

Trust and social capital in the design and evolution of institutions for collective action

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Abstract: This paper aims at developing an original account of trust in the framework of large scale, international collective action institutions. Our research question focuses on the structures and mechanisms that are necessary to sustain the trust needed to uphold the effective operation of institutions for collective action. Our theoretical framework for studying trust is based on the social capital theory. Social capital is defined as the features of social organization, such as trust, networks and norms that facilitate coordination and cooperation for mutual benefit. We claim that in different sectors and contexts stakeholders encounter difficulties in collaborating in setting up experimental institutions for collective action. In order to generate more collaboration, stakeholders need to create structures that incite actors to find better ways to sustain trust, to integrate the

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process of sustaining trust in the organization, and to nourish it with the precise normative idea behind the institutional apparatus. In the plant and biomedical sector, stakeholders have encountered difficulties in sustaining trust while experimenting with different coordination mechanisms for dealing with the increased appropriation of knowledge through patents. Our analysis of some examples from the plant and biomedical sector suggest that institutions could be understood as complex pragmatic connectors of trust, i.e. social matrices of collective action that sustain individual commitment, where routine and reflexivity drive trust-based coordination mechanisms in interaction with their environment.

Keywords: Biomedicine, experimental governance, institutions for collective action, IP coordination mechanisms, plant genetic resources, rational action theory, reflexivity, social capital, trust

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1. Introduction

Intellectual property (IP) rights – and in particular patents – tend to occupy a prominent position in many ongoing debates about so-called “grand challenges”, such as climate change, food security, protection of biodiversity, and global health. IP rights are often closely associated with these challenges and are regarded as one of the reasons for limited access to the fundamental products and services required to address these challenges. Public and private actors have made attempts to create collective action institutions that may assist in facilitating access to these essential technologies and services and in collecting IP rights; examples include the International Treaty on Plant Genetic Resources in Food and Agriculture (ITPGRFA) with its associated Multilateral System of Access and Benefit-Sharing, and the Medicines Patent Pool (MPP). These international collective action institutions require active and voluntary collaboration by the stakeholders concerned. In practice, support for some of these institutions appears to be limited or even in decline: empirical research has shown that a lack of trust may discourage stakeholders from collaborating with this type of institutions (Frison et al. 2011; van Zimmeren et al. 2011a). In the current paper we start off from the conception of “trust” as used by Hardin (2002), according to which trust is nothing more than an encapsulation of private interests. We examine, criticize and develop this conception in more detail in Section 1.1.3 focusing on the notions of “institutional trust” and “social trust”.

The focus and main objective of the current paper is to propose an original theoretical account of mechanisms for sustaining trust in the field of large scale,

international collective action institutions. Our main research question focuses on the structures and mechanisms that are necessary to sustain the trust needed to uphold the effective operation of institutions for collective action. We distinguish two stages in our analysis: first, a theoretical analysis and, second, an illustration of the theoretical analysis based on examples in the plant and biomedical sector derived from prior research (plant sector – Frison et al. 2011; biomedical sector – van Zimmeren 2011; van Zimmeren et al. 2011a,b). The purpose of this paper is not to provide a complete overview of the results of those studies. The studies were carried out independently and use a different methodology (plant sector – edited volume v. biomedical sector – survey and case studies with semi-structured interviews). However, both studies identified problems for collective action institutions in sustaining trust. This similarity triggered an interest in combining some of the results of the studies in a co-authored, interdisciplinary paper exploring the potential of a more theoretical and philosophical analysis of trust based on the social capital theory. In this way, we aim at adding to the literature related to collective action institutions by combining the insights of these two studies in different sectors and by further developing a theoretical account of trust in the framework of collective action institutions.

In the first, theoretical stage of our analysis, we question the dominant understanding of trust in social capital theory and propose a significant revision of it, based on the idea that collective action institutions are complex pragmatic connectors of trust, i.e. social matrices of collective action that sustain individual commitment (Section 1.1). The potential of such a revision lies in its capacity to take into account the complexity of any collective action in a non-reductionist (i.e. not exclusively economic) manner, also when considering the problem of generating trust. In this respect, we emphasize the relevance of the recognition that the emergence of the social capital paradigm goes along with a historical fact: economic liberalization. Social capital is a concept that implies a separation between the economic and the social spheres and a relative subordination of the latter to the former. The idea of social capital as entailing neoliberal principles, and their corollary logics of commodification, privatization, and the associated “legalization”, seem to be at the heart of current challenges of generating trust in complex collective action institutions.

In the second stage of our analysis, some examples derived from prior studies on IP coordination mechanisms for plant genetic resources and biomedicine are used to contextualize and illustrate the theoretical framework (Section 1.2). These examples confirm the importance of trust in collective action institutions suggested by this paper and show the challenges of framing governance proposals that facilitate the generation of trust among stakeholders. They demonstrate that the conceptual shift towards commodification of plant genetic resources and the increase of patented biomedical inventions have resulted in similar challenges in dealing with fragmented resources. Stakeholders in these sectors realize that due to the increased complexity and costs of research and development (R&D), collaboration between different actors, including both private and public

actors, has become vital. Both private and public actors have been cheering the phenomenon of “open innovation” whereby organizations increasingly benefit from the knowledge and experience proliferating outside the boundaries of their organizations by way of “purposive inflows and outflows of knowledge to accelerate internal innovation and expand the markets for external use of innovation” (Chesbrough et al. 2008, 2; Chesbrough 2003, 2006). Open innovation occurs between a wide range of – often *unobvious* (Piller et al. 2011) – external partners, such as customers, suppliers, competitors, universities, public research organizations, investors, intermediaries, consumer organizations, farmer’s organizations, and non-governmental organizations (NGOs), all of whom have different profiles and interests. Such knowledge flows can be facilitated through a wide range of *formal* and *informal* organizational modes, like in- and out-licensing agreements, R&D alliances, consortia, networks, patent pools, open source, and crowdsourcing platforms. Yet, we observe problems at the level of stakeholders that are active on emerging markets for intangible goods often previously understood as “commons”. Open innovation does not always entail a similar “openness” and innovative attitude with regard to access to IP rights. Once IP rights are involved, many actors adopt a more controlling, defensive stance. In order to facilitate these “open” collaborations, nourishing trust is fundamental in each stage of the creation and evolution of these expert institutions that collect, develop, and relay resources, knowledge, and/or IP in a network of diverse stakeholders.

