# Institutions: Rules or Equilibria?

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## 1 Introduction

In recent years, the interest in rational choice analysis of institutions has received substantial impetus from an accumulating body of evidence demonstrating the importance of a society's institutions in determining its economic outcomes. Econometric studies have uncovered correlations between institutional variables such as the security of property rights, the rule of law, and trust, and economic and political outcomes including levels of production, saving, and corruption.[1] Historical studies have revealed the role that institutions played in long-run trajectories of industrial and commercial development.[2] Studies of the developing world and of countries transitioning from socialism have revealed the challenges involved in creating well-functioning institutions, the benefits that can be obtained when institutional change and economic reform are successful, and the dangers that ensue when they are not.[3] Stimulated by these developments, the conceptual frameworks employed by scholars studying institutions have also been evolving, as old frameworks have been adapted and new frameworks have emerged to explore old and new questions about how institutions function, how they change, and how they affect economic behavior and outcomes.

The rational-choice approach to institutional analysis does not require us to assume that people are always 'rational', or that institutions are chosen rationally. Rather, it holds that a rational-choice perspective enables us to generate a theory with empirically refutable predictions about the institutions that can prevail in a given situation.

[1]For example, La Porta et al. (2008), Keefer and Knack (1997), Easterly and Levine (2003).

[2]For example, Milgrom et al. (1990), North (1990), Greif (1989, 1994, 2006).

[3]For example, Roland (2000), Aoki (2001), Qian (2003).

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This involves two key questions: first, how institutions are selected and second, how people are motivated to follow institutionalized patterns of behavior. One strand of thought within the rational-choice approach to institutional analysis, the so-called 'institutions-as-rules' approach, emphasizes the importance of a theory of selection of institutions, while an emerging alternative approach, the 'institutions-as-equilibria' line of analysis emphasizes the importance of a theory of motivation.

The institutions-as-rules approach, following North (1990, p. 3), identifies institutions as "the rules of the game in a society", including both "formal" rules such as constitutions and laws enforced by the state, and "informal" constraints such as "codes of conduct, norms of behavior, and conventions", which are generally enforced by the members of the relevant group (North, 1990, p. 36). Many kinds of formal rules are selected through a centralized process of bargaining and political conflict between individuals and organizations who attempt to change the rules for their own benefit. In other cases, formal or informal rules may be selected in a decentralized way through evolutionary competition among alternative institutional forms. In either case, the institutions-as-rules view holds that institutions are ultimately best understood from a functionalist perspective that recognizes that they are responsive to the interests and needs of their creators (although there is no guarantee that the rules selected will be efficient).

Within the institutions-as-rules view, the enforcement of the rules is considered as a distinct issue from the formation and content of the rules themselves. Enforcing the rules involves "enforcement costs". The formal and informal rules, together with their "enforcement characteristics" constitute the institutional structure within which interactions occur. Thus, the institutions-as rules approach employs a rational-choice perspective to study the formation of institutions, but a theory of motivation – explaining *why* people follow particular rules of behavior – is not integrated into the analysis.

A growing body of recent research on institutions places a theory of motivation at the center of the analysis, and thereby endogenizes the "enforcement of the rules", by studying 'institutions-as-equilibria'. This perspective focuses on how interactions among purposeful agents create the structure that gives each of them the motivation to act in a manner perpetuating this structure. To give a simple example: in the United States, people (nearly always) drive on the right-hand side of the road. This regularity of behavior generates expectations that motivate the behavior itself: people drive on the right because they expect others to do so, and wish to avoid accidents. Of course, it is also a "rule" that one must drive on the right. However, many alternative technologically feasible rules (for example, women drive on the right and men on the left) would generate expectations which would fail to motivate a pattern behavior consistent with the rule: that is, such patterns of behavior are not equilibria, and even if they were formally specified as a "rule" we would not expect them to emerge as institutions, because the "rule" would not be self-enforcing. For everyone to drive on the right, however, is one of two potentially self-enforcing "rules" which could emerge (or be enacted) as an equilibrium.

The crucial point is that while a "rule" may serve as a coordination device, it is fundamentally the expected behavior of others, rather than the rule itself, which

motivates people's behavior. A similar logic can be used to examine economic, political, and social institutions even in situations involving specialized actors and more complex formal "rules". From the institutions-as-equilibria perspective, it is always ultimately expectations about the behavior of the other actors (including those in specialized enforcement roles such as police, judges, etc.) that create the institutional constraints which mold people's behavior, and all such behavior must therefore ultimately be explainable endogenously as part of the equilibrium.

Despite their differences, the institutions-as-rules and institutions-as-equilibria approaches have much in common and are best viewed as complements rather than substitutes. Both seek to advance a positive analysis of the non-technological determinants of order and regularities of human behavior. Recent advances in the literature combine elements of the two perspectives. This chapter surveys these developments and highlights promising directions for future research. As we will discuss, the institutions-as-rules framework has been fruitfully applied to shed light on the emergence and functioning of a variety of institutions, including communities, organizations, and political and legal institutions. However, we will argue that by endogenizing the issue of enforcement, the institutions-as-equilibria approach enables a more satisfactory treatment of several key issues, including promoting our understanding of processes of institutional change.[4]

## 2 Institutions as Rules: Conceptual Issues

As discussed above, the most commonly cited definition of institutions is that advanced by Douglass North: institutions "are the rules of the game in a society, or more formally, are the humanly devised constraints that shape human interaction" (North 1990, p. 3). Institutions include both formal rules, which are explicit, written rules such as laws and constitutions, and informal constraints such as conventions and norms. In North's theory, formal rules are created by the polity, whereas informal norms "are a part of the heritage that we call culture" (p. 37) and therefore impervious to deliberate human design. The focus of the analysis is therefore on formal rules, namely, rules that are explicitly and intentionally created.

To illustrate the institutions-as-rules approach, consider the framework developed by Ostrom (2005), who envisages a hierarchy with several levels of rules: "operational rules" which govern day-to-day interactions; "collective-choice rules", which are rules for choosing operational rules; "constitutional rules" (rules for choosing collective-choice rules); "meta constitutional rules" (rules for choosing constitutional rules); and at the highest level, the biophysical world (p. 58).[5] That is, each level in this

[4]For a recent discussion, see Greif (2006). Kingston and Caballero (2009) survey theories of institutional change.

[5]North (1990, p. 47) envisages a similar hierarchy with four levels of formal rules: constitutions, statute and common laws, specific bylaws, and individual contracts.

hierarchy of rules consists of rules that govern how rules at the lower level are created. For example, constitutional and collective-choice rules provide the structure that governs the choice of operational rules. Higher-level rules are also more difficult and costly to change.

When they perceive that existing rules governing their interactions at one level are unsatisfactory, individuals are driven to "shift levels" and try to change the rules. A political bargaining process ensues. Each individual calculates their expected costs and benefits from any proposed institutional change, and an institutional change can occur only if a "minimum coalition" necessary to effect change agrees to it. What constitutes a "minimum coalition" is determined by the higher-level rules; for example, in a democracy, a majority would constitute a minimum winning coalition; in a dictatorship the dictator alone might constitute a minimum coalition. Therefore, the set of rules that ultimately emerges will depend on the perceived interests of the actors involved in setting the rules, on the ability of various interest groups to act collectively to make their interests count (Olson 1982), and on the higher-level rules that determine how those individual interests are aggregated.

There is no guarantee that this process will lead to the selection of efficient rules. In many cases, those with political power may try to select rules to generate distributional benefits for themselves; that is, to maximize their welfare rather than that of society as a whole. To explain why societies "choose" inefficient institutions, however, it is not sufficient to note that the groups in power have interests that diverge from the rest of society. If an institutional change could increase efficiency and economic output, why cannot the beneficiaries of the change agree to redistribute the gains to compensate the losers? Acemoglu (2003) argues that the key problem is commitment: the powerful cannot credibly commit not to use their power for their own benefit as the opportunity arises, and other groups cannot credibly commit to compensate the powerful for giving up their power. As a result, the set of bargains which can be struck is restricted to those bargains which can be sustained as equilibrium outcomes (Fearon 2007; Greif 1998, 2006). Because there is no external authority to enforce inter-temporal bargains, politically powerful groups may block changes that would be beneficial overall, or impose inefficient changes that benefit themselves at the expense of others. Fundamentally, therefore, a satisfactory understanding of these aspects of institutional change requires a recognition that the problem is not just choosing new rules, but the more restrictive problem of engineering a mutually beneficial shift to a new, self-enforcing equilibrium. We will return to this issue later.

