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## INSTITUTIONS: THEORY, HISTORY AND CONTEXT-SPECIFIC ANALYSIS\*

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A review essay on AVNER GREIF, *Institutions and the Path to the Modern Economy: Lessons from Medieval Trade*, Cambridge, Cambridge University Press, 2006, xx+503.

### INTRODUCTION

NOWADAYS virtually all economists would agree that «institutions matter» and that a better understanding of institutions is a prerequisite for a better understanding of the way in which economies work. Yet there is no consensus on how institutions should be studied and integrated to economics. Opinions concerning the origin, function, evolution and effects of institutions are diverse and many argue that there is a need for a better framework for studying institutions. Avner Greif's recent book, *Institutions and the Path to the Modern Economy: Lessons from Medieval Trade*, undertakes this task and offers a theory of institutions with a unique methodological framework that integrates theoretical research with historical analysis. The aim of this paper is evaluate Greif's attempt to furnish a unified theory of institutions.

*Institutions and the Path to the Modern Economy* is a masterpiece in economic history and institutional analysis which embeds Avner Greif's previous work on medieval trade within a clear methodological framework for institutional economics. The book combines state of the art historical research, game-theoretic modeling and philosophy of economics in order to understand and explain the place and role of institutions in history. For this reason, it is a challenging book for economists, historians, game theorists and philosophers. Nevertheless, the book is full of fine-grained ideas and models that deserve to be read, studied and discussed by all of the practitioners of the aforementioned fields.

Greif is modest in his aims. He characterizes the book as an «attempt to gain a better understanding of a particular historical episode and to learn institutions in general from this period» (Greif 2006, xvi). However, this statement of intent does not convey much about the nature of the book. Roughly, Greif provides a philosophically and methodologically informed *theory of institutions*, which is illustrated by *historical case studies* that utilize

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*standard game theory* to comparatively analyze the *institutional foundations* of medieval markets and emphasize the interrelations between institutional development and cultural evolution. It covers a broad range of issues. Ideally each and every chapter would need a separate lengthy review of its own. Nevertheless, in this review, I focus on what I take to be the most important contributions of this book: its theory of institutions, its use of game theory in historical research and its suggestions concerning methodology.

Greif is successful in providing a better understanding of the institutional foundations of medieval trade and in improving our understanding of institutions in general. In what follows, I merely focus on some of the important problems in his approach. Firstly, he does not always follow his own methodological suggestions. Secondly, he does not pay enough attention to the notion of 'unintended consequences'. Thirdly, Greif does not analyze or explain the origin of institutions. And lastly, his choice of standard game theory as an analytical framework may constrain the future development of his approach. The following four sections of this essay give a brief overview of the book, and the remaining parts present the aforementioned critical arguments.

#### THE DEFINITION OF INSTITUTIONS

Greif takes it that a theory of institutions requires an all encompassing definition of institutions. He distinguishes between what institutions are, what they do, and what they imply and reflect. He argues that a theory of institutions should not presuppose anything concerning their origin and function, or about what they imply and reflect. Thus, institutions may be intended or unintended, designed or spontaneous, efficient or inefficient, and they may have developed in order to fulfill a function or not. Greif suggests that origin, function and implications of institutions should be studied both empirically and analytically. This is important because according to Greif existing definitions and theories of institutions have presuppositions concerning origin and function of institutions. For example, the 'agency perspective' takes it that individuals bring about institutions, while the 'structural perspective' assumes that institutions shape human interaction. Greif's position is that both propositions are true, and which one of these is important depends on the questions asked and can only be determined by way of studying the particular case at hand. Similarly, while some argue that institutions are unintended phenomena, others argue that institutional evolution is a matter of intentional design. Again, according to Greif, both propositions may be true and this can only be determined with empirical and analytical examination of particular cases.

Greif's definition explicates what institutions are, and what they do: «An institution is a system of rules, beliefs, norms, and organizations that together generate a regularity of (social) behavior» (Greif 2006, 30). In this characterization rules, beliefs, norms and organizations are considered as *institutional elements*.<sup>1</sup> That is, institutions *are* systems of institutional ele-

<sup>1</sup> Yet every institution need not embody an organization.

ments, or «systems of factors that are social in being man-made nonphysical factors exogenous to each individual whose behavior they influence» (Greif 2006, 44). But more importantly they *generate* regularities of behavior.