We would like to emphasize that the objective of the current paper is not to criticize the social capital theory by applying it to concrete examples dealing with IP coordination mechanisms, but rather to uncover a similar logic of capitalization that may affect collective action theory and particular governance projects. The paper is based on the assumption that the general commodification of knowledge and resources has led to “crowding-out” and “anti-commons” effects, and that a theoretical focus on trust within the social capital paradigm will provide us, not only with the conceptual means to better understand the challenges in sustaining institutional trust at stake in our illustrative examples, but will also lead to some governance recommendations in terms of experimentalism.

1.1. Stage 1: Theoretical account of collective action institutions, social capital and trust

Our theoretical reasoning describes a particular aspect of the motivational risks related to any form of collective action: the disengagement of actors due to the instrumental understanding of trust proposed by the commoditized approach of social capital. Trust tends to be understood in functionalist terms as a peculiar social mechanism reducing uncertainty (Luhmann 1979). In the collective action field, trust is regarded as a safeguard to deliver optimal outcome – meaning the least expensive outcome – when facing collective action dilemmas, by replacing a constant risk calculus with a routine cooperation. Different levels of trust exist

(from familiarity to civility), but their result is similar: a suspension of the judgment that lubricates social interactions. In this context, institutions are understood as trust producers, which assist in preventing defection and opportunism. But by observing institutions solely in function of this particular purpose, meaning stimulating cooperation, constitutes a reduction of their inherent complexity. By analyzing the concept of social capital that relies on a commodification of social interactions, we will show why it is essential to consider trust and institutions as complex social products that cannot simply be created and evaluated on the basis of the capitalization logic.

Social capital can be defined as features of social organization, such as networks, norms and trust that facilitate coordination and cooperation for mutual benefit (Putnam 1993, 35; Ostrom and Ahn 2003). The success of the social capital theory seems to reflect the stranglehold of a neoliberal set of beliefs on our contemporary socio-economic reality. After all, the development of a certain theory cannot be isolated from its timeframe and its social embedding. Propositions upheld by a particular theory are aimed at explaining specific phenomena and problems, and are, thus, deeply influenced by the values and norms governing that theory's timeframe and place. Of course, we do not claim that all theories regarding social capital are an instantiation of neoliberal ideology. However, the logic of capitalization within social capital theory and its corollary of the reification of social connections align well with trends of commodification of plant genetic resources and biotechnological inventions. The core proposition of this reasoning is that, by separating the economic and the social realms, and by giving priority to the economic realm over the social realm, social capital theory justifies an instrumental logic and limits the opportunities to criticize normative choices from a social perspective.

We argue that a dual focus on power relations and social learning is essential in the context of the institutionalization of trust, and that most of the conceptualizations of social capital do not reflect that dual focus. Because trust is essentially a *suspension of judgment* (Simmel 1987; Möllering 2006), it implies a reflexive development of its modalities and institutional mechanisms. Suspension, meaning a leap into the otherness of the relation, constitutes the essential but complicated component of trust: without it, there is only a pantomime of trust. Indeed, reason is only one element in the concretization of trust, and social capital theory tends to overlook that. This results in a lack of attention regarding the interaction between power and social stakes, which can only be overcome by increasing reflexivity. The kind of reflexivity that we promote responds to needs identified by the diverse collective action disciplines and enables experimental governance (Dorf and Sabel 1998; Sabel and Zeitlin 2008) as an institutional product of philosophical pragmatism (Peirce 1992; Dewey 1998).

1.1.1. Institutionalism and collective action

Institutionalism has emerged in the social sciences in order to better understand the radical bureaucratization of the modern society as observed by Max Weber

(1978). Initially, the institutionalist movement explained the functioning of institutions and their influence on society. The concept of an “institution” was then conceived in its formal dimension in terms of concrete organizational structures. However, institutionalism also clarifies the paradigmatic expansion of Rational Action Theory (RAT). The fundamental idea of RAT is to provide a framework that explains the whole spectrum of human activity on the basis of an instrumentalist and individualist perspective. Principles such as *homo oeconomicus*, self-interest and utility maximization, stable preferences and efficient markets entered social theory through the powerful and highly explanatory RAT despite (or due to) its reductionist nature.² Based on the development of game theory, RAT became the main paradigm in collective action research, and the free riding issue revealed itself as its challenging core. As Mancur Olson famously stated, “unless the number of individuals is quite small, or unless there is coercion or some other special device to make individuals act in their common interest, *rational, self-interested individuals will not act to achieve their common or group interests*” (Olson 1965, 2). Institutions in RAT are, thus, perceived as coercive structures of cooperation.

The development of “new institutionalism” relied on the combination of the formal and informal dimension of the social game. Two breakthrough studies – *The New Institutionalism: Organizational Factors in Political Life* (March and Olsen 1984) and *The Economic Institutions of Capitalism* (Williamson 1985) – focused on the contextual aspects of institutions and their impact on policy implementation or the market equilibrium. History, culture and normativity were integrated into the scope of the collective action reflection. By way of this contextualization, the neoinstitutional paradigm created important bridges between social and economic disciplines, and the conception of actors and their motivations became more complex.³ This is why new institutionalism acknowledges that a simplistic treatment of motivational determinants of collective action is likely to lead to poor policy-making. The institutional features and the extrinsic and intrinsic motivations are closely related. Motivation crowding theory teaches us that in some cases, (inadequate) extrinsic motivations – such as monetary incentives – may undermine or “crowd out” intrinsic motivations (Frey and Oberholzer-Gee 1997; Frey and Jegen 2001). Three institutional features are essential in considering actual “crowding-out” or “crowding-in” effects (Frey 1997). First, to what extent is the institutional intervention perceived as legitimate and adequate? Second, to

² Russell Hardin, one of the advocates of RAT and the famous promoter of a rationalist approach to trust, describes RAT as follows: “Rational choice theory is the descendant of earlier philosophical political economy. Its core is the effort to explain and sometimes to justify collective results of individuals acting from their own individual motivations – usually their own self-interest, but sometimes far more general concerns that can be included under the rubric of preferences” (Hardin 1998, 64).

³ As we will see with respect to the social capital theory, it appeared that new institutionalism provided the leverage to integrate the individualist methodology at the core of RAT into the realm of social sciences, enabling the “translation” of purely utilitarian principles into political sciences (public choice theory), economics (neoclassical theory) and sociology.

what extent is participation in the collective action institution voluntary? Third, to what extent is the collective action institution either supporting or restricting the stakeholders concerned?

