the organizational problem associated with shipping goods by using the bill of lading, the letter of advice, and the legal responsibility they entail.

The differences between collectivist and individualist societies are also likely to manifest themselves in the development of organizations

³¹ For information on Genoa, see Bensa (1925). For the use of the bill of lading by the Maghribi traders and possible bias in the historical records, see Goitein (1973, p. 305 ff.).

³² For the generality of this practice, see Goitein (1967).

related to agency relations. For example, recall that proposition 1 established that a reduction in the probability of forced separation, σ , reduces the optimal wage. That is, the more likely it is that there will be future relations between a specific agent and merchant, the less that merchant has to pay his agent. Yet the magnitude of this reduction is a function of cultural beliefs. This is so because the gains from reducing the probability of forced separation depend on the probability that a cheater will be rehired and the probability that an honest agent will be rehired. The lower the probability that a cheater will be rehired and the higher the probability that an honest agent will be rehired, the lower the gain from changing the probability of forced separation. Furthermore, when an unemployed honest agent will be rehired with probability one, the gain from changing the probability of forced separation is zero. That is, $\partial^2 W(\cdot)/\partial h_c d\sigma > 0$ (for $\beta > h_c$), $\partial^2 W(\cdot)/\partial h_h d\sigma < 0$, and finally, $\partial W/\partial \sigma = 0$ when $h_h = 1$.

Collectivist cultural beliefs and the resulting segregation and collective punishment increase, and may bring to one, the probability that an honest agent will be rehired. Furthermore, these factors are likely to bring to zero the probability that a cheater would be rehired. Thus, under collectivist beliefs and segregation, a merchant's incentive to reduce the probability of forced separation is marginal, or even absent. In contrast, under individualist cultural beliefs and the resulting integration and second-party punishment, merchants are motivated to establish an organization that reduces the likelihood of forced separation.

The evolution of family relations and business organization among the Maghribis and the Genoese suggests that the latter but not the former introduced an organization that changed the probability of forced separation. When the Maghribi and the Genoese merchants first began trading in the Mediterranean, it was common in both groups for a trader's son to start operating independently during his father's lifetime. The father would typically help the son until he was able to operate on his own. After the father's death, his estate was divided among his heirs and his business dissolved.³³ Later development of family relations and business organization, however, differs substantially. During the thirteenth century the Genoese traders adopted the family firm, the essence of which was a permanent partnership with unlimited and joint liability. This organization preserved the family wealth undivided under one ownership, and a trader's son,

³³ Regarding the Maghribis, see Goitein (1967, p. 180 ff.) and Gil (1983b, 1:215 ff.). Regarding the Genoese, see *Il Cartolare di Giovanni Scriba, 1154–1164*, nos. 236, 575, 1047, 946.

reaching the appropriate age, joined his family's firm (see De Roover 1965, p. 70 ff.; Rosenberg and Birdzell 1986, pp. 123–24). The Maghribi traders, after being active in trade at least as long as the Genoese, did not establish a similar organization.

The analysis above indicates the sources of this uneven development. Given the collectivist cultural beliefs of the Maghribis and the resulting segregation, collective punishment, and horizontal relations, a merchant could not gain much by introducing an organization that reduced the likelihood of forced separation. Among the Italian traders, however, individualist cultural beliefs motivated merchants to increase the security of the employment they offered their agents. The family firm seems to have been the manifestation of this desire. In the Italian family firm, several traders combined their capital and formed an organization with an infinite life span and a lower probability of bankruptcy that replaced each individual merchant in his relationship with agents.³⁴