A second, complementary strand of thought within the institutions-as-rules approach views the development of rules as an outcome of evolutionary competition among alternative institutional forms. Alchian (1950) argued that competitive pressure weeds out inefficient forms of organization among firms in competitive markets, because firms that develop more efficient organizational forms will be more profitable, and the use of these rules and forms of organization will therefore tend to spread through growth or imitation. Demsetz (1967) extended the evolutionary argument to the development of property-rights rules, hypothesizing that these rules develop and adjust as a result of "legal and moral experiments" which

"may be hit-and-miss procedures to some extent", but which only prove viable in the long run if they generate efficient outcomes. Hayek (1973) argues that groups or organizations that, by accident or design, develop less efficient rules will not survive competition with groups that develop more efficient rules. Therefore, through group selection, rules will evolve towards optimality.

The evolutionary approach finds its most prominent modern expression in Oliver Williamson's "Transactions cost economics" (TCE). According to this view, 'transaction costs' arise in many transactions because of the bounded rationality and opportunism of the transacting parties (Williamson 2000). Depending on the attributes of a particular transaction, some sets of rules ('governance structures') will lead to more efficient outcomes than others. The transactions-cost economics approach assumes that the most efficient institutional forms (those which 'minimize transactions costs') will emerge.[6] So, for example, if a change in production technology renders existing institutions inefficient, then over time, new, more efficient institutional forms will emerge to replace them.

Although the political-design and evolutionary approaches envisage quite different processes for the selection of rules, the two strands of research are best viewed as complementary. Both treat institutions as sets of rules (or "governance structures"); and both focus on how new rules are selected rather than how they are enforced. Different institutions are associated with different "transaction costs", including "monitoring costs" and "enforcement costs", but the nature of these costs is not part of the analysis.

The concept of "transactions costs" is widely used in New Institutional Economics. The term is generally used very broadly to include the costs of finding trading partners, negotiating and drawing up contracts, monitoring contractual partners' behavior and enforcing agreements, and other costs incurred in an effort to define, measure and enforce property rights or agreements to exchange property rights. Transaction costs may also include the costs of political activity, bargaining, legal action, and so on involved in deliberate efforts to create new rules, the costs of inefficiency resulting from commitment problems and other forms of political transaction costs, as well as all the costs involved in setting up, maintaining and changing the structure of rules and organizations, and monitoring the actions of the agents governed by those rules. In short, any difference between the value of output generated in the real world, where a real transaction is governed by real institutions, and an imagined world without any agency problems or information asymmetries (and therefore a world in which no governance is required), including any deviation from first-best production and exchange, can be called a "transaction cost".

Despite this breadth, the concept of "transaction costs" has achieved wide acceptance as an analytical tool in the theoretical literature on institutions, particularly within the institutions-as-rules framework. The usefulness of the concept is

[6]Williamson refers to this as the "discriminating alignment" hypothesis. Thus, for Williamson, "The overall object of the exercise essentially comes down to this: for each abstract description of a transaction, identify the most economical governance structure" (Williamson 1979, p. 234).

that it provides a measure of institutional efficiency. However, the use of transactions costs terminology risks clouding the issue of enforcement. To illustrate, consider an agency relationship between a manager and the workers within a firm. The sale of the agent's labor services involves a fundamental problem of exchange: the decision of whether to work hard is made by the agent, but it affects the welfare of the principal. Given this fundamental agency problem, different institutions will give rise to different patterns of behavior. The explicit and measurable transactions costs in such a setting might include the costs of hiring a manager to monitor the workers and measure their performance, as well as the costs of designing an organization so as to enable this monitoring to occur, choosing a production process which facilitates such monitoring, installing surveillance equipment, and the legal costs of negotiating employment contracts, and suing or firing a shirker; and so on. In addition, if in the end it proves too costly to motivate the worker to act as she would in a first-best (zero transactions cost) world, then the resulting inefficiency would be another (implicit) transaction cost.

But while the concept of "transactions costs" can serve as a handy shorthand to describe how well these problems are solved, all of these "costs" ultimately derive from the agency problems and information asymmetries which give rise to the fundamental problem of exchange in the (potential) transaction of interest. By separating the "costs" of running the economic system – monitoring, enforcement, and so on – from the system itself, the institutions-as-rules approach clouds the issue of *why* people act as they do, and becomes a poor analytical substitute for an account of how behavior is actually motivated within alternative institutional regimes, none of which will approximate the zero-transactions-cost ideal. That is, the problem of designing efficient institutions is not fundamentally a problem of choosing rules so as to minimize "costs", but a problem of aligning incentives in a way which generates the maximum possible benefit, given a fundamental problem of exchange. Higher efficiency (or a lower transaction cost) is a desired outcome of a successful solution to this problem, but it is not the problem itself, and focusing on transactions costs as a catch-all minimand risks masking the essence of the problem, which is one of aligning incentives.

## 3 Institutions as Rules: Applications

### *3.1 Communities and Networks*

Community enforcement refers to a situation in which behavior within a group is governed by "rules" which are enforced by the members of the group themselves rather than a specialist third-party enforcer. One view holds that these kinds of informal rules are best taken as part of a fixed, exogenously-given cultural heritage (Williamson 2000). Other authors, however, consider that informal rules continually adapt and evolve. For example, based on his studies of cattle farmers in Shasta county and New England whalers, Robert Ellickson (1991) hypothesizes that groups

within which information (gossip) circulates easily and informal power is broadly distributed will tend to develop efficient informal rules. Ostrom (1990) found that many communities manage to develop rules to successfully avert the tragedy of the commons in the management of common-pool resources, such as fisheries, forests, and common pasture. Other communities, however, do not, and Ostrom found that successful rules were more likely to emerge in groups with small numbers of decision makers, long time horizons, and members with similar interests.

As communities become larger, therefore, both Ellickson's and Ostrom's studies suggest that informal community enforcement is less likely to be able to support efficient outcomes. For example, as the online community of traders on eBay grew in the late 1990s, the "trust" sustained by a multilateral reputation mechanism based on user feedback had to be gradually supplemented by formal rules developed by eBay to discourage cheating, resolve disputes, and prevent illegal trades (Baron 2001).

## *3.2 Organizations*

Organizations are akin to artificial communities of individuals brought together for a specific purpose – such as production, political activity, religious worship, recreation, and so on. While some organizations may begin as informal groups whose members later decide to develop a formal governance structure, others are created de novo by "entrepreneurs" with a goal in mind. As such, organizations are both cohesive entities which impact and interact with the broader world around them, and governance structures which develop formal rules to govern the interactions among their members and between members and outsiders. Within the institutions-as-rules framework, different authors have focused on each of these two aspects of organizations.

Some authors, notably Douglass North, have treated organizations primarily as unified entities that interact with the broader economic and political system within which they are embedded, and in particular, may act as "players" of the political game, attempting to alter broader institutional rules for the benefit of their members. This aspect of organizations will be discussed in Sect. 3.3 ("Politics"). The other aspect of organizations – their internal governance – is studied in economics primarily in the guise of the theory of the firm.

As is well known, the modern theory of the firm originates with Coase's (1937) insight that organizations and markets are alternative modes of organizing transactions, and the claim that the scope of activity carried out within organizations will therefore be determined so as to minimize "transactions costs". To explain the structure of an organization, therefore, we need to explain its function: what contractual problem it efficiently solves. But why would efficient organizations emerge? One possibility is that the structure of organizations is a product of rational design. If the organization's creators have a correct understanding of the effects of different organizational forms, then it may be reasonable to assume that they will design efficient organizations.

However, an alternative explanation for the emergence of efficient organizations is that evolutionary pressure forces firms to select efficient organizational forms by driving less-efficient organizations out of business. Alchian (1950) was an early proponent of this view, and it also implicitly underlies Williamson's "Transactions Cost Economics", which assumes that organizations (governance structures) will develop so as to achieve an optimal (efficient) match with the transactions they govern. The evolutionary approach has the advantage, noted by both Alchian and Williamson, that it enables us to assume that efficient institutions will develop even if the people designing them are boundedly rational. If a parameter change, such as a change in technology, renders existing institutions inefficient, then over time, by accident or design, some firms will develop more efficient sets of rules ("governance structures"), and through competitive pressure, these new institutions will gradually spread, so that the institutions governing the relevant transaction will evolve toward optimality.[7] Thus, the usefulness of the rational-choice framework does not rest on an assumption of rationality.