Trust, norms and networks are resources that permit one to go beyond the collective action dilemmas. If these resources are present, they will render the best outcomes (i.e. the least expensive) in situations of free riding, overexploitation of shared resources (“tragedy of the commons”), or myopic non-cooperation (“prisoners’ dilemma”). Communities with an important stock of social capital, in other words, with intense interconnectivity between its members, are better equipped to generate and sustain collective action. The concept of social capital refers basically to three collective action issues derived from different disciplinary approaches. First, institutional economics invokes social capital through the notion of “credible commitments” in order to reduce transaction costs in contracts (Williamson 1993; Karpik 1996; Hardin 1999). Second, political sociology focuses on the notion of power within social capital (Bourdieu 1972; Fine 2001; Ishihara and Pascual 2008). Third, sociological and philosophical research focuses on the complexity of its social nature and the need for learning mechanisms in building common values (McNiell 2007; Quéré 2009; Six 2013). The main objective of all these approaches is to overcome the anti-commons and crowding-out effects (Frey and Oberholzer-Gee 1997; Frey 2001).

1.1.2. Social capital: its potential and risks

The social capital theory developed with the publication of Robert Putnam’s *Making Democracy Work* (1993). Putnam emphasizes the idea that institutional performance is directly linked to the social context within which formal governance structures operate. Putnam based his theory on his analysis of civic traditions in modern Italy, and he sees in associativity the core principle of the democratic project. Influenced by the seminal work of Elinor Ostrom in *Governing the Commons*, Putnam relies on her definition of a “successful” institutional arrangement as an arrangement “that [enables] individuals to achieve productive outcomes in situations where temptations to free-ride and shirk are ever present” (Ostrom 1990, 15). Putnam mobilizes the concept of social capital in order to crystallize the nature of social normativity that makes democracy work. It is considered “capital” because it is a set of resources with productive capacities, but it should be distinguished from human and physical capital. According to Putnam, social capital results in trust through civic networks, norms of reciprocity, and associative organizations (such as guilds, clubs, neighborhood or religious associations). A community that has inherited a substantial stock of social capital will generate more voluntary cooperation.

Using this interpretation of social capital may increase our understanding of how cultural, social, and institutional characteristics of communities jointly affect their capacity to deal with collective action problems (Ostrom and Ahn 2003). Therefore, it is essential to understand how social capital can be built and sustained.

Furthermore, it seems even more vital to interrogate how such civic networks are created and maintained, and to question the nature of interactions between citizens and institutions. The capitalization of social factors is a fundamental concept of social capital theory that requires further thinking. Even though the potential of social capital theory to explain collective action issues could be considerable, we believe that its conceptualization has been insufficiently directed in the literature. In developing a theoretical account based on social capital, one should carefully consider the reasons and the logic behind its emergence.

Hence, an important question is whether a reductionist principle is at stake within the associative mechanism of the social capital theory. In Putnam's analysis, the answer to this question is far from clear. Indeed, his references to James S. Coleman's social capital theory (Coleman 1988) indicate that Putnam may not have fully grasped the risk of utilitarian reductionism. James Coleman sought to create a sociological paradigm based on the powerful principles of RAT (Coleman 1988). According to Coleman, every social interaction can be explained by an analogy with market interactions. Human behaviors are strictly guided by their private interest, and the social realm is nothing less than an abstraction that results in the aggregation of all non-personal factors. Similar to neoclassical economy, decisions are taken on the basis of the organizational principle of a perfect market and individual choices are the *modus operandi* of collective action. Individual values and beliefs are only relevant in terms of their influence on economic behavior. Coleman defends a theory of social exchange, according to which only long-term cooperative relations between rational actors guided by their own private interests are capable of explaining social exchange. Consequently, the social system only consists of individualistic solutions to individual problems without consideration of the potential consequences of these actions for others. For Coleman, this is how social norms constitute social capital (Coleman 1988, 101). Norms and institutions are the aggregate result of economic negotiations aimed at maintaining cooperation through their coercive impact. Similar to other forms of capital, social capital would act as a resource that enables the functioning of the social system through principles of interest and control. So, according to Coleman, social capital is an economic variable functionally defined by its control by the stakeholders and legitimized by the realization of their interests.

The economist Ben Fine has extensively criticized the social capital paradigm (Fine 2001). Fine argues that the fundamental risk of the social capital theory is inherent in its core assumptions. First, if social capital exists, it means that other forms of capital are not social. Any use of the term social capital is an implicit acceptance of the stance of mainstream economics, in which capital is first and foremost a set of asocial endowments possessed by individuals rather than, for example, an exploitative relation between classes and the broader underlying social relations that sustain them. Second, social capital theory would also require a separation between the social and the economic spheres. The hypothetical-deductive epistemology of the latter would give us the key to understand and explain the former. According to Fine, both assumptions are wrong. Capital is

social by essence. Any form of capital is social to the extent that power relations are implied through the capital production. The denial of the fluid nature of capital leads to an erosion of the concept. Starting from the premise that capital is inherently linked to social aspects, it is important to evaluate its contextual impact and the implied power relations (Ishihara and Pascual 2008). Putnam's social capital approach seems to focus only on the use of social interactions by individual actors in order to create efficient institutions. Yet, institutions are far more complex social constructs that require an analysis in terms of their powerful influence on the actors.

1.1.3. Trust

Our questioning of social capital theory can be extended and expanded through the analysis of its conception of trust.⁴ The trust phenomenon is at the heart of the social bond and is often used as a common explanatory feature of the success of collective action. But to regard trust as a resource that is simply created through the free encounter of supposedly equal actors in negotiation would be, once again, a very strong statement relying on a very simplistic social logic. The trust concept at stake within the social capital paradigm appears to rely only on neoliberal values of community formation.

According to Hardin, trust is nothing more than an encapsulation of private interests. He states that, "I trust you because I think it is in your interest to take my interests in the relevant matter seriously in the following sense: you value the continuation of our relationship, and you therefore have your own interests in taking my interests into account" (Hardin 2002, 2). This proposition fits well within the social capital paradigm. In fact, the main focus of Hardin is on trustworthiness, rather than on trust. One trusts someone with respect to the expected realization of some future event. The reason why networks are producing trust is because people fear retaliation by the others if they appear to be untrustworthy; hence, this is an issue of *public recognition*. Hardin claims that norms produce trust, because citizens know that they may pay a social cost if they do not respect them; hence, this is an issue of *public control*. Like in Coleman's theory, trust is regarded as a micro-phenomenon – A trusts B to do X – that explains macro-outcomes, such as social norms and institutions (Coleman 1990).

