partnership and "formal friendship." In partnership two or more traders invested capital and labor in a joint venture and shared the profit in proportion to their capital investment. In "formal friendship" two traders who operated in different trade centers provided each other with agency services without receiving pecuniary compensation.[77]

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: 51 ff.). Byrne (1917: 159) concluded that during the late 12th 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 (1155-1164) have an agency measure between zero and one and in value terms only 11 percent have this agency measure.[78] 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, 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.[79]

In addition, it seems that the Genoese utilized their legal system to restrict agents' ability to cheat. The legal system was complementary to the institution based on ICB. After all, an agent who embezzled goods would not be recruited by the cheated merchant again, but can become a merchant by himself, able to utilize agents under the same conditions as the merchant he had cheated. Hence, only if agents' wages are so high that anyone prefers being an agent rather than a merchant, can agency relations be established. In other words, for agents to be

[77] Goitein 1967: 214 ff.; Stillman 1970; Gil 1983, vol. 1, pp. 200 ff. For business associations, see Goitein 1973: 11 ff.; Gil 1983, vol. 1, pp. 216 ff. Goitein 1964: 316, concluded that about half of the business dealings reflected in the Geniza are formal friendships.

[78] Krueger 1957 concluded that only 6 percent (36 traders) in Giovanni Scriba functioned as both agents and merchants.

[79] Krueger 1962. For general discussion, see, for example, de Roover 1965. Knowledge: Lieber 1968.

employed the merchants have to pay them all the profit and a part of the capital. Clearly, there can not be an equilibrium with such a wage. Hence, for agency relations to be established in a individualist society there is a need for an external mechanism – such as a legal system backed by the state – that restricts agents' ability to embezzle merchants' capital.[80] This indeed seems to had been the case among the Genoese as reflected in the extensive writing of agency contracts.

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 ICB 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 CCB one's commitment ability is positively related to his 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 (that is, non-noble). In the cartulary of Giovanni Scriba (1155-1164) 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 versus 279), and the share of the latter amounted to only 64 percent of the total.[81] 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

[80] Note, however, that whenever this system has a limited ability to restrict cheating from mis-reporting profit expenses, and so forth, a reputation mechanism still has to be used.

[81] Kedar 1976: 51-2. De Roover 1965 argued that agency relations in Italy facilitated wealth transfer.

1158 Ansaldo sailed abroad as Ingo's agent, and by investing only his retained earnings he accumulated the sum of 142 lire. (A house in Genoa cost about 40 lire.)[82]

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 sub-group within a society is likely to lead them to demand a greater say in political matters. Hence as wealth distribution changes, one is likely to observe an attempt to change the political organization of the society. Indeed, the *popoli* of Genoa revolted during the 13th century against the nobility and changed the political organization of Genoa to reflect and protect their growing wealth (e.g., Vitale 1955).

17.4 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.[83] Commercially, both groups responded similarly and expanded their trade from Spain to Constantinople. From the perspective of institutional analysis, 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.[84] For example, in the letters of Naharay ben Nissim, the most important Maghribi trader in Fustat around the mid-century, 97 different traders are mentioned but only 2 were Muslims.[85] This segregated response was not a result of the Maghribis being a religious minority, as they did not establish agency relations with other Jewish traders even when these relations were (ignoring agency cost)

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[82] On Ansaldo, see de Roover 1965: 51-2. House: Giovanni di Guiberto (1200-1211), No. 260, 261.

[83] E.g., A. R. Lewis 1951. Among these changes, as also discussed in chapter 15, 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.

[84] Goitein 1967: 156-59, 186-92; Gil 1983, vol. 1, pp. 200 ff.

[85] Al Qasim and Muhammad. Based on the 37 documents published by Michael 1965.

perceived by the Maghribis as very profitable. This was true, in particular, with respect to Italian Jewish merchants. (Greif 1989, 1993; Goitein 1973: 44, 211.) That this segregation is endogenous is reflected in the Maghribis' later history when, toward the end of the 12th 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 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 (1155-1164), at least 17.3 percent of the total sent abroad through agents was sent or carried by a non-Genoese.[86]

The rationale behind the Maghribis' and the Genoese's different responses 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 move abroad, or hire an agent native to the other trade center. Such inter-economy agency relations are likely to be more efficient than intra-economy agency relations, since they enhance commercial flexibility and a native agent doesn't need to immigrate and is likely to possess a better knowledge of local conditions.

In deciding whether to establish inter-economy agency relations, however, a merchant's concern is profitability and not efficiency. The relations between efficiency and profitability are influenced by cultural beliefs that had crystallized before inter-economy agency relations became possible. ICB lead to an "integrated" society in which inter-economy agency relations are established if they are efficient. CCB create a wedge between efficient and profitable agency relations, leading to a "segregated" society in which efficient inter-economy agency relations are not established. Whenever there is uncertainty whether CCB or ICB will be practiced in inter-

[86] For non-Genoese in other cartularies see, for example, Oberto Scriba de Mercato 1186, No. 9, 38. Oberto Scriba de Mercato 1190, No. 138, 139. Guglielmo Cassinese 1190-1192: No. 418, 1325. Lanfranco 1202-1226: No. 524. The ease of hiring non-Genoese is reflected in their use to circumvent a politically unfavorable situation in Sicily. See Abulafia 1977: 201 ff.

economy agency relations, these more efficient agency relations are less profitable to collectivist merchants since it increases the agents' wages.

To see why this is the case, suppose that two ***identical*** economies, within which either ICB or CCB prevail, become a ***joint economy*** in which players can identify members of their previous economy but inter-economy 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.)