The validity of this approach, however, rests on the implicit assumption that there are deeper underlying institutions that lead to the selection of optimal (efficient) institutions. The issue of what exactly these underlying institutions are is frequently left unexplored, and thus the analysis can offer only a partial explanation for the observed configuration of rules. Nevertheless, for the purpose for which it was developed, namely examining the governance structures of firms operating in competitive markets within a modern economy, this approach works well and is an "empirical success story" (Williamson 2000, p. 607).

The assumption that organizations are organized efficiently (whether through evolution or design) also underpins much of the modern theory of the firm, including the literature on principal-agent problems within the firm, which studies how management can design optimal incentive systems to motivate workers; the property-rights approach following Hart (1995), which postulates that the boundary of the firm (ownership of assets) is determined in such a way as to minimize the inefficiencies which result from the inability to write complete contracts; and the theory of mechanism design.

Informal rules and norms, such as a "corporate culture", may also develop within organizations, including firms. The internal governance of organizations typically involves a combination of both formal and informal "rules". For example, one approach to overcoming the principal-agent problem between management and workers within a firm is through optimal wage and bonus structures based on contractible output measures. However, an alternative way to motivate worker effort, given the repeated nature of the relationship, is via the threat of firing a worker caught shirking (Bowles and Gintis 1993). While the formal contract, according to which

[7]Nelson and Winter (1982) built an evolutionary theory of the firm based on the evolution of routines – sequences of action which coordinate the activities of many individuals – rather than rules. Routines evolve as successful firms expand and their routines are imitated – perhaps imperfectly – by others, creating a tendency towards the adoption of efficient routines (although possibly with considerable inertia).

the worker is paid a wage for showing up to work, regardless of her effort – is enforceable in the courts, the worker's effort level is not contractible, and so the employment relationship is governed by both formal and informal rules: high effort is enforced informally through threat of non-renewal of the formal contract.

## *3.3 Politics, Informal Rules, and Institutional Change*

The state, of course, is the most important source of formal rules, including laws, constitutional rules and decrees passed by representative bodies, voted on by citizens, or proclaimed by kings. Standard neoclassical economics assumes the existence of a well-functioning "state", and state activities such as taxation, regulation, and the provision of public goods are treated as well-functioning policy instruments in the hands of a benevolent policymaker. While this treatment of the state is useful for some purposes, it is woefully inadequate for others. It makes improbable assumptions about the state's ability to obtain and process the information needed to arrive at an optimal conclusion (Hayek 1945), and it obscures the fact that policy decisions are generally the result of bargaining and negotiation among organizations and individuals with divergent interests, and that implementing these decisions involves motivating and coordinating the organs of the state, such as regulatory agencies, courts, and the police.

A key function of the state, taken as a given in neoclassical economics, is to provide security of property rights and contract enforcement. In the absence of a state (anarchy), individuals must invest resources in the private production of security by acquiring a capacity for violence (Skaperdas 2006). The well-known Hobbesian justification for the creation of the state is that the presence of a higher authority enables people to replace the costly and inefficient spontaneous order of anarchy with a set of rules designed to improve overall welfare.

In Yoram Barzel's Hobbesian theory of the origins of the state (Barzel 2002), individuals begin in a state of nature without institutions, and they find it in their interests to create a state, as a monopolist of violence, to provide order. However, they wish to efficiently limit the state's scope of activity. This raises the question of why the state (which Barzel treats as a single actor) would obey the "rules" that its subjects create for it, rather than using its capacity for violence to expropriate those under its rule or expand the scope of its activity beyond that which is optimal. Barzel notes this danger, and postulates before the people create a state, they will also create collective-action mechanisms that constrain the state's actions by enabling them to overthrow the state if it becomes predatory. However, in keeping with the institutions-as-rules approach, Barzel treats the enforcement of these collective action mechanisms as exogenous.[8] As a result, the enforcement problem (keeping the state

[8]"Although the "social" arrangements used to enforce decisions by collective-action mechanisms seem to be of utmost importance, there is little that I, as an economist, can say about most of them. I simply assume that such arrangements exist and are put into use" (Barzel 2002, p.119).

honest) is merely pushed back one level; ultimately, the enforcement of the formal rules is taken as exogenous.

The problem of empowering the state to create order while constraining it from predation is of fundamental importance. Djankov et al. (2003) postulate that the "institutional design" of the state involves a fundamental tradeoff between "disorder" and "dictatorship": creating a more powerful state helps to reduce disorder and the risks of private expropriation, but at the cost of increasing the costs of dictatorship, corruption and expropriation by the state. Each society has a set of feasible combinations of dictatorship and disorder (an "institutional possibilities frontier"), which depends on a variety of societal characteristics including technology, culture, education, social capital, ethnic heterogeneity, history, factor endowments and the physical environment. In Djankov et al.'s basic model, societies choose an optimal political system (that is, one which minimizes the sum of the costs due to private and public expropriation) subject to the constraint of its institutional possibility frontier.

However, there are a variety of potential impediments to the selection of efficient political rules. Djankov et al. argue that countries which are former colonies might have inefficient rules if the rules were transplanted or imposed by their formal colonial masters rather than arising indigenously. La Porta et al. (2008) find that countries' legal origins affect economic outcomes. The civil law system, they argue favors a greater degree of state control and regulation, whereas the common law system relies more on market-supporting regulation and precedent-setting private litigation.[9]

Many authors emphasize that distributional conflict can lead to the selection of inefficient rules. For example, Libecap (1989) explores the development of the "property rights" rules that govern the use of a variety of resources such as fisheries, mineral rights (mining), and the use of public land. Different rules entail different distributional consequences, and individuals and groups therefore engage in bargaining, lobbying, and political action to try to alter the rules for their own benefit. As in Ostrom's schema, this rule-changing activity ("contracting") is itself a game governed by a higher level of political rules, and these higher-level rules, together with the activities and perceptions of the actors therefore shape the direction of institutional change of the lower-level (property rights) rules.

Acemoglu (2003) and Acemoglu and Robinson (2006) emphasize the importance of commitment problems as an impediment to the selection of efficient rules. Political incumbents might be willing to make concessions to disenfranchised groups in order to avert a costly or violent revolution, but if they cannot credibly commit themselves to honor their commitments to reform after the moment of crisis is passed, then whenever groups have the opportunity, they will seize power and craft rules to benefit themselves without regard for the other groups.

[9]See, however, Hadfield (2008), who casts doubt on the importance of the civil-law/common-law distinction, and provides a richer and more refined alternative set of key parameters for the classification of legal regimes.

Even if a society does initially select rules which are "efficient" in a static sense, these rules may ultimately turn out to be suboptimal in a dynamic sense. For example, Engerman and Sokoloff (2002) argue that the soil and climate in Europe's South American and Caribbean colonies were suitable for the production of cash crops, such as sugar, that could be efficiently produced on large slave plantations, resulting in highly unequal distributions of wealth, income, and human capital, which in turn enabled the elites to establish legal and political institutions that promoted their interests. In the North American colonies, in contrast, the initial factor endowments were more favorable to the production of crops and livestock that could be efficiently produced in small family farms. This led to the development of more egalitarian and democratic political institutions, higher levels of public goods provision (such as primary schooling), and greater levels of social mobility. Acemoglu et al. (2001, 2002) tell a related story, but with the focus on the disease environment and indigenous population density rather than soil and climate as the key exogenous variables explaining the initial development of state institutions. In places where Europeans found settlement difficult, they created "extractive states" aimed at transferring resources to the mother country. In areas more conducive to European settlement, they found it more profitable to build institutions aimed at protecting private property and encouraging investment. These institutions persisted even after independence, and led to a "reversal of fortune" in the nineteenth century, because regions that had previously been poor inherited institutions that later enabled the societies to industrialize.

These arguments give history a role in explaining the scope and functioning of the state. Institutions developed as an efficient response to circumstances in one time period may persist even if they later become inefficient. But why do institutions persist? Again, the basic answer within the institutions-as-rules approach is due to North (1990), who developed a theory of institutional change that combines deliberate changes in formal rules with evolutionary change in informal rules. In North's theory, given the current structure of formal and informal rules, entrepreneurs form organizations to take advantage of perceived opportunities. Over time, as they acquire skills and knowledge, they may find it worthwhile to attempt to change the structure of formal rules. When changes in formal rules occur, then the informal rules which "had gradually evolved as extensions of previous formal rules" (p. 91) adjust in response, and the end result "tends to be a restructuring of the overall constraints – in both directions – to produce a new equilibrium that is far less revolutionary" (North 1990, p. 91).