Hardin, Coleman and Putnam refer to the neoliberal principle of a society as a free market. However, all three of them are aware of the necessity to have strong central institutions in order to "maintain peace" and collaboration in line with the principle of mutual advantage – the aggregation of individual consent – as the

⁴ Unfortunately, neither Robert Putnam nor James Coleman explores the concept of trust in great detail. They simply use the concept of trust and tend to mix it with social capital. To understand how they perceive trust, we will refer to the famous trust theory of political scientist Russell Hardin (2002). The reasons for integrating Hardin's trust theory into the current discourse are twofold. First, the rational choice institutionalism defended by Hardin shares similarities with Putnam's work. Secondly, Hardin refers in his work to the social capital account realized by Coleman (Hardin 1999).

basis of law. “What seems to be evident is that individuals who are left to their own values commonly have strong welfarist preferences. Market economic and liberal political institutions allow them to pursue those values” (Hardin 2001, 6). In Hardin’s theory, institutions are only understood by their *control and enforcement functions*. They guarantee the respect for free conditions for interpersonal negotiation exclusively aimed at the realization of welfarist preferences.

Will this instrumental explanation of institutions and trust be able to do justice to their complexity? Probably not: trust encompasses an element of *routine* that cannot be fully explained by such a rational action approach. Several trust modalities cannot be based on a private interest calculus. Philip Pettit calls this the “cunning” of trust: whenever a trusting request is put in motion, people naturally tend to respond positively (Pettit 1995). Simply presenting a trustworthy attitude automatically raises some sort of expectation of the relationship at stake.⁵ We do not support a notion of social trust obligation, but rather an optimistic grounding of social trust. This fundamental trust basis is the product of informal institutions, norms and their underlying heterogeneous values (i.e. not only interest-based values). As aforementioned, to trust is a *suspension of judgment* that permits a relational commitment through a complex web of beliefs. And this intrinsic force, the energy produced through this kind of commitment, should be taken into account if we want to improve our understanding of trust problems within collective action institutions.

We do not claim that this routine conceptualization of trust is better than the RAT approach towards trust, but we start from the presumption that they can coexist and complement each other. The rationalist account does not allow a complete reflection in terms of the routine beliefs revision process. And these kinds of processes seem to become key features for our complex and globalized societies. Using the famous distinction made by Niklas Luhmann (1979) between “trust” (active – to trust) and “confidence” (passive – to be confident), the philosopher Adam Seligman explains one important issue of modernity. He describes a decreasing interpersonal capacity to trust our peers coupled with an increasing propensity to simply be confident on the functional capacities of institutions and the social organization (Seligman 1997). In other words, people tend to trust each other through the law,⁶ without reporting some prior deliberation or inquiry. Relying on the powerful processes of rationalization and legalization of the social sphere, neoliberal political economy and its capitalist program have been able to diffuse its core set of beliefs where the success of one is the success of all. At the same time, they have removed the individual propensity to actively revise this exact set of beliefs by denying

⁵ For example, what could possibly justify the credit given to directions given by a total stranger in the street? What is one’s interest in giving such indications, and losing time in the process?

⁶ Jean L. Cohen also claims that legalization itself, in particular the expansion of personal individual rights and entitlement claims, may indeed be one of the most important factors of the disintegration of civil society and civic capacities (Cohen 1999).

a complex idea of the collectivity, because the collectivity only exists as a collection of individualities. Through the secularization of the principles of financial liquidity and of consumerism, capitalism has imposed the idea that only contractual negotiations are able to generate social trust. In doing this, capitalism has effectively contributed to the disintegration of civil society and civic capacities (Cohen 1999; Piketty 2014) and has erected barriers for a collectively reflexive process.

We contend that trust also reveals a routine aspect and a complex reflexive mechanism (Möllering 2006) at the core of the social bond, which connects individuality to sociality through a more optimistic notion of the abilities to interact and to manage the environment (Ostrom 1990; Sabel 1993). A full analysis of this aspect requires a reflexive concept of trustful cooperation that will automatically address its vulnerability issue in the process, but not as its central issue. The RAT paradigm seems inapt to provide an adequate understanding of social trust. Trust, far from resulting in the aggregation of individuals' optimization calculations or in a given social attitude, constitutes not only the beginning but also the evidence of a reflexive process that is the basis of every social bond. Reflexivity is the process that enables the creation of a bond between the individual actor and his social context. The intrinsic limits within the strictly rational and routine aspects of trust could be understood as qualitative impoverishments of institutional and social trust. The concepts "institution" and "trust" should be understood for what they really are: complex social constructs that show the vividness of the social bond.

1.1.4. Institutional trust and pragmatism

Which governance lessons can we draw from our criticism of social capital and trust? In accordance with social capital theory, it is clear that the performance of any kind of institution is highly dependent on the democratic vividness of its related communities. However, gathering actors and promoting their connectedness in order to stimulate them to cooperate in line with their private interests is insufficient. The empowerment of the stakeholders should focus on an evaluation of the evolution of their values, because it is impossible to implement a radical shift in economic behavior. Institutional trust can only be achieved through the collective experimentation of its modalities.

Pragmatism claims that the accuracy and the efficiency of an idea or a policy can only be assessed on the basis of its practical effects, which suppose an inquiry made by a community of interest (Peirce 1992; Dewey 1998). The pragmatist turn has convincingly undermined the epistemic dichotomy between fact and value by exposing their "entanglement" (Putnam 2002). One cannot expect changes in individuals' habits without motivating them to engage in a reflexive understanding of the proposed norm. Their contextual routines and their underlying values are our key concern. We promote such a pragmatist perspective not only for reasons related to its flexibility and its respect of social complexity, but especially in view of the trust conception that it conveys in the relationship between individuals

and institutions. In our understanding of this perspective, a potential way to create and to sustain trust is by working from local experimentation towards global implication (Dedeurwaerdere 2010). New governance projects should aim at a complete reflexivity by establishing institutions through a process that enables actors to measure the collective advantages that arise from the routine adjustment and the cognitive revision. In other words, institutional structures have an essential task in providing opportunities for the stakeholders (1) to understand the institution as a collective entity with particular values (Pettit 2004); (2) to experiment with and experience various models to optimize the functioning of the collective entity, and (3) to evaluate its actions, process them, learn, and adapt to the needs of the civic community.

The essential feature of our theoretical framework is then the idea that collective action institutions must be understood as complex pragmatic connectors of trust, i.e. social matrices of collective action that sustain individual commitment, where routine and reflexivity drive trust-based coordination mechanisms in interaction with their environment. The success of the normative stabilization by the central managing authority depends on its own procedures in response to constant social destabilization and contextual tuning, in order to be able to grasp the wealth and complexity of the rationalities on which trust inherently relies. Institutional trust can, thus, act as basis for social trust, but a reflexive connection between the two is mandatory. The institution needs to enable the stakeholders to understand it as a collective entity with particular values, assisting them in experimenting with different collective action models and adapting its operation to the needs of the civic community.

