# “Climbing the Hierarchical Ladders of Rules”: the Dynamics of Institutional Framework

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Abstract:

We analyze the process of emergence and evolution of institutions by pointing out how self-interests shape the design of institutional settings. We provide a framework in which “local and voluntary” institutions endogenously turn into more “generic and mandatory” ones. This leads us to analyze how a competitive process is automatically launched when institutions are decentrally created by agents, which leads to a race for generalization by which promoters of local orders are led to promote adhesion to their preferred rules among alternatives. We see then institutions as sponsored by groups of core members — often the founders — who have incentives, in certain circumstances, to cooperate with other sponsors playing on the same battlefield or imposing a higher rank order.

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# 1 – Introduction

Recent work in various sub-fields of economics highlighted the impact of institutions on economic development (or the lack of) and the importance of institutional changes. There is now a large literature suggesting that institutional rules deeply affect economic growth (Acemoglu and ali., 2001, Rodrik et al. 2004), for instance through the legal system they encompass (Djankov et ali., 2003, La Porta et ali., 1998) or the design of the political process (Person and Tabellini, 2006). In addition, recent examples from previously communist states suggest that it takes more than macroeconomic policies to succeed in a smooth and growth-enhancing transition toward market economy (Roland, 2000). Institutional change is also the heart of the reform as the creation of institutions to secure individual property rights and contractual agreements is a prerequisite for running a market-based economy.

This paper is a contribution to the analysis of institutional dynamic. In particular, we provide a framework in which "local and voluntary" institutions endogenously turn into more "generic and mandatory" ones. Our research is in the spirit of New Institutional Economics (hereafter NIE). A now classical distinction (at least among NIE scholars), introduced by North (1990), disentangles the institutional environment from institutional arrangements (see also Williamson, 2000). The former refers to the general institutions of societies that set the "rules of the game" and make them mandatory, either because these rules are enforced by a coercive, last resort power (*i.e.* the State), or because they represent the beliefs and conventions that serve to create the identity of a society (religion, customs, language, etc…). This institutional environment frames a wide range of heterogeneous (bilateral) interactions. In this sense, it is generic and mandatory. In contrast, the notion of institutional arrangements applies to mutual (and most often bilateral) commitments voluntarily established by contracts between agents as analyzed by Williamson (1985, 1996, and 2000) and many other scholars (e.g. Brousseau and Glachant, 2002, for an overview). We refine this dichotomy by identifying and integrating in the analysis intermediary levels of coordination (Brousseau and Raynaud, 2007). These intermediate levels are characterized by the fact that *voluntarily* and *collective* coordination takes place. They draw from the necessity for individuals who share common coordination problems to benefit from a collectivization of their effort to design rules and manage their enforcement.

This distinction between alternative levels of the institutional framework leads us to an analysis of the evolution of institutions, where bilateral governance structures, intermediate

and generic institutions are various steps of a life cycle, which makes it easier to study their natures and their interplays. To use a comparison, we see generic institutions like solidified lava — which hardens while spreading over a surface —, as the result of a process via which inter-individual negotiated agreements may become intermediary institutions — which are less negotiable agreements and broader in scope — that may then become generic institutions, which are non-negotiable. Some historical examples seem to fit this pattern of evolution. Kingston (2005) studied the evolution of the marine insurance business in the 17 and 18$^{th}$ centuries in England and in the U.S. He showed of rules originally designed almost "from scratch" by a set of private underwriters (in the Lloyd's coffee house) become progressively adopted by most of the market participants. Banner (1998) documented the same kind of progressive adoption of "local rules" by market participants in the evolution of the New York Stock Exchange, and their progressive implementation in the legal framework. Benson (1989) also analyzed the evolution of commercial law, emphasizing its spontaneous characteristic. All these examples suggest a "bottom-up" dynamic in the creation and evolution of rules. This point is also emphasized in Cooter (1994, 1996) for the creation of legal rules. Actual formal law may be the result of decentralized experiences in rules creation, some of them progressively becoming "institutionalized" rules.

We therefore establish a temporal and logical continuum between contractual governance mechanisms and institutional ones. Our general theory is as follows: the private order of a particular private institution is based on collective negotiations and the voluntary acceptance of common rules. However, with the passing of time, the set of common rules may apply to a wider community. This development makes these rules both decreasingly negotiable and increasingly mandatory. The private order may then become rigid — no longer negotiable — and mandatory — no longer based on voluntary adhesion — and end up becoming a generic and mandatory order. We thus see generic/public institutions as the consequence of the spreading and solidification of *some* private institutions. Below, we explain the drivers of processes of institutional change.

We start by reviewing the existing literatures and by pointing out the dichotomy between two approaches of institutional change, that we try to reconcile to a certain extent (section 2). We then explain our analytical frameworks pointing out, in particular, how self interests shape the design of institutional settings (section 3). This leads us to analyze how a competitive process is automatically launched when institutions are decentrally created by agents, which leads to a race for generalization by which promoters of a local order are led to promote adhesion to

their preferred rules among alternatives (section 4). We see then institutions as sponsored by groups of core members — often the founders — who have incentives, in certain circumstances, to cooperate with other sponsors playing on the same battlefield or imposing a higher rank order (section 5). Section 6 briefly concludes.

# 2 – Related Literatures and Our Contribution

## *2.1. Institutions as designed rules versus as convergences of anticipations*

As recently pointed out by Aoki (2001, 2007), there is a large diversity of use among economists of the term institutions. This diversity probably reflects the immature stage of research on this issue and Williamson (2000) suggested that, "*the recommendation is that, awaiting a unified theory, we should be accepting of pluralism*" (p. 595).[2] In an attempt to sort alternative meaning of institutions among economists, Aoki (2001) disentangled two main conceptualizations of institutions (see also Kingston and Caballero, 2007): institutions as "rules of a game" versus institutions as "endogenous equilibrium outcomes of a game". The first branch, conceptualizes institutions as the (formal and informal) rules of the game in a society, *i.e*. distinct from its players (North, 1990). Law, constitutions are examples of formal rules whereas norms, conventions are examples of informal rules. Rules are designed and negotiated among groups of interests. The second one analyzes institutions as self-sustaining system of shared beliefs (Aoki, 2001, p. 10), which are the equilibrium of a repeated game (see also, Greif, 2005, 2006; Aoki 2007). These shared beliefs generate behavioral rules that "stabilize" and reduce the complexity of social interactions. In both views, institutions reduce uncertainty by providing a frame for interactions.

How do these approaches analyze institutional evolution? This analysis depends of course of the way the two approaches view institutions. Viewing institutions as sets of rules, the first approach try to understand why and how do rules change. Different layers of (formal) rules are distinguished in North (1990, p. 11) from constitutions to individual contracts. Williamson (2000) also stresses a hierarchy of institutional layers from social embeddedness to resource allocation. Both of these authors contrast these institutional levels according to

[2] This was stressed in a funny way by Roland (2004): "*However, there are by now probably as many interpretations of the new institutional bible as there are different Protestant churches*" (p. 3).

how quickly they change. The higher an institutional layer in this "hierarchy", the slowest it changes (see for instance Williamson, 2000, p. 596-597, and Ostrom, 2007). This is nicely summarized by Roland (2004) who distinguished between "slow-moving" and "fast-moving" institutions. The formers refer to institutions, like social norms, which generally change slowly and incrementally; whereas the latter may change more rapidly and in a discontinuous way. In this "institutions as rules", perspective, evolutions occur because of shift in exogenous parameters like relative prices (due to access to stock of resources) or technological innovation (Libecap, 1989). North (1990) emphasizes the endogenous driver of institutional changes due to political competition among agents or groups to benefit of a given institutional design. In this approach, institutional change is driven by competition among political actors that try to change the rules to their own benefits. Organizations or organized groups are key players in this competition for rules-making. As previous institutions partly shapes bargaining power of different players, and as institutional changes may result in redistribution of costs and benefits among agents or groups (Libecap, 1989, Pirrong, 1995), institutional change is a path-dependent process. In his last book, North (2005) lengthen the list of (endogenous) drivers of evolutions by pointing out the role of learning and beliefs

The second approach tries to understand how beliefs do change. Institutional change results from destabilization of a prevailing equilibrium, and of a process of convergence toward a new set of shared beliefs. In situation of "institutional crisis", individual agents are looking toward new ways of playing the game and experiment (Aoki, 2001, 2007). A new set of shared beliefs may spontaneously (or "decentrally") emerge because of the creation of a new "focal points", or through impulse given by an organization or an entrepreneur. Just like in the previous view, competition prevails in institutional crisis among alternative focal points or alternative "new vision of the world". Path dependency may also occur. New focal points are never completely unrelated to previous ones, and the success of (political) leaders in bringing new visions depends on their previous institutional positions.