Intuitively, when players project their cultural beliefs on the new game–that is, when their expectations concerning others' actions in the post-change game are the pre-change expectations–these pre-change cultural beliefs constitute the initial conditions for a dynamic adjustment process.[87] For example, if the pre-change 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 pre-change cultural beliefs are insufficient to calculate best responses in the post-change game. They do not stipulate a complete strategy for a player, since the same pre-change behavior implies off-the-path-of-play situations in the post-change game that didn't exist before. For example, the pre-change cultural beliefs do not specify how merchants from one economy would react to actions taken by an agent from their economy in inter-economy 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 inter-economy 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 inter-economy 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 may consider an agent who cheated in inter-economy agency relations as a cheater subject to collective

[87] 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 culture patterns of behavior *ought* to be followed and the tension between this feeling and the actual behavior, see Davis 1949: 52-3. For a recent economic analysis, see Geanakoplos, et al. 1989.

retaliation, or they may ignore his cheating. There is nothing in the pre-change 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 inter-economy agency relations any probability distribution over these two responses is possible.[88] Considering the pre-change cultural beliefs and any such probability distributions as initial conditions enables examination of the merchants' best response (while not imposing any differences between the pre-change 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 initially that there is no efficiency gain from inter-economy agency relations. Intuitively, when inter-economy agency relations become possible between two collectivist economies, the initial cultural beliefs specify collective punishment in intra-economy agency relations. But if there is some doubt whether collective punishment also governs inter-economy agency relations, the optimal wage in inter-economy agency relations is higher than in intra-economy relations. It is higher because the uncertainty about collective punishment in inter-economy 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 inter-economy agency relations is higher than the cost of establishing intra-economy agency relations, only the latter will be initiated, and segregation is the end result. If inter-economy 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 inter-economy agency relations become possible between two individualistic economies. Although similar uncertainty is likely to exist, the inter-economy and intra-economy optimal wages are the same. ICB make this uncertainty irrelevant for the determination of the optimal wage. Hence any efficiency gains from inter-economy agency relations will motivate merchants to establish them. Proposition 4 makes the above intuitive discussion 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***

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[88] 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.

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 by A^t an agent from economy 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 played cheat 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 played honest when employed by M^t.

Proposition 4. (Proof in the appendix.)

Suppose that inter-economy agency relations do not entail efficiency gain and that the two economies are identical in their parameters. If the pre-change 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 pre-change economies are individualist, the joint economy is integrated for $\mu \in [0,1]$ and $\eta \in [0,1]$.

When inter-economy agency relations become possible between a collectivist and an individualist economy, a collectivist merchant would not initiate inter-economy agency relations regardless of the uncertainty regarding the individualist merchants' responses.[89] 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 CCB create a wedge between efficient and profitable agency relations and will be initiated by collectivist merchants only if efficiency gains from inter-agency relations are high enough.

In contrast, because the collectivist economy's wage is lower, individualist merchants <u>may</u> find it optimal to establish inter-economy relations even if such relations <u>don't</u> imply efficiency gains, thereby inducing (asymmetric) integration. To see why, consider the uncertainty regarding the collectivist merchants' responses that decreases the profitability of inter-economy 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 inter-economy relations ($\eta = 1$). The expectations that collectivist merchants wouldn't collectively punish a cheater in inter-economy relations can't by itself (that is when $\eta = \mu = 0$) decrease the profitability of inter-economy relations enough to prevent integration. It

[89] 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.

implies 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 inter-economy 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 inter-economy 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 is high enough would these expected responses by the collectivist merchants would forestall inter-economy agency relations.

Individualist (but not collectivist) merchants are likely to induce integration and, they may find it profitable to initiate inter-economy agency relations even if they don't 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.[90] Furthermore, since integration increases the wage in the collectivist economy, collectivist merchants may strive to prevent inter-economy agency relations through social or political actions. Proposition 5 establishes the necessary and sufficient conditions for integration and segregation.

Proposition 5. (Proof, under the same assumptions as in proposition 4, is in the appendix.)

(a) For any $\mu \in [0,1]$ and $\eta \in [0,1]$ a collectivist merchant will not initiate inter-economy agency relations. (b) A sufficient condition for integration is $\mu \geq \eta$. A necessary condition is $\mu + (1 - \beta)(V_h^{u,I} - \mu V_c^{u,c} - (1 - \mu)V_h^{u,c})/\beta\sigma(V_h^{u,c} - V_c^{u,c}) \geq \eta$. (Superscript c (or I) means collectivist

[90] 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.

(individualist) economy.) (c) A necessary condition for segregation is $\mu < \eta$. If μ is close enough to 0 and η close enough to 1, then $\exists\, \beta \in (0, 1)$, s.t. $\forall\, \beta \geq \beta$ the economy is segregated.

This sub-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 regrading the boundaries of the society. Difference cultural beliefs determine directions of trade expansion as 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 the next sub-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.

17.5 Transcending the Boundaries of the Game: Organizational Evolution

Among the Maghribis, CCB led to a collectivist society an economic self-enforcing collective punishment, horizontal agency relations, segregation, and an ingroup 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 8.2.1, 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, ICB led to an individualist society with a vertical and integrated social structure, 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.[91] The Maghribis immigrated to and operated within the Fatimid Caliphate, in which "the administration of their own affairs was left to themselves" (Goitein 1971: 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.

Indeed, during the 12th 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 (e.g., Vitale 1955). After the establishment of the *podesteria*, the law was, to a large extent, at the hands of him and his judges. In contrast, despite the existence of a well-developed Jewish communal court system, the Maghribis entered contracts informally, used or adopted an informal code of conduct, and attempted to resolve disputes informally. (E.g., Goitein 1967; Greif 1989, 1993.)

This, however, is not the case in an individualist society in which agents are not expected to be subject to collective punishment. An agent who embezzled goods would not be recruited

[91] E.g., Annali Genovesi, vol. I, 1162. See discussion in Airaldi 1986 and Vitale 1955.

by the cheated merchant again, but could become a merchant by himself, able to utilize agents under the same conditions as the merchant he had cheated. Hence, only if agents' wages are so high that anyone prefers being an agent rather than a merchant, can agency relations be established. In other words, for agents to be employed the merchants have to pay them all the profit and a part of the capital. Clearly, there can not be an equilibrium with such a wage. Hence, for agency relations to be established in a individualist society there is a need for an external mechanism – such as a legal system backed by the state – that restricts agents' ability to embezzle merchants' capital. (Note, however, that whenever this system has a limited ability to restrict cheating from mis-reporting profit expenses, and so forth, a reputation mechanism still has to be used.)

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 relative 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. Some enforcement mechanism is required to assure that each trader will indeed respect a collective decision to impose an embargo. (Chapter 6.) In collectivist societies one would expect that informal enforcement mechanisms would be sufficient to insure 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 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 tax increase 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 tax was abolished.[92] 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: 181-3.)

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 bills of lading even

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92 DK # 22, a, ll. 29 - 31, b, ll. 3 - 5, Gil 1983a: 97-106; TS 10 J 12, f. 26, a,ll. 18-20, Michael 1965, Vol. II, p. 85.

though the device was known to them.[93] 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 11th century by Ephraim, son of Isma'il from Alexandria, to Ibn 'Awkal, a prominent merchant who lived in Fustat (old Cairo), 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."[94]

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."[95] 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.[96] 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 related to agency relations. For example, recall

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[93] 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: 305 ff..