1.2. Stage 2: Illustration by two empirical studies

Our analysis of the bond between institutions and trust has shown that some theories focus on the vulnerability of cooperation and collective action, providing thus a rather skeptical account of sociality. In our view, skepticism about the actors' capacities to cooperate and solve collective action problems results from the absorption of sociality by a rationalist logic of capitalization. The neoliberal evolutions with respect to IP rights has led to the disappearance, or perhaps even a denial by some to consider other more personal, social and ethical motivations in the institutional discussion. As a result, stakeholders become increasingly dependent on the legal framework and contracts to regulate their interactions. What's really at stake is, however, their capacity to truly negotiate and discuss the object of their attention, i.e. trustworthy institutions.

As an illustration of this theoretical analysis, we present the results of two studies that deal with the institutionalization of IP rights. These studies clarify the "crowding-out" impact of the commodification logic that is occurring in the plant genetic resources and biomedical sector. Moreover, the studies question the belief that "translating" genetic resources and knowledge into marketable

goods, and setting up institutions to facilitate the exchange of those goods can solve collective action problems appropriately without building a proper trust basis within the governance system. Although stakeholders may have an interest in the well functioning of these utilitarian institutions, more may be required to drive voluntary collaboration. Indeed, in each of the examples described, trustworthy cooperation was expected to automatically emerge from the creation of an international treaty or contractual arrangement, relying on particular networks of knowledge created by interested actors. However, such social capital contributions were inapt to solve some collective action issues since the power of the capitalist interests at stake are not appropriately considered. More precisely, the will to create social capital by drafting an international treaty or a contractual arrangement is insufficient since it is based on a simple vision of the social sphere as a market.

These institutions may be unable to achieve an adequate level of reflexivity because they are regarded as risk attenuation artifacts of trust strictly understood as a rational phenomenon. This reflexive requirement can be ascertained through transparency and exchange of knowledge (Dorf and Sabel 1998; Sabel and Zeitlin 2008) as the best and easiest way to create and nurture both internally and externally a climate of trust behind the normative idea of the institution (Quéré 2009; Six 2013). In order to deal with motivational problems flowing from the commodification logic, institutional arrangements that do not solely rely on the same logic, and that foresee space for destabilization of economic and utilitarian beliefs, should be used. The creation of trust *between* actors *involved in/part of* an institution depends, thus, on their opportunities to rely on and take into consideration alternative social and ethical values.

In the next sections, we first describe more generally the trend to commodify resources and knowledge by way of IP rights (Section 1.2.1) followed by a description of two illustrative examples in the sector of plant genetic resources (Section 1.2.2) and biomedicine (Section 1.2.3) based on prior (empirical) research.

1.2.1. Commodification of resources and knowledge

Exclusive IP rights, in particular patents, are common tools to sustain the neoliberal market logic. Patents enable their owners to prevent others from making, using, offering for sale, selling, or importing the protected inventions for a certain period of time and in a particular jurisdiction, when these third parties engage in these activities without the patent owner's consent.⁷ A variety of justifications for the grant of patent rights exist. The three most common utilitarian justifications emphasize the need to create external motivations for inventors to engage in innovation. The first justification focuses on the need to stimulate research and development (R&D) and to enable protection against free

⁷ See Article 28(1)(a) of the Agreement on Trade-related aspects of Intellectual Property Rights (TRIPs-Agreement).

riding. The second justification suggests that patent owners would deserve this temporary, exclusive reward in exchange for their investments in innovation. It is presumed that without these rewards, inventors would not be inclined to make these investments, in particular for sectors such as the biomedical sector, where investments in R&D tend to be significant. The third justification is based on the concept of the social contract; a “contract” between the patent owner and society, which grants the owner a temporary exclusive right as a *quid pro quo* for the disclosure of the invention.

In many jurisdictions, patentable subject-matter has gradually expanded and encompasses biological material. This expansion aligns well with Frey’s criteria for crowding out effects listed in Section 1.1.1. The legitimacy of the expansion of patentable subject-matter has been questioned widely (Van Overwalle and van Zimmeren 2009). There is great heterogeneity among the profiles and interests of stakeholders in the plant and biomedical sector. As a result, the idea of granting exclusive rights for biological materials is not shared by all. Yet, some may feel obliged to participate in the appropriation cycle at the risk of becoming excluded. In some areas, patent rights have become extremely diffused and fragmented amongst a variety of patent owners, sometimes called “patent thickets”. This may restrict essential access to these resources for some stakeholders. The result of increased appropriation through external incentives may, hence, crowd-out intrinsic motivations and result in a loss of the non-economic aspects of essential resources: the conservation of the common heritage of mankind and concerns about access to public health.

1.2.2. A treaty-based IP coordination mechanism in the plant sector: the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)

Typically, farmers have always developed, conserved, and widely exchanged various plant genetic resources, i.e. crop and forage varieties (Pistorius 1997; Fowler and Hodgkin 2004).⁸ Until the middle of the twentieth century, public researchers and plant breeders continued these open patterns of use through trustworthy collaborations (Klose 1950). Since the 1960s, the rise of modern biotechnology and new national and international regulations for the control of biological resources has led to the “enclosure” of plant genetic resources for food and agriculture (PGRFA). The two major examples of enclosure of PGRFA are

⁸ “When it comes to food security, all countries share something important and fundamental. All depend on crops domesticated in distant lands during the Neolithic era. As crops, the maize grown in Africa, the wheat that blankets the Canadian prairies, and the potatoes cultivated on more than 10 million acres in China are botanical immigrants, and old ones at that. None are native to those lands [...]. Directly or indirectly, therefore, the world’s six billion people depend on crops and, thus, on genetic resources that would not normally be found in and are not part of the indigenous flora of their country. The questions of farmer and breeder access to and of availability of genetic resources – seeds, plants, and plant parts useful in crop breeding, research, or conservation for their genetic attributes – are of tremendous importance” (Fowler and Hodgkin 2004, 144).

the International Union for the Protection of New Varieties of Plants (UPOV) 1991 Convention and the Convention on Biological Diversity (CBD) (1992) UPOV 1991 defines so-called plant breeders' rights (UPOV 1991 Art. 14 et seq) which strongly limit farmers' use of cultivated plant varieties, and the CBD explicitly recognizes States' sovereign rights to control the access to biological material under their jurisdiction (Art. 15). De facto it resulted in a strict bilateral, contractual approach in terms of access to these resources. Paradoxically, the general feeling of "misappropriation" through IP rights of formerly freely accessible material led to increased 'public' control of these resources through the CBD access and benefit-sharing mechanism. Yet this mechanism, despite its constructive objectives, ultimately reduced the availability of PGRFA (ten Kate and Laird 2000). Access to PGRFA has been limited significantly in this process, in particular for small farmers who remain mostly outside the 'agro-industry market loop', and who are increasingly unable to support themselves.