Thus, North argues that because of the persistence of organizations and informal rules, overall institutional change is "overwhelmingly incremental" (North 1990, p. 89), and that institutional change is a path-dependent process: "the consequence of small events and chance circumstances can determine solutions that, once they prevail, lead one to a particular path" (North 1990, p. 94). Current institutions provide incentives to create particular kinds of organizations and to invest in particular kinds of skills and knowledge. They also affect the distribution of wealth and political power, the preferences of the actors, and the stock of physical and human capital. All of these endogenous parameter changes in turn affect the costs and benefits of

alternative institutions, people's perceptions of new possibilities, and their ability to bring about or stifle institutional change. In all these ways, past institutions can influence the direction of institutional change (Libecap 1989; Pierson 2000; North 1990, 2005).

Building on North's work, a growing recent literature considers processes of institutional change that explore the interaction between formal and informal rules. In Roland (2004)'s theory, informal rules ("slow-moving institutions") are constantly evolving, and if these changes become incompatible with existing formal rules, then pressure for change builds up, leading to periodic abrupt and substantial changes in formal rules ("fast-moving institutions"). Brousseau and Raynaud (2008) build a theory in which new rules begin as informal, local and flexible orders, which compete for voluntary adherents. Successful rules spread, and as they spread, they become increasingly global and mandatory and "harden" into rigid formal rules. Aldashev et al. (2007) show that changes in formal rules can alter outside options and therefore bargaining power within informal relationships, and thereby shift customary informal rules in the direction of the formal law, even if it is never explicitly used.

One difficulty which arises in thinking about institutional change in this way – as an interaction between "formal" and "informal" rules – is that the nature of the "informal rules" is often left rather vague, and how they interact with formal rules – for example, which rule is followed when the two kinds of rules conflict – remains unclear. As noted above, the institutions-as-rules approach treats the question of how rules are enforced, and therefore why they are followed (or not followed), as a separate issue from their content. Thus by definition, if behavior does not conform to formal rules, by default it is attributed to – and assumed to be governed by – unobserved informal rules. Yet, since informal rules are generally implicit, it is hard to observe what these informal rules are, whether in fact they are indeed being followed (and if so, why), and what kinds of behavior they are affecting, and in what way. Attributing unexplained behavior to informal rules therefore amounts to a leap of faith that invokes a mysterious and scientifically untestable explanation for the observed behavior.

The problem is compounded by the fact that the term "informal rules" has been used to describe several quite distinct phenomena. Some authors treat informal rules as internalized "ethical" codes of conduct which are directly reflected in players' preferences (e.g., Ostrom 2005). For others, informal rules are rules which are not written down, or which are not enforced by the state. Still others identify informal rules as self-enforcing codes of conduct, shared cultural "focal points", or as "social norms" enforced within a community using a multilateral reputation mechanism – or as all of these things, as the occasion demands. For some (e.g. Williamson 2000), informal institutions change only over a period of centuries or millennia, so they may safely be taken as exogenous and fixed, while others, such as Roland, hold that gradual changes in informal rules are often an important part of the story of institutional change.

Ultimately, therefore, the institutions-as-rules approach is limited in its ability to explain institutional change because a key element inhibiting and shaping the

direction of institutional change, informal rules, originates outside the analytical framework. For example, Ostrom (2005, p. 138) notes that "many written statements have the form of a rule ... but ... do not affect behavior. Such statements are considered rules-in-form rather than rules-in-use." Yet, because she treats the enforcement of rules separately from their content, any explanation of what makes some rules "rules-in-use" while others rules are ignored is outside her framework. She notes that "in settings where a heavy investment is not made in monitoring the ongoing actions of participants... considerable difference between predicated and actual behavior can occur," (p. 21), but achieving this monitoring and enforcement is treated simply as a cost; the incentives of the monitors are not examined.

## 4 Self-Enforcing Institutions, or "Institutions-as-Equilibria": Conceptual Issues

The core idea in the institutions-as-equilibria approach is that it is ultimately the behavior and the expected behavior of others rather than prescriptive rules of behavior that induce people to behave (or not to behave) in a particular way. The aggregated expected behavior of all the individuals in society, which is beyond any one individual's control, constitutes and creates a structure that influences each individual's behavior. A social situation is 'institutionalized' when this structure motivates each individual to follow a regularity of behavior in that social situation and to act in a manner contributing to the perpetuation of that structure.[10]

The focus on regularities of behavior and the motivation to follow them responds to the observation that these factors, rather than rules, are the direct cause of distinct welfare-related outcomes. The corruption plaguing many political systems in the world is not caused by an absence of rules prescribing preventive measures. It is due to particular regularities of behavior.[11]

Focusing on motivation has the key advantage of avoiding the conceptual difficulties that come with treating institutions as rules. For example, the legal speed limit on highways in Massachusetts is 65 mph, but this limit is widely ignored. This is not to say that there are no "rules", however. Police officers do sometimes pull over cars traveling at 85 mph, but they never pull over cars traveling at 68 mph. What accounts

[10]This idea builds on the 'conventions' literature (e.g., Sugden 1989). See also Schotter (1981), Calvert (1995), Aoki (2001), Dixit (2004), Kingston and Caballero (2009) and Greif (1994, 1998).

[11]A regularity of social behavior does not imply uniformity of behavior as it is a characteristic of aggregates of individuals and not of each individual. Furthermore, social behavior is usually conditional on social roles and does not necessarily imply the same behavior by individuals with the same role. The behavioral regularity of 'males propose to a female and only when they can support a family,' for example, captures gender roles and implies that some males will never marry and the ages of those who do, will vary. Similarly, regularity of behavior is not necessarily frequent behavior. The process of impeaching a US president is regularized although rarely employed.

for the difference between the behavior specified by the "formal rule" and the behavior actually observed? From the institutions-as-rules perspective, the standard answer would be that the police and motorists must be following an "informal rule" – for example, that the true speed limit is 75 mph. But this invokes an exogenous and ad-hoc explanation for precisely what we would most like to explain.

Focusing on motivation complicates the analysis, however. One reason is that regularities of behavior are often caused by the net effect of multiple, and possibly conflicting, motivating factors. The fear of legal sanctions might motivate a teenage driver to slow down, but social pressure from his peers might have the opposite effect.

The evolving institutions-as-equilibria approach has not yet converged on an agreed definition of institutions. On the one hand, Calvert (1995), for example, literally equates institutions with game theoretic equilibria. "There is, strictly speaking, no separate animal that we can identify as an institution. There is only rational behavior, conditioned on expectations about the behavior and reactions of others. . . "Institution" is just a name we give to certain parts of certain kinds of equilibria" (pp. 22–23). The premise of this definition, however, is too restrictive. Game theory provides little guidance for identifying institutions or studying their dynamics. Greif (2006, Chaps. 2 and 5) defines an institution as a system of 'institutional elements,' particularly beliefs, norms, and expectations that generate a regularity of behavior in a social situation. These institutional elements are exogenous to each decision-maker whose behavior they influence, but endogenous to the system as a whole. The social 'rules' which emerge correspond to behavior which is endogenously motivated – constrained, enabled, and guided – by self-enforcing beliefs, norms and expectations. In addition, for an institution to be perpetuated, its constituent elements must be (1) confirmed (not refuted or eroded) by observed outcomes (2) reinforced by those outcomes (in the sense that its ability to be self-enforcing does not decline over time) and (3) inter-temporally regenerated by being transmitted to newcomers.

## *4.1 Self-Enforcing Expectations and Motivation*

An empirically-oriented analysis relying on the institutions-as-equilibria approach focuses primarily on motivation provided by self-enforcing expectations (behavioral beliefs). Such an analysis usually begins by identifying the 'essential' physical, technological and social attributes necessary for the situation to be of interest. In the case of regularities of behavior among drivers, for example, essential attributes include that there many drivers who have property rights (or user rights) in cars, can benefit from driving compared to alternative modes of transportation, can observe other cars, and prefer to avoid accidents. Without any of these features, considering driving behavior is meaningless. Similarly, the analysis would be too general without more narrowly delineating the regularities of behavior we are interested in: is it the direction of traffic, priority-rules at intersections, speeding or passing?

By focusing on a situation's essential attributes, we initially set aside those potentially relevant social constructs that we initially wish to treat as exogenous to the analysis. In the case of driving, these might include such constructs as drivers' licenses, socialization to drive carefully, or a Highway Patrol Agency with the capacity to impose legal sanctions. Initially ignoring such potentially important constructs is not a statement about their irrelevance but a means to analytically examine whether they are relevant, why they are relevant, and to what effect.