[94] TS 13 J 17, f. 3. Goitein 1973: 313. For the generality of this practice, see Goitein 1967.

[95] Bodl. MS Heb. c28, f. 61, a, ll. 12 - 14, Gil 1983a: 126-33.

[96] E.g., Bodl. MS Heb., c28, f. 61, a, ll. 9-17, Gil 1983a: 126-33.

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 is 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, $\partial^2 W(.)/\partial h_c d\sigma > 0$ (for $\beta > h_c$), $\partial^2 W(.)/\partial h_h \partial\sigma < 0$, and finally, $\partial W/\partial\sigma = 0$ when $h_h = 1$.

CCB and the resulting segregation and collective punishment increase, and may bring to one, the probability that a honest agent will be rehired. Furthermore, these factors are likely to bring the probability that a cheater would be rehired to zero. 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 ICB 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.[97] Later development of family relations and business organization, however, differ substantially. During the 13th 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,

[97] Regarding the Maghribis, see Goitein 1967: 180 ff.; Gil 1983, vol. 1, pp. 215 ff.. Regarding the Genoese, see, for example, Giovanni Scriba 236, 575, 1047 for father's help and 946 for a will.

reaching the appropriate age, joined his family's firm.[98] 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, ICB 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.[99]

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 a specific reasons, it is likely, as discussed in below, 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 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.[100] 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

[98] See discussion in de Roover 1965: 70, ff.; Rosenberg and Birdzell 1986: 123-4.

[99] 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. E.g., de Roover 1963, 1965.

[100] de Roover 1963: 77-8. See additional examples in de Roover 1965.

information-transmission techniques, accounting procedures, and the incentive scheme provided to agents.

17.6 Conclusions

Constrained by the same technology and environment and facing the same organizational problem, the Maghribis' and the Genoese's divergent cultural heritage and political and social history gave rise to different cultural beliefs. Theoretically, their cultural beliefs are sufficient to account for their diverse institutional trajectories 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 ingroup communication and economic and social collective punishments. Collectivist cultural beliefs led to a institutions 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 Genoese's second-party enforcement mechanism 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 institutions 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 institutions and the related economic, political, legal, and organizations. Each of these elements complements the others to generate a self-sustained system, and each of the two systems analyzed here has different efficiency implications. The collectivist system is more efficient in supporting intra-economy agency relations and requires less costly formal organizations (such as law courts) but it restricts efficient inter-economy agency relations. The individualist system does not restrict inter-economy agency relations but is less efficient in supporting intra-economy 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' institutions resembles that of contemporary developing countries whereas the Genoese institutions resembles the developed West, suggesting that the individualistic system may have been more efficient in the long run. The analysis presented here 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. Historically, then, the medieval Latin individualist society may have cultivated the seeds of the "Rise of the West."[101]

Although the conjectures above await further research, the analysis here points to factors that make institutional trajectories – and hence economic growth – path dependent. Given the technologically determined rules of the game, cultural beliefs and organizations are two interrelated elements central to institutions. Thus, as discussed in the previous chapter, the capacity of an institution to change is a function of its history, since institutions are combined of organizations and cultural beliefs, cultural beliefs are uncoordinated expectations, organizations enables the cultural beliefs that led to their adoption, and past organizations and cultural beliefs influence the historical evolution of strategic situations and institutions.

The comparative and historical analysis of the Maghribis and the Genoese supports the assertion regarding the importance of the environmental, coordination, and inclusion effects and

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[101] See Greif 1997g regarding generality of the findings regarding the Maghribis.

demonstrates the merit of context-specific, interactive analysis of institutional dynamics. History has been used above to identify past institutions and cultural and social aspects that exerted the environmental, coordination, and inclusion effects. At the same time, game theory has been used to examine the inter-temporal links among institutions and the restrict arguments feasible institutions to those that are self-enforcing. Furthermore, the analysis highlighted the complementary relationships among institutions governing various transactions. In particular, the legal system among the Genoese complements institutions based on ICB.

Accordingly, the next chapter further expands on these two issues. It elaborates on the inter-relationships among institutions that the environmental, coordination, and inclusion effects imply and their implications for institutional dynamics. It then discusses the essence of the context-specific, interactive analysis of institutional dynamics and how it relates to the empirical methodology discussed in part IV with respect to identifying institutions.

Appendix:

Proposition 1. Proof: 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 playing cheat one period if offered W^*. Accordingly, denote by V_h the present value of lifetime expected utility of an employed agent who, whenever hired, plays honest. Denote by V_h^u the present value of the lifetime expected utility of such unemployed honest agent Denote by V_c^u the lifetime expected utility of an unemployed cheater (who will be playing honest in the future if hired). (The last two expressions takes into account only income from the next period and on which is the first period of unemployment.) These lifetime expected utilities are:

$$V_h = W^* + \beta(1 - \sigma)V_h + \sigma V_h^u,\ V_i^u = \beta h_i V_h + \beta(1 - h_i)(\phi_u + V_i^u) \quad I = h, c.$$

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 yields the result that an agent's best response is playing honest iff $W \geq (\Sigma - \beta\sigma H_h)[\alpha/(1 - \beta H_c) + \beta\phi_u(P_c/(1 - \beta H_c) - \sigma P_h)] = W^*$, where $\Sigma = 1 - \beta(1 - \sigma)$; $H_i = h_i/(1 - \beta(1 - h_i))$, $I = h, c$; $P_i = (1 - h_i)/(1 - \beta(1 - h_i))$, $I = h, c$. The properties of W can be derived from this expression using the fact that $h_c \leq h_h$. ■

Proposition 2. Proof:[102] Under both strategies the merchants act in accordance with the strategy assumed in proposition 1. Under the individualist strategy, $h_c = h_h > 0$ while 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 best response. The only non-trivial 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 equals zero (since a cheater is not expected to rehired), but h_h^c equals, along the equilibrium path, $\sigma M/(A - (1 - \sigma)M) > 0$ (since an honest agent will be hired in the future). According to proposition 1, the optimal wage for a cheater is $W^*_c = w(., h_h^c = 0, h_c^c = 0)$ and the optimal wage for an honest agent is $W^*_h = w(., h_h^c > 0, h_c^c = 0)$. Since the function w decreases in h_h, $W^*_c > W^*_h$, and a merchant <u>strictly</u> 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 is 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. ■