## *2.2. A Sponsored Approach to Institutional Development*

Several ideas emerge from the previous rapid survey of current vision of institutional changes. Firstly, path-dependency plays a role in institutional changes. Secondly, competition among different rules or "visions" is at play. Our contribution to the literature on institutional

dynamic takes stock of these analyses and proposes a "synergetic" approach[3]. We study the endogenous transformation of (some) "local" institutions into "generic" ones, through a competitive process in which institutions seek to attract new "adopters". Even if the local institutions at the origin of these processes of expansion correspond to convergence of beliefs, the competitive process among alternative institutions tend to have them sponsored by those who benefit the most of a given order. Thus more generic institutions tend to become of "rules of the game" types. In this process of competition among orders setters, path dependency and networks effects play a role. Furthermore, those benefiting of already established generic orders and able to handle the formal rules making and related enforcement mechanisms may have incentives to promote some decentrally-designed orders to avoid being completely bypassed by these emerging orders.

The previous literature, and this is especially true for those analyzing institutions as rules, disentangle alternative layers of rules with different sets of properties, in particular their ability to change and their scope of application. The logic of rule making is different at the various levels, which explains contrasts in their nature and in their factors of evolutions. The design of local orders are driven by efficiency consideration (in the line of Williamson), while the design of institutional systems is dominated by compromise among political forces (in the line of North and Weingast). As a result, rules may remain "stuck" forever at one level. Rules relied upon by a given group of agents will not be adopted by additional agents and thus will never shift to a "higher level". This justifies a theoretical separation between the levels of analysis. For instance, in Williamson (2000), the rules decentrally designed to solve bilateral coordination hazards do not turn into more "global" rules governing multilateral interactions.[4]

Actual facts show, however, that "local experiments" might become the tomorrow formal rules of the game. For instance the regulation of Internet provide interesting examples of new rules locally set that might become part of the future global regulation of the information society (Hadfield, 2000; Brousseau, 2004). In the same spirit, the regulation of franchised agreements at the European level has been mostly based on ethic codes and guidelines

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[3] Synergetics is an interdisciplinary science explaining the formation and self-organization of patterns and structures in open systems. See in particular H. Haken: "Synergetics, an Introduction: Nonequilibrium Phase Transitions and Self-Organization in Physics, Chemistry, and Biology", 3rd rev. enl. ed. New York: Springer-Verlag, 1983; and H. Haken: Advanced Synergetics: Instability Hierarchies of Self-Organizing Systems and Devices. New York: Springer-Verlag, 1993.

[4] Even if, in itself, the concept of governance is broad enough to encompass not only bilateral but also multilateral interactions. Authors like Aoki (2001, Dixit (2004) or Greif (2006) strongly suggest that governance might be collective.

designed by the profession (including the legal definition of franchising, see OECD, 1994). In this respect, we are close to the literature on rent seeking or "regulatory capture" emphasizing that the origin of regulation is rooted into the effort of particular pressure groups (see Stigler, 1971, for a seminal contribution). In this approach, regulation is mostly seen as a bottom-up process where groups tend to soften potential public regulations, which is a way for local groups to transform their favorite local rules into generic ones. However, our approach differs in two important respects from this literature. Firstly, this literature remains silent to explain why, even in the absence of public regulation, sponsors of local rules have incentive to expand them and turn them into regulation. Secondly, while a way to get generalization/expansion of the scope of application of a self–regulation is a negotiation with public regulators, we also take into account the fact that privately designed rules might become the norms for doing business in a particular sector bypassing and "covering" the public regulations and the social norms in place. For instance, the description of the US cotton and diamond industries illustrates the fact that merchants may reject state-supplied commercial law and develop industry-specific sets of trade rules and related enforcement devices (Bernstein, 1992, 2001). This is a case of "vertical institutional competition" between privately-designed rules and state law. Moreover, competition among "levels" of governance is not always between central formal institutions — symbolized by the state — and local self-organizing communities. If economic development is characterized by the progressive shift from personal to impersonal exchanges (North, 1990, North et al., 2006), the emergence of the formal institutions that promote the later and surpass the informal one sustaining the former has to be explained.

Thus even if we rely extensively on the view of "institutions as rules" developed by North (1990) to characterize our vision of institutional framework (institutional framework as a set and a hierarchy of rules) we aim at contributing to explain the endogenous change of institutions by pointing out some orders generalize by "climbing the hierarchical ladders" of the "hierarchy" of institutions. Furthermore, we explain instead of taking for granted, why these alternative layers of rules have different characteristics, in particular their different ability to change.

# 3 - Institutional Frameworks as a Multilevel System of Rule Making and Enforcement[5]

In this section, we describe our framework. Firstly, we analyze the main functions of alternative institutions or governance devices — namely to define and enforce "orders" —. We have in mind a situation where the institutional framework is made of several "levels" corresponding to wider (or narrower) sub-sets of the population fitting in each other. Individuals are embedded in "local" orders that sustain coordination within "local" communities. These orders are themselves embedded in wider intermediary institutional frameworks that provide additional coordination means to wider communities. These intermediary institutions are themselves included in generic institutional frameworks establishing common means of coordination for all the members of the considered population of reference (3.1). We explain the rationale for the creation of different levels of order provision by detailing how orders are agreed upon by agents on the basis of individual assessments of costs and benefits (3.2). This allows us to endogeneize a process of formation of collective orders that do not bring equal benefits (reduction of transaction costs) to all. (3.3). This leads us to justify the main costs and benefits attached to the different levels of provision of orders (3.4).

## *3.1. Nested Governance Systems*

Two key features of our framework should be emphasized from the beginning, as they will shape our reasoning in this section and, more generally in the rest of the paper. Firstly, we consider a finite population of reference made of heterogeneous agents.[6] All agents have both contrasted preferences and endowment, which result in heterogeneous coordination needs. Thus, the more general the order, the more it must deal with heterogeneous coordination needs. Secondly, we consider coordination problems in general, not only those related to economic transactions (*i.e.* the transfer of property rights for goods or assets). Governing the transfer of property rights is important, but it is just a sub-set of the coordination issues involved in the creation and enforcement of property rights. For instance, rules in a

[5] This section heavily relies on Brousseau and Raynaud (2007).

[6] Heterogeneity may be assessed in terms of "distance" between agents. Our understanding of "distance" between individuals in the reference populations is pretty wide. Distance may be geographic, or more generally socioeconomic (for instance, based on needs or preferences).

condominium do not regulate trade, but the mere fact that some agents share a common space. So we prefer to speak about interactions rather than transactions.[7]

Any institutions play two main roles (North, 1990): creating rules and providing enforcement capabilities.[8] A rule is the allocation of decision-making rights to agents, stating what they can or cannot decide concerning the use of resources or their interaction with other agents in various circumstances. Rules state sets of (authorized, forbidden or mandatory) actions to be taken and/or allocate decision-making rights (delegation of prerogatives, negotiation rules).[9] In addition to creating rules, governance also involves ensuring they are enforced.[10] In line with Barzel (1989) and Allen (1999) we consider that transaction costs are the costs for measuring and enforcing rights of access and of use over resources, and the costs of establishing and managing agreements to reorganize and transfer these rights. Since the rules provide economic agents with a certain ability to use resources, the later consider the difference between the "efficiency of use" resulting from a given order and the "level of transaction costs" when they must decide which governance principle to apply or create. By convention, we will use the notion of transaction cost minimization in this paper, but as pointed out in the NIE literature, it must clearly be understood as the maximization of governance efficiency.

The notion of institutional layer we rely on refers to the population subset coordinated by the governance mechanism in question (or the size of its "jurisdiction"). We qualify the provision of an order to a pair or small subsets of agents as "local" or "decentralized" governance. The provision of both common rules and common enforcement for the whole population or

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[7] Our notion of interactions is close in spirit to the definition of "transaction" given in Greif (2006, p 46).

[8] Enforcement is also intrinsically linked to rule making. On the one hand, it is different because it consists of complying with (a) rule(s) and exercising retaliation. On the other hand, enforcement often involves settling additional rules. Observed situations must be interpreted because rules are expressed in general terms that do not necessarily relate to the complexity of the actual situations faced by agents. Also, enforcement often results in the creation of default rules that apply when the rules to be enforced fail to state precisely the required behavior for a specific context (in other words, the system of rules to be enforced is incomplete). So there is complementarity between enforcement and rule making.