The preceding historical examples illustrate that collectivist and individualist cultural beliefs are likely to motivate the introduction of different organizations. Once an organization is introduced for specific reasons, it is likely, as discussed in Section II, to lead to other organizational innovations through learning and experimentation and as existing organizations direct responses to (historically) subsequent contractual problems. For example, the organizational “macroinvention” of the family firm led to organizational “microinventions” among the Italians. Family firms began to sell shares to non-family members. The capital of the Bardi Company consisted of 58 shares: six members of the family owned the majority of the shares, and five outsiders owned the rest. In 1312, the capital of the Peruzzi Company was distributed among eight members of the family and nine outsiders. In 1331 the Peruzzi family lost control of the company when more than half the capital belonged to outsiders (De Roover 1963, pp. 77–78; De Roover 1965). Tradable shares required a suitable market, and “stock markets” were developed. Furthermore, the separation between ownership and control introduced by the family firm motivated the introduction of organizations able to surmount the related contractual problems, such as improvement in information transmission techniques, accounting procedures, and the incentive scheme provided to agents.

³⁴ Additional theoretical and historical work is required to establish whether and how the family firm achieved a level of commitment above that of each of its individual members. It should be noted that agency relations in the Italian family firms were not confined to family members (see De Roover 1963, 1965).

VIII. Conclusions

Constrained by the same technology and environment and facing the same organizational problem, the Maghribis and the Genoese had divergent cultural heritages and political and social histories that gave rise to different cultural beliefs. Theoretically, their cultural beliefs are sufficient to account for their diverse trajectories of societal organization, indicating how these forces may have had a lasting impact despite their temporary nature. Collectivist cultural beliefs constituted part of the Maghribis' collective enforcement mechanism and induced investment in information, segregation, horizontal economic interactions, and a stable pattern of wealth distribution. The endogenous partition of society restricted economic and social interactions to a small group and further facilitated in-group communication and economic and social collective punishments. Collectivist cultural beliefs led to a societal organization based on the group's ability to use economic, social, and, most likely, moral sanctions against deviants.

In contrast, individualist cultural beliefs constituted a part of the second-party enforcement mechanism of the Genoese and induced a low level of communication, a vertical social structure, economic and social integration, and wealth transfer to the relatively poor. These manifestations of individualist cultural beliefs weakened the dependence of each individual on any specific group, thereby limiting each group's ability to use economic, social, and moral sanctions against individual members. Individualist cultural beliefs led to a societal organization based on legal, political, and (second-party) economic organizations for enforcement and coordination.

The analysis demonstrates how the interactions between institutions, exogenous changes, and the process of organizational innovation govern the historical development of societal organization and the related economic, political, legal, and social constructs. Each of these elements complements the others to generate a self-sustained system, and each of the two systems analyzed in this paper has different efficiency implications. The collectivist system is more efficient in supporting intraeconomy agency relations and requires less costly formal organizations (such as law courts), but it restricts intereconomy agency relations. The individualist system does not restrict intereconomy agency relations but is less efficient in supporting intraeconomy relations and requires costly formal organizations. Furthermore, each system entails different patterns of wealth distribution, each of which is likely to have different efficiency implications. This implies that the relative efficiency of individualist and collectivist systems depends on the magnitude of the relevant parameters. Hence although in the long run the Italians drove the Muslim traders out

of the Mediterranean, the historical records do not enable any explicit test of the relative efficiency of the two systems.

Yet it is intriguing that the Maghribis' societal organization resembles that of contemporary developing countries, whereas the Genoese societal organization resembles the developed West, suggesting that the individualistic system may have been more efficient in the long run. The analysis in this paper enables conjecturing about the possible long-run benefits of the individualistic system. To the extent that the division of labor is a necessary condition for long-run sustained economic growth, formal enforcement institutions that support anonymous exchange facilitate economic development. Individualist cultural beliefs foster the development of such institutions and hence enable society to capture these efficiency gains. Further, an individualist society entails less social pressure to conform to social norms of behavior and hence fosters initiative and innovation. Indeed, Genoa was well known among the Italian city-states for its individualism and was a leader in commercial initiative and innovation (Greif 1993*b*). Historically, then, the medieval Latin individualist society may have cultivated the seeds of the "Rise of the West."³⁵