Proposition 4. Proof: 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 (in what follows, 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

[102] 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 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 $h_i^{t,s}$ the probability 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. (The first subscript (superscript) denotes the merchant and the second the agent.) Assume that the two economies are collectivist. Taking the pre-change paths of play and Cultural beliefs 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

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

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

Inequality (**) states that if A_t may not be punished by the merchants from economy t for cheated 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: $W^*_{s,t} = w(h_h^{s,t}, h_c^{s,t}) > w(h_h^{s,s}, h_c^{s,s}) = W^*_{s,s}\ \forall\, \mu \in [0,1),\ \eta \in (0,1]$.
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. Following the line of argument above and using 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. ■

Proposition 5. Proof: Suppose that economy s is collectivist and t is individualist. **(a)** A^t who cheated M^s will be rehired with probability $h_c^{s,t} = \mu h_c^{t,t} + (1 - \mu)h_h^{t,t} > h_c^{s,s}\ \forall\, \mu \in [0,1]$. 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 $h_h^{s,s}\ \forall\, \eta \in [0,1]$. Since W^{*c} (the collectivist society wage) is lower than that of the individualist and, $\forall\, \mu \in [0,1]$ 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^* s.t. $(W^* + \beta\sigma V_h^u)/(1 - \beta + \beta\sigma) = \alpha + V_c^u$, where the superscript u means unemployed, $V_h^u = \eta V_c^{u,c} + (1 - \eta)V_h^{u,c}$, $V_c^u = \mu V_c^{u,c} + (1 - \mu)V_h^{u,c}$. The minimum wage for which $A^{t,t}$ is honest is $W^{*,I}$ s.t. $(W^{*,I} + \beta\sigma V_h^{u,I})/(1 - \beta(1 - \sigma)) = \alpha + V_c^{u,I}$. $W^{*,I} - W^* = (1 - \beta)[V_h^{u,I} - V_c^u] + \beta\sigma(\mu - \eta)[V_h^{u,c} - V_c^{u,c}]$. All the terms in $W^{*,I} - W^*$ are positive apart from $(\mu - \eta)$. Integration occurs iff $W^{*,I} - W^* \geq 0$ implying the sufficient and necessary conditions. **c)** The necessary condition follows directly from the analysis in (b). Continuity implies that to prove the sufficient condition it is enough to consider $\mu = 0$ and $\eta = 1$. From (b), $W^{*,I} - W^* \geq 0$ iff $[1 - \beta(1 - \sigma)][V_c^{u,I} - V_h^{u,c}] \geq \beta\sigma[V_h^{u,I} - V_h^u]$. Since $V_c^{u,I} - V_h^{u,c} < V_h^{u,I} - V_h^u\ \forall\, \beta$ and the limit of $(1 - \beta + \sigma\beta)/\beta\sigma$ equals 1 as β goes to 1, $\exists\, \beta \in (0, 1)$, s.t. $\forall\, \beta \geq \beta$, the inequality above fails to hold. ■

&Chapter 18 Institutional Complexes and Context-Specific Analysis of Institutional Dynamics

Institutional elements inherited from the past are part of the initial conditions influencing the trajectory of institutional dynamics while processes leading to new institutions transpire within the contours defined by them. Past institutions constitute the rules of the game taken as exogenous by each of the interacting individuals while norms and cultural beliefs within these rules constrain and provide opportunities for these individuals. Furthermore, past institutional elements and their cultural manifestations provide the raw material for new institutions to which new elements are added to create new institutions.

This historical process has particular implications on the synchronic nature of a society's institutions. Institutions are likely to be grouped in what can be referred to as institutional complexes: a set of inter-related institutions governing various transactions. Indeed, such inter-relatedness is well reflected in the history of the Maghribis and the Genoese. Within each group, distinct cultural beliefs and organizations were central to the institutions that governed agency relationships as well as the institutions that governed relationships among the traders and foreign rulers in each group. The first section in this chapter elaborates on how the historical process through which institution emerge is reflected in the nature of institutional complexes and how this nature, in turn, influence the process of institutional change.

Recognizing that institutional dynamics is a historical process has important implications regarding how to conduct a positive, empirically oriented analysis of institution. As we have seen, game theory alone is insufficient to restrict the set of admissible institutions. More generally, we have no theory of institutions enabling us to predict a unique institution in a given environment. But arguing that institutions reflect historical heritage does not sufficiently constrain the set of admissible arguments either. Combining constraints on admissible argument from both theory and history, however, fosters our ability to empirically study institutions and their dynamics. This requires context-specific, interactive analysis in which theory and history complements each other in exploring the nature of, and inter-temporal links among institutions.

History and theory are complement rather than substitute in institutional analysis. This issue is discussed in section 18.2.

18.1 Institutional Complexes: Synchronic Characteristics, Diachronic Implications, and Institutional Transitions

New institutions do not reflect only the underlying technology or attributes of the transaction. New institutions emerge and established within the context of existing institutions which exert influence on them through the environmental, inclusion, and coordination effects.[103] In particular, the inclusion effect implies that new institutions are likely to include some institutional elements inherited from the past. The environmental effect implies that new institutions that complement existing ones are more likely to emerge. An institution complements another when it increases the set of parameters under which the other is self-enforcing making it more likely to become relevant for a given selection process.[104] Hence, within a society, at any given moment in time, institutions would tend to be clustered in **institutional complex(es)**. Within each complex institutions governing various transactions are inter-related in the sense that they share institutional elements and complement each other.

Indeed, institutional inter-relatedness due to inclusion was reflected in all the historical studies presented above and particularly in the comparative study of the Maghribis and the Genoese traders. The Maghribi traders group and collectivist cultural beliefs were central to an institutional complex which encompassed institutions related, for example, to the merchant-agent transaction, the merchant-ruler transaction, and the transaction between merchants and the captains of the ships that carried their goods. Among the Genoese, individualist cultural beliefs and legal contract enforcement were elements in the institutions that influenced behavior in the same transactions.

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[103] The relationships among institutions implied by the coordination effect would mainly occur through organizations for collective decision making. Hence, it is likely to manifest itself in institutions that reflect the interest of those who control these organizations. This influence is not examined here.