[9] In practice, the nature of these rules widely differs. They can cover the provision of tools for interacting (e.g. languages and nomenclatures, measurement systems, technical standards, etc.), indicate how to get in touch (whether parties are anonymous or not, whether they can exchange types of information, etc.), control the behavior of parties in certain circumstances (by stating, for instance, liability principles or a "fair" dealing principle), and/or provide them with solutions to help create inter-individual agreements (e.g. standard reference contract , etc.).

[10] Enforcement can be provided for rules established at the same "level". But also for those created at higher and (most often) at lower levels. In a given nation-state, for instance, the judiciary is responsible for enforcing both the law and bilateral contracts.

jurisdiction is described as "generic" or "centralized" governance. We then consider that there are several levels of governance on this vertical "centralization/decentralization" axis.[11] When the order is (more) centrally provided, uniform principles are applied to a larger fraction of the population. When the order is (more) decentralized (or provided at lower levels of governance), different principles are applied to small(er) sub-sets of the population, which means several orders co-exist.

Institutional systems are therefore understood as nested levels of governance — which can be illustrated by Russian Matriochkas — ; higher levels wrapping lower levels of governance.

## *3.2. Orders as the result of decentralized processes of negotiation and adoption*

In our framework, individual agents are embedded in a, or a set of, pre-existing "generic" order(s). These generic institutions set the "general rules of the game". They may take the form of state-level collective rules or social norms and grant agents with initial rights and general coordination solutions and hence the initial costs of transactions.[12] However, this order is both incomplete and imperfect. It is incomplete because it cannot cover the diversity of coordination needs (and this is related to our assumption of a population made of heterogeneous players). It is imperfect because it provides broad and general coordination solutions that might be not adapted to idiosyncratic or particular situations. Some transactions/uses cannot be performed because transaction costs are prohibitive, or in other situations, transaction costs could be lower if more appropriate coordination solutions were available. So agents must make individual efforts to more clearly tailor their property rights over economic resources, to transfer them and ensure they are enforced (Barzel, 1989). This takes the form of bilateral contracting among parties (incompletely) describing both parties commitments and related enforcement devices. However, when several pairs of agents face similar coordination challenges (*i.e*. transaction, collective action, providing public goods and

[11] Our approach shares with the literature on fiscal federalism this notion of alternative levels of public goods production on a vertical axis (see Oates, 1999, 2005 for recent surveys). As pointed out by this literature, centralization leads to the provision of a uniform order (and which is not challenged by an alternative order). To the opposite, decentralization provides diversity (see Brousseau and Raynaud, 2007, for more on this).

[12] Within the NIE framework, this means that the institutional environment defines property rights over economic resources and provides mechanisms to enforce agreements (Barzel, 1989, North, 1990). Pirrong (1995) published a detailed description of the functions of institutions. Institutions in his analysis provide tools for defining and enforcing property rights, enforcing contractual agreements, mitigating information asymmetries and related contractual risks, and providing public goods (for instance, collective rules for coordination). We share a similar view.

usage), they are motivated to build collective devices to more effectively overcome this set of difficulties on a joint basis. Intermediary institutions emerge to address coordination problems at a lower cost than bilateral and generic devices. Previous works on specific sectors or industries showed that "private institutions" or "self-regulations" sometimes govern and foster market exchanges by creating a private and collective order through deontological codes, collective agreements, "private laws" and their related enforcement mechanisms (among others, Bernstein, 1992, 2001, Pirrong, 1995, Greif, 1993, 2005, 2006, and Milgrom *et al.*, 1990, Ogus, 1999).[13] The initial agreement at the heart of intermediary institutions results in the creation of a "club", *i.e.* a set of agents who agree to adopt common coordination rules and decision mechanisms for creating additional rules or adapting existing ones.[14] Because agents have heterogeneous coordination needs, several intermediary institutions or "clubs" may decentrally emerge.

When deciding to agree on a common order— or when deciding to adhere to an existing set of rules and related enforcement mechanisms — individual agents consider transaction costs and select the principle of coordination that save the most. However, agents try to economize on the transaction costs they individually bear. As long as they have different preferences for orders (and this is related to their heterogeneity), there may be differences between the interests of an individual, and the interest of a coalition, and the collective welfare for adopting a given order. Thus the collective order selected is not necessarily the socially efficient one.

## *3.3. The Emergence of Orders Centered Around Kernels*

We detail this process by first studying the case of two agents. Individual preferences and differences in bargaining power determine which common order is selected (3.3.1). We then study the case of an agent bargaining with an established community of agents already coordinating thanks to a particular order. This allows us to endogeneize differences in bargaining power (3.3.2).

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[13] In the same spirit "community" mechanisms are recognized as powerful tools of regulation to manage the provision of common goods like irrigation systems, fisheries, or oil reservoirs (see Ostrom, 1990).

[14] Like the rules, each mechanism may differ greatly. It may take the form of a simple negotiation process stating how a proposal can be made, discussed and approved among members of the club. It can be based on the delegation of decision-making rights (authority) to a decision maker such as one of the parties, a committee, external expert, etc. Lastly, the mechanism can be more formal and lead to the setting up of an organization for creating rules on the basis of delegating power to "representatives" of the various stakeholders within the club; these representatives are backed by experts hired to help them.

### 3.3.1. The Influence of Relative Bargaining Powers

The set of rules that will be selected in a given "club" will depend on the type of coordination issues agents must deal with and of their bargaining power. Let us contrast two types of coordination cases: in a "coordination game" type of problem, agents have converging preferences on the most desirable solutions; whereas in a "battle of sex" games, agents have interest in coordinating but their first best diverge. In the former case, the only problem is to "coordinate" in selecting compatible behaviors when several first bests exist. In the second case, the problem is to agree on a common rule and we will see that the distribution of outside option matters.

In the following, we consider a situation where there are two "players" (A and B) who have to choose between to possible common rules of coordination and related enforcement mechanisms (1 and 2). These orders result in transaction costs born by A and B. When agents "agree" on a common order, they benefit of lower transaction costs than when they fail to agree on common coordination principles. This reduced level of transaction costs refers to the idea that they use more efficiently the available resources and dedicate less time and energy to access them and capture benefits. While agreeing on order 1 or 2 leads to a better outcome that failing to agree on a common order, these two orders might have contrasted impacts on individuals and on the collective welfare. In the following tables 1 to 3, we consider alternative levels and distributions of transaction costs reductions between the two players. Each of the matrixes is filled with the outcome of the combination of behaviors of agents in terms of "individual" transaction cost they bear. Boxes corresponding to "order Y x order Y" correspond to agreements to rely on a common order. Boxes corresponding to "order Y x order Z" correspond to an inability to accept a common order. Either agents do not coordinate at all together (autarky), or they coordinate with third parts (which however are less interesting counterparts in the exchange), or they have to settle a more costly third type of agreement on a common order (order 3). All these possible alternative solutions correspond to their "default options", which best alternative result in the "transaction costs" indicated in the two "order Y x order Z" boxes.

It is important to have in mind that we try to analyze the fundamentals of the adoption of common rules by agents. While it is convenient to describe how agents converge to common rules and common enforcement principles in terms of negotiation and agreement, this is not always the way it goes. Indeed agents can accept to comply with common principle of coordination simply by considering the costs and benefits of the alternative options they face.

If these options are known by the parties, they might accept to converge to common rules even if they do not formally negotiate. Whether they formally negotiate or not, we believe that if agents are in asymmetric situation, it is likely that those with poorer alternative options, will be led to comply to orders that fit better to the preferences of those with richer alternative options, and this is essential to understand which collective orders are likely to emerge and why a competition among orders takes place. In the following we therefore rely for simplicity on the idea of negotiations, but we are in a non-cooperative game configuration. No third part attenuates the meeting of selfish interests. This does not prevent the emergence of collective orders, while it shapes their logic of emergence.

The first case to be considered is when agents have converging interest. This is illustrated in table 1. Both parties prefer to adopt a common order (since this allows them to minimize transaction costs). They are however indifferent between orders 1 and 2. They therefore have to agree on one of the two possibilities — e.g. “driving right or left” — to actually comply with the same coordination principle. This is a pure coordination game that is easy to solve if communication between the parties is allowed. The problem of agreeing on a common order would even be simpler if one of the two orders would be less expensive for at least one of the parties. In both cases, if the agents succeed in adhering to a common order, they minimize individual and social transaction costs.