#### DEDUCTION VS INDUCTION

If we accept Greif's definition, then understanding institutions necessitates a good understanding of the 'micro-mechanisms' that hold together its constituent parts and a thorough comprehension of the way in which they generate regularities of behavior. «This requires, in particular, considering the *motivation* (incentives) of the individuals involved» (Greif 2006, 7). While examining particular cases (*e.g.* in history) may inform us about the observable features of institutions (*e.g.* regularities of behavior), such an analysis cannot enlighten us concerning the unobservable features of institutions, such as individuals' motivations, incentives, or beliefs. Hence, according to Greif, induction is insufficient as a method of institutional analysis (Greif 2006, 19-20, 355-357).

To study motivations and beliefs that are associated with institutions, one needs an analytical framework from which the possible set of motivations and beliefs that may support the institution at stake may be deduced. Thus, deduction is a necessary component of institutional analysis. Yet it is not sufficient, mainly because of the 'inherent indeterminacy' of institutions and because history matters (Greif 2006, 352-355; on indeterminacy of institutions also see Schotter 1981). Greif argues that given the set of prior institutions, there are usually multiple potential institutions to choose from, and one cannot decide *a priori* which one of these institutions would prevail. Take the rules of the road, for example. It does not matter on which side of the road people drive as long as everyone drives on the same side. Both driving on the left and driving on the right are possible conventions (*i.e.* institutions). Yet we cannot decide *a priori* which side of the road will be chosen (or would be brought about) by individuals. Given their history and prior beliefs they may find it more convenient to drive on the right because they expect others to do the same. With different history and prior beliefs they may choose the left hand side. To understand why individuals choose to coordinate on right or left we need to know the context in which they make their decisions. Thus, indeterminacy of institutions suggests that historical analysis (*i.e.* induction) is a necessary (but not sufficient) component of institutional analysis. According to Greif, if and only if induction and deduction are used in combination we have an appropriate methodology for studying institutions. Hence, history should be combined with a deductive framework.

It should be noted here that many authors have suggested that a theory of institutions should be empirically oriented (*e.g.*, Sugden 1998a, 1998b, 2001, 2001a). Nevertheless, it may be argued that a deductive theory of institutions need not yield unique results, and existence of multiple equilibria by itself does not imply that deduction is insufficient. It may be enough for a general theory to «delimit a stable set of institutions that may evolve in an

economy» (Schotter 1981, 12). This should not be considered as a weakness. «The role of social science is not to find a solution to a problem but rather to define the set of all solutions» (von Neumann and Morgenstern 1947, 44; quoted in Schotter 1981, 13). The reason why Greif sees indeterminacy of institutions and existence of multiple equilibria as an indication of the weakness of deduction is that he is mostly interested in providing *singular explanations* of particular cases, rather than theoretical explanations. It is true that theory alone is not sufficient for explaining particular cases, yet the same is true for all sciences, including physics. To explain particular cases one needs to integrate information concerning the particular case at hand to the general theoretical framework.

#### INSTITUTIONS AS EQUILIBRIA

Greif's definition of institutions implies that individuals follow Nash equilibrium strategies (Greif 2006, 162). The existence and persistence of institutions suggest that concordant mutual expectations should be realized and that this very existence and persistence is based on a process of interactive and interdependent decision making. Because game theory is the natural tool for studying the conditions under which such concordant mutual expectations may exist, Greif suggests, it is the natural analytical framework that should aid institutional analysis. «Game theory [...] captures the conditions under which, and the mechanisms by which, the structure – commonly known rules and beliefs – generates behavior that reproduces this structure» (Greif 2006, 162). According to Greif, game theory also helps us limit the set of admissible set of institutions for a given situation by way of requiring Nash equilibrium behavior (Greif 2006, 139, 211).

Given these remarks one may consider an institution as one of the many possible Nash equilibria in a game where everyone expects others to follow a certain strategy; hence, the existence of a regularity of behavior. However, Greif is cautious in defining institutions *as* game-theoretic equilibria:

Institutions are not game-theoretic equilibria, games are not the basic unit of institutional analysis, and game theory does not provide us with a theory of institutions. Indeed, the key to advancing institutional analysis by using game theory is precisely to recognize the difference between game-theoretic equilibrium analysis and institutional analysis.