[104] For previous discussions of institutional complementarities from a game theoretic perspective, see Aoki 1994, 2001; Okazaki and Okuno-Fujiwara 1997; Greif 1998a. For studies of such complementarities see also Baliga and Polak 1999; Chiaki 1998; Yang 2000. For an analytical framework fostering studying such complementarities see Milgrom and Roberts (1990) and Topiks (1998).

Similarly, institutional complementarities were reflected, for example, in the discussion of the Community Responsibility System. States without the capacity to enforce contracts in transactions characterized by separation between the *quid* and the *quo* over time and space and the community responsibility system were complementary institutions. The CRS system was an equilibrium in the game relevant to such transactions in the absence of the state while a state without such capacity was an equilibrium given the existence of the CRS.

Much more complicated institutional complementarity is reflected in the history of the Genoese and the Maghribis. The discussion in the previous chapter concentrated mainly on the relationships among traders - merchants and agents - taking the nature of the state - the institutions related to the relationships between the traders and the political elite - as given. For trade to expand, however, the state has to be able to commit to respect traders' property rights. In the absence of such commitment - in case where the political elite can not commit not to use its coercive power to expropriate traders' wealth - the latter would be less motivated to invest their time, effort, and capital in otherwise profitable long-distance trade.

Two ways to mitigate this commitment problem are the following.[105] (For simplicity of presentation, I suppose that the society is composed only of a political elite and traders.) The commitment problem is mitigated when the merchants and the political elite are the same group. In this case, however, to secure property rights, the institutional foundations of the state should also limit the ability of various members of the merchants-elite itself to abuse the property rights of others. In the particular case of Genoa, as we have seen in chapters 15 and 16, this has been achieved by creating a balance of power among various groups. When such this is the case, using the legal system does not place a trader at the risk of exposing his wealth to the grabbing hand of the state. Hence, a state whose underpinning institutions protect traders' property rights is complementary to an individualistic organization of society in which bilateral reputation mechanism fostered by a legal system governs agency relationships.

When the political elite and the traders are not the same group, another way to mitigate the political elite's commitment problem is by creating an administratively weak state. An elite without an auxiliary extensive administrative organization with the information and capacity

[105] See also the analysis in North and Weingast (1989) regarding pre-modern England and Haber et. al. 2000 regarding Mexico.

required to abuse property right has a limited ability to do so.[106] This implies, however, that the elite needs ways to gain from its control despite its weak administrative structure and the traders can not use the legal system to mitigate the merchant-agent commitment problem. Hence, a state whose institutional foundations are based on weak administrative structure is complementary to a collectivist organization of society in which multilateral reputation mechanism does not rely on legal enforcement and the communal organization provides a means through which the political elite can raise taxes and benefit from its control.

These two sets of complementary institutions seems to have prevailed in the Genoese and Maghribi societies. We have already seen that in Genoa the merchants constituted the political elite and although their inter-clan conflicts implied high economic costs, there is no any indication in the extensive surviving historical evidence that traders were considered their property insecure because of these conflicts. The consuls responsible to act as commercial judges were elected on a yearly basis and each served in the neighborhood in which he was elected. When the podesteria was established, it took over the responsibility of enforcing property and commercial law.[107] In contrast, the collectivist Maghribis - similar to the other members of the "middle class" in the Muslim world at the time - were governed by a military elite. As has been noted by Goitein (1973: 10), "there was very little contact between the world of the [Muslim or other] traders and that of the government." The elite did not establish any elaborate bureaucracy and the government's control over the population was extended by taking advantage of the segregated nature of the society. It ruled through existing commercial associations, such as the Maghribi traders', urban neighborhood associations, and ethnic or religious groups. The weak bureaucracy established by this elite seems to have served them well in fostering their commitment to respect the property rights of their subjects. At the same time,

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[106] That is, it does not have the ability to obtain information regarding the distribution of wealth required for a predation profitable relative to the alternative. For the strategic use of administrative structure by the absolute kings of Spain to enhance their ability to commit to property rights, see Conklin 1993.

[107] For discussion and references, see Vitale 1951, 1955, Greif 1994b. For the observation that in the Italian cities of the period, in general, the political system was controlled by the merchants who utilized it to advance their interests. See, for example, Cipolla 1963: 397.

the segregated nature of the society enabled exchange despite the absence of elaborate bureaucracy, and provided a mechanism for extending control over the population to the elite.[108]

Institutional complexes often exhibit both complementarities and inclusion. The Merchant Guild and the Community Responsibility System were complementary to each other. Secure property rights abroad was a necessary condition for the functioning of the CRS. At the center of both institutions, however, were merchants' communities that provided intra-community enforcement, information, and coordination. Similarly, the different responses to the demise of the CRS reflect the importance of institutional environment and institutional complementarities in shaping institutional trajectories. By the end of the thirteenth century, England and France had already developed relatively centralized states that were able to provide contract enforcement alternative to the CRS. In Germany, however, the Empire *de facto* disintegrated during the Investiture Controversy. The death of Frederic II in 1250 marked the end of the first German Empire and sharp decline in the power of the central authority. Without a central authority to provide a contract enforcement institution alternative to the CRS, an institution based on using mercenaries to resolve commercial disputes had emerged. The trajectory of institutional change was shaped by existing complementary institutions.

The temporal relationships between past and new institutions leads to institutional complexes composed of inter-related institutional elements at a given point in time. We are now in a position to reverse the course of the analysis and examine the complementary question: what implications does the grouping of institutions within complexes have on the dynamics of institutional change?

An institutional complex is composed of inter-related institutions. This inter-relatedness, in turn, influences the rate of endogenous institutional change: implications of and changes in one institution are likely to reinforce or undermine other institutions within the complex. Such reinforcement and undermining operate in a manner similar to that of self-reinforcement and self-undermining discussed in chapter 15: changes in and changes implied by one institution

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[108] For general discussion see, in particular, Udovitch (1988). An extensive legal system did prevail in the Muslim world at the time but with limited ability of each particular court to exert its jurisdiction outside the place where it was located.

influence the self-enforceability of another. In particular, we can say that institution A reinforces institution B if A implies changes making B self-enforcing in a larger set of parameters.

But recognizing institutional inter-relatedness extends the discussion of endogenous institutional change of chapter 15 in an important way. Institutional inter-relatedness implies that individuals may be motivated to prevent the demise of a particular institution - to establish reinforcing institutional elements - because of this demise's implications on other institutions. The Genoese wanted to retain impartial legal system enforcing commercial and property laws because it was necessary for the functioning of an institution governing agency relationships. Similarly, responding to the political instability caused by strong clans, various Italian city-states attempted to weaken the self-enforceability of such clans. To undermine the self-enforceability of clans, they abolished, for example, various legal rules that held sons and fathers legally labile for each other actions.