**Table 1: Pure coordination game**

| Player A / Player B | Order 1 | Order 2 |
|---|---|---|
| Order 1 | 2, 2 | 10, 10 |
| Order 2 | 10, 10 | 2, 2 |

Choosing a common rule really becomes an issue, when parties have different preferences over the common order to be adopted. This corresponds to a “battle of sexes” type of coordination configuration. Each of the parties prefers to agree with the other on a common order, since the two available options allow them to benefit of lower transaction costs. The solution preferred by A is however more costly for B than the solution preferred by B, and vice versa. In that case, relative exit options matter. Table 2 illustrates this. It is important to note that, while the two possible common orders are more socially efficient than the situations in which the parties fail to agree on a common order, order 2 is a more collectively desirable order (total cost = 6 €) than 1 (total cost = 9 €). In case the two parties fail to implement a common order, A incurs lower (8 €) transaction costs than B (10). A benefits therefore from

an ability to impose his preferred order to B (Muthoo, 1999). A can indeed comply with the order that minimize his transaction costs, whatever B does. B's best response is to accept order 1 to pay 6 € rather than 10 € in transaction costs. Knowing that, both parties will converge toward order 1, while order 2 would minimize social costs.

Because B has a lot to loose if order 1 is selected, on could assume that she would be ready to compensate A to make him indifferent to the two orders by paying him at least 2 € if he accepts to comply to 2 rather than 1. Such compensation *à la* Hicks-Kaldor would guarantee the adoption of the most efficient collective solution. It is however implementable if and only if a costless and enforceable agreement between A and B is made. In a situation in which such a "Coasean bargaining" is too costly or cannot be guaranteed by a third part — which is consistent with our objective to analyze the "spontaneous" emergence of a collective order in a non-cooperative game framework —, a convergence of "adoption decisions" between the two parties depends on their respective bargaining powers only. B will have therefore to accept a loss of efficiency corresponding to higher transaction costs due to A's higher bargaining power. B will both bear the social loss and a *de facto* transfer of transaction cost from A to him. We call the difference of transaction costs incurred by B between the situation in which he benefits of his preferred rule (2) and the one he has to accept a worse one (1) maladaptation costs (here – 5 €).

**Table 2: "Battle of sexes" type of coordination game**

| Player B \ Player A | Order 1 | Order 2 |
|---|---|---|
| Order 1 | 3, 6 | 8, 10 |
| Order 2 | 8, 10 | 5, 1 |

### 3.3.2. Coalition Formation, Endogenous Evolution of Exit Options, and Dynamic of Adoption

Up to now, we have described a convergence/agreement between two agents whose respective outside options are exogenously given. Let us endogeneize them by pointing out how the emergence of collective orders impacts on the outside options of agents having already adhered to a common order or not. To do so, we describe the "negotiation/adoption" when B faces a group of agents A already relying on a collective order 1, which can be qualified as a *de facto* "club" of users of 1. The new situation is described by Table 3, which draws from Table 2.

Main changes are due to the evolution of the relative positions of A vis-à-vis B. There are benefits of adopting a common order and it results in transaction costs decreasing with the size of the club (for reasons developed in Brousseau and Raynaud (2007), and synthesized in the section 3.4.).[15] Generally speaking, users of rule 1 will experience decreasing transactions costs (for instance -1 € in our case). This impact on the costs of A and B if they would deal together on the basis of rule 1 (which explain the new values in the north-west box of the table). This impact also on A's cost of not agreeing with B. Indeed, for any member of the club of the users of rule 1, the best outside option is to deal with one of his peers. He benefits from lower transaction costs than before, even if the best deal he can make in the particular considered case is with B. Thus, all things equal, A's exit option decrease from 8 to 7 € in each of our "order Y x order Z" boxes. The emergence of the "A club" impacts also on B's exit options which becomes less advantageous. As the "A club" expands, the number of potential alternative partners in the population decreases for B, resulting in less opportunities and greater risk of rent capture because of small number bargaining (outside from club A). This leads to an increase in B's transaction costs in each of our "order Y x order Z" boxes (+ 2 € in our case).

The emergence and growth of a club of adopter of the same order (here 1) weakens any outsider's bargaining position and increases any B's incentives to join the club by adopting order 1 rather than order 2.

**Figure 3: "Battle of sexes" type of coordination game when one of the players is a "club"**

| Player A / Player B | Order 1 | Order 2 |
|---|---|---|
| Order 1 | 2, 4 | 7, 12 |
| Order 2 | 7, 12 | 5, 1 |

To sum up, we suggest that when they implement a collective order, and when they have diverging interests, and when there is no way to implement side payments, agents adhere to the order preferred by the agents with the more attractive outside option, and therefore the more bargaining power. One of the origins of these more attractive outside options is the belonging to a group already relying on common rules to coordinate. Therefore, individual

[15] Of course, there are also costs linked to a more generic order. Their analysis is also developed in Brousseau and Raynaud (2007) and in the section 3.4. We consider here, however, a situation in which a more generic order has already been adopted by the members of the A club, which can only result from lower transaction costs among them, since the order is voluntary.

agents seeking to coordinate with members of groups are more likely to adhere to the order of this group, than the reverse even if the order does not result in a minimization of their private transaction costs. The larger the group, the more likely is an individual to accept an order which does not minimize his own transaction costs (nor social costs), while transaction costs of the members of the clubs tend to be minimized.

In dynamic, it leads to the emergence of order around agents who, at the beginning of the process, were able to establish collective coordination principles fitting with their needs, and were nevertheless adhered to by additional members that had to accept the logic of the emerging order (up to a limit set by their alternative options of coordination in the society).

## *3.4. A Synthesis of the Costs and Benefits of Alternative Levels of Governance*

Up to now, we have assumed that there are benefits to coordinate at a "higher" level — within a club rather than through a bilateral contract —, while agents at the fringe bear maladptation costs. We review here the costs and the benefit of settling an order on a more centralized basis (which can be read as the benefits and the costs of settling a social order on an increasingly decentralized basis). This section sum-up the "centralization vs. decentralization" trade-off explored by Brousseau and Raynaud (2007)

The benefits of centralization (which are therefore also the cost of decentralization) are due to the combination of three effects:

(i) scale and scope effects: the wider the community to which a common system of rules applies and is made enforceable, the more the fixed cost of designing rules and establishing means of supervision/constraints can be shared among the members;

(ii) learning and specialization benefits: the wider the community to which an order applies, the easier it is to dedicate specific means and to specialize them in designing efficient principles of coordination, in supervising agents, in developing means to constrain them.

(iii) reduction of collective welfare losses: when an order is designed/enforced at a collective level, interdependencies among individuals are taken care of (are internalized), whereas several orders co-exist they can be partly incompatible, resulting in higher costs of coordination among individuals complying with heterogeneous orders and in externalities among communities. Thus the more unique

the order applying to a society, the less inconsistencies among local arrangements, and the wider internalization of externalities, and the higher is the creation of positive network effects due to the use of common rules.

On the other hand, centralization generates inefficiencies due to:

(i) (static) maladaptation: the more central is the provision of an order in a given society, the increasing heterogeneity of individual preferences and coordination needs, to which common solutions are applied. Thus, the increasing share of individuals who have to comply to coordination principles that are not their first best; and the wider the gap between the preferences of the members of the kernel and the members of the marginal circles of the community. The more centrally provided the order, the higher maladaptation costs in the society.

(ii) (dynamic) maladaptation: the larger the community to which a common order applies, the more difficult it is to manage adaptations to evolving coordination requirements. Indeed renegotiations of the rules are more difficult to organize due to the wider heterogeneity of preferences. In addition, core members being able to externalize costs on the other members of the community (who have less exit options when the order is more centrally provided), they have fewer incentives to adapt to new requirements. The more centrally provided an order, the less likely it is to adapt to needed changes, resulting in higher maladaptation costs.

(iii) Higher information asymmetries: the larger the community, the more difficult it is to supervise members of the community because information asymmetries cumulate. This result in costs either due to non-compliance, or to efforts made to supervise members of the community despite information asymmetries.

(iv) Increased enforcement requirements: since individuals complying with a collective order have to bear higher (static and dynamic) maladaptation costs when the order is more centrally provided, while they have less exit options (because they are fewer alternative collective orders), individuals have increasing incentives to free-ride. This result in increasing needs of enforcement, which leads to higher costs.