Therefore, facilitating access to PGRFA has become a priority for the United Nations Food and Agriculture Organization (FAO). FAO has created various institutions to safeguard wide public access and equitable benefit sharing, i.e. an intergovernmental Commission on Genetic Resources for Food and Agriculture, the International Undertaking on Plant Genetic Resources, and the ITPGRFA, with its associated Multilateral System of Access and Benefit-Sharing (MLS). The MLS aims at contributing to the economic development of small entrepreneurial farmers and breeding companies in competition with large companies by facilitating access to a list of PGRFA. In addition, it provides for the sharing of benefits derived from the commercialization of products and is aimed at facilitating the development of improved and diverse crop varieties in order to answer the challenges of producing food and other crops and forages in a more sustainable and cost-effective manner (Frison et al. 2010).

Frison, López, and Esquinas-Alcázar collected the views of a wide variety of ITPGRFA stakeholders by inviting them to write a contribution to an edited volume (Frison et al. 2011). They provide an additional level of analysis by including an extensive introduction and conclusion to the book exploring the views of the different stakeholders. Several 'stakeholder authors' contend in the book that a growing distrust between stakeholders is one of the consequences of the conceptual shift towards commodification. One can also turn this around, arguing that stakeholders shifted from free access to commodification of PGRFA due to a growing distrust. However, we tend to agree with the view that the dialogue between stakeholders gradually got distorted since IP rights limited the access and availability of PGRFA, resulting in increased distrust between the PGRFA actors (Mooney 2011). Indeed, privatization of PGRFA disturbed the prior existing intense interconnectivity between stakeholders by rendering PGRFA exchanges increasingly complex (Aoki 2008). The increased variety of PGRFA stakeholders with different interests seems to explain this weakened interconnectivity and growing distrust. These developments severely challenged the functioning of the ITPGRFA, during its conception (structural challenges) and

during its implementation (operational challenges), resulting in a decrease of the collective action efficiency in the plant sector.

Basically, IP coordination mechanisms are meant to overcome complex situations of fragmented IP rights. In the field of plant genetic resources, the MLS is based on an international treaty and, hence, operates in a rather politicized context. The structural design of the MLS, its terms and conditions, are established in the Standard Material Transfer Agreement (SMTA). A core feature of the MLS consists of mechanisms for the equitable and fair sharing of benefits arising from the commercialization of a PGRFA product covered by the ITPGRFA. A recipient of material from the MLS, who commercializes a product that incorporates material accessed from the MLS, must pay an equitable share of the benefits to a fund. This compulsory payment obligation is only applicable if further access to the material or product is restricted by the recipient, for instance through IP rights. Otherwise payment is voluntary.⁹ However, since the start of the implementation of the Treaty in 2007, stakeholders highlighted the difficulties that have slowed down the process, such as the heavy administrative burden to manage the flow of SMTAs, the costs related to the processing of SMTAs, the tracking obligation of the material, and the identification and notification of countries' PGRFA to the MLS list.

Tackling these operational challenges requires the modification of the Treaty. However, even relatively small policy or operational changes have to be approved by the Governing Body of the ITPGRFA, the Governing Body being the highest organ of the Treaty. Composed of country representatives from all the Contracting Parties, its basic function is to promote the full implementation of the Treaty. Decisions are generally taken by consensus. The politicized nature of the main decision-making body may alienate stakeholders from the actual operation of the mechanism. Their values may not be clearly represented within the complex governance scheme due to the distance between an international treaty-based coordination mechanisms and their day-to-day life. More detailed and extensive empirical research is necessary to verify the causality of these claims and to test whether it was actually the treaty-based structure and the politicized decision-making process that has led to an alienation of the stakeholders and ultimately to a disruption of the chain of direct experimental feedbacks and a decline of trust. Such detailed empirical research could also contribute to proposing different solutions to overcome the decline of trust and to generate support for those solutions amongst stakeholders.

⁹ Besides the mandatory payments to the benefit-sharing fund, voluntary payments can be made by anybody: industries, foundations, international organizations, etc. Article 13 provides that access to PGRFA, exchange of information, access to and transfer of technology, capacity building and the sharing of monetary and other benefits of commercialization are part of the benefit-sharing system of the MLS. Moreover, recipients are encouraged to place a sample of the product developed using MLS material into a collection that is part of the MLS, for research and breeding. Recipients shall also make available to the MLS all non-confidential information that results from research and development carried out on the material (SMTA, Article 6.9).

Still, by creating the prospect of an open and experimental dialogue amongst stakeholders, instead of the top-down principles of the Governing Body's decisions, a "forumization" and a "democratization" of the ITPGRFA may lead to the revitalization of *and* by its actors, in line with its initial normative idea and value system. Various approaches could be adopted in parallel. For instance, the development of an "Informal Multi-Stakeholder Dialogue" organized before the next Governing Body meeting in 2015, allowing all PGRFA stakeholders to propose solutions to enhance the functioning of the MLS. This approach, welcomed by a decision of the Fifth Governing Body,¹⁰ would significantly contribute to the democratization of the PGRFA discussion. Moreover, closer collaboration with the FAO Committee on World Food Security (CFS), which is aimed at being the most inclusive international and intergovernmental platform for all stakeholders in the area of food security,¹¹ could regenerate trust between different PGRFA stakeholders by allowing them an equal voice.

1.2.3. A contractual IP coordination mechanism the biomedical sector: patent pools

In the biomedical sector, pharmaceutical companies have traditionally used patents as a strategic mechanism to safeguard their R&D investments for new compounds and to maintain their monopoly position, enabling them to charge high prices for medicines. However, increasingly, academics and NGOs have been criticizing the use of such strategies with respect to medicines for patients in developing countries and the lack of R&D investments in neglected diseases. In response, important initiatives have been taken in setting up a variety of public-private partnerships, bilateral collaborations, and projects by individual pharmaceutical companies to deal with global health problems by increasing investments in neglected diseases. In parallel, the emergence of modern biotechnology has resulted in new types of technologies, diagnostic tools, therapies and treatments characterized by a higher number of components and level of complexity. Patenting strategies for these complex technologies have sometimes resulted in a "crowded" patent landscape. Even though an actual "tragedy of the anti-commons" in biomedical research (Hardin and Eisenberg 1998) may not yet have occurred, in some fields companies have encountered serious difficulties in negotiating licenses for further R&D and

¹⁰ In its resolution 2/2013 §7, the Governing Body "Welcomes the organization of an informal multi-stakeholder dialogue to enhance the functioning of the Multilateral System and increase contributions to the Benefit-sharing Fund, which may provide input to the Ad Hoc Working Group".