Although the conjectures discussed above await further research, this paper points to factors that make trajectories of societal organization—and hence economic growth—path dependent. Given the technologically determined rules of the game, institutions—the nontechnological constraints on human interactions—are composed of two interrelated elements: cultural beliefs (how individuals expect others to act in various contingencies) and organizations (the endogenous human constructs that alter the rules of the game and, whenever applicable, have to be an equilibrium). Thus the capacity of societal organization to change is a function of its history, since institutions are combined of organizations and cultural beliefs, cultural beliefs are uncoordinated expectations, organizations reinforce the cultural beliefs that led to their adoption, and past organizations and cultural beliefs influence historically subsequent games, organizations, and equilibria.

Understanding the sources of institutional path dependence indicates the factors that forestall successful intersociety adoption of institutions for which there are many historical and contemporary examples. North (1991) pointed out that the adoption of the U.S. Constitution by South American countries did not lead to democracy, and Litwack (1991) pointed to the failure of "Western" organizational

³⁵ See Greif (in press) regarding the extent to which the Maghribis' experience represents that of other groups in the Muslim world.

reforms in the Soviet Union to generate any economic benefit. The view of institutions developed in this paper indicates why it is misleading to expect that a beneficial organization of one society will yield the same results in another. The effect of organizations is a function of their impact on the rules of the game *and* the cultural beliefs of the society within which this game is embedded. Analyzing economic and political institutions and the impact of organizational modifications requires the examination of the historical development and implications of the related cultural beliefs.

Past, present, and future economic growth is not a mere function of endowment, technology, and preferences. It is a complex process in which the organization of society plays a significant role. The organization of society itself, however, reflects historical, cultural, social, political, and economic processes. Comparative historical analysis is likely to enhance our comprehension of the evolution of diverse societal organization, since this process is historical in nature. Furthermore, such an analysis provides the historical perspective and diversity required to examine institutional evolution and the interrelations between culture, the organization of society, and economic growth.

Appendix

Proof of Proposition 1

For a given h_c and h_h , to show that playing honest is optimal for the agent, it is sufficient to show that he cannot gain from cheating one period if offered W^* . Accordingly, denote by V_h the present value of lifetime expected utility of an employed agent who, whenever hired, is honest. Denote by V_h^u the present value of the lifetime expected utility of an unemployed honest agent. Denote by V_c^u the lifetime expected utility of an unemployed cheater (who will be honest in the future if hired). These lifetime expected utilities are

$$\begin{aligned} V_h &= W^* + \beta(1 - \sigma)V_h + \sigma V_h^u, \\ V_i^u &= \beta h_i V_h + \beta(1 - h_i)(\phi_u + V_i^u), \quad i = h, c. \end{aligned}$$

Cheating once yields $\alpha + V_c^u$ as the agent's present value of his lifetime expected utility. Thus an agent will not cheat if $V_h \geq \alpha + V_c^u$. Substituting and rearranging yield the result that an agent's best response is being honest iff

$$W \geq (\Sigma - \beta\sigma H_h) \left[\frac{\alpha}{1 - \beta H_c} + \beta\phi_u \left(\frac{P_c}{1 - \beta H_c} - \sigma P_h \right) \right] = W^*,$$

where $\Sigma = 1 - \beta(1 - \sigma)$; $H_i = h_i/[1 - \beta(1 - h_i)]$, $i = h, c$; and

$$P_i = \frac{1 - h_i}{1 - \beta(1 - h_i)}, \quad i = h, c.$$

The properties of W can be derived from this expression using the fact that $h_c \leq h_h$. Q.E.D.