(v) the rise of private capture of the order: again, the more central the order, the less exit options for those who comply to it. Kernel's members have therefore increasing capabilities to benefit from their asymmetric position to externalize costs on peripheral members and to capture rents on them. They also have increasing incentives to do so

since the field to harvest grows with the enlargement of the community (due to more centralization). Thus capture should increase.

It has to be pointed out that the three first categories of costs are "social" costs in the sense that they result in higher amount of resources spent in coordination activities, while the fourth category is essentially a matter of redistribution (which can nevertheless have consequences in terms of social costs by distorting incentives).

As it is understood, there is not best way to establish an order. Centralization and decentralization have their own advantages. Given the nature of the coordination problem, the shape of interactions networks, and their dynamic of emergence, some institutions can stop growing in scope, because additional expansion would increased transaction costs for members and even for members of the kernel.

## 4 - From Evolving Local Orders to Static Generic Orders

In this section, we explain in detail the dynamic of our institutional framework. We do so here by analyzing the competition between local orders in attracting new members to reach a higher level. In this section, we consider the drivers of the competitive process between emerging and developing orders. To do so, we consider generic institutions as "passive". There are no strategic interactions between promoters of local orders and the actors managing global orders. In section 5, we will relax this assumption by looking at the strategic interplay among "sponsors" of the alternative institutional layers.

Our analysis relies on the idea that a generic order tends to be rigid and non-negotiable. Its principles are not renegotiable *per se*. The order is mandatory because agents have no exit options. Those who refuse to comply are excluded from the society and loose their endowment and ability to interact with others. Generic rules and enforcement capabilities state indeed the distribution of initial rights of decision among agents. The resulting distribution of abilities is the starting point for negotiations between them. In that context, agents establish orders organized at sub-society levels. They are based on negotiations between a limited set of agents, seeking to settle common coordination problems. These orders are emerging and evolving. They are only restrictively mandatory because agents have exit options and voluntary adhere. They are therefore negotiable and renegotiable through an enhancement process. They are "drafts", which can be made more effective though learning-by-using (in fact, learning-by-interacting) and through additional negotiations, which either allow for the drawing up of rules to meet additional coordination needs (either those of

additional stakeholders or corresponding to problems that were not addressed before), or improve the initial draft. Rules in force are thus both incomplete and changing. They can be amended as long as the amendment improves the situation of at least one individual, without downgrading any other individual situation.[16] In what follows we details the reasons why some voluntary and local orders tend to expand, and by doing so become more generic and more mandatory; some of which becoming the future generic orders characterized by stability and mandatoryness. According to us, institutional evolutions result from an (endogenous) dynamic, driven by: (4.1) the benefits to be gained by users of a "fresh" order if it is expanded to a wider population, and the resulting competition among providers of alternative sets of emerging rules, (4.2) the (marginally decreasing) learning effects.

## *4.1 - Competition between Collective Rules and Incentives for Growth*

In a given generic institutional framework, transfers and the joint redesign of individual property rights through a set of bilateral agreements represents an option. However, such decentralized management is costly. Agents can therefore agree on common principles to transfer or change these decision-making rights at an "intermediary" level, in order to benefit from lower transaction costs. Since agents have heterogeneous coordination needs, sub-sets of agents with common coordination problems and similar preferences for solving them are encouraged to set-up local common orders.[17] Several local orders may therefore emerge.

When a local order is established, its founding "members" are encouraged both to boost the efficiency of the common rules and to include other agents in their 'community'. In both cases, it leverages the benefits they gain from the private collective order. Since there are alternative orders, competition for their adoption by additional economic agents occurs. Local orders then compete for members, just as technologies compete to attract adopters (Katz and Shapiro, 1985). Thus, while private institutions are "clubs", whose primary goal is not necessarily to attract new members, any given "club" has to consider the marginal and

[16] This is actually more complex, since amending a rule can make an individual's situation worse in two cases. Firstly, if his outside options are also worsening, he will prefer to stay in the coalition because his overall trade-off forces him to accept the losses. Secondly, the coalition can choose to implement a change that will harm one of its members, even if the victim leaves the coalition, if the cost to remaining members of losing a member is less than the individual benefits they gain by implementing the amendment.

[17] Because they must interact between each other, because they are neighbors (geographically or in a shared transaction chain), or because they face the same coordination problems (they transact similar goods or services).

dynamic effects of expansion (or of members leaving). As a result, whether they provide similar or contrasted "coordination services" to various sub-communities, emerging institutions compete (either frontally or at the fringes) to provide collective rules for any member of the given generic institutional framework.[18]

To illustrate what we mean, imagine a space where a finite number of agents interact. Given the web of their interactions, several subsets of agents emerge and create local orders to boost coordination between themselves. These subsets have incentives to grow. They therefore attract the neighbors of members of each subset, and subsets grow concentrically. At some point, the space is invaded by all the subsets and the only way for each of them to continue growing is to absorb the marginal members of competing subsets.[19]

As mentioned earlier, agents compare the net benefits of "membership" — adopting an institution's system of rules— with the net benefits of alternatives (adhering to a rival private institution or not adhering to any institution). An institution becomes generic (or an order provided a more central level) when there are no longer any alternatives, or when the cost of not adhering is prohibitive. How does the trade-off evolve with the passing of time? Network effects and the evolution of outside options are two key drivers. The first one increases the benefits of membership, whereas the second one reduces the availability of alternatives.

### 4.1.1 – Increasing Network Effects

Firstly, as a local order expands, individuals are increasingly interested in joining because it provides them with more efficient coordination solutions. The link between the size of the

[18] The benefits of growth are hindered at some point by the cost of further expansion as highlighted in section 3.4. and more generally in Brousseau and Raynaud (2007). However, unlike those of Buchanan (1962), our "clubs" have many reasons to grow. One of the main incentives to grow is that we consider a specific type of public good (a coordination mechanism) that is definitively non-rival, while in Buchanan's analysis of clubs providing common goods, he considers mainly rival resources (like physical equipments). We acknowledge however several factors inhibiting growth. In our analysis, they are not due to congestion effects, but to the fact marginal members are likely to have preferences and coordination problems that widely differ from those of the "founding/core" members of the institutions, resulting in a marginally decreasing level of positive externalities as the community expands. Increased "maladaptation" of more general rules to the specific needs of members of the club as their diversity increases, and the resulting increased cost of private enforcement are the main reasons why coordination "clubs" might stop growing.

[19] Recall here that the notion of space and proximity here describes either to a spatial metric or a metric in the spaces of agent's characteristics or preferences. A "neighbor" can be next door, or an agent in the same industry or an agent sharing the same beliefs.

"club" — the number of its members — and its efficiency depends on two kinds of network effect and apply both to measurement and enforcement issues.[20]

There are direct and positive network externalities (Katz and Shapiro, 1985) associated with the size of the clubs. For each member, growth widens the scope of potential partners, with whom transaction costs are lower due to common standards, shared visions, and reduced information asymmetries. A larger community of users allows greater diversity of trade within the group (Cooter and Landa, 1984). Furthermore, the risk of hold-ups related to small number bargaining (Williamson, 1985) decreases when the group of users increases. If adopting a common order requires "specific" investments, the redeployability of these assets increases with the size of the group. These positive network externalities form the basis of endogenous-style competition between institutions, whose members have incentives to increase membership.

Direct network externalities are boosted by indirect ones. As in competition in the field of technological standards (Arthur, 1989, David, 1985, Farrell and Saloner, 1986, Liebowitz and Margolis, 1994), increasing returns of adoption give the most adopted local order a competitive advantage in the competition among orders. Each new member strengthens the incentives of non-members to adhere, since each potential adopter understands that new members mean the order will provide him with a better service, and also, every new adhesion increases the probability the order will survive in the future (if other agents make similar predictions).

### 4.1.2 – Decreasing Outside Options

Another driver is the (endogenous) evolution of outside options. Indeed, local clubs that successfully attract new members, decrease the attractiveness of rival "clubs" with similar goals. This incites members of the latter to gradually leave. At the same time, the benefits of leaving are reduced for members of the expanding community. At the end of the process of competition, only the most attractive order — which became increasingly attractive during the

[20] Since we insist here on networks effects, we do not get back to other drivers of collective institutions building, in particular economies of scale and learning/specialization effects. Since any institution has to complete/update/enhance its system of rules and manage its enforcement operations, any given club might has incentive to grow to share the related costs among a growing number of agents. See again the benefits of centralization highlighted in section 3.4.

whole process — remains available.[21] Consequently, members of the "winning" local order no longer have credible exit options.