The discussion of institutional inter-relatedness within a complex was motivated above as reflecting the impact of past and existing institutions on the emergence of new institutions. Reinforcement and undermining constitute another source for institutional inter-relatedness. In the long-run, an institution which is being undermined by other institutions in the society will cease being self-enforcing and vanish.

Institutional complexes can differ from each other along various dimensions. Which institutions are grouped within the same complex, the degree of institutional complementarities within a complex, to extent to which a particular institutional element is shared by many institutions, whether coordination is based on explicit decision making organizations or not, what combination of reward and punishment provides motivation, and what are the objectives of those who administer them. Motivation can be provided by various combinations of fear of punishment and lure of reward. Punishments and rewards, in turn, can be provided by such factors as religious beliefs, social sanctions or reward, economic gains or losses, and the exercise of coercive power. Coordination can be obtained implicitly by building on past institutional elements such as rules and beliefs or can be provided explicitly by various organizations. Such organizations, in turn, can take various forms, from religious council, the King's advisors, the Parliament, or the village elders each of which reflect distinct interests.

The details of a society's institutional complexes have a profound effect on the rate and direction of institutional change. They determine the transaction costs of institutional transitions. (Section 16.5.) Consider, for example, one of the most profound institutional change that occurred during the late medieval period: the *de facto* elimination of slavery in Europe. It was "one of the great landmarks in labor history" (Duby 1974: 40) and arguably a major factor contributing to the changing long-run nature of European economic growth. While growth was slow during the millennium of Roman control, and negative during the 500 years that followed its collapsed, it demonstrated an upward trend during the following millennium which began with the decline of slavery. Arguably, property rights over an individual's own body and possessions provide better incentives to produce and innovate. Indeed, the origin of "labor-saving power technology which has been one of the distinctive characteristics of the Occident in modern times" began in the late medieval period (White 1962: 79 and see also Mokyr 1990).

As well known, slavery had been reintroduced by European later on in the context of slavery in the Americas only to be abolished de jura and de facto around the mid-nineteenth century. What is interesting to note, is the distinct process of the decline in slavery in the Christian and Muslim worlds. In contrast to the European experience, slavery still prevailed in many Muslim countries after World War II and, in some countries was legally abolished only as late as 1962 and still *de facto* prevail in various places (Segal 2001). The Christian world has thus constantly been ahead of the Muslim in abolishing slavery. Why was this the case?

This was so because the two civilizations developed distinct institutional complexes and slavery in each civilization was part of a different complex. The historical root of this distinction dates back to the rise of Christianity within the Roman Empire. As such, Christianity did not have to provide its adherents with a code of law governing everyday life. Its character emphasized a religion of orthodoxy and proper beliefs, and its rules let Christians follow the Roman law in earthly matters. During the late medieval period this background enabled the new European states to gradually reassert control over civil legal matters including slavery. Islam emerged through a very different process in which Muhammad established both a religion and a political unit. Islam thus emerged as an othopraxis religion, emphasizing the obligation of a believer to follow the Islamic code of law, the *Shari'a*.

The holy scriptures of Christianity and Islam discuss behavior toward slaves, thereby conferring legitimacy on it. (E.g., Leviticus 25:46, Ephesians 6; Quran 16:71, 4:36, 30:28.) But in each civilization the institutions governing slavery were part of distinct institutional complexes. In the Christian world, laws governing slavery fall within the institutional complex, at the center of which were legal and political organizations. Abolishing slavery did not have any implications regarding the organization, beliefs, or norms central to Christianity. This was not true, however, in the Islamic world where slavery was part of an institutional complex at the center of which were beliefs in the holiness of a religious law. The institutional elements relevant to slavery were central to Islamic religious beliefs. The *Shari'a* recognized slavery. Abolishing it thus implied an action that contradicted a central internalized belief of the believers - that the *Shari'a* is a scared law sanctioned by God. Abolishing slavery challenged the authority of the *Shari'a* in general and the status of those responsible for administrating it.

Because institutions interrelate with each other, it is often more challenging to change any of them than it otherwise would have been. The exact way in which a particular institution interrelates with others and the general character of the institutional complex to which it belongs, determines the difficulty or ease of its ability to change.

The details of a society's institutional elements would also influence the **nature** of institutional change. That is, the manner in which institutional change transpires. Institutional change can be, for example, gradual or sudden, local (that is, encompassing a few institutions) or comprehensive (that is, encompassing many institutions), and reflect intentional and explicit decision making or spontaneous evolution.

To exemplify the relationships between the details of an institutional complex and the nature of institutional change, consider the case in which an institutional complex is characterized by mutually reinforcement and institutional complementarities. Mutual reinforcement implies that institutional change is not likely to occur often but complementarities imply that once one institution would no longer be self-enforcing, many other complementary institutions are likely to cease being self-enforcing. Hence, institutional change is less likely to occur but when it does, it is likely to be comprehensive and include many institutions.

The same will be the case when many institutions in a society share the same institutional element. In such cases, any changes in this fundamental element implies comprehensive institutional change affecting many of a society's institutions. The rate of this change, in turn, will be influenced by its centrality. Because this institutional element is central to many institutions, maintaining or eliminating it imply distinct cost and benefit to different individuals. Hence, as long as the gains implied by changing it to a particular group are small, the objection of other groups to change are likely to forestall it. Change of this institutional element is thus likely to be "revolutionary:" it would rarely happen, comprehensive, and reflect actions by large number of people. If, on the other hand, an institutional complex is characterized by relative weak inter-relatedness among various institutions, institutional change is likely to be gradual and local.

Compare, for example, the implications of the English Civil war and the French Revolution. In the latter, fundamental institutional elements were those reflecting the King's power and these institutional elements underpin the operation of, for example, the bureaucracy, the legal system and, the property right regime. The French Revolution thus brought radical changes in them. In contrast, the reach of the English monarchy did not penetrated that deep. The English civil wars of the 17th century left a marginal impact on England's bureaucracy, legal system, and property right regime.