The next step in the analysis is to focus on the set of self-enforcing expectations and the implied behavior that can prevail in this situation, by modeling the situation as a game (specifying the set of players, their possible actions, the order of moves, information, and payoffs) and finding equilibria. By "self-enforcing expectations" we mean that if the decision-makers share the expectation that others will generally follow the equilibrium behavior, then each of them will be motivated to follow it as well (the Nash criterion). From each decision-maker's perspective, the others' expected behavior constitutes the structure motivating her to conform to the behavior expected of her. But by conforming, she contributes to motivating others to conform too. Thus, the structure is self-perpetuating, and although it is beyond the control of each decision maker, it is endogenous to all of them taken together. Note that the "self-enforcing" requirement includes expectations about how others will behave in situations that would not transpire in equilibrium. For example, if a player does not steal because of a fear of punishment, the 'off-the-path' expectation of punishment must be credible (this the sub-game perfection requirement).

Having found equilibria in the minimal game, we can next examine how various social constructs can change the set of self-enforcing expectations by changing the expected responses by other players to particular actions. When these expectations are credible, the costs and benefits associated with actions in the minimal game are changed, and the set of potentially self-enforcing behaviors may be enlarged. For example, the creation of a "group" can create restrictions on entry to the situation (who the participants are) and change the pattern of relations (e.g., repeated interactions among the same individuals). Other kinds of social constructs might alter the information structure, or introduce a new actor with the ability to punish or reward players (e.g., a judge).

The introduction of new social constructs can change people's expectations (and therefore incentives and behavior) in many ways. Sanctions can be coercive (such as violence or imprisonment), social (such as ostracism), or economic. Guilt and the fear of expected punishment in the after-life are other means to link past actions to future rewards. The institutions-as-equilibria approach focuses on how such expectations are formed, why, and to what effect. Note that this involves much more than just the introduction of new "rules". In order to shift people's expectations, cognitive categories (e.g., "honesty", "cheating") need to be coordinated upon so that all players share coordinated expectations about punishment. If the desired behavior is to be self-enforcing in the modified, extended game that includes the new interactions, then the punishment should be sufficiently costly to make deterrence effective. Those who are to retaliate must have the information about who and when to punish, which potentially includes motivating those who know about the transgression to

inform others. People must also be motivated to punish, as the expectation that punishment will be inflicted has to be credible. Furthermore, they have to have the physical capacity to punish and those who are to be punished should not be able to evade punishment.

## *4.2 Rules and Organizations in the Institutions-as-Equilibria View*

In the institutions-as-rules approach, rules are institutions and institutions are rules. Rules prescribe behavior. In the institutions-as-equilibria approach, the role of "rules", like that of other social constructs, is to coordinate behavior. Because there are multiple potentially self-enforcing expectations in a given situation, coordination mechanisms, including rules, play an essential role in generating regularities of behavior and social order. Rules fulfill this coordinating role by specifying patterns of expected behavior, and also by defining the cognitive categories – signs, symbols, and concepts – on which people condition their behavior. Actions have to be given meanings because, for example, 'cheating' is not naturally defined, but it must be defined before it can be discouraged. A road sign instructing a driver to yield at a pedestrian crossing has meaning, and motivates behavior, only because it is a component of a system ("rules of the road") that motivates behavior based on road signs.

The behavior that people can be motivated to follow depends on these cognitive categories and on the rules' ability to coordinate expectations based on these categories. Focusing on motivation exposes the limits on the realities that humans can use rules to construct. In order for a "rule" to matter, the behavior must be self-enforcing and it must be conditioned on observable aspects of the situation. If drivers cannot observe a pedestrian's age, they cannot condition their behavior on it. And it must be sufficiently costly to circumvent the categories. For example, a rule which conditions behavior on gender may not be self-enforcing if males can easily pretend to be females and vice versa.

Of course, the behavioral expectations and cognitive categories which people actually use to coordinate their behavior may be quite different from those specified by 'formal rules'. Nevertheless, we observe that explicit "rules" are often formalized and disseminated in a centralized manner. From the institutions-as-equilibria perspective, the creation of such formal "rules" can be interpreted as an *attempt* to achieve a coordinated shift of many people's expectations, while convincing the agents that these expectations are indeed widely shared. This mechanism can also be used, of course, to serve the interests of the politically powerful – those with the power to change formal rules. But if the new rules do not specify a self-enforcing pattern of behavior, they may not have their desired effect.

Organizations, too, are social constructs that change the set of self-enforcing expectations among the agents in the original interaction. Formal organizations, such as parliaments and firms, and informal organizations such as communities and

business networks, have a dual role both as institutions that govern their members' behavior, and as institutional elements within the broader institutions of society. Within the group, an organization can change the relevant rules of the game, such as information, actions, and payoffs sets, and can therefore increase the credibility and severity of sanctions, specify rules, and create shared knowledge. Organizations may also play a role in attempting to shape the preferences of community members, particularly children, through a process of socialization.

An organization and its members also interact, individually and as a group, with the outside world, and the beliefs, norms and expectations that govern the internal interactions between the members of the organization will often differ from those governing their interactions with outsiders. A police force, for example, has internal structures and rules to govern its members' behavior, but it also acts as an organization for enforcing other rules set by the government of the society of which it is a part. The reliance on organizations is fundamentally due to the fact that organizations have capabilities that are more than the sum of the individual capabilities of their members, due to their ability to coordinate their members' activities, economies of scale and scope in their efforts to change the rules of the game, and due to the organizations' longer time horizon and memory.

## 5 Institutions as Equilibria: Applications

### *5.1 Markets and Networks*

The ability to engage in voluntary exchange encourages production, specialization, and innovation, and is a key prerequisite for economic efficiency. However, in all but the simplest market exchanges, enforcement problems arise due to the "fundamental problem of exchange" (Greif 2000). For example, in labor market and credit market transactions, there is an unavoidable separation between the quid and the quo, and at least one party therefore may have an opportunity to "cheat" the other: a borrower may choose not to repay a loan, or an employee may choose not to work hard. Markets can function only when this fundamental problem of exchange is overcome.

Neoclassical microeconomics tends to either assume away enforcement problems, or to take the presence of well-functioning market-supporting institutions as given. The institutions-as-rules approach is an improvement, in that it considers how market exchange may be supported by institutions (rules) that punish defection, such as a legal system, or informal codes of conduct. For some purposes this is adequate. However, these rules themselves ultimately require enforcement. For a convincing account of the institutional foundations of markets, therefore, we need to consider the enforcement not just of the market transactions themselves, but of the rules which govern those transactions. Saying that there is a norm against cheating, for example, is insufficient. It is critical to study how the norm is sustained as part of

a self-enforcing equilibrium outcome of a game in which the enforcement of the norm results from the behavior, and expected behavior, of the players. The same is true if enforcement is carried out by formal or informal organizations, such as a court, a credit bureau, or a community.

In situations where formal institutions do not function well, economic agents may rely heavily on informal enforcement. McMillan and Woodruff (1999), for example, found that in Vietnam, firms scrutinize prospective trading partners carefully, and rely on informal "private order" institutions, including both bilateral enforcement (ceasing to do business with a firm that cheats) and multilateral community enforcement (sharing information about cheaters). However, these mechanisms are a poor substitute for well-functioning formal enforcement mechanisms. McMillan and Woodruff do not investigate how the behavior which sustains these private order institutions is made self-enforcing: why do people share information and punish cheaters, given that doing so is costly?

Kandori (1992) uses a game-theoretic model to show that among a community of players who are randomly matched into pairs each period to play a prisoner's dilemma, a multilateral community enforcement mechanism can support cooperation if the players can observe a label which indicates (roughly speaking) whether their current trading partner is "a cheat", and which is honestly updated through some exogenous process. Several papers study how this kind of reputational information might be shared within a community. Gazzale (2005) shows that players may have an incentive to gossip because a reputation for gossiping can deter their future trading partners from cheating. Greif (1989, 1993, 1994) shows how information transmitted in correspondence among a commercial and social network of medieval traders (the Maghribi traders) supported a reputation mechanism that successfully dissuaded cheating. Merchants who cheated could expect that their actions would be widely reported within the network. Since merchants who were ostracized from the network for cheating had no further reputation to lose, they would be expected to (rationally) cheat in any future transactions; and therefore, each merchant in the network was motivated to punish cheaters by the expectation that others would also do so, so the punishment was self-enforcing.