Joining another order is unattractive, because the remaining local orders provide coordination solutions that are totally maladapted to the coordination problem they must manage. One option for a dissatisfied member is to create an alternative order to compete with the existing dominant local order. The cost is inevitably high because it means convincing other members to join and devoting time and energy into creating a set of alternative rules. The latter agents will hesitate because they will no longer benefit from the advantages of the existing order, and because the additional benefits from the new competitor are uncertain. They can also leave the local order and rely only on rules provided by pre-existing generic institutions, or alternatively try to establish bilateral and more detailed governance arrangements. In both cases however, agents give up potential benefits attached to the successful local institutions. With generic rules as the only coordination devices, they run the risk of higher misfits between general solutions and their specific coordination needs. With detailed bilateral governance, this risk is mitigated, but agents will sacrifice benefits related to collective rules. So as the "market share" of a particular local institution increases, members have fewer opportunities to quit.

### 4.1.3 – The Strengthening Effect of Switching Costs

There is an additional reason for increasing the attractiveness of a local order within a competitive context. If the costs of switching from one institution to another are not zero, members of communities have incentives to enhance coordination efficiency among them.[22] Otherwise, marginal agents would leave and, by doing so, threaten the future of the local

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[21] Many reasons prevent a private institution from totally dominating all its competitors. As mentioned above, and as documented in studies on the diffusion of standards, negative effects may come into play, and hinder positive network externalities, thus limiting growth of any network. In the case of coordination solutions, it is easy to see why small, highly specific communities, that do not need to interact intensively with other communities, prefer to maintain highly specific coordination rules, rather than adopt non-specific and transversal rules. In addition, as pointed out in the percolation approach to distribution, the distribution process itself can maintain the viability of "islands" or agents using a different solution than those in the "ocean", because, within the community that depends on the "dominated" standard (of coordination) switching costs are too high to encourage individuals to leave. This maintains the viability of the dominated solution. Lastly, selection processes can be biased and the "inefficient" solution may win the race, leaving some space for the efficient one to exist (like the Macintosh OS in the industry of PC operating systems).

[22] Assuming positive switching costs appear reasonable, given that rules must be learnt and might require specific investments to be enforced, and since a member who chooses to join community A rather than community B should take this decision because A provides him with rules better adapted to his coordination problems. In this case, leaving A for B, or for any other community to which he does not spontaneously belong, carries an opportunity cost.

order that would become less attractive. By the end of a process of competition among orders, remaining members have to bear the costs of switching to alternative institutions. Competition for "membership" endogenously generates incentives to improve the quality of collective rules. Members of "local clubs" therefore rely on learning, trial and error processes, specialization, innovative effort when drawing up rules to cut transaction costs among members of the club, and by doing so reducing reasons for leaving.[23]

Network effects, the reduction of outside options, and better quality rules explain why "negotiated and adhered" sets of rules becomes "given and mandatory" with the passing of time. At the beginning of the process, the local order or club is the consequence of negotiations with outside options as the default solution. If a local club wins over rivals, then outside options become weaker or disappear. The institution no longer needs to be negotiated and adhered to. The order becomes mandatory.[24] At this stage, the local order becomes generic. Thus, generic orders basically differ from local or intermediate ones because they are mandatory, but this defining feature is due to the emergence and evolution of local and voluntary orders.

## *4.2 – Learning Effects and Adaptation Costs - Drivers of the "Freezing Process"*

Another driver that results in the "freezing" of some orders is a decrease in the benefits of learning. At the beginning of its "life cycle", the initial rules characterizing a local order evolve because the learning process can improve them. With the passing of time and as the community expands, agents test the actual efficiency of coordination solutions in various contexts, assess their robustness and identify potential inconsistencies between them, or difficulties in implementing them, etc. In addition, the expansion of communities widens the

[23] This relates to the idea, highlighted by Liebowitz and Margolis (1994, 1995) in the case of technology, of competition between "sponsored" institutions. Members of communities are not passive in the case of increasing returns of adoption, resulting in path-dependency. Those who at the core/origin of the institution realize that they must influence the "initial conditions" and "small events" that determine the institution's "market share". They are encouraged to stimulate adoption, to promote their solution, and improve the quality of the "service" provided for "users" (i.e. members of the private institution).

[24] While we consider the economic reasons we give for the "freezing" path from local to generic institutions are sufficient for justifying it, there are probably other causes for this process. For example, psychological drivers could also strengthen the economic process. Indeed, with the passing of time and successive generations, boundedly rational agents may well forget the starting point of their present negotiations is the consequence of a compromise made in the past. For them, the present distribution of decision rights is given, and no longer needs to be justified. The collective rule, initially established by cost/benefit analysis carried out by each agent, is no longer based on such analysis because agents forget what the *ex-ante* costs and benefits. The *ex-ante* situation is purely virtual and meaningless for them. So they reason on the basis of their "acquired rights".

diversity of potential "developers" and "users", which increases the probability of identifying efficient solutions.[25] However, for a given rule these learning benefits should be decreasing at the margin. Learning indeed depends on the use of a given rule in various contexts. If the distribution of coordination situations is a Gaussian, opportunities to experience never-faced-before situations should decrease with the repetition of tests over time and as the community of users expands. Indeed, members will gradually recognize most common situations and their best solutions. In addition, the usefulness of new knowledge decreases because it applies to scarcer situations (reducing incentives to learn). Lastly, with the expansion of institutions to include new users, the increasing heterogeneity of preferences might make changes and adaptation more difficult because of a lack of agreement over the requested changes (since they potentially result in the redistribution of costs/wealth among members). This is the cause of the costs of dynamic maladaptation highlighted in section 3.4.

To sum up, we identify a "life-cycle" of governance devices. In a given generic institutional framework, agents who frequently interact and share similar coordination problems are encouraged to settle them using collective rules. They create local and voluntary collective rules and enforcement mechanisms. These local institutions are originally aimed at settling a limited set of identified issues that are not resolved (or that are unsatisfactorily resolved) by generic ones. These local solutions may however spread and generalize in two understanding. They apply to a wider population. They may be used to solve a wider set of coordination problems. This is so because benefits of common orders and networks effects create a will for standardization of coordination rules at a wide scope (even if islands of diversity can persist), and because they are benefits for those relying on a given order to have the later becoming the most universal possible. Initiators and adopters of a given local order are therefore incited to promote them, in particular to avoid the generalization of alternative solutions that would not fit with their preferences. Promotion is based both on enhancement of the efficiency of the existing order and to its (limited) adaptation to the preferences of the potential new adopters. These incentives to change and evolve decrease with the generalization of an order. The poor exit options for members, the costs of renegotiations among a wide number of heterogeneous

[25] This ability to mix a wide variety of "cognitive profiles" is generally considered one of the competitive advantages of open source software communities, compared to the commercial "closed" mode of software development.

agents, and the benefits of channeled to the members of the kernel (see below), tend to freeze change.

# 5 – Competition among Sponsored Orders: The Strategic Interplay among Institutional Layers

Our analysis results therefore in a sponsored approach to the development of institutions. Whether institutions are spontaneous ("equilibrium") or constructed ("rules of the game"), they tend to benefit more to a group of core members that were at their origin. Indeed we see the movement of institutional development as the design and implementation of a collective order by a kernel of agents sharing common interest in solving collectively common problems (linked to trade or to the provision of public goods) who have then interest in having additional agents adhering to the same order. This results in multi-tiers institutions at the centre of which there is always a or a group of "sponsors", particularly interested in the survival of the rights and principles of coordination they have established. Whether the institutions built around this kernel are formal or informal, these sponsors have interest in developing strategies vis-à-vis each other. Given the possible strategic game among these sponsors, we identify below the different possible strategic interactions, their contexts, and the factors that could influence the dynamic of institutions in various circumstances.

We start by analyzing the horizontal competition between various competing local institutions (5.1). Then we study the vertical competitive process between (more) generic institutions and local ones.