18.2 Wandering in the Woods: Context-Specific Analysis of Institutional Dynamics

The transcendency of past institutional elements and their cultural manifestations implies that the past influences the future in a very particular way. Intentional and unintentional processes leading to new institutions reflect the environmental, coordination, and inclusion effects of past institutions. Hence, understanding the direction of institutional change requires knowledge of past institutional elements and their cultural manifestations. An empirical study of institutional dynamics requires context-specific analysis in which theory and history complement each other in exploring the nature of, and the link between institutions.

Recall, for example, the political institutions that prevailed in Genoa prior and after the civil wars of the 12th century. Theory alone could not inform us some alternatives - such as a democratic system - were not put in place. Knowledge of Genoa's political institutions prior to the war of 1164, however, indicates why this solution was not attempted. It contrasted with the historical heritage that had been already incorporated in clans structure and beliefs regarding each others' intentions. The Genoese established a new institution, the *podesteria*, which incorporated their heritage. In studying institutional dynamics, knowledge of past institutional elements and their cultural manifestation is crucial in understanding institutional selection. Combining historical with theoretical analyses enables investigating inter-temporal linkages among institutions by imposing on the analysis restrictions derived from both history and theory.

In such context-specific analysis of institutional dynamics, history complements theory. In strategic situations, theory alone insufficiently restricts the set of institutions that can be self-enforcing in a given environment. Using theory alone to consider institutional selection can thus divert attention to irrelevant alternatives because multiple institutions can usually prevail in a given situation. But if new institutions reflect institutional and cultural elements inherited from the past, history provides us with an additional information to sort out among various alternatives. We can rule out particular inter-temporal relationships among institutions by recognizing that institutional and cultural heritage influence institutional dynamics through the environmental, coordination, and inclusion effects.

At the same time, in context-specific analysis of institutional dynamics theory complements history. Without the discipline imposed by an analytical framework, purely historical analyses of institutional dynamics are at the risk of being ad-hoc. Theory is required to complement history in examining how past institutions influence the direction of institutional change by exposing the causal relationships between the historical heritage and new institutions and by deductively restricting arguments regarding admissible institutions. When using game theory, for example, only past institutional elements that are ex-post self-enforcing would have a lasting impact on behavior. Theory thus complements history.

Hence, the approach advocated here to study how past institutions influence the direction of institutional change uses history to discipline theory and theory to discipline history. When game theory is used for such context-specific analysis, it is far less permissive (in allowable inter-temporal links among institutions) than is the standard historical analysis and it is far less permissive (in allowable institutions at each point in time) than is the standard game theoretic equilibrium analysis.

Because institutions reflect a historical process, identifying institutions and studying their dynamics inter-relate. Identifying relevant institutions and institutional complexes at a particular time facilitates studying institutional dynamics while identifying the origin and dynamic of an institution further advances and substantiates a hypothesis regarding the relevance of a particular institution. Studying institutions at a point in time and institutional change over time is mutually constitutive. Identifying the origin of an institution, a plausible process through which it could have emerged given the historical context, as well as its dynamic implications lends further support to the hypothesis that this institution was relevant. Similarly, identifying the relevant institution is a required first step in studying institutional dynamics because past institutions influence the rate and direction of institutional change.

In particular, a conjecture regarding the relevance of a particular institution can gain support by addressing a set of inter-related questions regarding the associated dynamic processes.

- The first group of questions is regarding the process through which knowledge required for the operation of the institution has emerge. Given the historical context, can we identify, for example, a reasonable learning process by individuals or groups could have acquired knowledge or the cognitive understanding required for the institution? That is, a distribution of knowledge that is required to make the institution effective. (Note that such distribution does not imply that everyone has a full knowledge or awareness of all the details of the institution.)

- The second group of questions is regarding the timing of the institutional change. Can we identify, for example, changes in quasi-parameters or parameters that may have led to the emergence of that institution in this particular time and place?

- The third group of questions is regarding the process through which this institution actually emerged or was established. Here a distinction can be made between three issues. The first issue is the motivation to establish the institution if it was intentionally established. Why were individuals motivated, given existing institutions and cultural heritage to implement this institution? Second, if the postulated institution emerged unintentionally, can we identify a plausible evolutionary process through which this institutions could have emerged given the existing institutions and the cultural manifestations of past institutions? The third set of question is regarding the inter-relationships between the institution and the influence of past institutions on the direction of institutional change. Was the postulated institution feasible given the relevant institutional complexes? What were the transaction costs implications of the existing institutional complexes on the ability to reach or establish the postulated institution? Can we reconcile that institution with the environmental, coordination, and inclusion effects of previous ones?

- The fourth group of questions is regarding the dynamic implications of the institution. Do we observe long term changes predicted under the assumption that the postulated institution prevail?

Some of the analysis required to address such questions is historical. Consider, for example, the evolution of Genoa's political institutions. The discussion of this transition presented in chapters 15 and 16 addressed some, but not all, of the above group of questions. It mainly address questions related to existing institutions' dynamic implications and the implications of past institutions on the direction of institutional change. It argued that changes in quasi-parameters undermined the consulate and the later on the podesteria itself and how the inclusion effects - particularly that of cultural beliefs and clans - influence the direction of institutional change. The analysis did not examine, for example, how the knowledge required to establish the *podestà* was acquired or why were individuals motivated to implement it when they did.

Historical analysis, however, can, in principal, and does, in the case of Genoa, provides answers to these questions. For example, the transition to the podesteria system occurred when Genoa's commune faced a serious external threat. In 1194 the Emperor Henry VI was planning to attack Sicily, and he demanded that Genoa offer naval assistance. Genoa's bitter enemy in the Western basin of the Mediterranean, the Pisans, had already agreed to support the Emperor, who, in 1190, promised them numerous possessions in Sicily and Tuscany in return (Heywood 1921: 220-7). Refusing to help the Emperor would have been very costly for the Genoese. It would have meant alienating the Emperor, losing any claim over the possessions he promised them in Sicily, and allowing Pisa to grow stronger. In 1155 a similar threat by the Emperor Barbarossa under the consulate induced the two main Genoese factions, headed by the Carmadinos and Manecianos viscountal clans, to jointly mobilize their resources to acquire overseas possessions and expand Genoa's economy. When in 1164 the threat posed by the Emperor subsided, however, the consulate was not longer self-enforcing and a civil war between the factions broke out. (Section 15.1.)

The Carmadinos, who de-facto lost the civil war, learned their lesson. In 1194, despite the external threat, they refused to mobilize their resources, withdrew from the commune, and established a rival one. They seem to have learned from experience about the fragility of relying on external threats to weaken the link between resource mobilization and political order. Despite the high cost of refusing to mobilize their resources, the Carmadino's seem to have recognized the failure of the existing institutions.