(Greif 2006, 19)

Here, Greif implicitly distinguishes between different levels of analysis. Particular institutions are not game-theoretic equilibria, in the way that a toy-model of my car cannot be considered as the car that I drive. Game-theoretic equilibria represent institutions at an abstract level, as the toy-model represents my car. Games are not the basic unit of analysis for the same reason. Individuals do not really play the model-games in game theory. Yet games may represent the situations that individuals may be confronted with. Greif takes it that institutional analysis should be concerned with particular institutions, not with abstract representations of institutions, because he believes that such representations cannot capture an essential characteristic of particular institutions: that they are dependent on prior institutions and

associated individual beliefs (*i.e.*, there are multiple equilibria and history matters). Thus, he believes that game theory can only help us examine the 'logical possibilities' that are at stake and test the *logical consistency* of our analysis (Greif 2006, 140-141).

Basic units of analysis are not games, rather they are transactions, or more properly *intertransactional linkages* (Greif 2006, 15). A transaction is defined as «an action taken when an entity, such as commodity, social attitude, emotion, opinion, or information, is transferred from one social unit to another» (Greif 2006, 45). Thus, institutional analysis focuses on the type of transactions and the linkages among these transactions that prevail given individuals' motivations and beliefs.

Despite his focus on equilibrium analysis, Greif continuously emphasizes the need for a framework for studying institutional change as an endogenous phenomenon (Greif 2006, 53). Having said that, Greif acknowledges the difficulty of modeling institutional change as an endogenous phenomenon, because he characterizes institutions as equilibrium phenomena (in a game-theoretic model). Since Nash equilibrium indicates that no one has an incentive to deviate and because rules of the game are given in a game-theoretical model, it is difficult, if not impossible, to consider change as an endogenous phenomenon in a single model. Greif has a solution. He suggests employing *quasi-parameters* which are dependent on the outcome of the games played in previous periods (Greif 2006, 167). For example, if individuals' actions result in increased prosperity in a given environment, and if increased prosperity may influence individuals' evaluation of the environment, it is appropriate to represent this with a quasi-parameter in individuals' payoff functions. An increase or decrease in the value of the quasi-parameter, then, may influence the range of situations in which a certain equilibrium is self-enforcing. Greif suggestion is acceptable, yet he does not develop a satisfactory model that may explain one of his particular cases. This is because of the limitations of the repeated game framework that he uses. Evolutionary game-theoretical models or agent-based computer simulations could have been more appropriate, but Greif argues that evolutionary models are limited for other reasons, and does not mention the possibility of using computer simulations. We will come back to Greif choice of standard game theory after discussing his method of context-specific institutional analysis.

#### CONTEXT-SPECIFIC INSTITUTIONAL ANALYSIS

According to Greif, in order to understand particular institutions and to reach a better understanding of institutions in general we need to combine induction with deduction, and develop a context-specific institutional analysis which mingles the strengths of theoretical and historical research. The method of context-specific analysis is roughly as follows: i. identify the issues that are in need of explanation for the particular institution at stake; ii. study its history and gain contextual knowledge about it; iii. form a *conjecture* that may explain the issues in need of an explanation; iv. build a game theoretic model that is based on the contextual knowledge which may sup-

port the conjecture; v. test the predictions of the model against contextual information that was not embodied in the model; vi. repeat the preceding steps until you reach a satisfactory explanation (Greif 2006, 357-376).

The basic 'principle' of context-specific modeling is, then, to build a *realistic* model of the particular environment within which the institution at stake operates. That is, model's assumptions should correspond to the facts concerning this environment.

Greif emphasizes at several places that context-specific institutional analysis «helps to formulate, present, and evaluate alternative conjectures about the institutions we seek to identify» (Greif 2006, 351). Thus, it is important to note that Greif is not after an ultimate and complete singular explanation of the particular institutional facts at stake. Moreover, he also mentions that «the challenge in this interactive process is to avoid ending up with a tautology by adjusting the model to fit the data» (Greif 2006, 352). Of course, whether the context-specific analysis results in a plausible conjecture could be evaluated to an extent by examining the proposed model and suggested evidence. But, only someone who has knowledge of the 'interactive process' could really determine whether the resulting model has been adjusted to fit the data. Nevertheless, Greif offers enough case studies to convince us that game theory may be useful in formulating and testing a conjecture concerning particular institutions of interest.