*Proof of Proposition 2*³⁶

Under both strategies, the merchants act in accordance with the strategy assumed in proposition 1. Under the individualist strategy, $h_c = h_h > 0$, whereas under the collectivist strategy, $h_h > 0$ and $h_c = 0$ after every history. Hence, proposition 1 holds, and given W^* , an agent cannot do better by deviating. This implies that on the equilibrium path a merchant's strategy is a best response. The only nontrivial part of the proof regarding off-the-path-of-play events is verifying the optimality of the merchant's hiring procedures after cheating under the collectivist strategy. Denote the probability that a cheater (honest agent) will be hired by h_c^c (h_h^c) under the collectivist strategy. Note that under this strategy $h_c^c = 0$ (since a cheater is not expected to be rehired), but along the equilibrium path, $h_h^c = \sigma M / [A - (1 - \sigma)M] > 0$ (since an honest agent will be hired in the future). According to proposition 1, the optimal wage for a cheater is $W_c^* = w(\cdot, h_h^c = 0, h_c^c = 0)$ and the optimal wage for an honest agent is $W_h^* = w(\cdot, h_h^c > 0, h_c^c = 0)$. Since the function w decreases in h_h , $W_c^* > W_h^*$, and a merchant *strictly* prefers to hire an agent who has always been honest rather than an agent who has cheated. Thus firing a cheater and hiring only from the pool of honest agents are optimal for the merchant. Note that this implies that in another off-the-path-of-play event in which a merchant did not fire an agent who cheated him, there is no wage for which it is profitable for the merchant to employ the agent. The merchant should pay this agent at least W_c^* , implying that even if this agent will be honest, the best response of the merchant is to fire him in the next period. Hence, for any $W \neq \alpha$, the agent's best response is to cheat. Q.E.D.

Proof of Proposition 4

For any $\mu \in [0, 1]$ and $\eta \in [0, 1]$, the implications of the corresponding beliefs with respect to future employment of A^t last employed by M^s are the following (the first subscript [superscript] denotes the merchant's economy and the second subscript [superscript] denotes the agent's economy): $h_c^{s,t}(\mu) = \mu h_c^{t,t} + (1 - \mu) h_h^{t,t}$ is the probability that A^t will be hired if he is a cheater; $h_h^{s,t}(\eta) = \eta h_c^{t,t} + (1 - \eta) h_h^{t,t}$ is the probability that A^t will be hired if he is honest. Denote by $W_{s,t}^*$ the optimal wage that M^s pays A^t , $s \in \{K, J\}$, $t \in \{K, J\}$. Suppose that an unemployed agent from economy s was last employed by a merchant from economy t , and denote by $h_i^{s,t}$ the probability

³⁶ For technical reasons, it is assumed that if a merchant offers $W = 0$, employment is de facto not taking place and the merchant receives κ and the agent receives ϕ_u ; that the collectivist strategy also calls for ignoring cheating by more than one agent; and that under the individualist strategy in the off-the-path-of-play event in which a merchant did not fire an agent who cheated him, the agent's strategy specifies cheating for every wage and the merchant's strategy specifies offering $W = 0$.

that this agent will be rehired if he took action i when he was last employed, where i is either h for honest or c for cheat. Assume that the two economies are collectivist. If the prechange paths of play and cultural beliefs are taken as given, will a merchant hire an agent from the other economy? Clearly, M^s will not hire A^t if $W_{s,t}^* > W_{s,s}^*$, that is, if M^s has to pay to A^t more than he has to pay to A^s to keep him honest. Given the cultural beliefs, the symmetry of the two economies, and the collective strategy held in each of them, it follows that

$$\eta h_c^{t,t} + (1 - \eta) h_h^{t,t} = h_h^{t,t} < h_h^{s,s} \quad \forall \eta \in (0, 1] \quad (A1)$$

and

$$\mu h_c^{t,t} + (1 - \mu) h_h^{t,t} = h_c^{t,t} > h_c^{s,s} \quad \forall \mu \in [0, 1). \quad (A2)$$

Inequality (A2) states that if A^t may not be punished by the merchants from economy t for cheating M^s , then the perceived probability that he be hired after cheating M^s is higher than that of an agent from economy s . Simply stated, A^t , after cheating M^s , has an employment option not available to A^s , namely, to be hired by the merchants from his own economy.