But the Norman navy that protected Sicily posed a serous challenge to Henry VI's plans and hence he was determined to have a Genoese fleet supporting his Sicilian campaign. Indeed, a previous campaign he headed in 1190 failed largely because of insufficient naval support. At that time he relied only on a Pisan fleet, which was unable to defeat the Sicilian navy. Hence in 1194 the Emperor sent his seneschal, Markward of Anweiler, to Genoa. The seneschal advised the consuls - members Maneciano factions - to alter Genoa's political game by accepting a *podestà* nominated by the Emperor to rule the city.[109] The consuls agreed to accept a podestà for one year, and the Carmadinos followed suit.[110] Oberto de Olivano from Pavia, the Italian capital of Henry VI (as the King of Italy), was nominated, and under his direction the Genoese,

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[109] For this and subsequent events, see *Annali* 1194, vol. II: 231-2. For a discussion, see Vitale 1955, vol. I: 51-5; Abulafia 1977: 204-12; Day 1988: 149.

[110] This agreement was reflected by their participation in the 1194 expedition. The motivation of the Carmadinos is not clear. If they did not want the Emperor to consider them as the clan that curtailed naval support, they would have agreed to mobilize their resources under the consulate in the first place. It may be that they foresaw the coming of the new system.

including members of the Maneciano and the Carmadino clans, supported the Emperor, who conquered Sicily in 1194.[111]

The Emperor's use of *podestàs* to control Italian cities dates back to the rule of Henry VI's father, Frederick Barbarossa, and reflects a process of organizational experimentation. Several Italian communes conducted such experiments during the first half of the twelfth century, exploring the possibility of having a single administrator to manage their affairs. In 1155 such an administrator, Guido de Sasso, the rector or podestà of Bologna, met with the Emperor Frederick Barbarossa. Then, in 1162 Barbarossa destroyed Milan, subdued the rebellious Lombard communes, and, in the cities under his control, nominated outsiders to serve as imperial vicars or podestàs. Unlike the previous podestàs who were nominated by the communes in which they operated, Barbarossa used outsiders to administer the cities on his behalf and to ensure obedience within each city by manipulating and balancing opposing factions. Imperial vicars, counts, and podestàs are mentioned in cities not far from Genoa, such as Sienna, Miniato, Volterra, and Florence.

After 1168 the Emperor lost control of the Italian cities. Yet the historical records show that many cities continued to nominate civil officials called *rectores*, dom*i*natores, and *podestàs*, to act as administrators who were bound by the law and did not assume dictatorial power.[112] These administrators, who had judicial and police functions, and served for a limited time, after which their actions were assessed according to the law, resembled the dictatorships of ancient Rome (Spruyt, 1994: 143). I do not know whether the Italians in the late medieval period were inspired by this example. In the 1190s Henry VI once again attempted to use podestàs to secure his control over Italian cities.[113] His actions explained the simultaneous appearance of *podestàs* in many cities around this time.

Although Genoa did not submit to the Emperor, he nevertheless seems to have inspired them to use a podestà, whom he nominated, to provide a balance between the Genoese factions and thereby influence the commune's affairs. His aspirations are reflected in the events of 1194,

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[111] Giovanni Avvocato (a member of the Carmadino clan) participated in the campaign and was captured by the Pisans in Messina while fighting for Genoa. See *Annali* 1194, vol. II: 234-5.

[112] See Hyde 1973: 100-1; Heywood 1921: 262; Waley 1988: 42.

[113] See, for example, Day 1988: 147; Heywood 1921: 214 (Florence), 220 (Pisa).

when during the successful Sicilian campaign the Genoese podestà died. The Genoese decided to continue the podesteria and nominated Ottone di Carreto, a Ligurian.[114] When the Genoese, headed by their podestà, approached Henry VI demanding the possessions he promised in return for their assistance, he refused to recognize the legitimacy of their podestà and threatened to destroy Genoa if the Genoese dared to sail the seas.[115]

The Genoese were not intimidated, but were probably aware at this point that their political institution had failed. Motivated by the Emperor's threat, they transformed and reorganized the podesteria so that they could better mobilize their resources and make Genoa more powerful economically and politically. The podestà of Genoa combined the features of the above two uses of a *podestà*: on the one hand, an administrator nominated by the commune and bound by the law, and, on the other, an outsider with military power that ensured political order.

Hence recognition of institutional failure, historical circumstances that motivated the viscountal clans to relinquish power, and learning through organizational experimentation all increased awareness of the feasibility and provided the motivation for a particular organizational change that influenced Genoa's transition to the podesteria. The study of this historical process and details thus lend further support to our understanding of the origin and the nature of the podesteria.

Theory, however, also has a role in conducting context-specific analysis of institutional dynamics. Game theory, as we have seen above, provides a powerful tool to address various aspects of the above questions. Its strength are many. It explicitly captures, using extensive form games, the details of a historical process. Who are the decision makers at each point in time, what did they know, and what where the options available to them. More importantly, it provides unified analytical framework to analytically examine the issues central to the above four groups of questions. Game theory enables to study an institution a steady-state, equilibrium situation. At the same time, it exposes the motivation the related cultural beliefs provide for taking various actions and gaining particular knowledge that may alter the institution in the long run. Finally, game theory enables to capture the influence of past institutions on the structure -

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[114] *Annali* 1194 vol. II: 239. Explicitly written: "whom the Genoese made *podestà*."

[115] *Annali* 1194 vol. II: 240-1.

the relevant rules of the game - from within which new institutions emerge or are being establish as well as the impact of past cultural beliefs in influencing equilibrium selection within this structure.

Institutional dynamics inherently reflects the impact of cultural beliefs, particularly, peoples' beliefs regarding the relationships between actions and outcomes in new situations. Classical and evolutionary game theory provides a powerful tool to examine the development, regeneration, and implications of cultural beliefs inherited from the past. The merit of this contribution was well reflected in the above historical analysis. Genoa's political institutions, as we have seen, had been constantly built around the same set of cultural beliefs. Game theory enables us to study these beliefs, their relationships to various institutions at a given moment in time, and their dynamic implications. Similarly, the ability to study the influence of distinct cultural beliefs had been crucial to understand the distinct institutional dynamics - indeed, the distinct institutional complexes - among the Genoese and the Maghribis.