#### THE PROOF OF THE PUDDING

*Institutions and the Path to the Modern Economy* contains several intriguing case studies on medieval trade. This allows the reader to evaluate whether Greif abides to aforementioned 'principle' of context-specific modeling. For the present review, one example will suffice to give a feeling of the type of models that Greif develops and to show that he does not always follow his own 'principle'. In chapter 3, an institution called the «Maghribi Traders Coalition» is analyzed. Basically, in the Medieval period, Maghribi merchants employed agents in order to establish long distance trade relationships. Yet, Greif tells us that the previous literature is somewhat silent about the way in which the merchants solved the inherent commitment problem in merchant-agent relationships. The question to be answered is the following: How could a merchant trust an overseas agent in a period which is signified by the absence of legal contracts and related legal institutions to enforce contracts between merchants and agents? How did the merchants solve the existing commitment problem?

After identifying the problem, Greif tells us the important historical facts concerning this particular merchant-agent relationship with reference to historical documents. Basic facts are the following: There are certain norms and conventions that regulate trade, which constitute the *merchant law*. We learn that there is a coalition within which merchants share information (an intertransactional linkage) concerning their agents and about other things related to their trade relationships. We also learn that coalition members employ only member agents, and do not employ cheaters. Everyone be-

believes that opportunistic behavior could be detected, and when detected this information is shared with other coalition members, which leaves the cheater agent with no prospects for future employment by coalition members (community punishment). Given these facts, Greif asks: How did the Maghribi traders solve the commitment problem and «why was community punishment self-enforcing» (Greif 2006, 71)? Greif's conjecture is that a *multilateral reputation mechanism* could have mitigated the commitment problem. To test this conjecture, Greif uses a model with perfect and complete information where there are  $M$  merchants and  $A$  agents with infinite life spans. Merchants and agents are assigned distinct payoff functions. Since the historical evidence suggests that «there are less merchants than agents» the model assumes that  $M < A$ . In a repeated game framework Greif shows that given the existence of a coalition with perfect and complete information sharing, every agent prefers to be honest and every merchant prefers to hire an honest agent. Thus, he demonstrates that his conjecture is logically consistent and that a multilateral reputation mechanism *could have* mitigated the commitment problem. After this he goes on to show that the model is consistent with other historical facts that were not used in the process of model building.

In fact, at first sight, Greif convinces us that his conjecture is highly plausible and the model supports his story of the Maghribi traders' coalition. But, a more detailed examination raises questions concerning his implementation of context-specific modeling. It is appropriate here to ask what to expect from context-specific modeling. As far as I understand it the term «context-specific» indicates that a model should be sensitive to the details of the particular case to be examined. It should treat some of the details that a non-context-specific model would treat as unimportant as significant details. That is, it should be as realistic as possible given the limitations of the tools and techniques used. When we look at the model we see a couple of assumptions that follow this advice. Firstly, assumption that  $M < A$  seems to be in accordance with the facts. Secondly, assumption that merchant and agent have infinite life spans seems to be realistic, because Greif (2006, 73) tells us that «relatives are morally responsible for one another's business dealings and traders' sons became traders, serving as their parents old-age insurance policies». Thirdly, assignment of the payoffs seems to be highly intuitive.

There are other assumptions, however. For example, it is assumed that there is perfect monitoring, and complete information, and efficient information flows. Greif's narrative convinces us that neither of these assumptions holds for Maghribi traders. Historical evidence suggests that there was imperfect monitoring, and as Greif (2006, 73) notes, with imperfect monitoring the model would be marked by periods of noncooperation. Yet Greif's historical narrative does not contain periods of noncooperation among Maghribi traders. More importantly, the model implies that perfect monitoring is a necessary condition for the solution of the commitment problem. Thus, there seems to be a mismatch between Greif's historical facts and the model. The model abstracts from important factors (*i.e.*, imperfect monitor-



ing and incomplete information) that may change its results concerning the persistence of cooperation among Maghribi traders.

Moreover, the assumption that  $M < A$  could also be questioned. Greif (2006, 285) informs us that Maghribi traders served both as merchants and agents and that they «did not belong to a ‘merchant-class’ or an ‘agent-class’». However, we learn that Maghribi traders established trade relations mainly by «*friendship*» and «*formal-friendship*». This implies that the assumption that agents and merchants are distinct individuals with distinct payoff functions is not based on historical facts. That is, the model does not embody the fact that the trade relationships were established through friendship, or formal-friendship, and that Maghribi traders serve as merchants and agents *at the same time*. Thus, the model does not take into account the strength of mutual relationships between Maghribi traders, which *may* explain a great deal of the existent trust between Maghribi traders.