¹¹ The CFS is unique for its inclusive multi-stakeholder structure: all principal international agencies are represented on the formal Advisory Group to the member governments, as well as are civil society organizations (CSOs), through the civil society mechanism, or CSM. The CSM includes small-scale family farmers, fisher folk, herders, landless, urban poor, agricultural and food workers, women, youth, consumers and indigenous peoples, as well as international NGOs (Duncan and Barling 2012).

the provision of health services (Merz et al. 2002; Cook-Deegan et al. 2009; Huys et al. 2009).

Stakeholders in the biomedical sector have shown a growing interest in collaboration through public-private R&D alliances in response to the needs of developing countries. In addition, some attempts have been made to establish patent coordination mechanisms, such as patent pools or clearinghouses (for more information, see van Zimmeren et al. 2011a), that could further facilitate such collaborations. Interestingly, similar coordination mechanisms have existed for a long time in other sectors, such as consumer electronics and telecommunications, and have been quite successful. Nevertheless, a survey regarding IP coordination mechanisms in the biomedical sector (van Zimmeren et al. 2011a,b) amongst 177 respondents identified risks relating to trusting this type of institutions as a cause of concern.¹² Many respondents did not have any experience with these type of mechanisms and expressed doubts whether they would be willing to experiment with and participate in such a mechanism. Apart from a group of respondents who indicated that they did not see the need for complex IP coordination mechanisms for their organization, another group of respondents was concerned about loss of secrecy, loss of control and loss of exclusivity. These worries seem to be in line with the described commodification logic, which is characterized by private appropriation and control.

Despite the fact that IP coordination mechanisms have not been common in the biomedical sector, recently two public international organizations (i.e. UNITAID and WIPO) and one private entity (MPEG LA) have initiated IP coordination mechanisms in this sector, respectively the Medicines Patent Pool (MPP), WIPO:Research and Librassay™ (van Zimmeren 2011; van Zimmeren et al. 2011a). It is important to emphasize that the MPP and WIPO:Research should be distinguished from “traditional” pooling mechanisms, which are initiated by private parties and concluded on the basis of purely private contractual arrangements. The first example, the MPP, was established and funded as a separate legal entity in 2009 by UNITAID. The MPP negotiates licenses with patent holders to key HIV

¹² It is important to note that the problem of institutional trust originally had not been identified as such in the survey questionnaire. However, in the commentary boxes of the survey several respondents qualified concerns about the complexity of IP exchange and the risks of a lack of expertise of the operators and management of coordination mechanisms as a trust issue. One respondent to the survey explained more specifically that “[n]o competent company would entrust a clearing house [a specific type of IP coordination mechanism] with key patents. Therefore the only use for such a mechanism would be to try and get value for non-core technology”. In other words, IP coordination mechanisms in this area would unlikely be used to exchange key patents, but may be considered with respect to less valuable or less important IP rights. Stakeholders also suggested that (institutional) trust may be sustained by employing patent and licensing experts with a high level of expertise and experience in the particular business and technology field (van Zimmeren et al. 2011b). During an expert workshop with stakeholders from the biomedical industry dedicated to testing the provisional results of the survey (Workshop Survey Patent Licensing in Medical Biotechnology in Europe, Leuven, February 6, 2009), institutional trust was also frequently raised by stakeholders as a cause for concern.

medicines, making them available to generic companies and other manufacturers to produce low cost HIV treatments for use in developing countries. In 2011, our second example, WIPO Re:Search, was formed through the efforts of several major pharmaceutical companies, the World Intellectual Property Organization (WIPO) and BIO Ventures for Global Health. WIPO Re:Search has a broader scope than the MPP. It provides access to IP for pharmaceutical compounds, technologies, know-how, and data available for research and development for neglected tropical diseases, tuberculosis, and malaria. Third, MPEG LA, a private patent pool administrator in the field of telecommunications and consumer electronics, established the Librassay™ diagnostics patent supermarket in 2012. Librassay™ is a kind of web based store offering nonexclusive, nondiscriminatory access to a wide range of molecular diagnostic patent rights in support of tests for the diagnosis of disease, patient monitoring and personalized treatment.

The MPP, WIPO Re:Search and Librassay™ have been widely acknowledged as interesting experiments for their potential role in safeguarding access to essential health assets. However, others have also criticized these models – in particular NGOs such as Médecins sans Frontières – for not going far enough. Unfortunately, the attitude towards these models of some key patent owners has been quite reluctant.

During its establishment phase, the MPP encountered a certain reserve amongst many relevant patent owners (<http://www.medicinespatentpool.org/current-licences/>). In the beginning primarily the US National Institutes of Health granted a license to the MPP (2010). In 2011, this public entity was followed by the first company to collaborate with the pool, Gilead, and in 2013 ViiV Healthcare (GlaxoSmithKline, Pfizer, Shionogi), Roche and Bristol-Myers Squibb followed Gilead's example. Some patent owners are still in negotiation with the pool, others have explicitly indicated that they do not wish to collaborate with the MPP (e.g. Johnson & Johnson). The experiences of the MPP may provide some lessons regarding the set-up and functioning of this type of IP coordination mechanism. Firstly, the governance of the pool: if one of the major stakeholders is not clearly represented in the governance structure, a perception of bias may arise. Moreover, the role of certain key individuals within the organization and their background and expertise may reinforce this negative perception. The MPP is an independent Swiss Foundation set up and funded (for the initial five years) by UNITAID.¹³ The pool has a governance board, expert advisory group and an executive team. Most of the members of the governance board, advisory group and executive team are high-level international health professionals. The majority of these professionals previously worked either for NGOs in the area of access to medicines or for the

¹³ UNITAID is a rather atypical organization. Even though its name may suggest a link with the United Nations, UNITAID was launched in 2006 by Brazil, Chile, France, Norway and the United Kingdom in order to create an international drug purchase facility financed with resources that would be both sustainable and predictable. The funding is based on a tax on airline tickets, as this was regarded the most appropriate means of providing sustainable funding.

generic industry. However, the main aim of the MPP is to negotiate licenses with key HIV medicines patent owners in order to sublicense generic companies and other manufacturers allowing them to produce low cost HIV treatments for use in developing countries. Yet, this essential role of patent owners does not seem to be represented in MPPs governance structure. There is no representation of the major patent owners within the governance system of the pool. This may give the impression that the experts responsible for the operation of the pool may not fully comprehend or share patent owners' interests, values and concerns. A complete lack of representation of such an essential stakeholder seems a delicate issue if one wants to build a trust-based relationship with key patent owners. Despite the independent legal nature of the MPP and its laudable aims to operate in a transparent and accountable manner by making its statutes, by-laws, transparency policy and licenses publicly available, these attempts for good governance may not be sufficient to overcome certain negative perceptions.