Note that this approach directs attention away from the content of the "rules" about cheating to the networks and information flows that enable the expectation that other players will punish cheats to be sustained as part of a self-enforcing equilibrium. While the presence of these information-sharing structures (networks and communities) themselves can be taken as exogenous in the short run, if the informal punishment mechanisms sustained by the community are to survive as institutions, the maintenance of such networks must also ultimately be made endogenous to the analysis. In many cases, such as the Maghribi traders studied by Greif, the structure of the network is in large part an outcome of an historical process. However, even networks that are bequeathed by history need to be maintained. One way to study the origins and stability of such networks is to consider group members' incentives to retain their affiliation ex post, by submitting to punishment rather than attempting to evade it (Greif 1993). Another approach is to consider the networks themselves as an outcome of a prior game in which players (individuals, firms, or countries, for

example) deliberately form links with other players (friendships, supply links, or military alliances, for example) (Fafchamps 2004; Jackson 2006). In general, it is not necessarily the case that the networks that emerge through such a process will be "efficient" from the point of view of society overall, because individuals choosing to build links do not take into account the external effects of those links on other players. Greif (1993, 1994, 2006) emphasizes that when the group is an outcome of a historical process, there may not be a mechanism to coordinate inclusion of new members. Inefficient size is the likely outcome.

Even if formal enforcement mechanisms are available, they may not be employed in equilibrium. Kranton (1996) studies a model in which agents choose between trading within an informal network or in an anonymous market in which agency problems are absent – for example, because there is a well-functioning formal system to govern market exchange. The value of market interaction depends on the fraction of players who choose to buy and sell within the market. Therefore, two equilibria arise: if everyone makes use of their informal relationships to obtain goods, then the market is thin, the search costs of finding a trading partner in the market are high, and each individual has an incentive to use her network rather than the market to obtain goods. However, if instead many people choose the market, then finding a trading partner in the market becomes relatively easier, and the informal relationships break down as players' outside option improves. Therefore, either pattern of behavior – a market in which people carry out ephemeral, anonymous transactions, or a pattern of trading within long-lived, "trusting" informal relationships – can emerge as an institution corresponding to an equilibrium of the game. If the society begins in one equilibrium, in the absence of exogenous shocks, or some coordinating mechanism to engineer a coordinated shift in behavior, it may remain stuck in that equilibrium even if the alternative equilibrium would be more efficient. Thus, starting points matter, and history plays a role in equilibrium selection.

Kranton's analysis takes the market as given, but the presence of legal contract enforcement may itself be treated as endogenous. Greif (1994, 2006) has argued that in medieval Europe, the Genoese society characterized by individualistic cultural beliefs and interest-based communities experienced a higher demand for legal contract enforcement than the collectivist cultural beliefs and kin-based community of the Maghribi traders. As a result, the Genoese developed formal institutions including codified contract laws, double-entry book-keeping, family firms, bills of lading, and other antecedents of modern business practices.

## *5.2 Organizations*

As the size of a community grows, relying solely on informal governance may tend to become problematic as players' ability to observe each other's actions, and to share information about transgressions, diminishes. As a result, there is a tendency to evolve from informal to more formal modes of governance.

For example, at the medieval Champagne Fairs, large numbers of merchants from all over Europe congregated to trade. Merchants from different localities entered into contracts, including contracts for future delivery, that required enforcement over time (Verlinden 1979; Milgrom et al. 1990). There was no state to enforce these contracts, and the large number of merchants as well as their geographic dispersion made an informal reputation mechanism infeasible. Greif (2006) argues that impersonal exchange was supported by a "community responsibility system". Traders were not atomized individuals, but belonged to pre-existing communities with distinct identities and strong internal governance mechanisms. Although particular traders from each community may have dealt with merchants from another community only infrequently, each community contained many merchants, so there was an ongoing trading relationship between the communities, taken as a whole. Merchants from different communities were able to trust each other, even in one-shot transactions, by leveraging the inter-community "trust" which sustained these interactions. If a member of one community cheated someone from another community, the community as a whole was punished for the transgression, and the community could then use its own internal enforcement institutions to punish the individual who had cheated.

This system was self-enforcing. Traders had an incentive to learn about the community identities of their trading partners, and to establish their own identities so that they could be trusted. The communities had an incentive to protect the rights of foreign traders, and to punish their members for cheating outsiders, so as to safeguard the valuable inter-community trade. Communities also developed formal institutions to supplement the informal reputation mechanism and coordinate expectations. For example, each community established organizations that enabled members of other communities to verify the identity of its members. Ultimately, the growth of trade that this institution enabled created the impetus for its eventual replacement by more formal public-order (state-based) institutions which could directly punish traders by, for example, jailing them or seizing their property.

However, public order never entirely replaces private order: markets in modern economies contain a mix of private-order and public-order institutions, and transactions may rely on both (Greif 2006). For example, a lender may obtain a credit report on a prospective borrower from a private credit-rating firm that lacks any enforcement power beyond the ability to share information, but it may also rely on state enforcement to seize the borrower's collateral if she fails to repay.

As noted in the previous section, within the institutions-as-rules tradition, it is widely held that the boundary between firms and markets as alternative modes of organizing transactions will be determined so as to achieve efficiency (minimize transaction costs). From the perspective of the institutions-as-equilibria approach, organizations appear as components of broader equilibria, interacting with other institutional elements, and constrained by the past. In particular, if there are many possible equilibria, then there may be different configurations of organizations associated with each of these equilibria, and the structure of organizations, including the boundaries between firms and markets, cannot therefore be deduced from a knowledge of the characteristics of the transaction alone.

For example, during the eighteenth century the institutions governing marine insurance transactions developed in different ways in different countries. In Britain, a coffee house (Lloyd's of London) gradually developed into a sophisticated marketplace for underwriting by private individuals who "under-wrote" the amounts they were willing to insure on policies presented to them by merchants or brokers. In contrast, in France, Holland and the US, private underwriting disappeared and was replaced by joint-stock corporations. The underlying marine insurance transactions were plagued by serious information asymmetries and agency problems, including the potential for various kinds of fraud. Each institutional form – private or corporate underwriting – had advantages and disadvantages in dealing with these agency problems.

Kingston (2007, 2008) argues that the industry was characterized by multiple equilibria. In Britain, an equilibrium based on private underwriting became institutionalized over time through the development of specialized institutions, in particular Lloyd's coffee-house, which became a hub for information about ships and their crews, political and economic developments, and the many other factors affecting the risk of a voyage, and also for information about the reputations of market participants. This ultimately meant that in Britain, the corporations suffered a "lemons" problem because of their inferior access to information about vessels and other developments affecting the risk of a voyage, enabling the private underwriters to dominate the market. In contrast, in the American colonies, although private underwriting had been developing rapidly, it never reached the level of complexity of Lloyd's. Instead, in the late 1790s there was a shift between equilibria as private underwriting was extinguished by competition from joint-stock corporations (Kingston 2011). Kingston (2007, 2008) shows how the timing of a series of historical events, involving both exogenous shocks (such as war) and endogenous parameter changes and learning processes, drove the process of institutional change (equilibrium selection), leading ultimately to a path-dependent bifurcation of institutional structure between Britain and the rest of the world. Each equilibrium, once established, proved stable. Thus, although the fundamental purpose of the transaction – sharing risk – was the same, by the end of the Napoleonic wars, the manner in which the transaction was accomplished was very different in different countries. The "governance structures" that emerged were the outcome of a historical process with multiple stable end-points, rather than being designed to "minimize transaction costs".

## *5.3 Politics*

As noted in the previous section, a fundamental rationale for the existence of the state is that it can use its capacity for coercion to provide order and security. Many contemporary societies face the challenge of building states that effectively promote political stability, curtail political violence, and foster economic prosperity. This has proven no easy task, despite the fact that copying formal rules, including

constitutions and laws, is relatively straightforward. Why don't countries with inefficient or ineffective political structures simply copy the institutional structure of more successful ones? And why do countries that "transplant" formal rules frequently find that this fails to reproduce the desired patterns of behavior?

Within the institutions-as-rules framework, the explanation offered is that behavior is constrained not just by formal rules, but also by the "informal rules" present in a society. But as we saw earlier, this leaves unanswered the question of where these informal rules come from, and how the "rules", including the rules governing the behavior of the state itself, are ultimately enforced. The key puzzle is how to construct a state that is strong enough to provide order and protect the rights of its citizens, but in which political power-holders are nevertheless motivated not to use this power to abuse those rights: in other words, all actors, including "rulers", must obey "the rules". Thus, a stable, well-functioning political system should be viewed as a desirable equilibrium outcome rather than as a set of rules.