In sum, it is appropriate to say that Greif does not follow his own ‘principle’ of context-specific modeling. Of course, one may argue that these assumptions may be acceptable for the purposes of this particular model. Nevertheless, the above model cannot explain (and it seems to be in conflict with) the fact that Maghribi traders employed other Maghribi traders as agents rather than non-Maghribi traders, and that they served both as merchants and agents at the same time. Greif tries to explain this fact with a modified model in chapter 9. In this modified model, it is assumed (in accordance with historical facts) that Maghribi traders hold collectivistic beliefs. That is, every trader expects others «to respond to whatever transpires between others» and «traders have information about everyone’s past conduct» (Greif 2006, 278, 282). The model also assumes that merchants can act as agents as well – yet a trader can serve either as a merchant or as an agent at a given period –. Another assumption is that collective beliefs imply that it is cheaper to keep Maghribi traders (who are serving as agents) honest than to keep non-Maghribi traders honest. Thus, the model tells us that because Maghribi traders hold collective beliefs, they prefer to establish trade relationships with each other, but not with other communities. This argument seems to be somewhat circular, if not tautological.

Nonetheless, it should be emphasized that Greif’s narrative is plausible and convincing most of the time, and his models serve as a *thought experiments* to test the logical consistency and plausibility of his narrative. The argument and my criticism here is that his models are not as context-specific (*i.e.*, they do not fairly represent the particularly important aspects of the environment at stake) as one would expect after reading Greif’s methodological remarks. For this reason, I think that the methodological suggestions concerning interactive context-specific modeling are somewhat overrated in the book. Greif demonstrates that game theory may be useful in supporting a historical narrative, yet he does not really integrate context-specific information to game-theoretical models. The pudding is satisfactory, but it is not the pudding we have been promised for.

Greif’s context-specific analysis is further shadowed by two important issues. Firstly, there seems to be a confusion concerning the origin of institu-

tions and its relation to assumptions about rationality. Secondly, the choice of standard game theory does not seem to be appropriate for examining some of the important questions regarding institutions.

#### INTENDED VS UNINTENDED

Greif shows why we should favor his approach to others by way of pointing out that others assume too much concerning origin, function and nature of institutions. Yet his characterization is not always fair. Let us focus on his overview of the views concerning origin of institutions. Greif divides the opinions concerning origin into two camps: i) the design-camp argues that institutions are intended phenomena; and ii) the spontaneous evolution-camp assumes that they are unintended consequences of human action. While it is true that there are these two camps in the literature, it is not true that one camp rejects others' views in their entirety.

Consider Carl Menger, an economist that Greif would put in the spontaneous evolution-camp along with Hayek. Menger explicitly distinguishes between two types of social phenomena: those that are i) «the result of common will directed toward their establishment» and ii) «the unintended results of human efforts aimed at attaining individual goals» (Menger 1985 [1883], 133). While Menger realizes that institutions may be intended or unintended, he finds it more interesting to study the spontaneous evolution of institutions. Moreover, although Menger argues that the institution of money could have been brought about as an unintended consequence of purposeful human action, he also mentions that coined money is a matter of intentional design. He argues «[...] by state recognition and state regulation, this social institution of money has been perfected and adjusted to the manifold and varying needs of an evolving commerce, just as customary rights have been perfected and adjusted by statute law» (Menger 1892, 255). Similarly, Andrew Schotter (1981, 30) explicitly states that he is interested in institutions that are unintended consequences of human action, and not in deliberately, intentionally created institutions. Thus, neither Menger nor Schotter assume that institutions are unintended phenomena, they rather focus on institutions which may be unintended. Greif suggests that «various approaches have also adopted different premises about the related issue of institutional origin and functions» (Greif 2006, 42), but it is more appropriate to say that different scholars focused on different aspects of institutions by way of asking different research questions.

It is also interesting to note that Greif holds that Andrew Schotter, Douglass North, and Oliver Williamson, «have adopted the agency perspective, emphasizing that institutions are intentionally designed to constrain behavior» (Greif 2006, 41). Contrary to what Greif says, Schotter's focuses on 'unintended' institutions rather than intentionally designed institutions. It is important to understand why Greif puts Schotter, North and Williamson in the design-camp. Greif argues:

Economists have traditionally adopted the agency perspective, emphasizing that institutions are intentionally designed to constrain behavior. Economics is the 'study of how in-

dividual economic agents pursuing their own selfish ends evolve institutions as a means to satisfy them' (Schotter 1981, p. 5). Institutions are 'the humanly devised constraints that structure political, economic, and social interactions' (North 1991, p. 97).