## *5.1. Competition and Alliances Between Local Institutions*

As explained in section 4, there is a *de facto* competition among local institutions due to the benefits drawn from a unified order and due to the fact that a uniform order is the result of a process of adoption of this order by the whole population to the detriment or alternative orders. This competition is obviously stronger among orders that emerged in "close" sub-sets of the population. Closeness refers here to the distance in terms of (potential) links (or interactions) between the groups referring to the two considered orders. If there are several direct links among the members of the two sub-population (or even if there are members who belong to the two sub-sets), there are strong potential efficiency gains in establishing a common order. Everything being equal, the members of the two sub-populations, especially those (at the fringe) who are in touch with members of the other population, will favor the

raise of a common order between the two populations. Institutional competition is obviously weaker when there are no direct links among members of the two sub-groups. It is nevertheless potential since if these local institutions expand, it is likely that they will be in "direct" competition in the future.

One important consequence, is that sponsors of a given institutions, who are those who have the most to loose in case of victory of a competitive institution have strong incentives to attract those agents that are "go between" the two sub-populations or to incite them to adhere more strongly to "their" institutions, rather than to the alternative one. Again, the outcome of the game is a question of exit options. The later are partly exogenously given by the preferences and the initial endowment of individuals that state the most desirable transactions, partly endogenously established by the emergence and evolution of local institutions that lead some individuals to become "links" among memberships of alternative clubs. When institutions spread and come closer to each other, some individuals not only becomes go-between among the sub-populations, but also have their exit option becoming more appealing because they can choose between two alternative orders. This leads both kernels to take into account the preferences of these pivotal agents in the design of the order to convince them to adhere and to the opposite to quit the competing institutions. It is easy to understand that the resulting processes of adhesion could be highly path dependent, since each of the two groups of sponsors have strong incentives to convince these individuals to adhere. "Small events" in the attraction tactic are likely to play a strong role due to the dynamic of percolation and to the strength of networks effects. However it may be expected that the attractivity of a kernel is depending upon its closeness with these pivotal members and with the (ex-ante) density of links between members the group of pivotal agents and members of the kernel. In any case, strong movements of institutional reforms are to be expected when the spread of local institutions leads to multiply the "points of contact" between them. In certain cases it can even be expected that these pivotal individuals become the kernel of a higher-level institution that would result from the *de facto* merger between two local institutions. Again, the result is expected to be strongly depending upon the topology of the network of interactions/transactions within and across the two competing local institutions.

The strength of the competitions for the "go-betweens", its uncertainty, as well as its potential effect in matter of the determination of the future kernel — and more generally of the hierarchy of individual interests taken into account in the design of the more collective order — can lead the members of the two kernels to ally and collectively build a common order

privileging their interests, while compromising between each other. The bargaining strength of the pivotal agents should be an essential factor pushing for the formation of such coalitions. Also, if the two competing institutions are built around networks of interactions highly centralized around a core group, none of the two kernels can expect to win a competitive process, and the competition of alternative local institutions can lead them to come to a compromise.

"Poaching of go-betweens" and "explicit mergers" are therefore the two faces of the intense competition that might occur when local institutions provide orders to two communities that are closely linked and even entangled. When it is not the case, the two main competitive choices in the hands of the kernels' members are the enhancement of the quality of the order to make it more attractive to any adopter (either by increasing the overall quality of the order or by adapting it more to the requirements of marginal members), and the manipulation of switching costs. Indeed, rising the later is a good way of weakening exit options of any member. It has two advantages: it strengthen the institution as compared to its competitors since, everything equal, it raises rivals' costs of "acquisition" or new adopters (meaning that they have to make more efforts in adapting their order to potential new users); in addition it strengthens the power of the members of the kernel, reinforcing their capability to capture rents over members. In practice, manipulating switching costs can take two forms. First, it can be based on specific investments that are inherently lost when leaving the "club". These can be linked to adhesions fees (like in franchise systems) or to investments in equipment, learning, social capital, that are required to rely on the rules and enforcement capabilities provided by the club. Second, it can be based on ex-post retaliations in case of defection. Clans and Mafias exercise terrible repression to make the cost of defection as exorbitant as possible. Ostracization is common in traditional societies. Many modern social networks, while imposing less costly sanctions, manage to make exit costly since it is a good way to compete against competing orders.

It is worthwhile to note that while enhancement of the quality of the order is a tool available to kernel's members of both formal and informal institutions, the three other "competitive instruments" are available only when formal institutions are operating. To be more precise, the manipulation of switching costs is more effective in a formal context, since the defaulting member will be publicly sentenced and formal and informal mechanisms will be mobilized to enforce the penalty. In the case of informal institutions, detections and interpretation of possible infringements are let in the hands of each member of the community as well as

retaliations. Information asymmetries — which rise with the size of the group — tend to prevent perfect enforcement. The fact that poaching and mergers rely on negotiation, clearly make them more accessible to kernel of formal institutions since in that case entities are recognized by the members as responsible for the management of the institution (design of rules, management of enforcement, control of the process of inclusion/exclusion). Formal institutions are therefore expected to be more adapted to competition than informal ones. Increasing competition among institutions should favor formalization, and formal institutions are expected to be more successful, than informal ones (everything remaining equals).

One important consequence of these statements is that kernel's members should be major drivers of formalization of institutional framework. It is a way to enhance their capability to compete against competitive institutions. It has however a drawback. A process of formalization leads to establish formal delegation of authority and to institute organizations. While the influence in an informal institution is *intuitu personae* based on leadership, recognition in social network, (etc.), the authority in formal institutional frameworks is based on formal delegation. An internal competition, within the concerned community, may take place to take control of it to re-organize the institution to the benefits of another sub-groups.

This latest comment leads us to analyze vertical competition, which occurs among higher and lower level institutions (as well as within institutions between coalitions corresponding to the different tiers of the club).

## *5.2. Vertical Competition Between Rulers*

Following our reasoning, at a given moment in time, the mandatory aspect of the generic institutional framework becomes a relic of the past. This suggests that local institutions challenge the generic one and that generic institutions are "sponsored" as the local institutions are (5.2.1). While they may benefit the community of their "users" (which would otherwise make every attempt to escape the "mandatory" order), the benefits are higher for some groups of core members. This leads to identify several patterns of possible relationships between the sponsors of the local institutions and those of the generic one (5.2.2). While different, this view is consistent with those who consider the rent-seeking approach to institutional design.

### 5.2.1 – The Generic Institutional Framework resulting from a Sponsored Selection Process

When growth is completed, a local institution closely meets the coordination needs of those who share similar characteristics with its founding members. Those who differ from this group of core members adhered because it was their second best option. However, the collective rules were not designed to optimally meet their coordination needs. They merely meet their participation constraints, given their respective external options. On the "periphery" of the institution, agents adhere due to the lack of a better external option; despite the fact it fails to optimally meet their coordination needs.

The fact that generic institutions no longer suffer a credible and permanent fear of departure does not mean they do not reduce transaction costs. Firstly, even if selection processes do not always promote the most efficient solutions[26], competition between private institutions encourage improved efficiency of the order they promote. The "frozen" orders were adopted and enhanced in a competitive context. Secondly, common *de facto* mandatory rules are necessary conditions for coordination. Generic institutions are useful simply because they exist and so provide a common basis for inter-individual coordination and negotiations. This is developed in Lewis' (1969) notion of convention, which is no longer related to its initial purpose.[27] Lastly, existing generic institutions are permanently challenged by the emerging and growing private institutions (see below).

While generic institutions are not systematically inefficient, the fact they are "frozen" and no longer evolve is a problem, because individual needs change due to technical change, economic and social development, progresses of knowledge, etc. These evolving needs result in agents "completing" or "bypassing" the given institutional framework by creating new and innovative private institutions. Thus, institutional changes are mainly driven by innovations introduced by the creation of private institutions by agents. Faced with increasing discrepancies between generic rules and their changing coordination needs, agents have two options: change the generic institutional framework, or create private institutions. The former

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[26] Since the success of a standard depends on individual (not collective) benefits and interactions between strategies (Axelrod 1984, 1986), on path dependency (David, 1985) and, in particular, on lock-in effects (Katz and Shapiro, 1985) and initial conditions (Arthur, 1989)

[27] For instance, driving (right or left) was initially justified by the need to avoid accidents in military formations because riders could wound infantrymen with their swords. With the passing of time, this initial justification is no longer valid. It is only useful because everybody enforces it, and also because the physical infrastructure has been built to comply with the rule.

is extremely costly and often impossible, since taking control is difficult[28] and often does not suffice to wipe out the core generic institutions, which are partly embedded in social and individual beliefs (Aoki, 2001; North, 2005; Greif, 2006). The latter option is easier to implement. Private institutions are, of course, not necessarily set up to transform generic institutions. The main aim of their founders is to implement tools to coordinate more effectively. But as pointed out earlier, initiators have incentives to expand the scope of the institution they create, and this triggers a "natural" trend, which sees (successful) private institutions generalize and "freeze" until becoming generic.[29]

We see therefore two major factors of change for generic institutions. They do not radically differ from those driving change in local institution, but the context is different. Indeed, local institutions are malleable and competing (for growth and survival). Within private institutions, change is driven by negotiations between members and the search for increase in efficiency for members. These collective negotiations are not free from collusive strategies directed by some members against others. Moreover, as pointed above, with the formalization of institutions incentives exist to gain control over the institutional "control levers", initiating internal political competition. Collusion and political competition are nevertheless limited by the need to avoid exit and to attract new members. Generic institutions are "frozen" and submitted to a weaker competition since a generic institutions surpassed its competitors and since all the agents of the society have to comply with the mandatory order. Factors of changes are linked either to radical political shift or "revolution" — a process by which decision-making rights are redistributed without compensation, and therefore without consensus[30] — or by extinction/re-covering — more efficient order that

[28] As pointed out by North (1990), formal institutions arise from compromises between political forces and between politicians and sub-groups within civil society. These compromises can be difficult to reverse, and new compromises can be difficult to draw.