Bates et al. (2002) study a model in which players can choose to allocate their effort among three goals: production, leisure, and arming themselves to engage in violence. A capacity for violence enables players both to defend their own productive output and to "raid" the output of others. In anarchy (a situation with no "state"), there are two kinds of equilibria: one in which there is little violence, but also little production, so that most effort goes into leisure; and another equilibrium in which there is production, but also a lot of violence, as people who produce must also be willing to defend their output. As in the Hobbesian vision, the creation of a state as a specialist in violence can improve efficiency by enabling players to produce without fear of being raided by others. In return for taxing the output of the players, the state undertakes to punish raiding. Bates et al. (2002), however, go beyond Hobbes in probing the incentives of the state itself; they show that the state can be constrained from predation by the shadow of the future, since a failure to protect the property rights of the citizens can lead to reversion to a "warlord equilibrium" in which no taxes are paid, and the players arm themselves not just against raiding by other players, but against state predation as well. Thus, the balance of coercive powers can sustain the state as an equilibrium.[12]

Weingast (1997) shows how the rule of law emerged as an equilibrium outcome of a game between a ruler and his subjects in seventeenth-century England. The king (James) initially supported the interests of the landed Tories at the expense of the mercantile Whigs, who lacked the power to overthrow this ruling coalition.

[12]Of course, real-world processes of state-building do not start from the "clean slate" envisioned by Hobbes. Bates (2001) argues that historically, monarchical states emerged out of competition among feudal lineages as rural, agrarian societies based on kinship networks became increasingly urbanized and industrial. Olson (1993) provides an alternative parable for the origins of the state, arguing that the state emerged as those with the greatest capacity for violence found it privately more profitable to use this capacity to provide order in exchange for tax revenue, rather than simply to live by plunder.

However, after the king began to infringe on the rights of the Tories, the Whigs and Tories combined to overthrow him, and installed a successor (William). At the same time, they created a new constitution with the aim of preventing the king from future predation. The new constitution, Weingast argues, was fundamentally a coordination device that laid out the conditions that would trigger a coordinated reaction by the citizens against the king in future. Thereby, it enabled a shift from an equilibrium in which the king was able to transgress the rights of the Whigs with impunity to one in which the Whigs and Tories undertook to jointly resist any transgression by the king against either of their rights.

To achieve this, the new agreement needed to be self-enforcing. Both groups of citizens had an incentive to abide by the agreement, as a failure to do so would enable the king to abuse the rights of both groups in the future. The king was motivated torespect property rights by the credible expectation that both groups would react in concert to an infringement of the rights of either group. Thus, as in Bates et al.'s model, while the players may articulate "rules" to govern their behavior, it is the ultimately the threat of a breakdown of cooperation in an infinitely-repeated game that enables a non-predatory state to be sustained as an equilibrium outcome.

Greif (2006, Chap. 8) studies the process of state-building in medieval Genoa. Genoa's commercial expansion had been hindered by the threat of conflict between two rival feudal clans, which led each clan to waste substantial resources defending itself from the other. To achieve gains from cooperation, the warring clans agreed to invite a non-Genoese ruler/administrator, the *podesta*, to rule the city. The *podesta* held the balance of power between the clans, but was not militarily strong enough to impose his will on them and become a dictator. To avoid the danger of the *podesta* aligning himself with either clan, he and his family were forbidden from involvement in Genoese society or politics. Indeed, the *podesta*'s position depended on ensuring that neither clan became dominant, or they would have had no further need of him. Thus, the *podesteria* system was a set of self-enforcing institutions that promoted inter-clan cooperation and reduced the threat of conflict. The process of institutional change was shaped by the initial conditions, including the set of organizations (in this case, clans), and the feudal rules, beliefs, and norms inherited from the past.

Scartascini and Tommasi (2009) study a model of policymaking in which individuals can either pursue their interests via the formal political process or through violence, protests, bribery, and so on. They show that there may be multiple equilibria: one equilibrium in which all players choose formal channels, and another in which some players use the formal process, but many players "go to the streets". Moreover, the stability of these equilibria is reinforced by actors' investments over time. Their model can account for the differences in observed political behavior between countries with similar "formal rules" (such as the U.S. and Argentina) but these behaviors are explained as equilibrium outcomes rather than by invoking differences in unobservable "informal rules".

# 6 Institutions-as-Equilibria: The Frontier

## *6.1 Beliefs, Culture, and Institutional Trajectories*

In the institutions-as-rules perspective, beliefs influence behavior through their impact on the choice of rules. In North (2005)'s framework, economic agents have "mental models" which reflect their understanding of the world and which they use to evaluate the desirability of particular rule changes. Over time, as they learn about the world, they revise their mental models, and this may alter their perceptions about the net gains from alternative possible rules, or lead them to perceive new possible rules, leading them to try to change the rules. Thus, "the key to understanding the process of change is the intentionality of the players enacting institutional change and their comprehension of the issues" (North 2005, p. 3).

The institution-as-equilibria perspective emphasizes additional causal relations between beliefs and outcomes. Beliefs motivate people's behavior by influencing the perceived costs and benefits of various actions, including expectations about others' behavior. Beliefs matter because individuals have potentially limited and different information, knowledge, and cognitive understanding about the environment and the strategies of other players.

Rules provide one means for people to coordinate their beliefs. Consider, for example, the seemingly unnecessary law specifying the direction of traffic (drive on the left, or drive on the right). Such a traffic law provides new drivers (or those visiting from abroad) with the knowledge required to make an informed decision based on a minimal understanding of the system. Furthermore, because such rules specify self-enforcing behavior, agents are motivated to acquire knowledge of the rules and follow them.

The analysis of the processes through which rules aggregate knowledge and information is in its infancy. A notable contribution is Aoki (2007) who proposes that as an existing equilibrium breaks down, cognitively limited agents perceive that their former strategies are no long optimal, without necessarily understanding why, and begin to experiment with new strategies. As their behavior and expectations change, institutional change – a movement to a new equilibrium – occurs. Eventually, agents' strategies and belief systems are brought back into alignment with each other as mutually consistent components of a new institutional equilibrium.

Greif (2006) proposes a social, rather than individualistic process of learning and convergence. Agents respond to the expected behavior of others as articulated in a known rule of behavior (either formal or informal). The traffic-law specifying a speed limit, for example, constitutes a social rule, known to the drivers and to which each of them responds. Their responses lead them to choose a speed higher than the legal maximum. But this is not explained by asserting that there is a hidden "informal rule" specifying the observed behavior. Rather, as players observe behavior and outcomes over time, the institutionalized 'rules of the road' which develop reflect the dispersed beliefs and information of individuals responding to a 'structure' which is simultaneously created by their aggregated responses to the structure itself.

The institutions-as-rules approach makes a clear distinction between formal rules, which are created in particular by the state, and culture, which consists of informal rules formulated by society. In contrast, the distinction between 'rules' and culture in the institutions-as-equilibria approach is one of kind and not one of essence. Both rules and culture influence behavior by giving rise to shared beliefs, norms, and expectations that generate regularities of behavior. This facilitates studying the inter-relations between institutions and culture.

Clearly, neither culture nor institutions are immutable. There are many historical examples of rapid cultural change. Yet, to the extent that one associates culture with institutional elements that prevailed prior to state formation or emerge independently of it, distinct cultures can lead societies along distinct trajectories of institutional development. The perpetuation and implications of both institutions and culture depend on the context, unintended consequences, and historical contingencies such as the sequence of various exogenous events, leadership, and the outcomes of military conflicts. Cultural change and culture's impact are not deterministic, but a specific culture can render some institutional trajectories more likely than others.

Benabou and Tirole (2006) give an example of how multiple equilibria can result from the two-way interaction between shared beliefs and public policies. They argue that in societies where many people hold a belief in a "just world" – the belief that economic success is highly dependent on effort – these people will favor low levels of redistribution and low tax rates. These policies increase the reward to economic effort, giving people an incentive to adopt (and teach their children) the "just world" ideology. If, instead, people believe that luck plays more of a role in determining individual success, they may favor higher levels of redistribution, which dampens the incentives for high effort, confirming the bases for their beliefs. Note that these ideological beliefs are more than just a reflection of different institutional structures. They are a fundamental part of each equilibrium.