(Greif 2006, 41)

Greif takes it that if institutions are brought about by individuals who are pursuing their own selfish ends, this would imply that the resulting institution would be an intended institution. Or, if institutions are humanly devised constraints they should be intended. He further argues that «some hold that institutions reflect unintended outcomes of interactions among individuals with limited rationality and cognitive ability, whereas others maintain that institutions reflect intentional responses by rational, forward-looking individuals» (Greif 2006, 13).

According to this characterization, if one assumes that individuals are rational, forward-looking agents, one cannot argue that institutions may be unintended phenomena. On the other hand, if one assumes that individuals are boundedly rational agents with limited cognitive ability, one cannot argue that institutions may be intended phenomena. Yet neither needs be the case. There is nothing that prevents individuals with limited rationality from intentionally designing institutions and it is entirely possible that fully rational, forward-looking individuals may unintentionally bring about institutions. Schotter (1981), for example, argues that rational individuals may bring about institutions as an unintended consequence of their purposeful (*i.e.*, intended) actions. The question is the following: How could rational individuals who are intentionally pursuing to satisfy their own ends unintentionally bring about institutions? The answer to this Mengerian question lies in the distinction between different levels of analysis to which Greif pays very little attention. Rational forward-looking individuals need not pursue ends concerning macro-social results. Individuals who are concerned with their own affairs may intentionally seek solutions to their individual problems (at the individual level) yet this does not necessarily imply that they intentionally act to bring about macro-social consequences (at the social level) (see Aydinonat, forthcoming). Thus, rational, forward-looking individuals who are pursuing their own selfish ends at the individual level, may unintentionally bring about institutions without knowing that their actions are in fact contributing to a macro-scale process at the social level. Menger's explanation of the origin of money is a good example where rational individuals who are trying to solve the problem of double-coincidence of wants bring about a commonly accepted medium of exchange (an institution) as an unintended consequence of their actions.

Greif models individuals as rational agents and it is no surprise that he argues that the institutions of medieval trade were not unintended consequences of human action (Greif 2006, 388-389). In Greif's models every individual acts solely to get the best possible results out of his own trade and Greif is right in arguing that the order (*i.e.*, institutions) is brought about by the efforts of intentional agents. Yet the question remains, how could their efforts get coordinated while no one has the power to coordinate the actions of all (*i.e.*, the Mengerian question)? Despite Greif's claims it is still possible

to consider institutions of medieval trade as unintended consequences of intentional individual action (*e.g.* individual efforts to secure their property rights). Of course, it could also be possible that everything was intended, planned and designed. The point is that it is wrong to equate intentional action with rational design and unintended consequences with blind and futile individuals (Aydinonat, forthcoming and 2006).

Under Greif's definition, institutional elements, including organizations, may be considered as smaller scale institutions as long as they involve rules and beliefs that generate a regularity of behavior. An explanation of the origin and persistence of a large scale system of rules and beliefs may be different from the explanation of the origin and persistence of the particular rules and beliefs in it. Social order at different levels of complexity may be based on different mechanisms and may have different implications (see Klein 1997). Greif does not pay enough attention to the different levels (*i.e.* social or individual level) at which intentions may be targeted and consequences be realized (Aydinonat, forthcoming). Greif's lack of attention to the relationship between different levels, and between 'institutional elements' and 'institutions' contributes to his confusion of the terms of 'intended' and 'unintended'. Nevertheless, it may be argued that this does not influence Greif's general analysis because he is not interested in explaining origins of institutions. But is it possible to have a theory of institutions without explaining their origins?