[29] For instance, it appears the French labor law is, to a large extent, evolving along these lines. At a given point in time, the legislation that "regulates" the relationship between employers and employees is both incomplete and not totally adapted, given the pace of technological and managerial innovation. Labor contracts often organize new practices. When these practices grow, framework arrangements are signed at industry level between workers and employers unions to implement common practices. Employers and employees in a given industry consider these "*conventions collectives*" mutually binding arrangements that substitute contractual ones. In some cases, these arrangements are, at the end of the process, passed as laws by parliament, when the latter considers the practices tested in some industries should apply to all the employment relationships in the country.

[30] It is a purely political logic since a group — which can be a majority or minority — capable of imposing change on all the members of the society, without requiring consent, drives evolution. The resulting change can enhance collective efficiency (or wealth), but this is not a necessary condition. Changes can be driven by the logic of private capture of economic power and wealth. It can also be motivated by other logics (e.g. reducing inequalities). Of course, "revolutions" can be pacific, which sometimes occurs in a democratic system when a

gradually replace obsolescent ones (as occurred, for instance, with the ban on interest loans in the Middle Age in Europe; see Pribram, 1983). The first factor leads the members of the kernel to try to avoid revolution either by strengthening power while not taking into account the interests of peripheral groups, or by implementing political regimes that allow negotiations and compromises among groups (even if asymmetries persist). This point is well taken by political economics. It also leads members of the more generic institutions to dedicate a substantial amount of resource in a zero-sum game of political competition. The second factor leads the members of the kernel to try to control the development of local institutions.

### 5.2.2. – Competition and Cooperation Between Local and Central Institutions

There is a de facto competition between sponsors of local institutions, by definition dissatisfied with the coordination solutions provided by the generic institutions, and the sponsors of the later that benefit of the resulting order. Thus, while their primary goal is not to compete with the sponsors of more generic order, but simply to implement local governance solutions that fit their needs, they become objective competitors as soon as they implement these solutions due to the dynamic of competition among local orders, which leads them to extend the scope of application of the rules they design and of the enforcement mechanism they operate.

The strategic reply of the sponsor of the generic order can be competition or cooperation. Competition consists either in combating the emergence of local orders and trying to confine it, or in developing competing orders. The eradication/confinement strategy is costly and doomed to failure. Indeed, emerging local institutions are promoting collective efficiency (even if biased), and the sponsors of the generic institution loose the related benefit if they forbid its development. Losses are in static and dynamic, since emergence leads to competition among local orders that is a strong driver of a seek for efficiency. These efficiency gains benefit to all, including to the sponsors of the more generic orders. More important, agents likely to benefit the most of these positive effects — i.e. the sponsors of the emerging local orders and those who have close preferences and needs — have strong incentives to bypass the generic order. These may hinder the capability of the sponsors of the generic order to prevent the development of local orders. There are thousands of historical

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radical redistribution of rights might be carried out by a changing majority sharply shifting to the opposite side of the political spectrum.

examples of successful bypassing strategies by group of interests who implemented their own order despite oppositions of the sovereign, or of the church, or of the dominant class. This is why another, more likely to succeed, option is to manage adaptation of the generic order. The sponsors of the generic order have therefore to implement changes that fit to the coordination needs and preferences of those groups calling for adaptations and changes. Lack of appropriate knowledge can however weaken such strategies. As pointed out by Hayek, the spontaneous process of emergence of orders via local initiatives and competition among them may well give better results that the designed order by a social planner who inevitably lack of knowledge and can be submitted to information asymmetries.

There is however another option for the sponsors of the generic order, which is to try to cooperate with the sponsors of the emerging local orders to benefit of their innovations while avoiding having them used to surpass the order promoted through the existing generic institutions. On the side of generic order's sponsors, the drivers of this "cooperative" strategy draw of what has just been written. It is a way for them to benefit of the knowledge of the promoters of local orders, who identified weaknesses of the existing order and developed solutions. Implementing these local orders in the generic one — by recognition of the local rules as part of the set of rules constitutive of the generic order —, is a way to enhance the later and hinder parallel initiatives by alternative groups of dissatisfied users. More generally it promotes the efficiency and the competitiveness of the generic order, which reduces the willingness to (directly) compete against its promoters. From the point of view of the sponsors of local orders, there are two drivers. First they generally do not seek to compete against the sponsors of the generic order. They are looking for more efficient coordination solutions. Second, they are competing against promoters of alternative orders, and being backed by the sponsors of the generic order is a strong asset. Thus sponsors of local institutions have incentives to accelerate their transformation into generic and mandatory ones, which is one way of definitively winning the competitive race. This is why they "lobby" authorities in charge of the formal generic institutional systems to have their rules recognized as part of the related order. The laters accept to do so for two reasons. Firstly, it weakens the incentives and ability to bypassing the existing generic orders and confines *de facto* the local authority that recognizes the supremacy of the higher rank one. Secondly, the adoption of a local standard at a generic level reduces the resources and time needed to create a rule, and improves the "reactivity" of the generic institution to external shocks. So there are

mutual incentives for negotiating and coming to agreements.[31] This explains why, in practice, organizations resulting from private institutions lobby public authorities to obtain "recognition" for the self-regulations they organized, or to have the principles of these self-regulations legally implemented.

Two of the drivers of such cooperation between the levels of government are certainly the degree of competition among higher level institutions — as pointed out by North [1990] in his analysis of what happened in Europe among the crowns — and the degree of diversity within the society — which prevent the central level institutions to identify specific needs and design adequate solutions —. Acceleration of pace of needed change is also a potential strong factor that may explain the current movement of increased cooperation among level of governance, often qualified in the literature as "multi-level governance".[32]

# 6. The Driving Factors of Alternative Scenarii

This paper seeks at highlighting that the major factor of institutional transformation is the agents' strategies to promote orders that fits their coordination needs. While all local orders are not led to generalize (because at some point diseconomies of centralization overcome benefits), and while it is not in the intention of agents to have their preferred coordination principles replacing those in force in a given institutional environment, the de-facto competition among orders lead those at their origin — backed by those who benefit the most — to sponsor its development and at least to protect it. This may lead to (explicit or implicit) cooperation process among promoters of orders. As competition, cooperation, can be horizontal and vertical, leading to a wide set of possible options. The implementability of these options can be identified. It results from the pre-existing distribution or resources and preferences and to the depending transactional networks. It also results from the process of emergence of alternative orders. There are therefore strong path dependent dynamics. The success of alternative strategies by orders' sponsors is totally depending upon the choices made by alternative sponsors and coalitions. Due to this combination of path dependent

[31] This falls in line with North's (1990) analysis of the process of institutional evolution through bargaining between civil society and the government influenced by inter-governments rivalry.

[32] As pointed out by Liebet Hooghe and Garry Marks [2001], the notion of multi-level governance — together with others such as multi-tiered governance, polycentric governance, multi-perspectival governance, FOCJ (functional, overlapping, competing jurisdictions), etc. — seeks to describe how governance has been changing in western societies. All refer to the dispersion of authority away from central government, upwards to the supranational level, downwards to subnational jurisdictions, and sideways to public/private networks.

phenomena interplaying with strategic games, it is impossible to draw precise predictions in terms of scenarii more likely to occur in a general context. However, our framework propose a precise list of determining factors that have to be analyzed in a given context to be able to establish predictions and scenarii.

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