Greif (1994, 2006) showed how distinct cultural beliefs led to distinct developments of contract enforcement institutions among eleventh century Jewish merchants operating in the Muslim world and the Latin-Christian Genoese. Collectivism among the former fostered reliance on enforcement based on a multilateral reputation mechanism while individualism among the latter fostered enforcement based on bilateral reputation and the law. The latter's reliance on the law, in turn, was facilitated by the fact that it was a man-made law and not a divine law. This fundamental distinction in legal conceptions was not instituted by states or rulers but reflected the distinct historical processes through which Christianity and Islam emerged.

## *6.2 Moral Norms and Endogenous Preferences*

A second frontier issue in the institutions-as-equilibria approach is the inter-relations among institutions and preferences. Although some aspects of individual preferences, such as those directly related to survival, are primordial and selfish,

other aspects of preferences are shaped by society because humans have other-regarding preferences and seek moral justification for their behavior. The crucial element here is internalized moral norms or values that individuals are psychologically motivated to follow. An internalized norm against stealing, for example, places a wedge between the net utility value of five dollars earned and five dollars stolen. Such moral norms based on intrinsic motivation are different from 'social norms' which rely on extrinsic motivation provided by the threat of non-legal punishments. Moral norms influence behavior directly through their impact on preferences, and indirectly by influencing the expected behavior of those who are perceived to have internalized such norms.

People are born with the capacity and the propensity to internalize norms, and absorb norms through socialization by role models, parents, peers and organizations (such as schools and churches). Institutions can influence norms through their impact on these socializing agents. Tabellini (2008) provides a wonderful analysis of how norms of generalized or limited morality can evolve in the same situation depending on the incentives institutions provide to parents. Specifically, a parent faces a trade-off between socializing her child to have her norms or socializing the child to have the norms which would be optimal for the child in the future. Institutions influence this trade-off.

Akerlof and Kranton (2005) discuss the value of intrinsic motivation within organizations. They use the military as a compelling example of an organization whose members are primarily motivated by non-monetary incentives (such as honor). Such a theory of motivation has important implications for organizational design. For example, employing a supervisor to monitor a worker's effort may enable the firm to motivate the worker using high-powered monetary incentives, but Kranton and Akerlof argue that there is also a hidden cost: hiring the supervisor may also reduce the employee's sense of identification with the firm and its goals, thereby eroding the firm's "motivational capital" (worker's loyalty).

Akerlof and Kranton's work is related to an emerging literature on "endogenous preferences", much of which uses evolutionary arguments to investigate the role institutions play in molding not just people's behavior, but also their goals (Bowles 1998). These theories emphasize that while institutions, being man-made, are created through human action (whether intentional or not), institutions also play a role in reconstituting the goals and perceptions of the individuals they govern. The integration of these considerations in the institutions-as-equilibria perspective is in its initial stages. If successful, it will improve our ability to study norms as one element in a larger system in which people are moral, yet materialistic, and motivation is provided by endogenous beliefs, norms, and expectations.

## *6.3 Origin, Dynamics and Complementarities*

The institutions-as-rules approach, as we have seen, studies institutions as (exogenous) constraints (rules) leading to (endogenous) behavior, while enforcement of the rules is treated as a separate issue. Institutional dynamics is fundamentally about

changing rules, and the analytical focus is on changing formal rules. In contrast, the institutions-as-equilibria approach focuses on the behavioral manifestations of endogenous motivation; how (endogenous) behavior generates (endogenous) institutions that perpetuate this behavior. Institutional dynamics is therefore fundamentally about changes in motivation and regularities of behavior, and the analytical focus is on changes in beliefs, norms, and expectations (Greif and Laitin 2004; Greif 2006).

Two causes of institutional change are particularly important. The first is an intentional attempt to bring about change by those who realize (or hope) that they can benefit from it. This kind of institutional change can result from the perception of new institutional possibilities, perhaps brought about by learning or by new interactions with outsiders. Because the existing institutions are equilibria, however, they generally cannot be changed unilaterally by a single actor. Bringing about a change may therefore involve overcoming collective action problems as well as overcoming the opposition of those who stand to lose from the change. Such collective action may occur through persuasion or through the use of new or existing organizations, or, less commonly, through the rise of a charismatic leader.

The second main cause of institutional change is "institutional disequilibrium" which results when an institution ceases to be self-enforcing. This can occur either due to exogenous shocks or due to endogenous changes in "quasi-parameters" (Greif and Laitin 2004): variables which change gradually over time as a result of the operation of the institution itself, and may ultimately pass a critical threshold so that the institution ceases to be self-enforcing. Whether the subsequent institutional change is gradual or abrupt, evolutionary or intentional depends, in particular, on whether the actors are cognitively aware of the process leading to change, who is aware of it, and how they can institutionally respond.

The details of the resulting new institutions, if they lead to the intended outcomes, are partially dictated by the function they have to serve. Yet, there are many institutions that can achieve the same objectives. From the institutions-as-equilibria perspective, past institutional elements influence the details of subsequent institutions because institutionalized beliefs, norms, and expectations are embodied in people's beliefs systems, preferences and memories, while existing organizations have enduring physical capacities, routines, and other resources. Although it may be technologically possible to create new beliefs, norms, expectations and organizations, doing so is usually costly, time consuming, and requires venturing into the cognitively unknown (Greif 1994, 1998, 2006).

There is therefore a *fundamental asymmetry* between institutional elements inherited from the past and technologically possible alternatives. Past institutional elements are the raw material on which new institutions are based. Sugden (1989) argues that people wishing to coordinate their strategies will generally adopt rules which are analogous to rules with which they are already familiar, for example, the "first come, first served" rule which is used to assign property rights in many situations (and thereby avoid potentially costly conflict). Greif (1989, 1994) argued that organizations inherited from the past and cultural beliefs determine selection among alternative institutions. Patterns of organizational membership determine whose identity is known to whom, and where information flows, while cultural beliefs

coordinate expectations. Campbell (2004) argues that actors often create new institutions through a process of "bricolage": recombining elements in their institutional repertoire to deal with new situations. New institutions often resemble older, familiar institutions because they contain elements inherited from or inspired by past institutions. Greif (2006) delineates how exactly past institutional elements influence subsequent institutions through their environmental, coordination, and inclusion effects.

Thus, the institutions-as-equilibria approach conceptualizes institutional dynamics as an accumulative historical process of inter-related institutional elements. Past institutional elements are incorporated into new institutions that emerge within the context of – and hence are complementary to – existing institutions. The results are *institutional complexes*, which are a set of institutions that govern various interactions, have common institutional elements, and are complementary to each other. Society's institutions have to be studied from a holistic, systemic perspective (Aoki 2001).

## 7 Concluding Notes

Recent scholarship has demonstrated the power of the rational choice framework for advancing our understanding of institutions and institutional change. And as our understanding improves, the conceptual frameworks employed to study institutions continue to evolve, enabling us to develop richer and more complete answers even as we probe deeper and more complex questions about the nature of institutions and processes of institutional emergence and change.

From the institutions-as-rules perspective, institutions are rules that are either optimal responses to the institutional environment or are determined by the interests of the political actors who make the rules. This approach has been fruitfully applied to explore how the "rules of the game" are formed in diverse settings. However, because enforcement of the rules is treated as exogenous, the institutions-as-rules approach works best in situations where there are, in fact, well-functioning and transparent enforcement institutions which can be taken as given, and in which the rules (whether formal or informal) are easy to observe, so that they may be expected to translate more or less directly into effects on human behavior.

If these conditions are not met, then ultimately, to explain how the rules are enforced (or not), and why they are followed (or not), the institutions-as-rules framework must be supplemented or replaced by a theory in which enforcement is treated as endogenous, and the incentives of all players to follow the rules are explained rather than assumed. The institutions-as-equilibria approach focuses on motivation provided by beliefs, norms, and expectations that both shape individual behavior whilst simultaneously themselves being a product of the strategic interplay between agents (individuals or organizations). Thus, both the content of the rules (behavior) and their enforcement (people's motivation for following them) can be studied within a unified framework. The key to institutional change, from

this perspective, is not just changing rules, but changing players motivations and patterns of behavior in a self-enforcing way.

These two approaches can be seen as complementary parts of the analysts toolkit. The institutions-as-rules approach seems appropriate for studying the development of institutions within an established structure that can enforce the rules, for example, in a stable democracy within which basic market-supporting institutions are already well-established. The institutions-as-equilibria approach might be better suited to studying the institutional foundations of markets and democratic political structures, and other situations in which enforcement of the "rules" must be considered as an endogenous outcome rather than taken as given.

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