#### THE ORIGIN OF INSTITUTIONS AND GAME THEORY

Greif's book does not contain an analysis or explanation of origins of institutions. He argues that it is appropriate to study institutions without studying their origins because they are equilibrium phenomena: «Whether an institution evolved spontaneously or was established intentionally, whether it reflects individualistic learning, evolutionary pressure, or social design, its equilibrium nature is the same» (Greif 2006, 147). While it is true that we could discuss the conditions under which a certain institution may exist without any reference to its origins, it is highly implausible to argue that a theory of institutions can do without a clear focus on their origins. To explain origin one needs to identify the mechanisms that caused its coming about and a thorough understanding of such mechanisms is a necessary condition for a good understanding of institutional change. I believe Greif would agree that understanding origins of institutions is a necessary (if not sufficient) condition for understanding institutions. The reason why Greif pays almost no attention to questions concerning origin lies elsewhere. Greif's theory of institutions cannot examine questions concerning origin because of his chosen analytical framework. Standard game theory is an appropriate tool for studying conditions under which a certain equilibrium may exist, prevail, persist or reinforce itself. It does not tell anything about the causal mechanisms that may have brought about the equilibrium (*e.g.*, see Mailath 1998). An appropriate analytical framework for studying the origin of institutions is evolutionary game theory (*e.g.*, see Young 1998). Thus,

one wonders why Greif does not use evolutionary models with limited rationality and learning.

Basically, Greif (2006, 12) offers two reasons for not using evolutionary models. Firstly, «the processes of experimentation, mutation, and learning that drive the process of institutional change are taken as exogenous to the analysis», which limits their applicability. Secondly, evolutionary models have unrealistic assumptions concerning human nature. This second reason is worth discussing because many evolutionary game theorists would argue that their models are much more realistic than standard game theoretical models with full rationality (e.g. Young 1998). Yet, Greif argues,

[...] for technical reasons, the analysis often resorts to extreme assumptions about human nature. Individuals are usually assumed to be completely myopic, unable to recognize those with whom they interacted in the past, unable to choose with whom to interact unable to coordinate their behavior, and generally incapable of structuring their environment. These assumptions provide unsatisfactory microfoundations for evolutionary processes in human societies.

(Greif 2006, 12)

The social level is ignored, as individuals are assumed to be unable to coordinate, communicate, or collectively alter the environment within which they interact. Processes of mutation that drive institutional change are taken as exogenous, while inertia, which determines the rate of change, is assumed rather than derived endogenously.

(Greif 2006, 155)

I think Greif misrepresents the literature of evolutionary games. Yet this does not affect my main argument concerning this issue. Even if we accept Greif's characterization of evolutionary game theory, it is still hard to understand why one cannot use an evolutionary framework to check the *logical consistency* of one's conjectures concerning origins of institutions. As I have noted earlier, Greif's models contain unrealistic assumptions such as full rationality and complete information. Yet they are useful in testing the logical consistency of his conjectures. Similarly, one may use evolutionary game theory in order to examine whether certain types of learning and/or imitation may bring about the institution at stake. Greif's criticism that learning, imitation and mutation are exogenous is not agreeable because one may conjecture about the types of learning, imitation and mutation that may bring about a certain institution and test this conjecture by way of employing relevant assumptions.

Furthermore, assumptions concerning learning, imitation, mutation and the rate of change can be adjusted to reflect the particularities of the environment (i.e., context-specific modeling). There seems to be nothing that would prevent us from using evolutionary models to test the logical consistency of our conjectures concerning the origin of institutions. Moreover, it may be argued that models with limited rationality and learning are more realistic (as a representation of real human beings) than models with highly rational forward-looking agents who could continuously calculate their payoffs given certain discount factors while their actions are changing the quasi-parameters which influence their future payoffs (cf. Giocoli 2003, Sugden 2001b).

In brief, Greif's models are useful for analyzing the self-enforcing nature of institutions, yet his criticism of evolutionary game theory is not satisfactory. Standard game theory is only appropriate for studying the self-enforcing nature of institutions, not their origin. If Greif is after a more general theory of institutions that also analyzes the origin of institutions, he might have to reconsider his thoughts on evolutionary game theory.

#### CONCLUDING REMARKS

*Institutions and the Path to the Modern Economy* is a very rich book with many valuable contributions to institutional economics. Obviously, in this review I have mainly focused on some of the problematic issues in this book. Yet the reader should not be diverted by these critical remarks. *Institutions and the Path to the Modern Economy* deserves a place on the shelves as a classic in institutional economics. In fact, one cannot overemphasize the novelty of Greif's methodology of historical analysis. His method of employing game theory as a tool for developing and testing conjectures concerning particular episodes in history gives additional analytical strength to his narratives: Not only they are supported with historical evidence, but they are also tested in terms of logical consistency and coherence. His approach to history and institutions is novel, powerful and mind opening. It seems to me that Greif's book will be a milestone in the history of institutional economics.

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