A logical follow-up to this first lesson is the experience of key personnel of the coordination mechanism in working in similar organizations and their expertise. Patent owners who have partnered with a certain organization in the past, or who are well aware of the expertise and skills covered by a certain organization, may be more willing to open up to such an organization. This may prove particularly effective if that organization takes a low profile, nuanced initial stance while strongly supporting certain shared values and objectives. This more "neutral" position and shared values may be important reasons why WIPO Re:Search and Librassay™ seem to have been encountering less opposition from private actors than the MPP. In particular, Librassay™ can build on over ten years of experience of MPEG LA in pooling patent licenses in other sectors. Despite their limited expertise in licensing in the biomedical sector, the partnering, matching, and negotiating process will be similar and MPEG LA has all the necessary skills and capacity on board. Moreover, both WIPO Re:Search and Librassay™ initially adopted a low profile approach to sense the interest of the relevant stakeholders in the coordination mechanism. Such a low profile approach seems to leave more space for experimentation and mutual consultation in order to achieve a gradual, reflexive establishment of trust.

1.2.4. Towards experimental governance

Food security, biodiversity and global health issues are quite complex, particularly because they are dynamic concepts. This dynamic nature renders not only their solutions, but also their definition rather problematic. The level of complexity might be so high that it is even difficult to simply identify the problem, which makes them "wicked problems". Therefore, bottom-up collective action institutions seem particularly appropriate in complementing other measures for dealing with wicked problems: someone, somewhere, may be confronted with a particular problem before others observe that same issue, and should be enabled to pull the alarm. Similarly, if someone finds a solution to a problem, others should be enabled to hear about it, to experiment with it and to learn from the solution-finder. Even if

the underlying normative idea is authoritatively determined and hierarchically institutionalized, its interpretation and application should be responsive to the particularities of the context. Actors should be able to elaborate on the values underlying the institutions, and share experiences about successes or failures. This mechanism is the core principle of *experimental governance*. Experimental governance focuses on enabling different groups to test the implementation of a normative idea and to share their successes and failures (Dorf and Sabel 1998; Sabel and Zeitlin 2008). The governance principles proposed by social scientist Charles Sabel are based on a pragmatist epistemological model. It relies on an optimistic perspective of the actor and its reflexive construction of trust, rather than on a socio-skeptical perspective (Sabel 1993).

But more fundamentally, the analysis of the treaty based coordination mechanism (ITPGRFA) and the contract-based coordination mechanism (patent pools and clearinghouses in the biomedical sector) illustrate the limits of commodification logic. They provide some examples indicating how exclusive reliance on markets, where institutions are organized as top-down initiatives driven by formal or informal coercive principles, may undermine the non-economic sources of trust. More precisely, the studies demonstrate why trust sustained by such coercive principles becomes irrelevant when a deep discrepancy of values is prevalent. Instead of expecting stakeholders to surrender secrecy, control and exclusivity due to extrinsic and monetary incentives, the bottom-up recreation of a trustworthy expert collective action institution around alternative values could render the institution more sustainable. These alternative values would reflect common informal norms on biodiversity, biotechnology ethics, and a sense of openness and collaboration. The legitimation of such values goes beyond the rationalist explanation of trust formation based on notions of *control* and *private interests*.

The examples reflect the need to promote and sustain coordination mechanisms for IP to facilitate the confrontation with global grand challenges. Whereas this assertion seems to be shared widely, the main challenge lies in deciding on how to implement such principles. We have explored the key issue that seems to block the effective implementation of such models: the resilience of economic beliefs behind the present strategic equilibrium. Our core proposition is to incite actors to participate in the reflexive redefinition of trustworthy normative contexts built around an alternative set of food security, biodiversity protection and global health values. It is essential to include a wide variety of stakeholders in negotiating the concrete modalities in order to sustain their commitment and avoid exit strategies. At the same time, it is essential to emphasize their inscription in a large network of such commitments, and to inform them about failed and successful mechanisms.

2. Conclusion

Whereas both the ITPGRFA and the MPP rely on interesting and well-intentioned governance propositions to create and sustain, through the creation of social

capital, a trustworthy cooperation between stakeholders, they may not have been sufficiently radical in terms of destabilization of mercantile behavior. The normative idea behind the creation of institutional structures may promote positive cooperation, but if its interpretation by stakeholders in context is not allowed, it is unlikely that it will generate a level of trust that is appropriate for the effective operation of the collective action models. To sum up, for solving collective action problems associated with the commodification logic developed for decades in many sectors of human activity, we need both conceptual tools and regulative arrangements that do not rely on a reductionist perspective whereby sociality is understood exclusively as a free market of self-interested exchanges between stakeholders.

As we have pointed out, the main challenge for collective action institutions for plant genetic resources and biomedicine is to reinsert social considerations in domains guided by principles of profitability and return on investment. Although these principles may be essential in view of the viability of economic activities, they should also be evaluated in terms of their legitimacy and support for broader social values. However, by the time stakeholders finally observe the risks of the capitalist logic, the commodification and privatization inherent in IP coordination mechanisms may already have been ossified to the point that their renegotiation becomes extremely complicated. Even if the will to change may be present, as is shown by the interest in open innovation and social responsibility (van Zimmeren 2011), the strategic equilibrium in place may not allow sufficient flexibility for change without raising important trust issues.

The trust issues at stake in the examples is essentially assessed as the result of a lack of openness to the interests and programmatic skills of stakeholders, and the incapacity to experiment with various models in the creation and evolution of these institutions. In order to create and sustain trust, stakeholders need to be part of the institutional game from the beginning. Mechanisms of knowledge exchange, innovation, and commitment to sustainability should be deployed and their functioning and normative program should be evaluated by the collective intelligence. The key issue in understanding the dynamics of an experimental network lies precisely in the perspective of the social mechanism of trust as a phenomenon that grows and improves through its reflexive practice and decreases through its resistance to arbitrary coercive measures.

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