Proposition 2 established that the function w increases in h_c and decreases in h_h . Thus for $s = K$ and $t = J$,

$$W_{s,t}^* = w(h_h^{s,t}, h_c^{s,t}) > w(h_h^{s,s}, h_c^{s,s}) = W_{s,s}^* \quad \forall \mu \in [0, 1), \eta \in (0, 1].$$

By symmetry, the same result holds for $s = J$ and $t = K$. The best response of a merchant from one economy is never to hire an agent from the other economy unless $\mu = 1$ and $\eta = 0$. If this condition does not hold, the joint economy is a segregated one in which merchants from one economy hire only agents from their own economy and play the collectivist strategy with respect to them.

Assume now that two individualist economies interact. If one follows the line of argument above and uses the fact that $h_h^{s,s} = h_c^{s,s}$ in individualist economies, it is easy to demonstrate that within each economy a merchant is indifferent about whether he hires an agent from his own economy or from the other, since the optimal wage (W^*) of an agent is identical. (Clearly, this assumes that the number of P and A in each economy is "large.") If all the merchants are indifferent (and hence may as well hire randomly from both economies), the joint economy is an integrated one in which an individualistic strategy is played. Q.E.D.

Proof of Proposition 5

Suppose that economy s is collectivist and t is individualist.

a) Agent A^t who cheated M^s will be rehired with probability

$$h_c^{s,t} = \mu h_c^{t,t} + (1 - \mu) h_h^{t,t} > h_c^{s,s} \quad \forall \mu \in [0, 1].$$

Agent A^t who was honest when employed by M^s will be rehired with probability $h_h^{s,t} = \eta h_c^{t,t} + (1 - \eta) h_h^{t,t}$, which is equal to $h_h^{s,s}$ for all $\eta \in [0, 1]$. Since W^{*c} (the collectivist society wage) is lower than the wage of the individualist

and, for all $\mu \in [0, 1]$ and $\eta \in [0, 1]$, $h_c^{s,t} > h_c^{s,s}$ and $h_h^{s,t} = h_h^{s,s}$, a wage higher than W^{*c} is required to keep the agent honest.

b) The minimum wage for which $A^{t,s}$ is honest is W^* subject to

$$\frac{W^* + \beta\sigma V_h^u}{1 - \beta + \beta\sigma} = \alpha + V_c^u,$$

where the superscript u means unemployed, $V_h^u = \eta V_c^{u,c} + (1 - \eta)V_h^{u,c}$, and $V_c^u = \mu V_c^{u,c} + (1 - \mu)V_h^{u,c}$. The minimum wage for which $A^{t,t}$ is honest is $W^{*,t}$ subject to

$$\frac{W^{*,t} + \beta\sigma V_h^{u,t}}{1 - \beta(1 - \sigma)} = \alpha + V_c^{u,t}$$

and

$$W^{*,t} - W^* = (1 - \beta)(V_h^{u,t} - V_c^u) + \beta\sigma(\mu - \eta)(V_h^{u,c} - V_c^{u,c}).$$

All the terms in $W^{*,t} - W^*$ are positive apart from $\mu - \eta$. Integration occurs iff $W^{*,t} - W^* \geq 0$, implying the sufficient and necessary conditions.

c) The necessary condition follows directly from the analysis in part b. Continuity implies that to prove the sufficient condition it is enough to consider $\mu = 0$ and $\eta = 1$. From part b, $W^{*,t} - W^* \geq 0$ iff

$$[1 - \beta(1 - \sigma)](V_c^{u,t} - V_h^{u,c}) \geq \beta\sigma(V_h^{u,t} - V_h^u).$$

Since $V_c^{u,t} - V_h^{u,c} < V_h^{u,t} - V_h^u$ for all β and the limit of $(1 - \beta + \sigma\beta)/\beta\sigma$ equals one as β goes to one, there exists $\tilde{\beta} \in (0, 1)$ such that, for all $\beta \geq \tilde{\beta}$, the inequality above fails to hold. Q.E.D.

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